

# When Healing Becomes Educating

Selected Articles from the  
*Journal of Anthroposophical Medicine*  
(1986-1998)

**Volume III:**

**Planets and Plants  
in the Healing Processes**



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**PLANETS AND PLANTS  
IN THE  
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*When Healing Becomes Educating*

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# Potentization and the Peripheral Forces of Nature\*

GEORGE ADAMS, MA (Cantab)

## INTRODUCTION

### Protective Geometry and Amnesia

One of the minor pleasures of studying homeopathy is its sense of history, which contrasts so sharply with the ahistoricity of mainstream medicine. Most doctors feel that there was no real medicine before the discovery of Penicillin (but this is little more than a feeling, for there is virtually no teaching of medical history in medical schools). Before Penicillin all seems to have been darkness, pierced only by an occasional brilliant shaft of light associated with a great name—a Harvey, Virchow or Pasteur—but since 1940 all is clarity and reason. This is, of course, a highly distorted image.

In homeopathy, we have a much greater sense of continuity, indeed we rest too much on our laurels, accepting far too readily the opinions of famous teachers of the past. Yet while every word of Hahnemann or Kent is treated with exaggerated reverence, other important historic discoveries originating in homeopathy are almost forgotten. Hering it was who introduced nitrates into medicine (Glonoine)—a fact which was recalled recently in the journal *Circulation*, but almost forgotten by his heirs in homeopathy. Reilly, in researching his recent work on hayfever, discovered that hayfever was first correctly attributed to pollen allergy by Blackley, a British homeopath.

Many other episodes of intellectual amnesia among homeopaths could be cited. This seems to be mainly a short-term memory loss; more recent contributions are less likely to be remembered than older ones! It is for this reason that I make no apology for reprinting, from time to time, classical but neglected pieces of work. The paper which follows, “Potentization and the Peripheral Forces of Nature” by George Adams, is based on a lecture given at the 1961 British Homeopathic Congress. To judge from the congress report, and the recollections of those who were present, it aroused great excitement at the time. Certainly it has important implications for the nature of extreme dilutions, implications which are not widely recognized,

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and have not been developed, but instead have fallen victim to our collective short-term memory loss.

- Peter Fisher, MB, Hon. editor of the *British Homeopathic Journal*

Dr. Twentyman, Ladies and Gentlemen:

May I begin by saying that I feel it a great privilege and satisfaction to be invited as a layman to address this Congress. My theme will be to tell of new ideas and discoveries—well founded, though still in their initial stages—which, among other things, should contribute to the long desired scientific explanation of the effectiveness of high potencies in medicine. Let me remind you to begin with where the difficulty lies. For generations past the effectiveness of high potencies has been a fact of experience for the physician and of untold benefit to countless patients. Also in recent decades, in the work of L. Kolisko,<sup>1</sup> Boyd<sup>2</sup> and others, it has been experimentally established by biological as well as purely physical and chemical reactions. Yet it is difficult to account for, both in the light of rough and ready common sense and of prevailing scientific notions. The chemist who surmises that a particular component present in small quantities in a solution or mixture, is responsible for some physical, or physiological effect, will contrive by distillation, crystallization or the like to concentrate it. His theory is confirmed if the effect increases; thus with Madame Curie, when with endless pains she extracted a few grams of radium from tons of pitchblende. Why, in the preparation of homeopathic remedies, do we dilute instead of concentrating? I am, of course, aware that potencies are no mere dilutions. “Dilution alone,” says Hahnemann, “say when a grain of common salt is dissolved, produces the merest water. Diluted with a vast amount of water, the salt simply disappears. This never makes it into a medicine. Yet by our well-prepared dynamizations the medicinal virtue of common salt is wondrously revealed and enhanced.”<sup>3</sup> Nevertheless, there is no denying that among other things the potentizing or dynamizing process does dilute the substance and in so doing brings forth its virtue. To quote Hahnemann again: “The homeopathic dilution of medicaments brings about no reduction, but on the contrary a true enhancement of their medicinal virtues; thus our dilutions represent a truly wonderful unveiling, nay more, a calling-to-life of the medicinal and healing spirit of the substance.”

The down-to-earth, common sense difficulty of understanding how this can be, is reinforced by the prevailing molecular theories of matter, according to which the number of molecules in a gram-molecule of any substance is of the order of  $10^{23}$ . The exact figure, variously known as Avogadro’s or Loschmidt’s number, has been found consistently by several

methods. In terms of molecular theory, therefore, starting with a normal solution and with the normal technique of potentization, by the 23rd or 24th decimal potency only a single molecule would be left, and from then onward it is ever more unlikely that even this will be there in the medicine bottle or ampule bearing the name of the substance! Ways of escape from this theoretical dilemma have indeed been suggested by the more recent theories of physics. The Nineteenth Century conceived the molecules or their constituent atoms more or less naïvely as ultimate and self-contained pieces of matter. The atoms and subatomic ‘particles’—protons, electrons, and so on, in terms of which even the chemical affinities and biological effects of substance are today explained—have become purely ideal entities figuring in recondite mathematical equations. Thinking of the mysterious duality of particle and wave, the philosophically minded physicist can even aver with scientific reason that with its sphere of influence each single atom is co-extensive with the entire universe. Some people therefore pin their hopes on a future science of biophysics in which the subtle influences of life will be illumined by the idealized conceptions of atomic physics. Yet it should not be forgotten that the experiments and discoveries on which the latter are based have been increasingly remote from the realm of living things, depending as they do on the deliberate enhancement of conditions—high values, high-tension electric fields and the resulting radiations and ‘bombardments’—downright inimical to life. It is therefore better to regard the apparent gulf between the experience of homeopathic medicine and the conventional scientific outlook in a wider historic setting, not only in terms of the ever-changing theories of Twentieth-Century physics.

The growth of physical science from the times of Galileo and Torricelli, Newton, Boyle and Huyghens, Dalton, Lavoisier and Faraday down to the present day is a wonderful chapter in the intellectual and spiritual history of mankind. Hahnemann’s long life (1755–1843) spans an important period in this development, leading from the celestial mechanics of the Eighteenth to the electro-magnetic theories and growing chemical discoveries of the Nineteenth Century. Still in his youth when hydrogen and the composition of water are discovered, he is in his prime when Dalton enunciates the atomic theory, Cavendish in 1772 confirms the inverse-square law in electrostatics, Oersted and Ohm make their discoveries on the electric current in the 1820s, and Faraday’s electro-magnetic researches culminate in 1831. In 1828 Wöhler’s synthesis of urea undermines the old vitalist ideas of organic chemistry which Hahnemann—himself a creative chemist—still entertained in common with his contemporaries.

It is well to remember this when reading Hahnemann's forms of expression, which as I shall hope to show are scientifically important to this day. For the vitalism, inevitably abandoned in its old philosophic form, the vagueness of which stood in the way of true research, can now be reborn on a clear and scientific basis. Hahnemann's vitalism underlies his use of the word 'dynamic' and the noun 'dynamis' which he adopts, or coins for himself. "From the beginning," says Tischner, "his notion of the vital force prevailing in the living body was essentially spiritual."<sup>4</sup> He attributes illnesses to immaterial, dynamic causes, and in his essay of 1801 describes the medicinal effects of high dilutions as 'dynamic' rather than 'atomic'—a contrast the literal significance of which will, I hope, emerge in the course of this lecture. We also have to remember that the clear distinction of energy and matter and the law of conservation of energy were not yet current in Hahnemann's day. The 'mechanical equivalent of heat' was discovered by Mayer and Joule almost exactly at the time of his death (1842–1845). Heat, light and other energies—bio- and psychological as well as physical, even including 'animal magnetism,' for example—were until then still being thought of as tenuous if not imponderable substances. The supposed substance of warmth was called 'caloric.' Lavoisier in 1789 still included heat and light among the chemical elements. Rumford's experiment was widely supposed to have released the 'caloric' from the iron made hot by friction. Even in 1824, when in his *Puissance motrice du feu* Carnot in effect discovered the second law of thermodynamics, soon to become a cornerstone of physics, he still interpreted it in terms of 'caloric.' Perhaps this idea of imponderable essences is in the light of present-day ideas no longer quite so wide of the mark as it might have seemed sixty years ago. It should at any rate be borne in mind when reading Hahnemann's expressions, when for example he describes as *feinstofflich*, 'delicately substantial,' or as 'virtual' or 'well-nigh spiritual' the medicinal effects set free from the material during the rhythmic processes of dilution, trituration and succussion.

I have deliberately drawn attention to these aspects. The history of science is not the unidirectional process which neatly finished textbooks lead one to suppose. Many streams run side by side; the most essential discoveries, experimental or theoretical, may lie unnoticed for decades till a fresh aspect emerges to reveal their importance.

Let us consider for a moment in a human and historic spirit what it was that gave the orthodox scientific outlook its strength, accounting too for the intolerance with which the claims of homeopathy have only too often been met. It was the combination of an instinctive and robust materialism with the mathematical clarity and cogency of theories supported by experiment and observation. The instinctive materialism is well illustrated by the story

of Dr. Johnson's angry reaction after listening to a sermon in which Bishop Berkeley put forward his idealistic theory of the world. 'I refute it thus,' the learned doctor exclaims, kicking his foot against a stone. In scientific atomism until the close of the Nineteenth Century, Johnson's stone—vastly reduced in spatial but proportionately grown in spiritual dimensions—became the highly satisfying football, better perhaps the baseball, of science. For it is this intuitive feeling of the ultimate reality of tangible material things which underlies the older forms of scientific atomism. It is a very genuine element in the consciousness of Western man throughout the Seventeenth to Nineteenth Centuries, inseparable from the age of exploration, the growth of natural history and of artistic naturalism, the dawn of industrialism. Nor is it out of harmony with the patriarchal, simply believing, strongly Old Testament forms of religion then prevailing.

Yet the instinctive materialism is reinforced by another, more ideal factor—and this alone accounts for the spiritual tenacity of a materialistic science—namely, the confidence born of the intellectual clarity and probity of mathematical thinking. It is too apt to be forgotten how many purely ideal, in other words spiritual, elements are built into the resulting scientific system. Mathematics is an activity of pure thought, and in the past (if not in the extreme formalism and empty nominalism which is now the fashion) was never quite remote from philosophical and even religious thinking. Certainly Isaac Newton, whom we may justly think of as the founder of modern physics, was in his own dominant interests a philosopher, even a theologian, as for example his correspondence with Henry More and the Cambridge Platonists reveals. For all the scientific care and scepticism sincerely voiced in his '*Hypotheses non fingo*' he—who was afterwards to describe his Universal Space as 'the sensorium of God'—built into his *Principia*, in formal quality if not in intention, an almost theological masonry of thought. The implications of it were but inverted by the French atheists and rationalists! Over a century later, other Englishmen of philosophic and religious disposition brought a like clarity of geometrical imagination and mathematical analysis into the rising science of electric and magnetic forces. I refer, of course, to Faraday and Clerk Maxwell. It is this mathematical element in physics which gives it strength and power—power for technical uses, strength in its influence upon our mental outlook. There is an element of tragedy in this, for the resulting system becomes a rigid framework barring access to the more spiritual aspects of reality, of which the truths of homeopathic medicine are an example. But the spiritual power of geometrical and mathematical thinking which has helped build this framework can also help in the much needed release. Of this I am about to tell.

Till about half a century ago—the time of Einstein and Minkowski—the space in which the real events of the universe were supposed to be taking place was that of Euclid, the geometry of which we learn at school. It is the space measured in finite and rigid lengths, or areas and volumes based on the measurement of length. It is determined by the well-known laws of parallelism and of the right angle, as in the theorem of Pythagoras or in the statement that opposite sides of a parallelogram are equal. The same type of space was held to prevail down to the smallest and up to the largest dimensions. Inward and outward, the identical scale of length leads to the millimicrons of atomic science and to the parsecs and light-years of astronomical speculation. What happens when a straight line is extended to the infinite, was held to be an idle question, of philosophic interest perhaps, but beyond the effective range of science.

Occasionally, scientists of the Nineteenth Century—W.K. Clifford, for example—reflected that cosmic space might after all be ‘non-Euclidean,’ its structure differing from the Euclidean to so slight an extent as to escape our instruments of measurement. But neither this nor Einstein’s four-dimensional space-time did more than modify the profoundly Euclidean—I might also call it earthly—way of thinking about space and the realities it contains. This is so taken for granted as to be difficult to describe; few people realize that there is any other way. Space is conceived as a vast empty container—the Irishman’s box without sides, top or bottom—populated (in some regions more and in others less densely) by point-centered bodies sending their forces and radiations to one another. It becomes a field of manifold potential forces, but the real sources of activity are, once again, point-centered—material or at least quasi-material—bodies. Apart from these, there would be emptiness, mere nothing. That, surely, is a fair description, both of the popular idea and of the mathematical analysis.

As against this, I now have to tell of what opens out quite new possibilities, both of pure thought and of insight into the realities of nature. For in the Seventeenth to Nineteenth Centuries, while physicists and astronomers were busily applying to their problems the ancient geometry of Euclid—rendered more handy and more elegant but in no way altered by the new analytical methods of Descartes, Leibniz and Newton—among pure mathematicians a new form of geometry was arising. It is a form which, while including the Euclidean among other aspects, is far more comprehensive, also more beautiful and more profound. I refer to the school of geometry variously known as protective geometry, modern synthetic geometry, or the geometry of position. In the Seventeenth Century its truths began to be apprehended by the astronomer Kepler and the mystical philosopher Pascal, also by

Pascal's teacher, Girard Desargues, a less known but historically important figure. It was, however, in the early Nineteenth Century, about the last twenty years of Hahnemann's own life, that the new geometry really began to blossom forth. Once again, French mathematicians—among them Poncelet, Gergonne and Michel Chasles—were the pioneers, soon to be followed by a few brilliant thinkers in Switzerland and Germany, England, Italy and other countries. Largely unnoticed save among pure mathematicians, upon whose thought it was to have a deep and lasting influence, it grew into an ever wider insight, which by the end of the century was seen to embrace most if not all of the known forms of geometry, Euclidean and non-Euclidean alike. Today, as I shall presently contend, it opens out new ways of understanding nature—above all, living nature and the subtler, more spiritual forces which the intuitive genius of Hahnemann was perceiving.

