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EDUCATION AND DEBATE

Magic of signs: a non-local interpretation of homeopathy†

H Walach[1]*

[1]*University Hospital Freiburg, Department of Environmental Medicine and Hospital Hygiene, Freiburg, Germany*

Among homeopaths the common idea about a working hypothesis for homeopathic effects seems to be that, during the potentization process, 'information' or 'energy' is being preserved or even enhanced in homeopathic remedies. The organism is said to be able to pick up this information, which in turn will stimulate the organism into a self-healing response. According to this view the decisive element of homeopathic therapy is the remedy which locally contains and conveys this information. I question this view for empirical and theoretical reasons. Empirical research has shown a repetitive pattern, in fundamental and clinical research alike: there are many anomalies in high-dilution research and clinical homeopathic trials which will set any observing researcher thinking. But no single paradigm has proved stable enough in order to produce repeatable results independent of the researcher. I conclude that the database is too weak and contradictory to substantiate a local interpretation of homeopathy, in which the remedy is endowed with causal-informational content irrespective of the circumstances. I propose a non-local interpretation to understand the anomalies along the lines of Jung's notion of synchronicity and make some predictions following this analysis. *British Homeopathic Journal* (2000) **89,** 127–140.

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Introduction

> 'When the Baal-shem had to deliver something difficult, some occult work to help the creatures, he went to a specific place in the woods, kindled a fire and, in deep mystical meditation, said prayers — and everything happened as he had designed. When, a generation later, the Maggid of Meseritz had to do the same, he went to the same place in the woods, and said: 'Fire we cannot kindle anymore, but the prayers we can say.' — and everything happened according to his will. Again a generation later, the Rabbi Moshe Leib of Sassow was to do the same work. He also went into the woods and said: 'We cannot kindle the fire, and we do not know the secret meditations anymore, which animate the prayers; but we know the place in the woods, where all this belongs to, and this has to suffice.' — And it was enough. When, however, another generation later Rabbi Israel of Rishin had to operate this work, he sat down on his golden chair in his castle and said: 'We cannot kindle a fire, we cannot say prayers, and we do not know the place anymore, but we can tell the story about it.' And — said the person who related this story — his narration had the same effect as the acts of the other three.'*

With this story the eminent scholar of Jewish mysticism Gershom Scholem ends his work 'The Jewish mysticism'.[1] It describes the fading of the Chassidic tradition and introduces the image of dilution, in this case the dilution of magic rituals: although the original ritual is diluted and only the story of it remains, it is effective. The same is true for homeopathy, as those believe who have their own experience. Although the original substance is diluted,

*Correspondence: H Walach, University Hospital Freiburg, Department of Environmental Medicine and Hospital Hygiene, Hugstetterstrasse 55, D-79106 Freiburg, Germany.
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it is still in some way 'present' and effective. This presence, I will contend in this paper, is a magical, not a causal presence, like the one described in the text by Scholem. Magical presence and effects are wrought by signs, not by causes. In this sense, homeopathy is effective in a non-local way: it acts by magically activating connectedness. It uses a system of signs to bring about this action. I propose to use Jung's model of synchronicity, or, in more general terms, a general model of acausal effects, in order to understand this action. I will turn to explain how the scientifically obscene word 'magic' can be understood in an inoffensive way. Then Jung's concept of synchronicity will be elucidated and set into a wider frame of a possible general class of acausal effects. At last homeopathy will be exemplified as one phenomenon falling under this category. Before I set out, I will make plausible why such an approach is called for by interpreting the empirical database for homeopathy. I will use some concepts at the beginning loosely and clarify them in due course.

Inadequacy of causal and local interpretations of homeopathy

The empirical database

It has become fashionable among homeopaths to lean back and proudly pronounce homeopathy as empirically proven. While this may be true for optimists who are convinced of the efficacy of homeopathy by their experience anyway, it is certainly not true for the scientific community at large. Although the review of Kleijnen and colleagues,[2] the meta-analysis of Linde *et al*,[3] or the series of conceptual replications including a meta-analysis of Reilly[4–6] make a strong case for homeopathy, one should observe the following caveats:

1. Although Linde's *et al* meta-analysis showed a significant odds ratio for all placebo-controlled clinical trials of 2.45, this odds ratio drops to 1.66 (CI 1.33–2.08) for the 26 studies which were considered methodologically good. If one would include recently published studies which showed clear negative results,[7–11] and use only those which study classical homeopathy and with adequate methodology the odds ratio would drop to insignificance.[12,13] In that sense, the 1997 meta-analysis is a provisional result, not a definitive one. A recent re-analysis of the methodologically convincing studies which studied classical homeopathy (leaving out David Reilly's studies which studied, strictly speaking, isopathy) came to the conclusion that classical homeopathy is in fact placebo.[14]
2. There is little evidence for the efficacy of homeopathy from *independent* replications. While there are the conceptual replications of the efficacy of isopathic preparation in atopic conditions,[4–6] these studies have not been replicated so far by independent groups. They might prove to be a non-classical experimenter effect, which is well known in parapsychological research.[15,16] The only evidence for significant and stable effects is a series of studies of a formula of homeopathic preparation in postoperative ileus,[17] which, however, is not very representative of the clinical use of homeopathy. The research on efficacy of homeopathy in childhood diarrhoea[18,19] has been replicated in a third study now.[20] Although this result is positive, too, the analysis was not conducted according to the original protocol, and the time course of the improvement is different.
3. Promising clinical models of homeopathic efficacy generally have failed, when probed for independent replicability. While a first series of studies of classical homeopathy in rheumatoid arthritis were promising,[21,22] a conceptual replication failed.[23] While the first trial of homeopathy in migraine, a condition said to be well amenable to homeopathic therapy, was strongly positive,[24,25] a direct replication[8] and two conceptual replications failed to substantiate the claims made by the Italian group.[7,26]
4. Fundamental research has not been able to come up with a simple, replicable model so far. Although, taken together, there seems to be some evidence for the claim that ultra-high dilutions can be active,[27] single models have not been able to stand up to independent scrutiny. Benveniste's model of immune reaction, originally promising,[28,29] could not be replicated.[30,31] Although one could argue with a multitude of single research paradigms which in the hands of single researchers have been produced impressive results, as witnessed by reports made at various meetings of the International Research Group on Very Low Doses (GIRI), there is no single paradigm as yet which could be replicated by researchers critical of homeopathy.[32] The research by van Wijk and Wiegant is a beautiful example of how there is possibly a biological foundation to the similia principle in that they could show that low doses of toxic agents induce repair and protection mechanisms in cells, but as yet there are no results with ultra-molecular doses.[33,34]