Like that of Euclid, projective geometry is not only a discipline of pure thought, resting securely on its own ideal premises or axioms; it is also related to practical experience, though to begin with in a rather different direction. Our experience of the spatial world is above all visual and tactile. There are indeed other and less conscious senses—senses more 'proprioceptive' of our own spatial body both in itself and in its interaction with the world, such as the sense of movement and that of balance—to which our spatial awareness and geometrical faculty are largely due. But in our outward consciousness it is the sense of touch and that of sight which reinforce and confirm geometrical reasoning and imagination. Now the geometry of Euclid relates above all to the sense of touch; hence too its natural connection with a scientific outlook taking its start from tangible material things. The inch, the foot, the yard, derive from our own body. We measure as we touch the earth, foot by foot and step by step, or in the rhythmic act of measurement with fingertip and yardstick. By tactile experiences we confirm the constant distance between parallels, the symmetry laws of the right angle. We even prove the first theorem of Euclid by the imagined tactile experiment of applying one triangle to another. But our experience of space is also visual, and as such far more extensive, more manifold and satisfying. We see things we can never touch by hand or foot or tool; our vision reaches to the infinite horizon and to the stars. Now in the Fifteenth to Seventeenth Centuries the beginnings of modern science coincided with the increasingly naturalistic art of the Renaissance. Both were inspired by the same love of nature and wish to penetrate her secrets. So as to give an outwardly 'true' picture of the scenes of landscape and the forms and works of men, artists such as Leonardo da Vinci and Dürer studied the science of perspective vision, which from its practical and aesthetic applications presently gave birth to

a new purely geometrical discipline—to wit, projective geometry. The latter therefore naturally deals not only with tangible and finite forms but with the infinite distance of space, represented as these are by the vanishing lines and vanishing points of perspective. Thus in the new geometry the infinitely distant is treated realistically, in a way that was foreign to the classical geometry of Euclid and the Greeks.

To include the infinitely distant, sometimes referred to as the ‘ideal elements’ of space, no less definitely than those at a finite distance, is a bold step in thought, and is rewarded by a twofold insight of an importance hitherto unsuspected for the science of living things.<sup>1</sup> Attention is focused no longer on rigid forms such as the square or the circle, but on mobile types of form, changing into one another in the diverse aspects of perspective, or other kinds of geometrical transformation. In Euclid, for instance, we take our start from the rigid form of the circle, sharply distinguished from the ellipse, parabola and hyperbola, as are these from one another. In projective geometry it is the ‘conic section’ in general of which the pure idea arises in the mind and of which various constructions are envisaged. As in real life the circular opening of a lampshade will appear in many forms of ellipse while moving about the room, or as the opening of a bicycle lamp projects on to the road in sundry hyperbolic forms, so in pure thought we follow the transformations from one form of conic section to another. Strictly speaking, the ‘conic section’ of projective geometry is neither circle, ellipse, parabola, nor hyperbola; it is a purely ideal form, out of which all of these arise, much as in Goethe’s botany<sup>5</sup> the ‘archetypal leaf is not identical with any particular variety or metamorphosis of leaf (foliage leaf varying in shape from node to node, petal, carpel and so on) but underlies them all. The new geometry begets a quality of spatial thinking akin to the metamorphoses of living form.

The other insight<sup>2</sup> is perhaps even more important. Projective geometry recognizes as the deepest law of spatial structure an underlying polarity which to begin with may be called, in simple and imaginative language, a polarity of expansion and contraction, the terms being meant in a qualitative and very mobile sense. (If I now illustrate by using, after all, some of the more rigid and symmetrical forms, the limitations of which I have just referred to, it is only to make it easier by starting with familiar pictures.) Think of a sphere—not the internal volume but the pure form of the surface. One sphere can only differ from another as to size; apart from that, the form is the same. Now the expansion and contraction of a sphere leads to two ultimate limits. Contracted to the uttermost, the sphere turns into a point; expanded, into a plane. The latter transformation, though calling for more careful reflection, is no less necessary than the former. A large spherical

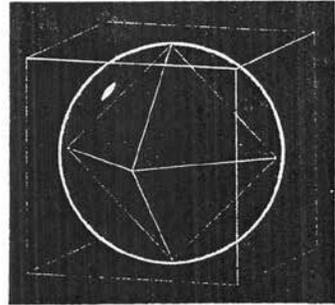
surface is less intensely curved than a small one; in other words, it is flatter. So long as it can still grow flatter, a sphere has not yet been expanded to the utmost limit, which can only be the absolute flatness of a plane.

The above experiment in thought—the ultimate contraction and expansion of a sphere—leads in the right direction. Point and plane prove to be the basic entities of three-dimensional space—that is, the space of our universe and of the human imagination. Speaking qualitatively, the point is the quintessence of contraction, the plane of expansion. Here comes the fundamental difference as against both the old geometry of Euclid and the naïve and rather earthly spatial notions which culminate in a onesidedly atomistic outlook. For in the light of the new geometry, three-dimensional space can equally well be formed from the plane inward as from the point outward. The one approach is no more basic than the other. In the old-fashioned explanation, we start from the point as the entity of no dimension. Moving the point, say from left to right, we obtain the straight line as the first dimension; moving the line forward and backward, we get the two dimensions of the plane; finally, moving the plane upward and downward, the full three dimensions. To modern geometry this way of thinking is still valid, but it is only half the truth—one of two polar-opposite aspects, the interweaving harmony of which is the real essence of spatial structure. In the other and complementary aspect we should start from the plane and work inward. To mention only the first step: Just as the movement of a point into a second point evokes the straight line that joins the two, so does the movement of a plane into a second plane give rise to the straight line in which the two planes interpenetrate. We can continue moving in the same line and obtain a whole sheaf of planes, like the leaves of an open book or a door swinging on its hinges. We thus obtain a ‘line of planes,’ as in the former instance a ‘line of points.’ In the space-creating polarity of point and plane, the straight line plays an intermediate role, equally balanced in either direction. Just as two points of space always determine the unique straight line which joins them, so do two planes: We only need to recognize that parallel planes too have a straight line in common; namely, the infinitely distant line of either. At last we see that all the intuitively given relationships of points, lines and planes have this dual or polar aspect. Whatever is true of planes in relation to lines and points, is equally true of points in relation to lines and planes. Three points, for example, not in line, determine a single plane (principle of the tripod), but so do three planes, not in line (e.g., the ceiling and two adjoining walls of a room) determine a single point. The planes must again be extended to the infinite and thought of as a whole to see that this is true without exception.

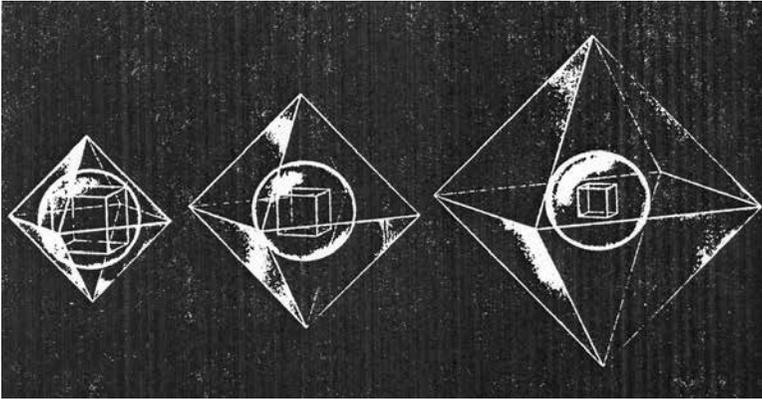
All spatial forms are ultimately made of points, lines, and planes. Even a plastic surface or a curve in space consists of an infinite and continuous sequence, not only of points, but of tangent lines and tangent or osculating planes. The mutual balance of these aspects—pointwise and planar, with the linewise aspect intermediating—gives us a deeper insight into the essence of plasticity than the old-fashioned, one-sidedly pointwise treatment.

The outcome is that whatever geometrical form or law we may conceive, there will always be a sister form, a sister law equally valid, in which the roles of point and plane are interchanged. Or else the form we thought of—as for example a tetrahedron with its equal number of points and planes—proves to be its own sister form, arising ideally out of itself by the polar interchange of point and plane. The principle just enunciated, as it were a master-key among the truths of projective geometry, is known as ‘the principle of duality.’ It would perhaps have been better had it been described as a ‘principle of polarity’ from the outset, for in its cosmic aspect it is also one of the essential keys to the manifold polarities of nature. The recognition of it leads to a form of scientific thinking calculated to transcend one-sided atomism and materialistic bias.

A simple instance is shown in Figure 1. A sphere is placed inside a cube just large enough to contain it. Touching the six planes of the cube, the sphere picks out six points of contact. Joined three by three, the latter give eight planes, forming the double pyramid of the octahedron. Octahedron and cube are sister forms, in polar relation to one another. The structure and number relations are the same, only with plane and point—the principles of expansion and contraction—interchanged. The octahedron has eight planes, each of them bearing a triangle or triad of points and of the lines that join them; so has the cube eight points, each of them bearing a triad of planes and lines. The octahedron on the other hand has six points or apices, each with a fourfold structure, answering to the cube with its six four-square planes. The number of straight lines or edges is the same in each, namely, twelve.



The sphere is only one of many spatial forms which evoke the polarity of plane and point—qualitatively speaking, of expansion and contraction. It does so not only by actual contact as in Figure 1. For any given plane in space, the presence of a sphere evokes a point; for any given point, a plane. I cannot stop to explain the comparatively simple construction by means of



which this happens. The mutual relation is literally one of expansion and contraction, as shown in Figure 2. Here, on the left, we see the positions of cube and octahedron reversed as compared with Figure 1. The sphere is just large enough to fit inside the octahedron, touching the eight planes at the mid points of the triangular faces. The points of contact obviously mark the eight corner-points of a cube, which is now inside the sphere. In the middle corner-points of a cube, which is now inside the sphere. In the middle and right-hand pictures the size of the spheres is left unaltered, while in imagination we have deliberately caused the cube to contract towards the center. The sphere preserves the mutual relation of cube and octahedron, only the octahedron now has to expand. For in the same proportion as the eight points of the cube recede, inwards from the surface of the sphere toward the center, the corresponding planes hover outward, causing the octahedron to expand even as the cube contracts. In the right-hand picture the cube is in linear dimensions half, the octahedron twice as big as on the left.

We can imagine the same process continued 'to the bitter end.' The octahedron quickly grows outward into the spatial universe. For when the cube is a hundred times smaller, the octahedron will be a hundred times bigger than before. And when at last the cube disappears, its eight corner-points merging into the single center, we must imagine the eight planes of the octahedron coalescing in a single plane—the infinite periphery of space. For the infinitely distant taken as a whole in all directions—as it were, the infinite sphere of space—being of infinite radius, is no longer a sphere at all in the ordinary sense (just as a sphere contracted to a point is no longer a true sphere); it is a plane. We thus arrive at another of the basic concepts of the new geometry; namely, the single infinitely distant plane qua infinite

periphery of space. It is the presence of this unique plane which from the indeterminate and ever mobile forms of pure projective space helps to produce the more rigidly determined space of the physical world, in other words the space of Euclid. We need only think of parallelism. Parallel lines and planes are those that meet at an infinite distance. Now as the crystals in nature and human works of architecture show, parallelism plays an essential part in all the laws and measures of the physically spatial world. To the laws of parallelism must be added those of the right angle and of angular measure generally. These, too, are determined from the infinite periphery inward. The way in which this happens would take too long to explain in the present context, but the fact is evident, for we bear witness to it in every act of mensuration, when we take our sightings from the most distant points available—to be exact, from infinitely distant points.

Now my contention is that these ideas—the fundamentally planar and not only pointwise structure of universal space, and the mutually balanced relation of contractive and expansive, or centric and peripheral qualities, known to pure mathematicians for well over a hundred years—should at long last be taken seriously in our understanding of real nature. The same thing was suggested a few years ago by Professor H.W. Turnbull,<sup>6</sup> editor of Newton's correspondence now in course of publication. "In the realm of growth and form," writes Professor Turnbull, referring to the pointwise and planewise aspects, "both analyses are significant. The seed, the stem and the leaf of a plant suggest two ways of studying the three-dimensional shape, the one pointwise microscopically and the other planewise." He also draws attention to the fact that the relative completeness of a pointwise analysis, reached at a certain scientific stage, neither excludes nor is vitiated by the polar opposite aspect which may still be awaiting discovery. "This mathematical duality is not a case of competing theories, where one is right and the other is wrong ... The characteristic description of their relationship is that of in and through, but not of for or against." It is only a deeper and fuller insight which we may expect along these lines. Surely it is not unreasonable to suppose that nature is built on the same principles which light up in the mind of man when he exercises one of the noblest of human faculties—that of clear geometric thinking and imagination.

Let us now turn from the world of pure form to that of active forces. Here once again, since Newton, Faraday and Clerk Maxwell, clear geometrical and mathematical thinking has enabled us to master the play of physical forces, such as the force of gravitation, the momentum of heavy bodies, the electric and magnetic forces. Primarily, we know of these not by dint of thought alone, but by experiment and observation. Unlike that

of velocities or of accelerations (though some of the textbooks fail to make this clear), the 'parallelogram of forces' cannot be proved by any reasoning or definition; it is a fact of experience, confirmed as accurately as we like by many kinds of experiment. But though we only know of them empirically to begin with, nature reveals that in their interplay and balance the physical forces obey mathematical laws. When we discover these laws and bring our minds into harmony with them, we learn to understand and master the play of forces. Hence all the power of our applied science and technology. Now it is characteristic of nearly all the forces known to physics that they are point-centered. These are the kind of forces which emanate from heavy matter; it is only natural that we have found them first, since physical science took its start from mechanics—from the investigation of the cruder properties of matter. But this was also due to the prevailing forms of thought. Man naturally notices what he is wont to think, and things escape his notice even if he sees them if the idea that is in them is foreign to his mind. Through his Euclidean schooling, the spatial thinking of the scientist has hitherto been one-sidedly centric and pointwise. He has the mental equipment for understanding centric forces; no wonder if he finds them.