Since homeopathy poses a challenge to the mainstream biomolecular paradigm which equates effects with the action of molecules, it is reasonable to demand independent replications in order to substantiate the view that homeopathic effects are indeed local and causal. There is one possible exception:[35] the recent abstract presentation of work still in progress by Sainte Laudy and colleagues.[36] In this research model, a somewhat different model from that of Benveniste's group

is being used, and the inhibitory effect of potentized histamine is studied. So far, in four different laboratories experiments have been carried out, and while controls showed a degranulation of 48.8%, experimental observations were of 41.8%, a difference of clear significance ($P < 0.0001$). However, only 3 of the labs produced independently significant effects, and it remains to be seen whether the results will remain reproducible.

5. Within homeopathy itself there have been at least one, probably more, field experiments ongoing over the times. Causticum, a remedy introduced by Hahnemann, has rarely, if ever, been manufactured according to the original pharmacopoetic instructions given by Hahnemann (Jörg Wichmann, personal communication). Yet Hahnemann's symptoms seem to be valid for Causticum produced according to different rules. The same is probably true for other remedies like Petroleum or Carcinosinum. This makes it unlikely that the effects of the homeopathic remedies are locally tied to the medicinal products of homeopathy. Rather they seem to depend on the homeopathic therapeutic ritual as a whole.
6. The pillar of homeopathy, remedy provings or pathogenetic trials,[37] rests on shaky ground. The provings conducted and published since 1945 are not very convincing from a scientific point of view,[38] the ones conducted in the United Kingdom being methodologically slightly more rigorous but not very convincing either.[39] The provings which I have conducted myself[40–43] do not show a clear pattern of different or more symptoms with homeopathic substance than placebo. Modern homeopathic provers like Jeremy Sherr or David Riley admit in personal discussions that very specific symptoms can be observed with placebo. These are rarely published, however. It seems to be an open secret that true homeopathic symptoms, meaning specific clearcut symptoms known to belong to the remedy, can also be observed with placebo, albeit normally only in the context of a homeopathic remedy proving.

Taken together, the data poses a double challenge to an open-minded observer: it shows too many irregularities which cannot easily be dismissed as chance results. Deviations and effects sizes are too large. Hence some type of anomaly seems to be clearly present. But the irregularities are striking. They are not persistent enough to be taken as local, stable or causal effects.

Causal and local interpretations of homeopathy and some clarifications of notions

With the rise of the molecular paradigm it has become compulsory for homeopathy to provide a rationale for its purported effects. Within German homeopathy this has led to a split between critical, rationalist homeopaths and followers of 'classical' homeopathy.[44–48] High potencies were considered unscientific, because no theoretical rationale for their efficacy could be provided, while the Arndt–Schulz law, which stated that small doses could have stimulating effects, gave justification for the application of low potencies. Homeopathy had unwittingly drifted towards the causal-local paradigm which is at the base of the modern scientific enterprise. Aristotle introduced four categories of cause: material cause, formal cause, final cause and efficient cause. Modern science has dropped all but efficient cause from its explanatory armarment. When we now talk of causal explanation, we normally mean efficient causes, causes for movement in Aristotle's terminology. In order for something to be an efficient cause, it has to fulfill three criteria, according to Hume's analysis, which is still unchallenged:[49]

- It has to temporarily precede its effect.
- It has to be spatially contiguous.
- Cause and effect have to be related in a lawful or regular way.

Hume noted that 'cause' is not something material, but something which has subsistence only in ideas. It is an abstraction. In our modern view, the notion of causality is usually tied to the concept of locality. Locality means that only those regions of our universe can be in causal connection with each other, which are within the temporal or spatial reach of a light signal to travel from one place to another. Locality describes 'the condition that two events at spatially separated locations are entirely independent of each other, provided that the time interval between the events is less than that required for a light signal to travel from one location to the other'.[50] In order for two events to be causally connected, then, there has to be a material signal or connection, which conveys effects and connects the cause with its effect.

It is this situation which places homeopathy in a difficult position. Since there is no conceivable mechanism in the molecular paradigm—no molecules present in high potencies—homeopathic effects can claim no conceivable cause. It has been claimed, therefore, that the mechanism for homeopathic action is not molecular, but causal and local nevertheless.

Difference in isotope ratio of the solvent depending on the solute,[51] electromagnetic information,[52] cluster formation in the solvent[53,54] are the more prominent candidates of local-causal models which try to establish a connecting causal link between the homeopathic remedy and the organism. A good review can be found in Schulte.[55] And even if the possible link is said to be of informational content[56] or a systemic memory effect,[57] the implication is that eventually there be some sort of physical substrate, which in its theoretical content is thought to be a locally causal

process. A direct implication is that it is the remedy itself which contains somehow this information or causal agent.