For the sake of brevity may I now put as a categorical statement what I certainly do not intend thus dogmatically, for like any other scientific proposition it is only stated to be put to the test. The forces of nature, manifesting in the world of space and time, are not only centric; there are peripheral forces also. Even as the pure form of space is in the light of modern geometry balanced between point and plane, so are the forces that prevail in nature; they are not only pointwise or centric but peripheral or planar. Moreover, as in the domain of centric forces the central point of the material planet on which we live, in other words the center of gravity of the earth, is for us a center of primary importance, so in the realm of the peripheral or planar forces, what we experience as the infinitely distant plane—in simple language the vast periphery of the blue sky—is a most important source of the peripheral forces.

This, I shall now endeavour to explain, is an ideal key to what you are really doing when you enhance the power of your medicaments by the rhythmic process of expansion or dilution. But let me first point out that the idea of peripheral forces is not altogether new. Under the name of 'ethereal forces' or by other kindred forms of description they have been known since time immemorial. In the East, their reality has never ceased to be recognized. They only need to be re-discovered in terms of modern science. In the Seventeenth Century a more or less instinctive knowledge of them still lingered on traditionally, but had grown so confused that the

new science, based on experiment and reason, could make nothing of it. Tradition undoubtedly helped give rise to Huyghens' idea of a 'luminiferous ether,' but this too was interpreted in terms of physical and centric forces and was to that extent a misunderstanding, which has in any case been abandoned by Twentieth-Century physics. The new geometry on the other hand, grown to maturity during the Nineteenth Century, gives us the possibility of understanding the ethereal qua peripheral forces in a strictly scientific sense. They are forces related above all to the realm of life, just as the centric forces—gravitational, electro-magnetic and so on—manifest most strongly in the sphere of inorganic matter. By sensitive and spiritually developed, people, though often called by different names or not named at all, they can be known from direct experience.

The late Rudolf Steiner,<sup>7</sup> to whom I am most indebted in this connection, was always at pains to integrate with scientific method what is experienced by subtler and more spiritual modes of cognition. Thus in his medical work *Fundamentals of Therapy*, written in conjunction with Dr. Ita Wegman, he described the ethereal formative forces of the human and other living organisms as in their essence 'peripheral forces.' He distinguishes between the forces—manifested above all in the lifeless realm—emanating from material centers, and another kind of force, working not outward from any earthly center but inward from the periphery, generally from the surrounding cosmos. In spatial character he describes them succinctly as 'forces which have not a center but a periphery.' They tend indeed towards the material bodies of living things—above all towards the germinating centers of fresh life—but the relative center towards which they work is not their source, rather their infinite receiver. We must invert the accustomed functional notions of center and periphery to get the right idea. A physical force emanating from a center needs the surrounding space into which to ray out. The infinite periphery has to be there to receive it. So does an ethereal or peripheral force need the living center towards which it works. It springs from the periphery, from the vast expanse, and tends towards the living center which it endows, just as the physical force springs from a center, from a place of concentration, and works outward.<sup>8</sup> In lectures to scientists towards the end of his life, Steiner himself referred to projective geometry as a valuable pathway along which such ideas could be elaborated.

The ethereal or peripheral forces, in the nature of the case, have more to do with living growth and development, with the 'becoming' of things. If there were only rigid and finished forms the old Euclidean geometry might suffice us. To understand the genesis and metamorphosis of living forms we need a more mobile thinking, and one that reveals the balance between the

centric and peripheral, architectural and plastic aspects. Yet even the most rigid of nature's forms, that of the crystal, is understood in a far deeper way (as any crystallographer with an elementary knowledge of projective geometry may confirm) when we perceive how the crystal lattice derives from an archetypal pattern in the infinitely distant plane—the infinite periphery of universal space.<sup>9</sup> In the realm of living form, once the new geometrical idea has been awakened in the mind, morphology and embryology confirm what is known to us by simple everyday experience from the world of plants—how life on earth is sustained by forces flowing inward from the surrounding heavens. Biology has hitherto been trying to understand these things with concepts derived from the inorganic world, where centric forces predominate. As has been said by Bertalanffy among others, it has in some ways been a hindrance to biological thinking to have to borrow its basic concepts from the non-biological sciences of physics and physical chemistry. Ideas no less scientifically exact should be derivable directly from the study of living phenomena, even as the ideas of mechanics and electromagnetics have been derived from the study of non-living things. Far from implying a gulf between the living and the non-living, it would then be found that the ideas derived from the world of life reveal the non-living too in a deeper aspect. A corpse is understandable as the remnant of a once living body. To try to comprehend the living with the science of the dead is in an almost literal sense to put the cart before the horse.

To open-minded contemplation, nature reveals on every hand the forms and the signature of active forces, not only centric but peripheral and planar. Once this is recognized, the enhancement of medicinal virtues by the potentizing process becomes intelligible. There is a passage in the *Organon*<sup>10</sup> where Hahnemann distinguishes between the raw state of matter and what becomes of it “by ever higher dynamization when at long last it is entirely sublimed (or subtilized) into its spirit-like medicinal virtue ... It is most probably that in the dynamizing process the matter is in the end entirely resolved into its individual spirit-like essence, and that in its crude condition it should in any case be regarded as consisting of this spirit-like essence in a latent, undeveloped state.” (Hahnemann uses the word *Wesen*, which I have here translated ‘essence.’ One is reminded that in former times the most volatile and fragrant effusions of a living plant were taken to be a physical manifestation of the ethereal forces and virtues; hence the traditional names which still survive. In English we call them ‘essential oils,’ and the equivalent in German is *aetherische Oele*, i.d. ‘ethereal oils.’ We come near to Hahnemann’s meaning when we realize that the ethereal, peripheral forces of life, working in towards the earth from the surrounding heavens, are the

means of bringing into the physical world the purely spiritual essences to which the specific virtues of living things are due. I think this, too, is the significance of Hahnemann's often repeated phrase, 'well-nigh spiritual.')

Let us pursue the thought a little further. If crude matter alone were concerned—if stress were laid on the domain of centric forces, expressed in material quantity and weight—it would be natural to expect that an effect, comparatively feeble in a dilute solution, would be enhanced with increasing concentration. We reduce the volume; in other words, draw in towards the center. But if the substance is the bearer of ethereal virtues of which the origin is peripheral, experience will show—and it is equally natural to expect, once we get used to the idea—that the effect will be enhanced, not by concentration but by expansion. Admittedly this notion is too simple; for it is the rhythmic sequence of dilutions and successions or triturations which renders the potency effective. This too, however, is understandable in terms of centric and peripheral or physical and ethereal spaces, and our attention is thus drawn to a principle of great importance which we could scarcely approach at all, but for these ideas.

May I explain by a familiar comparison from physics. Again and again we see rhythmic phenomena taking place along and about a line stretched between two end-points—a violin string, for example, a monochord, even an organ pipe. Or again, between the poles of a Wimshurst machine—it is well known that the spark is not a simple but a rhythmically alternating discharge. Tension between two poles begets a play of forces giving rise to rhythm. But in these purely physical examples either pole is of point-like centric nature. I believe science will presently discover a deeper and more primary source of rhythmic activity—no longer between two point-centers or the two ends of a line, but between center and periphery, or point and plane, in concentric spheres, of which there may be many forms. The tension is no longer between two foci of like kind, competing with one another as in a tug of war, but between entities polar opposite in nature, physical and ethereal respectively—related to the polarity of point and plane, of which the mental picture is evoked in its simplest form by the geometrical function of a sphere, illustrated in Figures 1 and 2. I would suggest that a polarity of this kind is latent in every chemical substance, and that there is no physical material that has not ultimately arisen from the interplay of centric and peripheral forces—forces of earthly and cosmic origin. The finished substance lying there in its crude and quiescent state is the ultimate precipitation of an activity between center and periphery—qualitatively speaking, between earth and heaven. I think the number-relations of valency and chemical constitution, also the wonderful rhythms of the spectral lines, will prove to

be an expression of this fact. The words of the poet, 'Out of the everywhere into here,' apply not only to the human child but to all living things, and in its ultimate origin to the very substance of the earth.

Even the simplest facts of science point in this direction, though one will only see this if one's idea of space derives from the new geometry. Think of a body radiating light and heat, say a candle-flame, a glowing ember. Purely as a phenomenon—a fact of everyday experience confirmed by exact experiment—the radiation expresses itself in concentric spheres about the source. In the one-sided thought forms of the old geometry and physics, the whole activity is attributed to the visible, point-centered source of the radiation, with the surrounding space a mere emptiness into which it spends itself as it falls off with increasing distance. But in the light of modern geometry, the figure of concentric spheres only has meaning as a mutual relation between center and infinite periphery. The center is the answering point or 'pole' of the infinitely distant plane; spheres are concentric if this point is the same for them all. It is only by virtue of their common relation to the cosmic periphery that the spheres are concentric. Thus in the simple phenomenon of radiation nature is bearing witness to the fact that in some way the periphery is an active partner.

Incidentally, something like this appears to have been known in earlier times; perhaps it is only waiting to be re-established in a more scientific form. I spoke of Newton's relation to the Cambridge Platonists. Another of Newton's contemporaries who also moved in these circles was Thomas Vaughan, brother of the better-known poet Henry Vaughan. Like Newton himself, Vaughan was an alchemist and wrote books not very easy for us today to understand. In his *Lumen de Lumine*<sup>11</sup> he tells of a 'spiritual fire-earth,' by which he evidently means something of the quality of a circumference, a cosmic periphery enveloping the earth. He who attains to the great secret, says Vaughan, will come to know "how the fire-spirit hath its root in the spiritual fire-earth and receives form it a secret influx." Nay, more, he will know "why all influx of fire descends—against the nature of fire—coming downwards from heaven ... and why the same fire, having found a body, ascends again towards heaven and grows upwards." Such paradoxical ideas as are suggested to us by the clear and cogent thought forms of the new geometry seem here to be expressed as an immediate outcome of mystical communion with nature.

Admittedly the thought I have put to you concerning radiation is purely geometrical to begin with: Nature alone can show whether and how it is relevant to the real play of forces. Yet in the light of your own experiences, ladies and gentlemen, this is precisely the suggestion which I now venture

to put forward. In homeopathic remedies, insofar as rhythmic potentization plays an essential part in their preparation, you are already dealing with a realm to which this kind of thought applies. The substance you are potentizing was originally formed from the cosmic periphery inward, by an individually rhythmic, not to say musical, relation between the cosmic periphery and the earthly center. True, it has come to rest in the earthly place where it abides—in root or leaf of plant, in metal or crystal mineral, or even in the bottle on the apothecar's shelves. But this is only its last resting place. In the precise earthly locality where it was first precipitated, it came into being through a specific and individual relation between the earth-planet and the vast spheres of the cosmos. In this relation lies the secret of its chemical individuality qua substance, and of its vital nature if still embedded in the living realm. The formative rhythm is still latent in it, and when the careful hand of the pharmacist, guided by experience and inspired by the will to help, subjects it to the rhythmic process of expansion, mingling it by trituration or succussion with the spatial medium which is to receive it, an opportunity is given for the formative rhythm of its origin to be reborn and for its latent connection with the healing essences of the cosmos to be restored. One is reminded of the saying of Novalis: "Every disease is a musical problem and every cure a musical resolution"... Moreover is not the picture I have been giving in harmony with Hahnemann's own words quoted above, when he speaks of the spirit-like individuality of the substance which in the crude material lies latent and concealed?

If I am right in the main thesis I have put before you, a new chapter will be opened out, tending to bring our science nearer to life—to human life above all. Work in the new direction is progressing, both in its biological aspects and in its bearing on the facts of chemistry and physics.<sup>12</sup> The concept of ethereal space as the natural field of action of living, formative forces, which I have had to put forward all too briefly in this lecture, can be worked out with all mathematical precision. And as so often happens when an idea is really fertile, in doing this one finds that one is not alone; that what is seemingly new has been divined and adumbrated and was implicit in much of the specific work that has gone before. The seemingly insurmountable division between an orthodox scientific outlook and realms of human skill and experience which find no place in the accepted system of the day, is overcome without injustice to either party when a fresh aspect springs into focus. This I believe is about to happen, and in it your profession too, ladies and gentlemen, will find new life and vindication.

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# The Sunrise

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From a mechanical point of view the motion of the earth as it revolves around its axis brings into being the diverse set of phenomena known as the sunrise. From a more poetic point of view the sunrise is a rune of high significance for human life. At sunrise, the earth breathes out her vital energies to reanimate and revivify all forms of life. This breath is a subtle stirring of the life forces. This can be experienced in mountainous country as a slight breeze which stirs the surface of a lake just as the sun strikes the peaks. Below in the valleys lies the darkness, the native power of the earth and her shadows. The play of subtle forces and tensions between the light and the shadow begins as soft stirrings, subtle movements where colors begin to flicker and gleam amid the shadowy depths. The poet Goethe recognized that it was in this fringe zone where light and shadow meet that the true nature of color can be experienced. This zone is an interface where currents of light meet and layer over the currents of darkness. Out of this layering motion the dynamic of color arises in the world.

In nature this layering process is accomplished in many ways. A turbid atmosphere in front of the darkness of space creates the blue sky. The same turbid atmosphere in front of the light of the sun moves its color to the yellow side of the spectrum. In these phenomena the turbid medium of air acts in polar opposite directions according to the ground tone over which it passes.

In the sunrise, the delicate play of light and dark exchanging ground and figure relationships gives rise to the complex unfolding of the color sequences. The motion of the earth slides planes of light and shadow across each other changing their relationships. As the rays of the sun first appear the preponderant motion is for light to glide across the darkness of space. This gives birth to the rising of the blues of which we will speak more in detail later in this essay. As the sunrise progresses the darkness which is covering the earth intrudes between the observer and the light behind it. This brings forward the red end of the spectrum. This separation into red and blue is at the heart of the sunrise and is the source of its mystery and healing potential. As we shall see, the gliding layers of light and shadow over

each other is a product of the diurnal motion of the earth in context with the annual progression of the sun through the zodiac.

In order to begin to work with these images however, it may be of help to try to perceive the essential nature of the whole nexus of motions surrounding a sunrise. To do this more clearly we can refer to a well known phenomenon known as the “glory.”

### The Glory Phenomenon

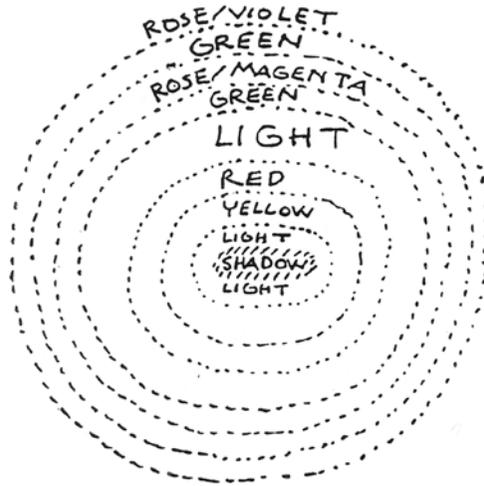


Figure 1

The “glory” is an optical phenomenon that can be experienced by any observer on a foggy day when the sun is just beginning to penetrate through the fog and irradiate the fog with light. Here we have the classic situation of light meeting shadow in a turbid medium. In such a radiant fog or mist the observer should place the sun over their shoulder. This will cast the shadow of the observer’s head out into the illuminated fog in front of them. When this happens a wondrous aura of colors can be seen surrounding the shadow. Historically this phenomenon was thought to constitute the person’s aura or halo and was considered by persons in the middle ages to have mystical portent. More recently this “glory” phenomenon can be most readily observed in the following situation. If an airplane in which one is flying crosses a field of light cirrus clouds and the sun is near the midheaven then the shadow of the plane will be cast into the fine clouds in a manner similar to the earlier example. When this occurs the shadow of the plane will be seen as a dark shape surrounded by a field of light. The light spreads in a circle into a ring of yellow surrounded by a tinge of warm red. This constitutes the “glory” but

it is not the end of this phenomenon if conditions are proper and the eye of the observer sufficiently sensitive. A further series of rings at a distance of 44 degrees from center can be seen. These rings are composed of alternating bands of bright rose-magenta-red, and parrot green. These two colors are the two special hues that arise when the polar groupings in the spectrum are blended. The color bands which compose the usual spectrum are actually two polar and separate phenomena. The red, orange and yellow bands can actually be blended together into the hue of rose-magenta when viewed at a distance through a prism. The violet, blue, and green band blend into parrot green, also when viewed at a distance through a prism. Rose-magenta and parrot green are the two primal colors out of which the other hues emerge. They arise where phenomena of light and dark are in a dynamic balance. In this situation where the "glory" is seen from the plane, these two colors alternate in an infinitude of pulses at the outer edge of the glory. They finally disappear into a darker outer edge where their union results in a barely perceptible violet/indigo.

In the image of the "glory" a significant mystery is revealed about the nature of color in general and the sunrise in particular. If we observe the sequence of events in a complete sunrise from total darkness through to light we can see the unfolding of the various pulses found in the different rings of its "glory." Starting about an hour and a half to two hours before the arrival of the sun on the horizon a phenomenon begins to unfold which is known as first light. At first light the most progressive roosters begin their morning call to prayer. Looking into the eastern sky we can perceive that the sky up above appears violet in contrast to a slowly greening band at the horizon. The pale green band gives a sensation of pulsation and as it grows broader it is possible to see fingers or rays of light penetrating and sliding in front of the still, violet-hued night sky. The green gives the impression of forming within itself, as it gathers force and pressure on the eastern horizon. Slowly this shifting, raying pale green force begins to lift the violet and raise it toward the midheaven. A half hour after first light and a blue tone enters between the violet and the pale green. The green takes on the blue hue as the light begins to spread in earnest. The earth is breathing its forces out into the formation of dew at this time. The life energies which will be available to the natural world are spreading upwards from the earth. Rising mists on lakes, bird and insect movements and other related phenomena are indicators of this motion. All of this can be pictured in the blue rising into the violet just after first light. The blue begins to curve space and creates the dome of the heavens or vaulted sky we see during the day. The violet, by contrast, is flat, still, and self-contained. Its movements, if any, are subtle

and flickering. The secrets of the night are contained in the violet. It is a threshold to tremendous power and energy, standing as it does as a pillar to the doorway of the visible spectrum. The still, brooding mood of the violet is overcome and disturbed by the rising light.

If we picture to ourselves the outer rim of the “glory” phenomenon we can see that the rising of the violet and the greening of the light are common to both the sunrise and the outer rim of the glory. The position of the violet above and the green below is consistent with the “glory” phenomena. There the outer rings of magenta and green can be seen within each other with the magenta always to the outside and the green to the inside. First light is actually the last magenta/green band where the magenta blends into the violet of the night sky and the green is the first light of day near the horizon. The pulsing of the rising light playing into the lifting darkness is an image of the subtle fringes of repeated magenta/green bands. When the light begins to wax strongly and the blue of the sky rises out of the green a final green/magenta crescendo is reached. Beginning at the horizon a pale rose color can be observed. This rose or magenta spreads upward and along the north and south horizon in a swelling wave. Just as the wave reaches 20 or so degrees above the horizon the whole sky above the rising sun begins to take on a pale magenta hue that overlaps the blue. When high clouds are present they glow with a cool rosy incandescence. With the blooming of this rosy hue on the clouds it is often possible to see a complete spectrum in the morning sky, with reds, yellows, and oranges on the clouds and blues, greens, and violets in the sky behind. This wonderful vision only lasts for a short minute or two and then begins to quickly fade. The clouds turn grey and the sky darkens and the rosy hue disappears. As the rose bloom fades an observer who turns to look at the opposite horizon can experience a surprise. Up above the western horizon at about the same degree of elevation as from where it disappeared in the east the rose bloom hovers magically in the dark sky. It has apparently leaped over the vault of the sky and reappeared in the west. As the sun continues to rise, this magenta rose slowly descends and gathers strength on the western horizon where it presses down on the darkness below in a striking contrast of vibrant rose above and brooding blues below. The pressing of the rose upon the blue gives rise to violets just at the horizon. This phenomenon is a manifestation of the compression and overlapping of the magenta/green outer bands of the “glory.” It may be that we are seeing through these bands that are overlapped in space, running in advance of the rising sun.

Whatever the scientific explanation, they constitute an amazing phenomenon. At the time when these bands of color are gathering on the

western horizon the eastern horizon is devoid of much color except for a faint warm red near where the sun will eventually rise. In this red there is a definite vermilion hue which replaces the rose color of the first wave.

The unfolding of the rose bloom from the horizon gives the observer the impression that the color is acting like a tincture put into a glass of water. The color first appears as a concentrated band along the horizon. As the sun rises the color spreads from its concentrated band out into the sky and is diluted by this process. The deep magenta, when spread out over the sky, turns into a bright rose. The spreading of the concentrated color into a lighter, more diluted color is at the very heart of the motion of the sunrise phenomena.

This spreading motion is most evident in the next wave of color following the rose bloom. The “glory” model shows that the next wave of color after the rose bloom would be a deepening of the rose into a scarlet or vermilion. It can be observed in the “glory” that there is a space in which there is no color between the inner rose band and the scarlet/vermilion. If the color were to follow the order of the outer bands it would be a green. This points to the consideration that the light in nature is actually a pale green. Goethe’s prism experiments point to this as well as the fact that a thin layer of gold leaf can cast a green hue on the light when the landscape is viewed through it. Gold has since ancient times been connected to the light of the sun. The empty space in the glory where a green should be seems to confirm this ancient belief. In nature, in the sunrise this space is filled with the first appearance of true light in the morning. With this light the rose bloom fades into the west, true blues can be seen in the upper sections of the eastern sky. Dark purples and violets can be seen in the shadows on the ground and a faint yellow, orange, green band can be seen strung between the horizon and the rising blues in the sky. In the “empty” space of the “glory” we find the emergence of the first true light accompanied by a complete continuous spectrum. This spectrum however is divided into the three great families of colors, the colors behind the light, the colors around the light, and the colors in front of the light. The colors behind the light are the blues and violets. These colors are seen in nature in the blue of the sky and the distant mountains. They arise when light passes over a dark ground. In the sunrise they emerge with the first true light after the rose bloom. The colors behind the light are associated with space and a feeling of recession, contraction, and coolness. The colors in front of the light represent the effect of light seen through veils of darkness. These colors are the reds, from magenta, the darkest color in front of the light through crimson, carmine, scarlet and vermilion and orange. The reds get progressively warmer as they

move closer to the light. These colors are closely associated with substances and the material world. This can be observed, for instance, in the plants which turn these colors when they die, and in the animal world as the color of the flesh and blood of the higher animals. The colors before the light are closely associated with feelings of advancing towards the viewer, expansion (inflammation) and warmth.

The colors around the light are both warm and cool. They represent the subtle veils of darkness immediately around the light. On the warm side, there is warm yellow and greenish yellow leading into the pale green of its light. These colors are veils of darkness in front of the light. On the cool side of the colors behind the light we find turquoise closest to the pale green, leading into greenish blue. The colors around the light serve as a ground to the other two tendencies. They form a bridge between the two sides of the spectrum and show up often in atmospheric situations. They are used to harmonize and support imbalances in the other spectral families. These three families of colors appear in the morning sky as the rising sun lifts the violets high up with the outer band of the "glory." In watercolor, fine veils of magenta and pale viridian green layered over each other create an atmospheric blue. In nature, the outer bands of green and magenta reach a culmination in the rose bloom, the inner section of the outer rings. Here the rose color continues rising with the rising sun, leaping upward from cloud to cloud and slowly spilling out along the horizon towards the west. As the rose fades from the eastern horizon a brief intermezzo is preceded by the frequent appearance of the full spectrum. The clouds show rose colors, violets and purples high up with warm reds and often oranges below. The sky ranges from violet high up through cobalt blue into turquoise near the horizon. Then comes the intermezzo, when all this color fades.

Sometimes the fading of the rose colors in the intermezzo is complete with a few minutes of neutral colors predominating in the eastern sky. Sometimes the fading is not evident at all as warm vermilion and oranges begin spreading across the lower clouds even as the higher clouds are radiant with rose/magenta. If a cloud is large enough it is sometimes possible to observe rose magenta and violet shadows at its top and vermilion and scarlet at its base. Whatever the duration of the intermezzo it is the prelude to a scherzo of flashing golden yellows, strong oranges, vivid scarlets and pale cool lemon yellows that accompany the actual appearance of the sun on the horizon.

With the rising of the yellows and warm reds a complete cycle of color is attained once again as the full spectrum is often evident. The inner circle of the "glory" is the earthly incarnated circle of color as opposed to the cosmic

outer rings of magenta and green. The oranges, reds, and yellows are found often in the plant world and in minerals.

In the sunrise these warm substantial colors set the clouds aflame and spread in a rapid inflammatory crescendo ending with the penetrating rays of the sun's face singing across the horizon. With this light, shadows are struck across the earth and the colors of night rush to attach themselves to objects. Where once the reds freely played in the dark atmosphere near the earth during the rose bloom they are now dried and fixed into and onto objects. The blues which during the early morning hours so freely mingle with yellows, violets, and rosy hues harden into the cobalts and crystalline sky blues of midday.

At noon all colors have fled. They hide beneath objects in little pools of shadow. Their vibrancy and motion is fixed into pale echoes by the glare of the too bright sunlight. Shadow is reduced to simply grey and black in this powerful onslaught.

Beginning about an hour and a half before sunset however the sky in the western horizon begins to glow with a pale yellow. High clouds start to pick up a yellow version of the color which was the last strident note of the yellow flash in the sunrise. For now the "glory" will play itself out again only this time in reverse. As the sun moves towards the horizon strong oranges and vermilion reds begin to rise.

This has often been attributed to the increased incidence of particles of dust in the atmosphere due to the activity of the day. The same orange can be seen however, at daybreak just as the sun is about to rise just as it can be seen at sunset. In both instances the orange is found in the company of strong yellows and pale greens. At sunset we see oranges just before the sun touches the horizon. Similarly at sunrise, we see oranges just before the sun touches the horizon. In the morning the vermilions and scarlets spread out in advance of the yellow flash. In the evening the vermilion and scarlets smoulder on the clouds after the sun has set. In the morning the rose bloom is in advance of the sunrise by  $\frac{3}{4}$  of an hour. In the evening the rose bloom is behind the actual sunset by  $\frac{3}{4}$  of an hour.

We can see from this that the colors of sunrise and sunset are consistent and follow the same lawfulness. This is not to say, however, that there is no variation within this lawfulness. On the contrary, there are wide, yet subtle differences to be seen in the movement and duration of the different bands. It can be observed, for instance, that the "empty" intermezzo place in this glory between the rose/green bands and vermilion/yellow bands can vary considerably.

Sunrise in a tropical latitude in which the sun rises straight up from the horizon has very distinct bands of rose and a bright, cool yellow with

very little orange. The rose does not pulse but spreads high and wide in the pre-dawn darkness. Then as the dawn progresses the rose lifts quickly to the western horizon where a strong rose/indigo polarity can be seen. During this time there is very little loss of color in the east as the yellow rises singing, to replace the fleeing rose on the thunderheads. This sequence can be contrasted to a mid-winter high latitude experience in which the painfully slow rising of the winter sun takes almost two hours from first light until the sun appears above the horizon. This low angle of rise is accompanied by multiple, very pale waves of rose and green pulsing and weakening again and again on the high ice clouds. Below on the snow, violets, ethereal blues, deep indigos and cool hints of turquoise play under the pulsing roses that wax and wane for an hour before a dull, weak orange announces the approach of the sun. The last flushes of this rose usher in an extended grey period and then the pale orange begins to arise as if awakened from a deep melancholic sleep. In a dry mid-latitude climate pale roses pulse many times in the pre-dawn violet hued upper atmosphere never reaching a crescendo. The climax comes slowly as the orange tones of the central color circle dominate the sunrise itself. These observations point to the deep mystery contained in the phenomena of the "glory." The structure of the color bands coincides with an old alchemical division into phenomena that are "moist" and phenomena that are "dry." Moist phenomena are those which are connected to the sulfur process.