It is worth our while to note three points of interest here:

1. Hahnemann himself clearly held a nonphysical theory of the action of remedies, in that he wrote of the 'spiritlike' nature and action of remedies. He clearly wanted to abstract from the material presence of substances and point to the nonmaterial essence of the remedy. I do not think that reverting back to Hahnemann's original notion would do our understanding any good, let alone the scientific reputation of homeopathy. But it is interesting to find the father of homeopathy with these words.
2. Efficient local causality, as we generally assume, is not the only way to view causality. William Ockham in the 14th century had already seen that causality is something like a theorem or axiom which we use, in order to make scientific statements, but which does not say anything about the 'being', the material connection between events. It describes regularities, strong correlations, which cannot be traced back to anything deeper, without reverting to abstract entities. Ockham's conception of causality, as formulated in his Commentary on the Physics of Aristotle is:

   We have to presuppose one proposition, which seems to be evident: something is a cause of any thing, if, the cause not present but everything else being present, the thing is not, when present, it is.—

   ...sumpta una propositione quae videtur manifesta, quae est ista 'illud est causa alicuius rei, quo non posito omni alio posito, res non est, et quo posito, res est'. Si enim negetur ista propositio videtur perire omnis via ad sciendum aliquid esse causam alteris.[58] p. 629f

   Against the then fashionable notion of causality as always involving an entity, Ockham formulates a purely correlative notion of causality which also allows action at a distance, a very modern concept.[59]

   The problem of causality has been hotly debated through the ages. Our notion of efficient, local causality is by no means the only rational approach. It has become so pervasive, though, to equate causality with efficient causality and to presuppose locality and connectedness via material signals that in what follows I will adopt this language. I will refer to causality whenever efficient causality is meant. I will refer to acausality when other forms of regularity are intended.
3. Hume, 400 years after Ockham, took the same stance. He was well aware that causality is something which happens in our mind. Our mind abstracts from regularities and poses causality. We never observe causality, but regularity. This finds its expression in the fact that the carriers of the four fundamental forces are *virtual* particles which are supposed to interact with other particles in order to convey information and mediate forces. We are somehow locked into this worldview that we are not able to understand regularity or causality without conceiving of real or virtual particles and the corresponding physical theory.

Although newer approaches like classical systems theory, dynamic systems theory, autopoiesis theory, or chaos theory seem to have remedied the situation somewhat by posing networks of influence instead of causes,[60–67] non-linear jumps instead of linear relationships, importance of infinitely small changes in initial conditions, and therefore have some appeal for homeopathic researchers,[57] these approaches are nevertheless local. That is to say, they all presuppose some sort of material or direct connection, and therefore fall under the same verdict. Thus systems theory in any version does not really help (as Martien Brands suggests in his commentary, this issue pages 141–145), but only obscures the principal problem. Apart from this, in a recent test of dynamic systems theory in a paradigm of extrasensory perception, predictions of a dynamic systems approach could not be verified, although the study showed a significant overall effect of extra sensory perception.[68]

In what follows I will try to outline a non-local model of homeopathy. One might call it an acausal model, according to the modern, restrictive view of causality, or a correlative causal model, according to a broader perspective, or a formal-causal model in Aristotelian terminology. For clarity's sake I will call it non-local and acausal, in order to delineate it from local and causal models.

Magic

Magic is a common human experience through the ages. Even now it is a common feature of folk medicine.[69–71] It seems to be tied to a specific state or level of consciousness. The German–Swiss philosopher of culture, Jean Gebser,[72] has provided a useful framework for understanding magic, not as a fake ritual for peoples who have not yet reached our cultural level, but as a common stage within a general development of consciousness. In Gebser's view, magic consciousness is a consciousness which still has access to the general connectedness of all beings, which is at the base of life. It was common in earlier developmental phases and is a transient phase in child development. Some aboriginal and native peoples still live mainly within this stage of consciousness, and some individuals seem to be able to activate this level of consciousness at will. Tart, knowing about different

states of consciousness, has called for a state-dependent description of reality and science.[73,74]

In the magic phase, action is possible via the general connectedness of beings. By attacking an image of a prey the real hunt is more likely to be successful. Image and reality are in some ways interchangeable. The image itself does not seem to be effective in itself, but the reality of connectedness which is evoked. Moerman [75] describes an example of a Navajo healing ritual. In it, a decoction of healing plants is brewed, all of which are pharmaceutically active in our understanding. But whereas a modern herbal doctor would probably make the sufferer drink the tea and the relatives attend to his sickbed, in the Navajo ritual the decoction is spersed over the whole family or tribe, and whoever is connected with the sufferer. This is a wonderful illustration of the different emphasis which is placed on connectedness within a clan or tribe in a different culture. In ethnographic documents many different phenomena of this magical type of consciousness are reported, from telepathic relatedness in the dream-time of the aborigines, to special ways of healing or fortune telling. While some of those phenomena are clearly faked,[76] others seem to be well documented.[77–81]

While interconnectedness of all beings surely is the common ground for the effectiveness of magical consciousness, it has always been acknowledged by thinkers in the West to be the basis for understanding the world at large. Leibniz has contended that in order to understand consciousness and the mind–body problem one has to presuppose a universal connectedness of all beings through time and space, which he called pre-established harmony.[82]

Schopenhauer, who was the source for writers such as C.G. Jung and Wolfgang Pauli alike, explicitly mentions in his 'Essay on Seeing Spirits', what he calls 'nexus of all beings' as being the basis for magical action:[83]

> Moreover . . . animal magnetism [ie mesmerism; author] . . . has testified to an immediate action of the will on others and over distances: However, this is exactly the general character of what is known by the illreputed name of *magic*. For this is an *unmediated effect of our will* which is *liberated from causal preconditions* of physical action, from *contiguity* as it were; . . . animal magnetism, sympathetic cures, magic, second sight, precognitive dreams, apparitions and visions of all kinds are related phenomena, twigs of the same tree. And they point securely and irrevocably to a *Nexus of all Beings*, which is founded on a totally different order of things than nature, which has at its base the laws of space, time, and causality; . . . such that changes are wrought by totally different ways than those of the causal chain and its successive links.

Note that Schopenhauer explicitly posits magic against causal action: magic is free from the constraints of time and space and it works immediately, without mediating causes. In our terminology adopted so far, magic is an acausal, nonlocal action in Schopenhauer's view.

According to Gebser, the magical phase is followed by mythical consciousness. The hallmark of mythical consciousness is the rise of consciousness as imaginative, psychical, as it were. Mythical consciousness is emotional consciousness. It is heralded by the initial phrase of Homer's Iliad: 'The rage, sing, O Goddess.' The Greek word 'menis', meaning 'rage', has the same root as the Latin 'mens' and our modern word 'mind'. While 'menis' is emotional mind, so to speak, mythically conscious mind of the ancient hero, our mind is abstract. Nevertheless, both words have the same root and thus point to a common notion. The ancient Greek myths—and probably other myths as well—tell the tale of the struggle of consciousness, in the image of the hero's journey, against the powers of nature which want to devour the hero or hold him back.[84] The mythical mind has to overcome his emotions—as a youth in puberty—in order to become modern analytical mind.

In Gebser's model the mythical phase of consciousness is followed by the mental phase, which is the predominant mode of consciousness in modern Western cultures. It's signature is perspective, which in painting was discovered in the Renaissance.[85] Perspective opens up a space and creates the illusion of distance. And in this distance the observer experiences himself as separate from the object. Perspective is the reflex of a consciousness of subject and object as distinct entities. It is an expression of mental consciousness. It is three-dimensional space which allows for the laws of mechanics to be formulated. And incidentally it was Newton, who postulated an absolute space—against Leibniz who argued for the relativity of space[86]—and thereby laid the foundations of a mechanics of efficient causes, which restrict scientific thinking, if they are taken as absolute. Mental consciousness is analytic consciousness. It operates in the framework of cause and effect, of order and measure. It has achieved great progress, has provided us with freedom from the immediate grip of nature, has given us a notion of human value and general human rights. It has accomplished unprecedented technological progress, which opens up an abundancy of possibilities. The deficient side, as Gebser calls it, is a loss of nature and a disconnection from the roots of mutual connectedness.

In Gebser's model the mental phase is to be followed by a phase of integral consciousness, which he sees as emerging. Its hallmark is aperspectivity, as he calls it. This can be seen in art, which has become increasingly aperspectival or multiperspectival. It is obvious in quantum mechanics which by the principle of complementarity forces scientists to think in a dual way in order to understand physical phenomena. It is equally obvious in the *n*-dimensionality of

Hilbert spaces. I do not want to speculate on this stage of consciousness, since Gebser saw it as emerging and only slowly taking form such that one would have to wait for its definite shape to grow. One of the purported benefits of this phase would be that earlier stages of consciousness would be equally accessible without mental consciousness losing its achievements.

For the purpose of this paper it is enough to see that magic can be seen as a stage in the development of consciousness which draws on different presuppositions, and that the modern scientific stance can be relativistically seen as a mentalist concept, which is not necessarily complete and not necessarily unique. The precondition for magical consciousness to be operative is the activation of connectedness. This, however, does not mean regression to earlier stages of development, which is usually connotated with the word 'magic'. It could be a hallmark of integral consciousness to be able to keep the achievements of mental consciousness while being able at times to activate magical connectedness. We therefore should turn to connectedness and elucidate this concept.

Connectedness

Whitehead

The development of modern thinking can be viewed as an explication of atomist thinking, emphasizing individuals or external relations, against internal relations or connectedness.[87] Alfred North Whitehead was one of the few modern thinkers who tried to understand individuals—actual entities or actual occasions—in terms of their connectedness or nexus with other occasions.[88] He emphasized the noteworthy fact that individual actual entities, atoms of being as it were, arise out of connectedness, integrating many different influences into their distinct existence, and radiating out influences, thereby giving rise to new entities. The final reality in this view is the connectedness of single entities, or individual entities creating a network of mutual influence or nexus. Individuality arises out of connectedness, connectedness gives rise to individuality. One without the other is not a rationally conceivable notion. Hence reality is in some sense non-local.

Quantum entanglement

While Whitehead's philosophical concept of the universe relies on its theoretically convincing power, which in turn is dependent on one's implicit ontology, quantum mechanics (QM) as a fundamental theory of matter has settled some metaphysical questions by experiment, an important fact which has not been given due credit.[89] In the formalism of QM, two parts of a single quantum system remain entangled no matter how distant in space and time they are. If a measurement is made of one part of the system, the other part is known in its corresponding state as well. This fact is known as Einstein–Podolsky–Rosen (EPR) entanglement, according to a paper of these authors, in which they tried to show that QM cannot be complete. The state of affairs remained undecided until in 1964 John Bell[90] showed a way out. He wrote down the preconditions for two parts of a system to be independent in his famous inequality. It is in fact based on a simple thought and describes the boundaries of correlated observations which can be obtained under the preconditions of independence of any system.[91] This inequality, however, made it possible to test the predictions of QM experimentally, one of the most famous experiments being those of Alain Aspect and colleagues.[92,93] Bell's inequality is violated by QM, as has been experimentally ascertained beyond reasonable doubt, and thus the predicted nonlocal entanglement of parts of a quantum system have to be accepted, unless one wants to subscribe to a positivist view and give up realism, which is normally deemed not an acceptable alternative.[94–98]