Although sulfur is a combustion process there are two ways a combustion process can unfold. A moist combustion can be seen in the plant world as a plant consumes itself in order to produce flower, fruit and seed. Here fluidity, fragrance and color are produced. The light from such a moist sulfur combustion tends towards the blue pole of the spectrum. In the complete diagram of the glory (Fig. 2) we see the blue pole arise where rose and green alternate.

We could ask the question, how is it that blue arises out of colors which are composed of the light (green) and the darkness in front of the light (rose). To begin to answer this it is helpful if we can shift from a conception of color as it appears when attached to objects and view color inwardly as a process of becoming or arising. From Fig. 2 we can see that there are a number of different lights and darkneses, each dependent upon its relationship to the others. Starting in the center of the circle we can see the darkness labeled shadow or matter. In the glory there is always the shadow which is cast by the object into the atmosphere which serves as the focal point of the glory phenomenon. This dark focal point is surrounded by a field of light. The light gradually darkens into a warm yellow and then a warm vermilion red and ultimately to a cool carmine. This same progression can be seen in

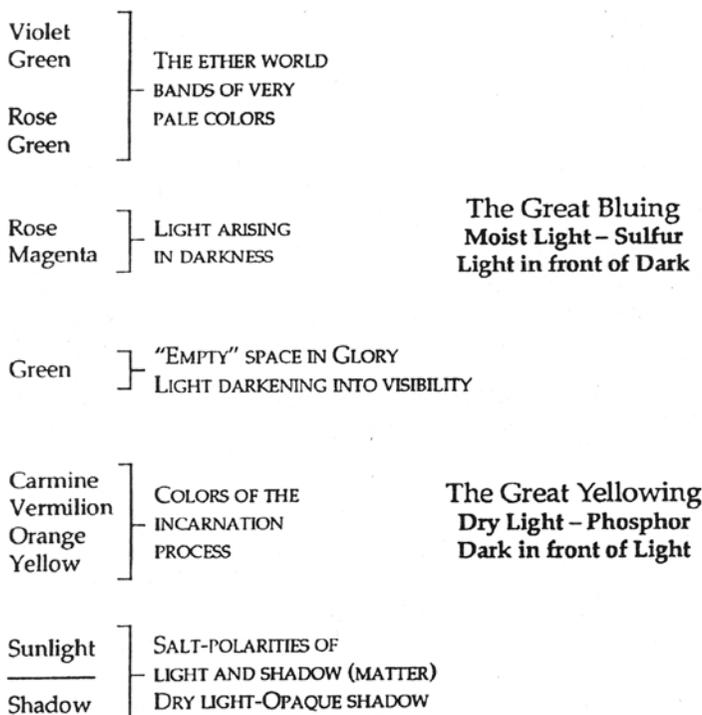


Figure 2

natural phenomena as the color progressions in a candle flame. The black is the wick surrounded by a luminous corona that tapers upward to a yellow and finally in the sluggish flame into a warm red at the tip. Alchemically, a combustion process in which darkness is at the center is indicative of a condition of increased gravity forces. The shadow at the center of the glory existing in the center of a light field is an image of what alchemically was known in the past as "dust." As a substance was led through a phosphorus combustion process it was gradually dried out and atomized into dust. The dust or smoke was characterized as a "yellowing" of the light. The dark center is an image of an autonomous gravity point existing in a field of drying light. In the yellowing of the light an individuation process is at work under the influence of warmth. The point in contrast to the plane, the individual in contrast to the community, the autonomous mote of dust with its own center of gravity are all images of the great yellowing process. A dark vision of matter lies at its center. Its light is a dry light which casts opaque shadows. The progression of reds is a picture of incarnation. Is it any wonder then that this phenomenon accompanies the physical emergence of the Sun on the

horizon. With the appearance of the Sun all objects suddenly cast discrete, autonomous shadows while overhead the sky is bathed in warm yellows and oranges and reds. In this instant the expansive, levity-filled ether forces of the sun become fixed to matter and the shadow pole of substance springs into existence. The feelings which arise out of a contemplation of this phase of the sunrise can be experienced as a melancholic “letdown” now that all of the potential and drama has finally reached a climax in the physical light. The colors are now gone from the sky and clouds and the rich darks of the pre-dawn earth and sky begin to be diluted by the ever increasing blueness and moistness in the sky opposed to the waxing of the harsh drying light on earth. Perhaps the Druids in their reverence for the Sun shining up through the earth at midnight had an appreciation of this mood of soul and what could heal it. If the great yellowing is an image of individuation and the dry gravity of autonomous existence its polar opposite, according to Goethe, would be a great bluing, since yellow and blue were his primary polarities. A look at the total diagram of the glory shows that nowhere is there a mention of blue. We can see that between the warm yellows which represent the darkness in front of the light and the rose/magenta and green bands there is a light gap in the color progressions. By recalling the formation of the green and rose magenta bands in Goethe’s prism experiments we can, perhaps, gain some insight into these phenomena. A dark bar on a white field brought the violet end of the cool spectrum across the red end of the warm spectrum. From the crossing of the violet and red there arose the color rose/magenta which Rudolf Steiner, after Goethe, calls “peach blossom.”

This color, neither red nor violet, exists in the space where infrared and ultraviolet are the Joachim and Boaz of the color world of the midnight rainbow. (Joachim and Boaz are the two pillars of the Rosicrucian alchemist which stand on either side of the entrance into the garden in which the holy archetypes reside.) Here all is unifying wholeness instead of differentiated autonomy. Goethe called rose/magenta the creative force of the Elohim. Through it we gain a glimpse of the back door or anterior unity of the color language of astrality working into the ether world. In the dry warm yellows and reds we see spirit producing incarnated substances. In the rose glow of peach blossom we see the rising levity of the moisturizing cosmic sulfur. The heat here is lifted from the sphere of fire (manifest) into the latent warmth of reactions or the subtle energies of planets moving in their orbits. The stuff of dreams is printed in a palette of rosy hues. Lilacs, violets, and purples are in the family which reaches into the other side of the threshold of color. From the diagram of the glory we can see a gradual progression from rose magenta and green in the outer bands to red and yellow in the inner band. This progression coming in from the other side of violet at the periphery is

a process that will ultimately go through violet and indigo and then through the blues on its way into the green which hovers as a darkening of the light in the gap between the inner and outer bands of the glory. Simultaneously the violet periphery is interacting with the carmine of the inner band. The rose/magenta arises in this interaction in a reciprocal fluctuation with the green; as a result both the dark before the light and the dark behind the light are present. Were we to overlap the rose/magenta and the parrot green a color would arise which would be bluish in nature. The reciprocal alternating of light which is darkening (green) and dark which is lightening (rose/magenta) is an image of the mystery space of the etheric where the dynamic reciprocal processes happen in the same space simultaneously. In protective geometry, points in a line A projected reciprocally onto another line B will give rise to a series of points in a line M which the two original lines share in common. The line between the two original lines (line M) is an image of their reciprocal relationship. (Fig. 3)

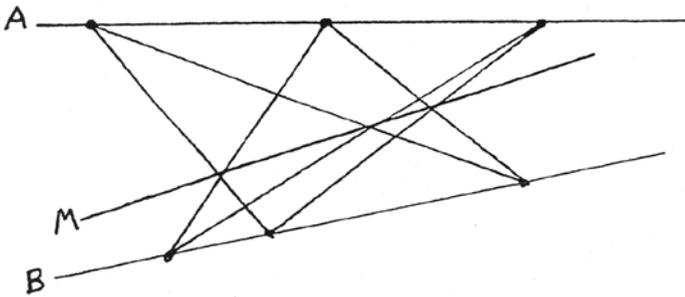


Figure 3

In the glory the green and the rose/magenta are reciprocal polarities. They share in common the dynamic space where it is possible to potentize substances known to anthroposophy as the etheric. In the glory the etheric space is the reciprocal of light darkening (green) and dark lightening (rose/magenta). This reciprocal space has a color of its own (blue) which is an image of the reciprocal dynamic of these two colors. Alchemically we could call this process “the great bluing.” The great bluing is a sulfur combustion and its alchemical principle leads to the sulfur/moist pole. Alchemically the “great yellowing” is an example of a phosphorus combustion and its alchemical principle is salt/dry.

Between these processes is the gap of light which has no darkness at its core. It is a cool steady light which is soft and casts no shadows. In place of a core of darkness at its center it is a light in the center of two darknesses.

Violet rose  
Green  
Rose magenta  
Green

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Intermezzo/Gap of light between two darknesses

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Carmine  
Vermilion  
Orange  
Yellow  
Light  
Shadow

One darkness leads to shadow, unconsciousness, and gravity-permeated physicality. This is the differentiating darkness before the light. The other darkness leads to the periphery and expansive levity. This is transcendent, chaotic, creative darkness behind the light. The light itself which lives between two darknesses is not the dry light of incarnation and differentiation. This light is alchemically the great Mercurius, the carbon touch-stone, the selfless healer, the Christ. This light softly greening itself as a darkening gesture between two great yawning darknesses is barely perceptible; it is a listening light, full of gratitude, willing to grace the petals of a white rose or the tender folds of a high cirrus cloud. This light, which is casting its dying sacrifice onto earth, is the great balancer between the hubris of the great yellowing and the terror of the great bluing. In the sunrise it comes at the moment when the rose darkness has bloomed and fled to the opposite horizon and the climactic incarnation finale is about to begin. It appears as a fleeting Mercurial tenderness between the gaudy scarves of the pulsing darknesses. The inattentive rarely see it in the morning or evening sky and will even deny its existence but it is there living its balancing life between shreds of brightly colored clouds. Seen in this perspective we could envision the glory phenomenon as an atmospheric rune of the tremendous processes at work in the human soul. The great yellowing is an image of the tendency to inflame and inflate the lower self so prevalent in popular culture today. Through darkening our light with the dust of the world we tend to deify the unconscious in art and inflame the whole soul life with the colors of the personality. The art business and the entertainment industry provide many examples of this tendency. A symbol of this in the sciences is the technology surrounding electromotive force. At the opposite pole we can experience

the expansive declarations of the New Age phenomena. Spiritualism in its many forms is an example of the great bluing.

The light which greens itself, the Christ, is present at every moment on the earth. He is there in the space between the two darknesses. He is there, constantly moving over the face of the earth as the wave of the sunrise travels around the globe. Somewhere at each moment the tender flicker of pale green light rays out from between a sunset or sunrise cloud. In that moment to those who have the eyes to see it, He reveals the power of the Holy Ghost through the Will of the Father, healing the split between the two darknesses, proclaiming wholeness in the face of moral misery. To others, hurrying through the dust of the world, it is just another sunrise.

# The Effect of the Planets on the Human Organism\*

HANS JOACHIM POHL (1909-1963)

The medicinal use of metals plays a considerable role in the anthroposophical system of medicine founded by Rudolf Steiner. However, an abundance of indications about metals and how they relate to the human organism, often given from varying standpoints, makes it difficult to gain a comprehensive view of this wide field.

The following is an attempt to indicate common principles and show ways of combining many of these varying standpoints, thus allowing common features to emerge. The author makes no claim to completeness, which is something only attainable through collaboration by many colleagues.

The metals in question are the seven classical metals lead, tin, iron, gold, copper, mercury and silver whose relationship with the seven planets Saturn, Jupiter, Mars, Sun, Venus, Mercury and Moon has been known since ancient times. In extensive laboratory experiments over the last few decades L. Kolisko has clearly substantiated the relationship between these planets and the seven metals.

The question to be discussed will be dealt with in principle only, since space here does not allow for a description of every detail regarding each of the seven planets. A system will emerge which, however, must not be taken as an end in itself, just as the carpenter's plane and saw are not ends in themselves but tools with which to make chairs and cupboards. The system is intended as a tool to serve further thought.

We will begin by considering the nature of the planets as such. According to modern astronomy the planets describe elliptical orbits round the Sun which is situated at one of the two foci, the other being somewhere else in space. All the planetary movements take place in a plane that changes its position within very narrow margins. Kepler's well-known laws describe the viewpoints applied to this system as a whole. The more ancient Ptolemaic view places the earth at the center and sees the planets, including Sun and Moon, circling and looping around it. The planetary system is related to the

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constellations of fixed stars, among which those of the Zodiac are singled out and seen as lying in the same plane as the planetary orbits.

Neither the one view nor the other can be taken alone in today's view of the relationship between the earth and planets against the background of the Zodiac; the dance of the stars reveals a wonderful play of interweaving curves. Sun and earth, for example, form a lemniscate as they move in relation to one another. We can assume that the universe surrounding us is spherical; the starry sky certainly appears to the unprejudiced observer to be a hemisphere which in thought can be completed to form a whole sphere. In keeping with this the planetary orbits appear as circles of which the earth, the place where the observer is standing, is the center. However, in our cosmos a circle always merely marks the limit of a sphere. Seen on its own it is an abstraction, and the same applies to a point, which is actually always the central point of a sphere. If the earth is the center, then the planet is on the outer limit of the sphere which it embraces in its orbit.<sup>1</sup> This sphere comprises the totality of the planet as such; it is entirely filled with its activities, while the planet as such is merely a concentration of its substance at a particular place in the periphery. There it becomes a body in space and, in a way, dies within itself. In this sense the planet is something that is subtracted from the sphere which it represents. There can be a conception of the sphere even if the earth is not assumed to be its center. There must, however, be a central point, and in the relationship between periphery and central point we have a third element of the planet as a whole. This is radiation, which in our terms is the activity going towards the center

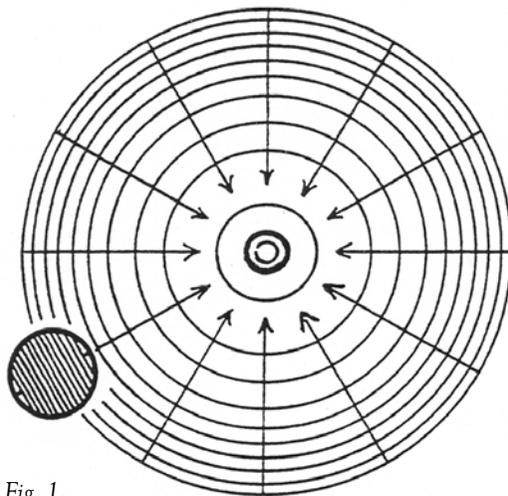


Fig. 1

from every point on the periphery. Radiation cannot really be defined with reference to points, and the term “radiation” is merely used to express this activity as such. The rays of light received by the human eye from the planets shining in the night sky are only representatives for the radiation coming in from all sides, just as the orbit of a planet is only a representative of the total sphere of that planet.