It is generally accepted that entanglement or nonlocal or EPR correlatedness is a fundamental fact of nature. It is normally only detectable by intricate experimentation and predicted by theory only for quantum systems. Therefore, one normally assumes that EPR correlations are of not much interest for everyday life. Some physicists point out that we do not know whether the fundamental entanglement of nature is completely broken up and what the boundary conditions are,[89,99,100] others voice the opinion that EPR correlations might have played a major role during the evolution and thus could have an importance even for macroscopic systems.[101] It should be noted that a quantum system is not defined by its size but by the fact that it has to be described by a noncommutative algebra of observables: '... the empirical cornerstone of our present understanding of measurement is the existence of non-local (EPR) correlations which are ubiquitous in any system requiring a description in terms of a noncommutative algebra of observables. From the viewpoint of algebraic quantum theory it is such an algebra that characterizes the quantum nature of a system. Neither its size nor its number of degrees of freedom is a good criterion to distinguish 'quantum' from 'classical'.'[89] Primas[102] has pointed to Landau's[103] observation that Bell's theorem is generalizable and that in any system, irrespective of its size and physical make-up, EPR-like correlations exist if two preconditions are jointly met:

1. The two systems have to be kinematically totally independent.
2. In every system there exists a set of incompatible or complementary variables, such that an algebra of non-commuting observables is required.

While this is an abstract and theoretical formulation, it immediately makes it clear that EPR correlations could be operative in other than experimental

quantum systems. Since this is a totally unexplored area as yet, we have to leave it at that stage, pointing out that the generalization of EPR correlations to other systems might open up new venues for exploration and research yet to come. In any case it remains an unarguable fact that QM has experimentally verified fundamental connectedness at the basic level of being. In this sense, QM has introduced a moment of non-locality into our compartmentalized and localized picture of the world. By postulating connections across spacelike and timelike[104,105] separated domains of the universe QM is introducing a kind of acausality which was one of the reasons for Einstein to oppose QM. For EPR correlations do not convey information in a causal sense, they are correlations without physical interactions. They describe correlated or concerted actions without local interactions, as it were. This is a genuine feature of interconnectedness.

Synchronicity

Another instance of connectedness is exemplified by what was called synchronicity by Carl Gustav Jung (1875–1961).[106] Although the basic idea was expressed earlier in several places,[102] it was only rather late in his career, 1952, that Jung published his ideas together with a paper by the eminent German quantum physicist Wolfgang Pauli (1900–1958). This joint publication was the culmination of an intense exchange of ideas over more than two decades from 1931 onwards,[107] the year of Pauli's crisis. Pauli was a professor of physics at the Technical University in Zurich. By the age of 30 he had accomplished nearly all of what had won him a world-wide reputation and would later earn him a Nobel prize.[108,109] Following the breakdown of his marriage he entered a severe crisis which eventually lead him to seek the help of Jung, who had a reputation as one of the leading psychiatrists and psychotherapists in Zurich. Jung immediately discovered the potential of this relationship and recommended one of his students, Erna Rosenbaum, as an analyst to Pauli. This made Jung free to develop and carry on a personal relationship with Pauli, which is reflected in the recently edited letters. In these letters Pauli discusses his dreams and the progress of his therapy with Jung and scientific ideas pertaining to the questions of the relationship between mind and matter. Pauli, who had one of the sharpest minds in the physics community, deeply felt the inadequacy of the purely quantitative, materialistic approach to physics. This he saw expressed in many of his own dreams which heralded a new type of science symbolized as new lectures to be given and new positions to be taken. He communicated his concerns to Jung, who, in turn, would share his ideas about the pervasive nature of the psyche and the common ground. This he called 'unus mundus—one world', which would give rise both to matter and mind. Jung also shared his ideas of what he called an 'acausal' relationship of inner, psychological states and outer, material events. Out of this exchange of ideas developed the joint publication 'Naturerklärung und Psyche—Explanation of Nature and Psyche', which contained the final form of Jung's ideas on synchronicity and a paper of Pauli's on the development of quantitative science as reflected in the struggle between Kepler and Fludd.

Jung's notion of synchronicity is the parallel occurrence of physical events in the material world which correspond to an inner, psychological state of a person and which are related to each other by meaning. In Jung's own words (translation mine)[106] p31, p 26f:

> An unexpected content which unmediatedly or mediatedly relates to an objective outer event coincides with a common psychological state: this event I call synchronicity.
>
> I use the generic term synchronicity in the special sense of temporal coincidence of two or more events, which, however, are not causally related with each other and which have the same or similar content of meaning.... Thus synchronicity in the first place refers to simultaneity of a certain psychological state with one ore more outer events, which appear as meaningful parallels to the momentaneous subjective state and vice versa.

By synchronicity Jung denotes (and postulates) a category of events which can be described by the following joint conditions:

1. There is a specific psychological state or state of mind. Usually this is, in Jung's terminology, brought about by an activation of an archetype. This could be a personal crisis, a developmental threshold, a problem to be solved, etc. In any case, it is different from ordinary waking consciousness in that it can be described by higher emotional and cognitive arousal and activity.
2. There is an event happening in physical, material reality. This could be quite a chance event, like a person dropping in by accident and giving the information sought.
3. These two situations are linked by meaning, which is immediately apparent to the person experiencing the synchronistic event.

Jung placed emphasis on temporal coincidence, but this is not a necessary condition for synchronistic events. Temporal coincidence simply makes the experience more striking. But the psychological state might have been present for some time in which case it makes not much sense to bring in the temporal relationship between psychological state and material event. The decisive point is that an inner, mental, psychological state has a relationship with an outer, material, physical event or state which is not mediated by what is commonly taken as an efficient cause. Note that in a wider terminological framework which

would encompass also final or formal causes this problem would not arise and one would not have to speak of an acausal relationship. But given the scientific terminology which equates cause with efficient cause, and given that there is no direct known physical interaction between mental states and physical events, Jung calls this relationship 'acausal'. This qualification 'acausal' is always to be taken as acausal in the sense of efficient causality. The second important point is that the relationship is not determined, technically speaking, by external relationships — by qualifications of the event or the state of mind which would be obvious to an external observer — but by internal relationships — by meaning. Meaning here is to be taken as an individual sense of meaning, as the subjective meaning which the particular situation has to a specific person in a special state of mind. It is not necessarily obvious from a third-person perspective or observable from the outside.

Here are some examples or illustrations: The first two examples are from Jung, the other two are examples from history. Jung himself illustrates his point by the example of a woman patient of his, whose progress in therapy came to a halt because the patient would not want to let go of very rational and restrictive ideas about herself and her own self-image. In that impass she reported a dream in which a scarab beetle figured prominently. Jung tried to analyze the dream in terms of the symbolic content of what the scarabeus stands for: death and rebirth in Egyptian mythology. He pointed out that this was possibly a sign for her to let die some old concepts in order for a new self to be born, without much avail. In that moment of therapeutic impass something banged against the window, which Jung found to be a rose beetle, which, in our area, is the closest relative to the scarabeus. He presented this 'scarabeus' to his patient, who was so stunned that she gave up her resistance and progressed in therapy.

The second example is taken from the book 'L'inconnu et les Problèmes psychiques' (1900, p. 231, quoted by Jung, 1952, p. 14, note 1):

> A certain M Deschamps was once given a piece of plum pudding in Orleans, by an M de Fontgibu, when he was a boy. Ten years later he saw a plum pudding in a restaurant in Paris and ordered one. But it turned out that this piece of plum pudding was already ordered by M de Fontgibu. Many years later, M Deschamps was invited to have plum pudding as a specialty. At the dinner table he remarked that now only M de Fontgibu was missing. At that moment the door opened and a senile, disoriented old man came in. It was M de Fontgibu who had mistaken an address and wrongly stepped into this closed society.

The third example is taken from history:[110] During the Middle Ages the Spanish jews were oppressed by the Christian rulers of Spain after the reconquista. The kabbalah had been compiled there; one of the compilers is considered to be Rabbi Moses of Leon. One of his successors was his student, Rabbi Samuel ben Abraham Abulafia. He decided to travel to Rome to discuss the sad state of Jewish affairs with the Pope. When he started his journey he had a good chance for a fair talk, since the Pope was Peter of Spain, a renowned philosopher, originally from Portugal, who had taught at the University of Paris and was open-minded. But meanwhile Peter had died and the new Pope, Nicholas III, gave out the order to take Abulafia captive and burn him on the stake, should he proceed towards Rome. Abulafia, who was of course warned, did not pay attention to the threat and wandered towards Rome. When he entered Rome on 22 August 1280, the Pope died.

The last example is taken from Pauli's life.[108] Pauli was a converted Jew. Although he was denominationally Catholic, he did not care much for his new religion, and was raised in the spirit of scientific materialism. Ernst Mach was his godfather. And yet he had retained a basic sense of spirituality and thereby was drawn to Jung's psychology. Pauli's teacher was Sommerfeld, after whom the Sommerfeld fine structure constant was named. This is a constant, which, as a dimensionless number, describes the electric elementary charge as electron charge squared times 2π, divided by the speed of light times Planck's constant. It is an important natural constant which, according to Pauli, is decisive in developing a general field theory, to be precise: Pauli thought that the development of a general field theory was dependent on the deeper understanding of the *numerical value* of this constant, which is approximately $1/137$. Pauli had learnt from Gershom Scholem that the numerical value for the Hebrew word 'Kabbalah – HLBQ' was $H = 100$, $L = 30$, $B = 2$, $Q = 5$, which is 137. Wolfgang Pauli died 15 December 1958 in room number 137 in the Rotkreuzspital in Zurich. Enz, who recounts this story and who visited him shortly before his death, remarked that Pauli was well aware of this meaningful coincidence and was quite sure that he would not leave this room alive.

Synchronicity depends on the subjective meaning, which relates inner psychological state and outer physical event. All examples and stories of synchronicity are by definition third-person accounts, because the experience of synchronicity is by definition subjective, since personal meaning is subjective. In that sense all of the above examples cannot do more than exemplify occasions which might be counted as instances of synchronicity. Each person will in the end be the sole arbiter of what is a synchronistic event.

While Jung and some of his followers[111] apparently want to reserve the term 'synchronicity' for rare occasions of numinous experiences, some remarks of Jung's and general observations favour a wider stance with synchronistic events as facets of reality

complementary to efficient causality (or efficient causality complemented by final causality, in the Aristotelean framework). Jung himself, in a footnote in his original article (p. 85, note 7), remarked that it could well be the case that synchronistic events might be more common than he himself at present wanted to admit. In a letter explaining synchronicity,[112] Jung states that the fact that some people could produce paranormal events could be explained by invoking synchronicity: these individuals, he said, are capable of entering a state of mind which evokes archetypes and thus make synchronistic events possible. If this explanation were to be adopted, then synchronistic events in the sense of Jung would be amenable to control under certain circumstances. Furthermore, in his correspondence with Pauli,[107] Jung emphasizes the fact that synchronicity should be viewed as a principle of relating events which complements causality thereby implying that synchronicity could be just as fundamental a relationship as (efficient) causality. Taken together this would mean that synchronicity, as Jung and Pauli understood it, would have served as a principle of connecting inner, mental states and outer, physical reality by a bridge of meaning, without, and this is the important point, a material interaction of the type of efficient causality.

From this perspective we can sum up: Jung and Pauli generated the idea that psychological states and physical events could be acausally connected via an element of meaning. This relationship could be a complementary fundamental form of relatedness. It would be acausal in the sense of efficient causality, yet it would be the expression of a definitive form of relatedness. In a synchronistic event outer reality behaves in a way corresponding to an inner state of mind, or vice versa, mediated by meaning.