Our way of looking at a planet as a whole is thus threefold: We see it as a sphere of which, for us, the earth is the center; we see it as an inward radiation from the periphery to the center; and we see the actual body of the planet as a physical manifestation of the planet as a whole (Fig. 1).<sup>2</sup> The seven planetary spheres are like the skins of an onion around the earth, which is their common central point. But they are not rigid, because they contract or expand depending on how near or how far away the planets are from the earth.

Every interrelationship between polar forces can be graphically depicted by means of the lemniscate, including, therefore, the interplay between the forces of the planetary periphery and those of the earth as center of the sphere. One loop of the lemniscate embraces the planetary forces and the other the forces of the earth (Fig. 2). The seven planets themselves also express a certain kind of polarity. Between the three outer and the three inner planets with their entirely differing characteristics stands the Sun as

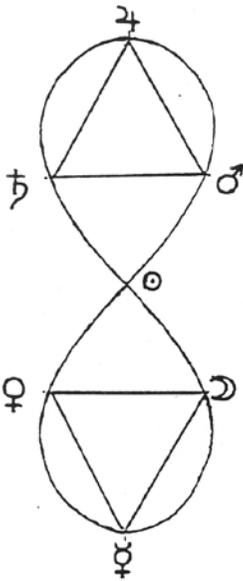


Fig. 3a

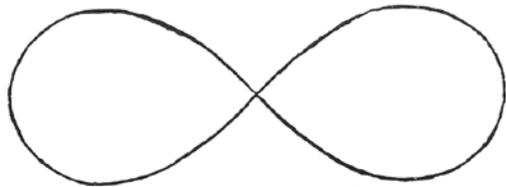


Fig. 2

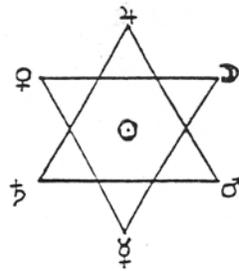


Fig. 3b

a mediator, and this, too, can be depicted in a lemniscate (Fig. 3a). If lines are drawn to link the three outer planets in the one loop and the three inner planets in the other, two triangles result. If these two triangles are pushed into one another they form the hexagram, Solomon's seal (Fig. 3b). This diagram shows most clearly how the planets are diametrically opposed in pairs: Saturn-Moon, Jupiter-Mercury, and Mars-Venus. This corresponds entirely with their polar behavior as seen in the anthroposophical view of medicine. We shall call this the "greater polarity." In addition there is another oppositeness in two pairs of planets, Saturn-Venus and Mars Moon. This polarity is less pronounced, but has relevance when it comes to therapy; we shall call it the "lesser polarity." Only with Jupiter-Mercury are "greater" and "lesser" polarity coincidental. This has to do with their particular position in their group which is in each case between the planets that are furthest from and closest to the sun. They have an element that mediates between their neighbors.

The question that concerns us here is: What is the effect of the planets on the human being? In asking it we have to distinguish between two stages of human life, that of the embryo, and that of life between birth and death.

As an embryo the human being is entirely surrounded by forces of the cosmos, remaining virtually free from any influence coming from the earth. The human body is formed out of unadulterated cosmic forces so that after birth it may take in the forces of the earth in the right way. Every human individual is thus on the one hand a creature of the cosmos, and only after birth does the duality of being a creature of the cosmos as well as of the earth come fully into play. We bear within us a lemniscate founded, for example, on the polarity between head and limbs. During embryonic development (from about the 7th or 8th week), however, we are as though carried by the lemniscate of the planets that is situated outside our body. Prior to this, in the segmentation stage, the embryo is tightly curled up in a spherical shape. Depicted in a diagram you have the outline of a median section of an embryo with round it a lemniscate. One loop, with the three outer planets, surrounds the head part, and the other, with the three inner planets, embraces the rump. The crossing point is somewhere near the heart (Fig. 4). If we place the three outer planets outside the lemniscate, then, in keeping with its laws, the three inner ones will have to be drawn inside the other loop.

As soon as the first breath is drawn after birth far-reaching changes begin to take place in the organism. These are expressed in the need to adapt to taking in food and to breathing and also in the fact that the infant is now fully exposed to the force of gravity. Later the child will grow strong enough

to stand up in opposition to this force. To express this in a lemniscate it must rupture and stretch lengthways to correspond with the increasing elongation of the body: The lemniscate becomes more like a sine curve. The point of rupture occurs somewhere near the intersection of Saturn and Moon, so that now the outer planets lie outside the line at the back and the inner planets radiate inwards from the front down below (Fig. 5). This curve lies in the median plane, whereas the lemniscate encompassing the head and limb forces of the embryo lies in a frontal plane. If the curve bearing the planets is completed by adding another going in the opposite direction from below upwards, symbolizing the forces of matter that come from the earth, the result is again a form resembling an entire lemniscate. The two curves intersect in the heart region of the human being. The points where the planetary forces radiate inwards are thus the vertex for Saturn, the nuchal region for Jupiter, and the region a little above and between the shoulder-blades for Mars. Exact points of inward radiation cannot be determined for the inner planets, but it could be said approximately that the Venus forces radiate inwards in the epigastric region, the Mercury forces in the region of the navel and the Moon forces in that of the sexual organs. Form-giving forces are attributed to the outer and substance-forming forces to the inner planets. Of course the substances as such derive from the earth.

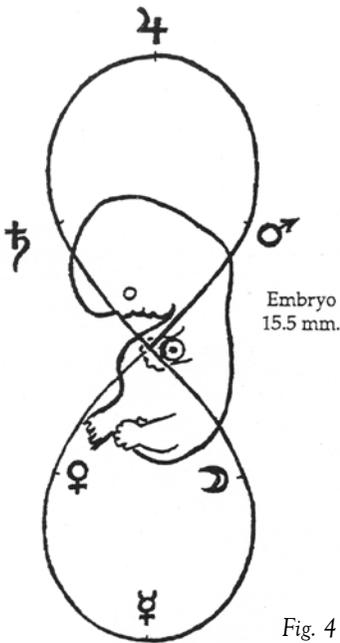


Fig. 4

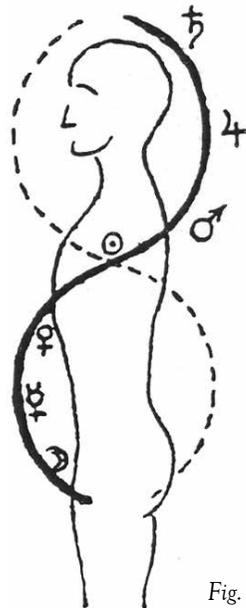


Fig. 5

It is interesting to note that no great differentiation of form appears at the points where the radiations from the outer, form-giving planets enter, and likewise that comparatively little substance is found at the points where the radiations from the substance-forming inner planets enter. These features are found instead along the curve that carries the earth forces, which is the polar opposite of that carrying the planetary forces, so that there is massive bone formation in the sacral region and strong differentiation of form in the face.

We shall meet this picture of two functional spheres running counter to one another once again when we consider how the individual planet works within the human organism. What is said for one planet is valid for them all, except that the direction in which the forces work is from above downwards in the case of the outer planets and from below upwards in that of the inner planets.

The threefold nature of a planet described earlier becomes obvious again when the way the planet works within the human organism is considered. Here, too, we have to distinguish between the *planet as a body*, *its sphere of influence*, and *its radiation*.

By radiation we mean the planetary forces that stream towards the human being from the cosmos, entering the human organism at a specific point. In this connection the human being represents the central point of the planetary sphere. Within the human organism the planetary forces then work in a particular way, the end result of which is a specifically human activity with which the human being gives back to the cosmos what he has received from it. This is a kind of radiating outwards and is intimately bound up with the radiation that concerns us here. This will become clearer during the course of these considerations.

The effects within the human organism will be described in connection with the Mars forces, which are the easiest to grasp.<sup>3</sup> The planetary forces that have just entered the body are not likely to hurry immediately to the point where they come to rest in their particular organ, just as in the cosmos the planetary forces only create their planetary body by a process of gradual condensation. So when the radiation has entered the body it can be observed how the forces in question begin to develop a particular range of activities. In the case of the Mars forces this is expressed at the moment when the first breath is drawn. At this moment arterialization of the blood takes place for the first time when the human organism itself sets in motion the sharp distinction between arterial and venous circulation which did not exist in the embryo. So we have to regard the first effect of the Mars forces to be the unfolding of the lungs and the genesis of arterial blood which encompasses

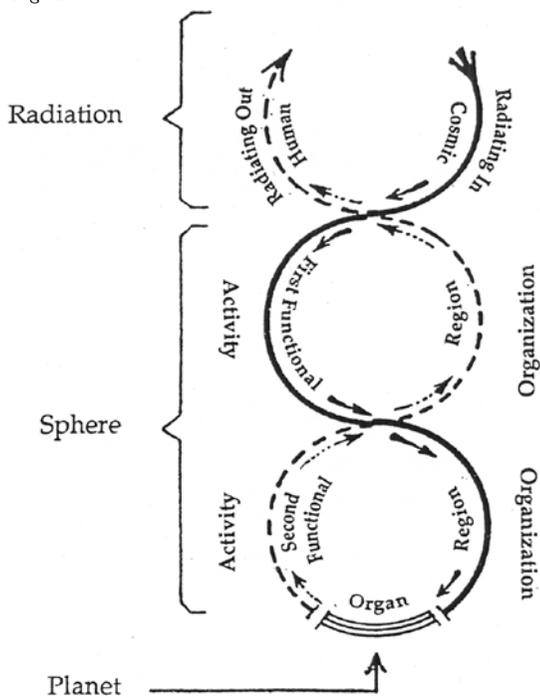
a limited region of the total circulation beginning at the lungs. Of course the prenatal and postnatal effects of the planetary forces are interwoven because the human organism has been created from the start in accordance with a divine blueprint in a manner that enables it to take in these forces in a suitable way and bring them to expression. Thus oxygen-saturated blood has to have a suitable vascular system that can express the whole dynamic of these forces. So the first thing the Mars forces achieve when they become fully active is the function of breathing. And a second function is immediately added which is expressed in the combining of the iron in the blood with oxygen. In keeping with this an organic system is brought into being that can both take in this function and itself be functionally active.

Turning our attention now to the iron forces as such, we find that nothing remains of either of these functions because on the one hand the arterial system continues on into the capillary system, and on the other the previous function is reversed when oxygen begins to be released by the iron in the blood. This process takes place peripherally all over the body, but it culminates at the point where even the red color of hemoglobin is transformed into the complementary green color of bile.<sup>4</sup> This is where the iron process ends and at this point an organ develops that corresponds to the planetary body, in this case the gall bladder with its bile ducts. In order to find the Mars forces again we must look for them in the function we last saw them carrying out. The characteristic function of the Mars forces is to make liquids flow, and we find it in the activities taken on by the gall bladder. In the intestines this takes the form of the peristalsis triggered by the bile acids. The bile also plays a leading role in breaking down the fats taken in as part of earthly food. It is worth remembering the myths which personify the Mars forces in the person of Mars himself, armed with his sword and seen as one of the driving forces in the universe.

In the blood circulation, the capillary region continues on into the venous system which involves flow dynamics that physiologists have so far not entirely explained. The iron content of the venous blood has not changed, only now the iron combines with carbon dioxide instead of oxygen. Just as in the intestines intestinal activity is stimulated by the effects emanating from the gall bladder, so in venous circulation the flow impulse may be sought in the iron forces of Mars. Thus in the veins belonging to the intestines some of the bile, for example in the form of urobilinogen, is continuously reclaimed by the blood. And finally the venous blood is returned to the lungs via the heart, thus completing the circle.

But this is not all there is to say about the Mars forces. As regards breathing we have to distinguish between the two phases of inhalation and

Fig. 6



exhalation by showing that in its inner dynamic inhalation is the passive phase and exhalation the active one. The airways are formed by the active forces in accordance with this, which means that we have to think of the bronchial tree as having been created from the alveoli inwards in a similar way to the forming of the arterial system inwards towards the heart. In this sense one would have to speak of a bronchial "root." The culmination of the whole system is in the one case the heart and in the other the larynx without which speech, borne on the outbreath, would be unthinkable. In resounding words of speech arising from the iron forces of Mars the human being gives back to the surrounding cosmos an expression of his own individuality. Speech or song could thus be seen as the crown of the tree unfolding from the bronchial "root."

On the path leading inwards from the point of entry of the planetary radiation to the organ of a particular planet we find a functional sphere, beginning with an activity, from which an organic system expressing this activity develops. And on the path leading outwards from the planetary organ we find another functional sphere, also beginning with an activity and leading to an organic system that can then form a basis for a specifically

human activity. These two functional spheres are polar to one another, since the one begins in the cosmos and ends in an earthly human organ whereas the other radiates outwards from this organ and ends in the cosmic periphery. This can be depicted by the figure given for the planet as a whole, which comprises the two sine curves running in opposite directions. This area of the two functional spheres represents within the human organism what was initially described as the sphere of the planet. Using the Mars forces as an example, a very rough sketch has been given of the way in which a study of this kind may be carried out. At every phase of the functional spheres there is actually a whole complex of further differentiations that lead even further into the nature of the way planetary forces work in the human organism. They cannot be taken into account within the framework of this article.

The diagram of the two sine curves is completed by adding as a precursor to the first functional sphere the cosmic planetary activity which radiates into the human organism, and as a continuation of the second functional sphere the human activity which radiates out into the cosmos. In each case they appear as a third curve, so that a tripartite sine curve results (Fig. 6). This double series of curves is nothing other than a picture of the Staff of Mercury.

#### NOTES

1. Of course it is in turn also the center of another sphere which can, however, be left out of account for the purposes of the present discussion.
2. Obviously, from a standpoint other than the earth the interrelationships are very much more complicated, depending on what central points and what spheres are assumed.
3. Only the essential elements can be described within the framework of this paper.
4. The purely quantitative considerations of science must not be allowed to obscure our awareness of qualitative phenomena.

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# Archetypal Relations between Plant and Man\*

WILHELM PELIKAN

## GOETHE'S PIONEERING WORK

Goethe has been called the Kepler and Copernicus of the organic world by Rudolf Steiner. Through his concept of metamorphosis he opened up for human perception a dynamic image of the plant, grasping it as an entity both "sensible and supersensible." He was looking, not for what had come into being and was apparent to the eye, but for what was coming into being; not the finished form, but the form-giving process; not something which, as it comes into being, is already dying, but that in it which lives on, the formative law, the metamorphosing form, the archetypal life element, the essential nature of the plant. Goethe described how this essential being of the plant enters into the physical, material world from a spiritual world of forces which are beyond immediate perception, and how it does so in three great stages of development; how in the physical world it manifests in a form apparent to the senses and then "passes away" again, back into the sphere of the "supersensible" the essential. The three stages of development may be seen as three variations of an interplay between forces of expansion and contraction. From the contracted seed or bud, the leafy shoot arises; this contracts in the calyx and again expands in the flower; it finally gathers itself up again in the seed, and expands in forming the fruit. From the seed, the cycle of life then begins anew.

Contemplation of this cycle of life will yield an important discovery: The more perfect a plant element appears in its external, visible form and structure, the more it has lost of its *vital energy*. The structures which abound with life are always less well formed out: seed, bud, root, shoot. In the flower, a rose for instance, the plant appears in the most perfect form it can have in the world of the senses—but it is also very short-lived. The noblest form goes hand in hand with the shortest life-span and great fragility.

Goethe's concept of metamorphosis is a foundation stone in the *study of life*, therefore, and the laws of life it reveals are comparable in significance to

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those discovered by Kepler. Every future botanist will have to take this into account. Yet in its present form it does not lead to a *materia medica*. Only a study of the archetypal relations between plant and man can provide the basis for such a *materia medica*. These archetypal relations were subsequently discovered and described by Rudolf Steiner.

### THREEFOLD PLANT AND THREEFOLD MAN

#### Leaf Process and Rhythmic System

One of the chief indications of the existence of such archetypal relations, in which nature reveals herself beyond all theory, is the relation between plant respiration and human respiration, and between leaf pigment (chlorophyll) and blood pigment (haematin). This brings us face to face with one of the archetypal polarities in life. The fundamental organ of the plant, the organ through which it manifests most strongly and purely as plant, is the leaf and the node belonging to it—all other parts of the plant must be seen as metamorphoses of this. The plant is therefore actually inviting us to look for the archetypal relations between itself and man *in the leaf*.

Even externally the foliage—node upon node piling up in rhythmic repetition—is quite obviously the middle part of the whole plant, its rhythmic system. Its counterpart in man is the middle, rhythmic, system, anatomically based on the spinal column and its rhythmic sequence, on the rhythmically arranged arches of the ribs forming the thorax. Rhythmic—in accord with the changing light of night and day—are also plant respiration and assimilation; they represent the complete polar contrast to human respiration and the dissimilation connected with it. The leaf takes carbon dioxide from the atmosphere, and puts it through a process of carbon-condensation, a carbohydrate metamorphosis providing most of the material for the physical part of the plant; oxygen is exhaled in the process. In man, the rhythmic system takes up oxygen in the chest organization and breaks down the “carbon-ness” of the body, fighting against its condensation, and ejecting carbon dioxide. Both processes are rhythmic and take place between the fluid and the airy elements, but they go in opposite directions. The hollow structure of the lung with the trachea and its branches, bronchial space, may be seen as an ideal tree. Like a real tree, it takes up carbon dioxide and gives off oxygen to the inner world of the blood-filled lung. The whole of it is an illustration given by nature herself, of the ideal relations between the rhythmic systems of man and plant.

The same rhythmic processes as those in the airy element may also be observed in the fluid and the semi-fluid spheres. The leaf pigment—how clearly nature spells things out for us here—is extraordinarily similar to blood

pigment in its material composition. In each case the respiratory metal is surrounded by four pyrrole nuclei, the only difference being that in the plant the metal is magnesium and in man it is iron. The plant also needs iron in order to form chlorophyll, but this iron does not enter into the structure, it remains *outside* it. Man *interiorizes* iron. Conversely, chlorophyll used as a remedy will greatly stimulate haemopoiesis in man. With all this great similarity between blood pigment and leaf pigment, we must not overlook the fact that even in external appearance the two are polar opposites: chlorophyll, the green pigment, fluoresces blood-red, and blood, the red pigment, fluoresces leaf-green. An archetypal phenomenon of life, at the same time an illustration that behind polar opposition a secret unity must nevertheless exist, that it must represent a true “dis-unity.” Having grasped this, one is forced to come to far-reaching conclusions. It means that man, the more highly developed being, cannot have evolved from the less developed one, the plant. And archetypal existence must have “disunited” and thrown off the plant form of life, so that the human form of life might be released. The archetypal relations between plant and man and their polar opposition must have their cause in the evolution of earthly existence, and that is where we must look. Any notions we have of the evolution of earth and of man must take into account such primal facts as these. The modern schools of thought on the subject omit this; but it is taken into account in the description of world and human evolution given by anthroposophical spiritual science. But more of this in later chapters.

To sum up, one may say: The rhythmic systems of man and plant correspond to each other as polar opposites. There will be many examples later on of how remedies from the leaf sphere act on the thoracic organs, on breathing and on the circulation, but also on all other rhythmic activities.

In man, the rhythmic system mediates between two polarities, and the same pertains to the plant. In man, the sphere of nerves and senses, chiefly concentrated in the head but extending all over the body, stands opposed to the metabolic system which is chiefly concentrated in the abdomen but also permeates the whole organism and, organically speaking, includes the activity of the limbs. In the plant, the rhythmic leaf system lies in the middle between flower and root processes. The threefold form of man and the threefold form of the plant invite us to look further into their relations.

### **Root Process and System of Nerves and Senses**

Let us first of all go down and contemplate the root. Through the root, the plant belongs to the earth and its sphere of forces. It is also the organ through which the plant comes to grips with the kingdom of nature below

it, with the dead, mineral kingdom. The root is subject to the forces of gravity, it is “geotropic,” i.e., “sensitive to the earth,” just as shoot and leaf are “sensitive to the cosmos.” “Sense-of-gravity organs,” statoliths, have been found in root cells. But the root is also “sensitive” to the material conditions of the soil, its water content and concentration of salts; it is in “perceptive contact” with its physical environment—just as the head is in touch through its sense organs with its physical surroundings, the world of the senses, though this only reveals to it the external mineral and physical aspects. (Our sensory perception cannot grasp the vital activities and the conditions pertaining to the soul or spirit of the objects around us; it perceives them merely as “objects” standing out in opposition, like “obstacles.” Until man develops higher forms of perception, anything beyond this will have to be grasped by thought.) The root grasps what it “perceives” in its environment by actively growing into it. It employs a selective faculty by very specifically, in a manner dependent on the species, taking up this or that substance from the earth and making up a “salt composition” that is individual to each species. An analysis of the plant ash only gives a dead image of this. The whole process is analogous at the material level to the way in which sense perceptions are taken up and processed in the functions of the brain and nerves. In the root, salts and water are vitalized, lifted out of gravity and the laws of the earth, and then handed over to the plant’s own organization. Through the salt processes which have been taken up, a process of mineralization goes through the whole plant, permeating all its vital processes and in this way making it into a being that truly belongs to the earth. Hardening and mineralizing processes are also emanating from the human head; the head is the most hardened, mineralized (calcified) part of our body.

But one must always look for the polarities in such analogies. Root process and head process correspond as polar opposites. The head, with the highly organized brain floating within it, rises above gravity; the root becomes part of it. The root does, however, wrest away from gravity the substances that it takes up, enlivening dead substance, meeting the dead mineral with the highest vitality of the plant and handing it on to the forces of “levity.” The root is the most vital organ of the plant. In the head, on the other hand, great finesse is used to throttle down the vital processes most strongly; here mineral processes previously taken up into human vitality are forced into the human form. The daring feat is done of bringing this human form into appearance in a calcium skeleton. This form represents the greatest contrast to the form of unenlivened mineral—truly a masterpiece of creation. The skeleton is *human mineral*.

In the head and the sphere of the nerves and senses one may therefore see a human counterpart and polar opposite to the root processes. Numerous drugs from roots with their marked effect on head and nerves give proof of this—later chapters will discuss it further.

### **Flower and Fruit Process and Metabolic System**

Descending from the leaf to the root we have lost sight of the leaf form and the rhythmic sequence belonging to it; only the nodes and their vessels remain, in a way, pressed closely together, almost without form but highly dynamic, concentrated, sucking, the root organ. Ascending to the region of flower and fruit we also move up into a region where form is highly developed. The purely plant element, the green leaf, becomes the stuff used in sovereign fashion by a higher form-giving principle. Not just *one* leaf, but a *multiplicity* of leaves are taken together and appear as a new structure. The green color, and the assimilating function belonging to it, are lost. The rhythm of leaf arrangement, spiralling upwards according to strict mathematical laws, is held up and changed into a circular movement. The time sequence of the leaves becomes an arrangement side by side in space, with new numerical laws coming in to establish something new.

The leaf, ideally part of a plane reaching into infinity, touching infinity and nourished from the infinite cosmos, now curves up into a spherical surface. Forming a bowl, a bell or a tube, it now encloses *internal spaces*, whilst for the leaf there is only one space, *external space*. Deep within the internal space the fruit node lies enveloped, the highest form of development of the node. Color, scent, nectar, warmth and pollen are now *exhaled*. Pollen brought to the flower from the air or through animal activity is *inhaled*. To the final contraction, the concentration of the seed, is now added the final expansion, the swelling of the fruit. This fruit is now merely a structure enclosing a space and enveloping it, for now the inner space is completely filled with inner substance. The far-away outside world has become interiorized, right into physical substance. This substance develops with the aid of a great deal of warmth coming from outside, and in some flowers the plant even develops a certain amount of heat of its own. In the root, the plant needs water and salts; in the fruit, it needs ripening warmth and cosmic radiations coming in. The whole force of summer is enclosed in the formation of the fruit.

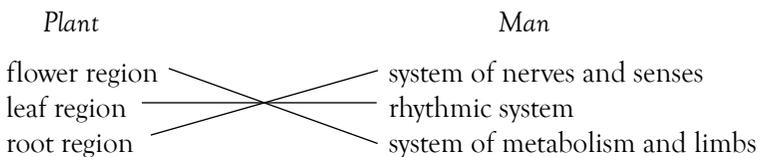
The connections with the reproductive process immediately make us relate the upper organs of the plant with the abdominal organs of man. But this actually applies even more comprehensively to the whole metabolic sphere. But it is the “how” of these connections that deserves particular

attention. The plant is being “opened to the world.” This is clearly indicated by the form and function of its chief organ, the leaf. Ideally the leaf is a plane tangential to the infinitely great sphere belonging to it. From this cosmic sphere, activities and influences are radiating which either form the basis of the metabolic processes in the plant, or at least influence and integrate them. These activities are incorporated in the plant, but the centers giving the impulse remain outside in the universe. Man, on the other hand, has taken these centers of impulse into himself, in the world of his inner organs. Liver, kidney, heart, gall-bladder and so on are autonomously, in cooperation with the wholeness of the human being, performing tasks which the plant can only carry out together with the outer universe. (The building up and breaking down of carbohydrates in the plant, for instance, follows the rhythms of the sun and of the earth, in the cycle of day and night, in the cycle of the seasons. In man, however, in the life process, this carbohydrate metabolism is subject to the impulses of the will which move the limbs.)

The specific metabolic activity of each plant species, from the leaf to the formation of the flower, fruit, and seed, may be seen to be a synthesis and accumulation of substance that is definitely peculiar to the species; the fruit element serves to nourish others in the natural kingdoms above that of the plant. In the flower, this is expressed more in form, in the fruit, more in substance. The form developed by the flower tells us something of the forces that are involved, by the way it comes close to animal form and animal nature. Tendencies related to those normally belonging to animal and human nature take effect, are accepted into the life principles of the plant, in order that the flower form may arise. Deviation from plant principles of formation and from the form of the leaf is even greater in the development of the fruit. As a nutritive substance the fruit then enters directly into the form and mobility of the system of metabolism and limbs in man.

It becomes obvious that the polar projection to the region *above* the leaf must be found in the region *below* the rhythmic system of man. Such connections are emphasized by the medicinal action of the flower element of the plant on the metabolic region.

It is possible to represent this diagrammatically as follows:



## A Brief Reference to the Threefoldness of Man

We owe the discovery and systematic description of the functional threefoldness of the human organism to Rudolf Steiner. After thirty years of preliminary studies he published his first outline of this in 1917, in his book *Von Seelenraetseln (Riddles of the Soul)*. This book describes the relations of the human soul to the physical, bodily element. The nerve processes, extending into the sense organs on the one hand, and into the internal physical organization on the other, are the physical counterpart to the soul process of ideation. This agrees more or less with modern scientific thinking. What is new is that in the same way as ideation and nervous activity are linked, so feeling must be brought into relation with the rhythmic processes, with the “rhythm of life that has its focus in the activity of breathing, and is connected with it right down into the furthest periphery of the organization.” And just as the soul, in feeling, rests on the breathing system—though also in its encounter with nervous and sensory processes reflecting the mental image of what has been felt in consciousness—so the activity of willing rests on metabolic processes, throughout the whole of the organism. If something is willed, “a metabolic process occurs, providing the physical basis for what we experience as ‘willing.’”

A fully conscious, waking experience, however, exists only for mental images formed through mediation of the nervous system. In ordinary consciousness, anything mediated by the breathing rhythm has the power only of dream images: all emotions, affects, passions, etc. And “the willing based on metabolic processes is not experienced at a level of consciousness higher than the very dulled one that goes with sleep.” The experience of willing must be distinguished from the “idea of willing.” “Willing is a mental concept, because, within the conceptual experience of the soul, a non-conception comes in, entering into fully conscious experience very much as sleep represents interruptions in the progress of conscious life.” The system of “motor” nerves also serves perception, but the perception of the subtle metabolic processes which provide the physical basis for the activity of willing.