Semiotics

This leads us on to discuss semiotics. Semiotics, taken as a general theory of signs, deals with the production of meaning. Decidedly developed among others by the eminent American philosopher, logician and mathematician Charles S Peirce, semiotics can be seen as a fundamental theory of relationship by meaning.[113–117] Peirce thought that the whole universe can be seen as an evolving system of signs which were interconnected. He introduced a basic triad, which he takes to be fundamental categories. He sometimes calls them firstness, secondness, and thirdness, sometimes he uses the semiotic terms object, sign and interpretant. Every sign, he says, stands for an object, and produces a certain meaning in the mind of someone interpreting the sign. This meaning, or 'relation-of-the-sign-to-its-object',[117] can again become another sign, signifying the preceding meaning as its object, thereby generating a new interpretant or meaning, 'and so on, endlessly'.[118] This web of meaning is woven by interconnected triadic relationships of signs signifying objects and thereby generating meaning. In the words of Peirce himself:

> A Sign, or Representamen, is a First which stands in such a genuine triadic relation to a Second, called its Object, as to be capable of determining a Third, called its Interpretant.[118] (2.274)

> A sign or representamen, is something which stands to somebody for something in some respect or capacity. It addresses somebody, that is creates in the mind of that person an equivalent sign .... That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object.[115] (2.228)

It should be noted that this triadic relationship with meaning mediating between the sign and the object, as it were, leaves room for interpretation. While in a mechanistic framework an efficient cause, all circumstances being equal, always and irrevocably produces its effect, in a semiotic perspective an object may have different effects according to the meaning which are perceived by recipients of the sign, signifying the object. Thure von Uexküll, the doyen of German psychosomatic medicine, pointed out that, while the discourse of cause and effect always is in diadic relations of cause and effect, the semiotic viewpoint is expressed in triadic relations thereby breaking the quasi-deterministic relationship into an open one, where a cause, seen as an object in a semiotic triad, does not always have the same effect or meaning, but this effect depends on the particular meaning generated.[119–122] This situation is graphically depicted in Figure 1. One could visualize the emergence of meaning or triadic relations out of causal or diadic relations as a gradual growth of complexity and degrees of freedom, as systems grow more complex. In such a view, causal relationships would be special cases of more complex triadic semiotic relationships which in basic contexts break down to simple diadic cause–effect relationships. Thus the triad would be the general case and the causal diad the specialty. As material systems aggregate and form more complex autopoietic and living systems, the capacity to understand and generate meaning grows out of the original,

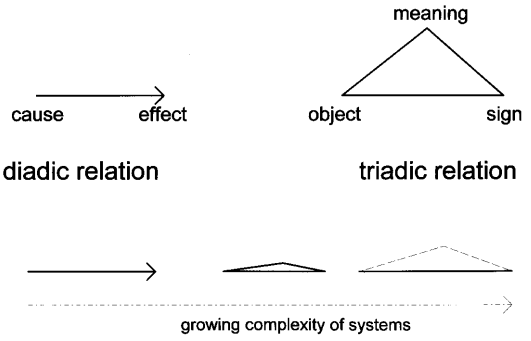

Figure 1 Causal and semiotic relatino according to von Uexküll. For explanation see text.

simple elements, which in Peirce's terminology would already have very basic, crystallized potentials for meaning. In more complex systems, however, the degrees of freedom would grow thus generating semiosis or communication by signs. Uexküll points out that many biological and immunological processes indeed are semiotic processes, and that an analysis in terms of cause and effect is not adequate.[119] An antigen, for example, is not a cause for illness to an organism which is immunocompetent. It is a sign to activate certain antibody-generating cells. It is a totally different sign to an organism which is not immunocompetent. It even can be no sign at all, as it were, if the antigenetic potential is not recognized as in highly virulent diseases like rabies, thereby becoming a direct cause of death. Note that causality in this case is the absence of a differential meaning of an object—the antigen—as a sign. I would venture to say: cause in semiotic terms means the absence of sign characteristics or meaning. This analysis shows that causes are special cases of signs, and usually, at least in the intercourse of cognitively competent persons, meaning prevails causing.

I have pointed out that homeopathic therapy can be analyzed in semiotic terms:[123,124] the symptoms of a disease signify the disease, taken as an object. They are signs for the intrinsic, and according to Hahnemann unobservable, object 'disease'. Taken together they have a specific meaning, the homeopathic remedy, in the mind of the trained homeopath. By choosing a remedy from the homeopathic materia medica the homeopath also enters a semiotic process. He tries to understand the meaning of the illness, which would be the homeopathic remedy indicated by the symptom picture. This he can do, because the materia medica contains a lot of signs and symptoms, which had been produced in homeopathic provings by volunteers. Thus, homeopathy can be seen as matching one type of meaning, the one given by the symptoms of the sick person, with another one, given by the symptoms of remedies in the materia medica. Homoeopathy in fact is applied semiotics. The similia rule connects the two semiotic spheres of illness and remedies.

Magic of signs: the semiotics of synchronicity

We are now in a position to put together the pieces. My suggestion is in fact quite simple. I propose letting go of a causal, local interpretation of homoeopathy and homeopathic remedies as causal agents. Homeopathic remedies are signs, not causes. Their sign character is, however, not fixed by any 'informational' content present in the remedies. It is of a magical nature. It activates the general connectedness by the rituals of producing remedies, teaching and studying their nature, studying the patient's symptoms and prescribing the appropriate remedy, and finally applying the remedy. The success of these rituals probably depends more on states of mind, as usually admitted. We don't know anything about this, because there is no research in this area as yet. But very likely some of the conditions posed by Jung as a prerequisite for synchronistic events to happen are present.