It would be wrong to see the “threefoldness” of man as a division of the human body into three. Nervous activity, breathing rhythm and metabolic activity “do not lie side by side, but *one inside the other*, they interpenetrate, and enter into each other. Metabolic activity goes on all over the organism, it permeates the organs of rhythm and those of nervous activity. But when it permeates rhythm, we cannot ascribe to it the physical foundation of feeling, nor when it permeates nervous activity that of ideation; in both these spheres, it remains linked with the activity of willing, permeating

rhythm and nerves.” In the nerve, “metabolism is to be found to the extent to which it is permeated with willing.” Whatever “metabolic activity there is in rhythm, has to do with the element of willing present in that organ.” Not only metabolic and rhythmic processes are to be found in the nerve, but also the physical processes which form the foundation of ideation. These are processes of degradation and paralysis only to be found through “a process of elimination.” It is not possible to go further into this here, but readers are strongly recommended to read the book already mentioned (*Riddles of the Soul*). What is so important is that “the *body as a whole*, and not only the nervous activity included in it, is the physical basis of soul life; that the three elements of the human body we have been discussing lie one inside the other, not side by side; though the maximum concentration of sensory and nervous activity is predominantly in the ‘upper man’ that of rhythmic activities in the ‘middle man,’ and that of metabolic activities in the ‘lower man.’”

## Disease Process and Medicinal Plant\*

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It is necessary to get a real understanding of the nature of disease in man, and confront it with a corresponding concept of the nature of the medicinal plant. Will we be able to think that which is the medicinal plant, and not merely determine it empirically?

We may consider it one of the great, universal insights given to us by Goethe that disease, pathology, should not be ascribed to something from outside, but must be seen and understood from within, from the viewpoint of what is absolutely healthy and normal. The forces and causes, the archetypal possibilities for all abnormality, all disease, must be looked for in the normal. A healthy organism is in balance with itself, with all the many different forces and impulses that make it up, differentiate it, and harmoniously combine all parts into a whole. In consequence it will also be in balance with the environment surrounding it.

According to the point of view we are discussing, a diseased organism contains the same forces and impulses as a healthy one, but these are no longer able to stay in balance. They have come to a crisis which might, for instance, be a crisis of development. Development, a process inseparable from human nature represents the transition from one state of balance to a new one that has to be achieved. An old equilibrium is given up so that a higher one may be attained. However this may be, in whatever form the crisis may present itself: Through the disruption of the balance some parts of the whole are given an advantage, others put at a disadvantage. Some wilt, others flourish and develop in excess. Harmony, the very expression of wholeness, is deeply disturbed, and the whole is "hurt," it is ill. Not only is it at war with itself; in one way or other, depending on the nature of the disturbance in equilibrium, it also loses its healthy relation to the forces of the world outside. This will either come in too strongly or it will not be properly mastered. And so damage from outside is added to disruption within. The internal imbalance establishes the disposition to disease, and

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\*Translation by R.E.K. Meuss, reprinted by kind permission from the July 1970, *British Homeopathic Journal*.

the outside world gives rise to secondary effects, e.g., the development of bacterial infection and the like.

Goethe did not develop this further for human pathology, but he did so for that of plants. The study of malformations in plants showed him that here the same form-giving forces were at work as in the normally developed plant, except that they were in the wrong place or at the wrong time. And indeed, to him such malformations did not become objects of horror, but a place where one might immediately perceive forces which are not perceptible, because they are held in balance by other forces. Now they are overshooting the goal, breaking through set limits—and become visible.

Seen this way, the pathological is not just an inexplicable fact to be recorded, a painful imperfection in creation, but a sphere where the nature of health becomes clearly apparent—something to marvel at as we see it. Disease—as a brilliant aphorism by Novalis put it—becomes a musical problem, a dissonance that must not be allowed to fall back into the harmony which preceded it but must be resolved into a better harmony that is to follow, an illness properly gone through will lead to better health. The idea of disease and its justification, indeed its necessity, in a world of beings who are developing further, is becoming apparent, and from this one can then work towards an idea of healing.

But this “idea of disease” can only lead to a concrete notion of the nature of the various individual diseases if it is linked with the concept of the human organism as a threefold entity. In this threefoldness we have two spheres of function that are totally opposed and yet necessary to each other. The system of nerves and senses, formed to meet the sense organs and through them the world of external impressions, surrendering to these and passing them on to the sentient soul, must keep down its own organic life to make room for a higher form of life, that of consciousness. The outside world reflected in the sense organs becomes the subject of a striving for perception and knowledge. Physical development must be brought to a halt at an early stage in these organs, so that such a development of the higher faculties becomes possible. The metabolic system actually ingests the outside world, but it overcomes it, forces it to nourish it. The outside world is destroyed in the process and must become inner world. Organs filled with a strong life of their own, enclosed inside, bring this about. Unconsciousness covers them all.

A third, centrally situated, system is needed to relate and balance such polar opposites. Through it, the opposites are united into a whole. Here rests the essential being of health, its rhythms guarantee it. The system of nerves and senses, indispensable though it is to the human being as a whole, does

in itself represent paralysis of life, and disease for the rest of the organism; for consciousness, for thinking, it has to pay the price of degradation, hardening, weakening of vital activities. Conversely the metabolic system, if acting on its own, acts as disease, because it can only develop its excessive vitality in a state of dampened-down consciousness, with the soul asleep. Complete health for man lies only in the right interaction of all three systems. This is something dynamic, therefore, not static. The human being is made to be in unstable balance, in every respect. His walk and upright posture express this externally, like a symbol. It is on such instability in all directions that the ability is founded of being in constant further development.

#### **THE POLARITY OF INFLAMMATION AND TUMOR**

The rhythmic system passes the anabolic processes of the “lower” organization on to the “upper” one, thus continually balancing the destructive processes which this upper organization must of necessity undertake, in order to fulfill its function within the organism as a whole in the right sense. If, however, metabolic activity becomes excessive, for some reason or other which we cannot go into here, the result may be inflammatory, dissolving processes. Conversely, excessive development of the upper organization will find expression in phenomena of hardening, in a damming up of metabolic activity, in excessive deterioration. Just as the archetypal phenomenon of the development of color is revealed to us in a double phenomenon, a polar pair of colors—yellow and blue—so the archetypal phenomenon of disease, which has its roots in the nature of the organism itself, is manifest in the polarity of inflammation and tumor, of dissolution and hardening. This applies to the whole of the organism, but also to each individual organ, for each organ has a characteristic balance of nervous and sensory as well as metabolic activities, and this must be maintained.

#### **DISSOLUTION AND HARDENING IN THE PLANT PROCESS**

Plant life, too, everywhere contains those two opposites: dissolution and hardening. One belongs to the sphere of activity of the root, the other to the flowering processes. And in the plant kingdom, too, the two activities are brought together, brought into rhythm, through a middle entity, the leaf function. But, a predominance of one or the other of these polarities does not lead to the development of pathological plant processes. On the contrary, in the world of plant forms this is a creative principle. There are forms which make it immediately apparent that the harmonious, primary plant element is “distorted” towards one pole or the other. The “idea” of the plant, the spiritual reality that lies behind all plant life (Goethe tried

to grasp this in his Archetypal Plant), appears in a very one-sided physical form in many plants. We come across plants that are practically nothing but root, with leaf and flower development stunted. Others form enormous blossoms, with hardly any root or leaf to them. Or any other organ may be overdeveloped, without moderation: the stem, the cotyledons, or the whole plant becomes predominantly leaf. The development of stamens may be hypertrophy at the cost of the stigma, and there are innumerable other possibilities.

Rudolf Steiner was the first to point out that the medicinal plants, in particular, have a tendency to develop one part, or part of a process, in excess, making it the outstanding characteristic in their appearance. It is the abnormality which makes the plant a medicinal plant. Often one can see very clearly how one part wants to become the whole, to proliferate, or at least to preponderate, stunting the other parts and thus distorting the “archetypal image” of the plant.

By understanding the way in which this “distortion” has arisen, therefore, one may discover the direction in which the plant could serve medicinally. And on this it should be possible to base a “rational” *materia medica* of plants.

The question now arises why such a process of “distortion of the archetypal image,” with one part and its functions so predominant, should lead to illness in human beings but not in plants. By following this up we can gain some deep insights into the essential nature of both. It is only possible to touch on the subject here; details may be found in the pertinent works of Rudolf Steiner.

A principle which in the plant kingdom causes “distortion” and produces the interesting, individualistic forms of medicinal plants—this same principle stands for disease in the human sphere. It does not produce new forms, or new species of human beings, but pathological conditions. It goes hand in hand with pain, with a threat to life, but also with advancement in inner development, purification, the achievement of a higher state of health. Quite different levels of existence are apparent in this.

To get closer to the mystery, let us consider the fact that the plant does not progress to a true development of organs and does not possess a system of nerves and senses comparable to that of man, nor a comparable metabolic system with the requisite internal organs (such as liver, kidney, gall-bladder, etc.). The well-springs of the “archetypal phenomena” of disease in man, inflammation and tumor, do not flow for the plant, are simply outside its sphere. The rhythmic system of man, the essence of archetypal health, is the only system which is fully reflected and has a counterpart in the plant. The

leaf system is the only form of organ produced by the plant, all other parts of it are also only leaves. It has no brain, nothing comparable to eyes and ears, nor any form of viscera. The states of being which in man constitute disease in the true sense—and which must be bound up with the states of being through which we may experience disease—cannot become part of this plant, remain for ever outside it. Disease is bound up with that which actually makes man a human being, through which he is more than that pure life structure, the plant. Being only a life structure—while man is more than that—the plant shows as characteristics of its external form what in man is pathology, change in his inner, psychic form. It becomes a medicinal plant for man when he is a bearer of disease and it may be used with healing effect on man, thanks to those projective archetypal relations which exist, quite generally, between plant and man. In the first chapter [the previous article] we have tried to describe these, as they find expression, in one and the same way, in the threefoldness of both.

To gain further understanding, it will now be necessary to see in what way man is more than the plant. When the creative forces of nature cause such variation in the archetypal image of the plant that hypertrophy on one part overcomes all others, producing, for instance, the monstrous root form of a bryony or a mandrake, or the leafy one-sidedness of a fern, the excessive floweriness of the elder, of dodder or even rafflesia, the stem structure of the horse-tail, the giant fruit of the pumpkin—all these one-sided structures are nevertheless perfectly healthy. And even if some of it does look misshapen to us: root forces breaking through into spheres normally reserved for the leaf, the flower, or conversely the root region being flooded with flowering processes—examples of this being yellow gentian in the first instance, and the carrot in the latter—all this is wholly viable and never gives itself discomfort or pain anywhere.

But when in man metabolic processes encroach too much upon the region of the nerves and senses, or possibly the brain, this may be an extremely unpleasant experience, an inflammation of the nerves or migraine, for example. The hardening impulses belonging to the skeletal system will be most painful in the blood vessels. In man, such shifts between forces do not lead to the development of new forms, possibly giving rise to a race of giant heads, barrel chests, fleshy feet, long arms, etc.; at the most there will be only hints of this. Such shifts between forces remain entirely in the dynamic sphere in man, they do not become form. Man—this is now becoming obvious—has a different relation between form-giving forces and physical body than the plant has. Quite obviously the form-giving forces are used in a different direction by man, so that they are not channeled

into physical form to the same extent as they are in the plant. The plant lives much more in giving expression to form, its form is never finished, is constantly kept going. There must be growth with the plant, or it is finished. Man concludes formative activity quite early, reaching a finished form, and with that really only begins his existence.

The plant must end its existence or it ceases to produce form. That growth comes to a conclusion can be seen very clearly when the plant enters into the flowering process. Vitality decreases, the living green disappears, leaves become short-lived and fragile. At the same time the plant touches upon the sphere of life that lies above it, the animal sphere, both internally and externally. Externally by taking into its life scheme certain animal activities, for instance in the form of pollination or the distribution of seeds through butterflies, bees, ants, birds, etc. (There are orchids with flowers so similar to animals that certain butterflies take them for females and treat them accordingly.) But at this point of transition, plant life dwindles away, the plant breaks off its existence and contracts again into its point of origin, the seed. Animal and man are beings "beyond the plant." They have made something part of themselves which the plant must leave outside, for this they have sacrificed the ability to continue to produce new shapes, have brought this process to a stop in a permanent form. But the animals have retained the ability to form species; in them, seen as a whole, another sphere of being has remained fluid and finds expression in the development of thousands of species, whilst there is only one species of man (the various races are only variations of one human species).

It is the creative nature of instinct which finds expression in the abundance of animal forms, giving them the very form apparent to the senses. The fear of the hare, the patience of the lamb, the mental apathy of the sloth, the greed of the wolf, the fury of the tiger, the anger of the lion—these are features of the soul, but they are inseparably bound up with the bodily forms that go with them. Animal bodies are the symbols of psychic qualities become flesh. If the much-used phrase of the oneness of soul and body has any justification, it is here. Man also bears within him these forces of the soul, but they are dampened down, they are governed by a higher principle. On the one hand this suppresses the development of unbridled instincts, on the other it prevents them from entering into the form-giving elements of the body. The abundance of flowing, living, form-giving forces in the plant is held up and fixed into a single, permanent shape to produce the animal form; in the same way the abundance of body-forming psychic instincts is hemmed in, held back from the processes which give rise to the body, and so the human stature arises. This form does not express psychic

qualities and drives. The instinctive life is not given the opportunity of expressing itself in the shaping of the individual body. The human soul contains all possibilities of psychic experience. The human body also contains in one archetypal form all the specific ways in which bodies are formed in the animal kingdom. It is the spirit which contains the whole soul element. And the human body does not reflect soul quality, but is a bearer of spirit.

But it is only possible to touch on these things very briefly here. They are described more fully in a study of animal nature and of man based on spiritual science.

What has been discussed may be summarized as follows: The full protective relation of man to plant—and above all of disease in man and the nature of medicinal plants—demands not only that one should consider their threefold polarity, but also calls for an evaluation of the differences in nature between plant and man. The members which constitute both have to be outlined at least briefly. Starting points for this may be found all along the road we have so far covered.

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