Usually homeopathy produces its most remarkable effects either in very acute or very chronic cases. These are usually exceptional cases where patients, doctors, and relatives are likely to be in activated states of mind. Seen as a synchronistic event, homeopathy would be acausal, not dependent on a local efficient cause, but dependent on a specific state of mind, perhaps in the doctor, the patient, or both. The synchronicity occurs when the semiotic process, the 'understanding of the case' in the homeopath, generates a meaning.

This, of course, is only a tentative approach. It leaves a lot of questions unanswered. How does this synchronistic event trigger healing? Is it perhaps only a minute change in the organism which is effected by this synchronistic process, which then in turn leads to a whole cascade of self-healing responses? Exactly how do the spheres of meaning—or consciousness—and physical reality interact? In that sense my proposal seems to destroy more than it offers. It certainly is destructive in the sense that it denies a causal, local efficacy of homeopathy, which will bring me in stark opposition to mainstream opinions within homeopathy.[125] But it might be constructive in the long run, because it makes predictions and warnings.

I would predict that it is not possible to find a single, reproducible causal model of homeopathic effects, either in fundamental research or in clinical research, as long as the role of psychological states in synchronistic events is not understood. In the language of transpersonal psychology: Homoeopathy probably is a state dependent healing technique which can only be researched consistently, if the according states of mind are understood. If the language of the generalized EPR correlatedness may be applied here, this could mean that homeopathy depends on the presence of complementary states (of mind?). This certainly needs clarification in terminology and empirical content.

If synchronistic events are misunderstood in the framework of efficient causality they are lost. They can not be replicated at will, neither will they turn up according to a general rule, since we have not understood the rule so far. The similia principle indicates only a necessary condition. It is not at all certain that it is also a sufficient condition. Therefore the research strategy for homeopathy should not be focused on proving the causal nature of homoeopathy, which might not exist. It should rather be oriented towards demonstrating its general usefulness and effectiveness as opposed to pharmacological efficacy.

My analysis brings homeopathy in close proximity to other paranormal or anomalous disciplines, like

distant healing, extrasensory perception or psychokinesis. There is a lesson to be learned from these disciplines: although a series of meta-analyses have shown impressively significant and sometimes impressively large effects,[126–132] they are far from accepted by mainstream science. There are several reasons for this state of affairs. One is that early claims could not be reproduced by more controlled studies.[133–135] Another reason is that there are theoretical problems associated with anomalous phenomena. As long as we do not understand them and don't have a proper theory which can accomodate them, they will not be recognized, despite the empirical evidence. But they are also elusive. Critics fail to replicate results, which points to the possibility that the results might be dependent on the states of mind of experimenters. As long as these phenomena remain obscure, there will be no sufficient replicability. But these other areas of anomalous research are in a far more comfortable position than homeopathy. Although effects sizes are sometimes small, the significances in these meta-analyses are beyond doubt. This means the effects are more stable. This is so because there has been more research effort directed towards replication of the same experimental paradigm again and again. This could mean that effects of that type — and I take synchronistic effects to be one example of direct mind–matter interaction effects — can only be discovered in a large ensemble of data. Therefore homeopathic research should opt for some very simple, easy to do and cheap experimental paradigms which would have to be repeated a great many times in order to tease out the effect. This certainly can't be done with clinical research, which is expensive. Clinical research should therefore be open in a way that it does not force the system to perform in a causal way.[136,137] This would imply introducing a deliberate element of uncertainty. This could be the usage of formula remedies in which one never can be sure which was the curative agent. This could mean deliberately leaving out the question whether the remedy or the whole setting of homeopathy is the curative agent. One way of doing this would be to focus more on open, randomised comparative trials which compare real-life homeopathy to other clinical approaches. In open trials one could always argue that the homeopathic remedies were not at stake, but the whole therapeutic approach, thus leaving open the question whether homeopathic remedies are placebos or not. My prediction would be that the more trials and experiments focus on the question of whether homeopathic dilutions are causal agents or not, the more negative results will be produced and it will be only in the very long run that a positive overall result could be filtered out of the data.

Another suggestion following from this approach would be that, in order to understand the action of homeopathy it may be vital to research the mental or psychological processes in patients and doctors as a moderating variable of therapeutic efficacy. By admitting that homeopathy could be quite an efficient form of magic, thereby pointing to the importance of the states of mind, homeopaths could possibly understand better, what happens. If we tentatively adopt the possibility that generalized EPR correlatedness could give the background for understanding synchronistic events, then it would be necessary to focus on possible candidates for complementary variables in the mind of the homeopath or in the system of homeopathy as a whole. And perhaps this would prove to be a very progressive attitude. It could well be the case that even in orthodox medicine states of mind are more important than the causal pharmacological paradigm would make us believe. This could be a more promising way of linking up with mainstream medicine than fighting the battle for causal agency of remedies.

In sum, I propose to abstain from a causal interpretation of homeopathy. Instead I contend that homeopathy is an acausal event, similar to synchronistic events. The homeopathic medicine is a sign which mediates the meaning between a mental-psychological state, the illness in the patient, and the physical realm of bodily functions, elements of nature, and the like. It acts via the original interconnectedness of all beings, which is activated, as in magical rituals, by the homeopathic ritual of case taking, remedy preparation, repertorization and remedy prescription. My hunch would be that homeopathy is only one example of a whole range of phenomena of the same category, which are neglected by mainstream science, because we do not have a proper understanding of them. The understanding, I would guess, can only come out of the analysis of mental states, and not of purported causal content. Maybe further analysis along the line of generalized EPR correlatedness could point the way to understanding acausal, synchronistic events in general, magic as an instance thereof, and homeopathy as a special case. Even if this should come as a narcissistic shock to many, it might be curative on the long run.

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