

MESSAGE IN A BOTTLE (about the information storage in homeopathic remedies)

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ABSTRACT

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ABSTRACT

In the last decade the concept of talking about homeopathy as an "informative", in stead of a "chemical" or "energetic" agent has become very popular. The term "information" however is poorly defined, both in physics and in homeopathy. This essay tries to set pathways towards a more exact definition, and will mainly refer to the biological impact of "information".

Information originally meant something like coming into shape, comparable to "evolution". The meaning of this word has shifted from indicating a process to indicating the start- or end point of this process. This has lead to confusion especially in the discussion about evolution, information and entropy. It is suggested to be consequent in talking about "coded" or "non-coded" information. The assumption that all matters on earth have informational aspects as well as aspects of chemistry and physics may be helpful in understanding the everyday practise of classical homeopaths.

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1. Introduction

Despite many positive clinical experiences concerning the use of homeopathic remedies, high potency homeopathy (the solutions that chemically contain "nothing" anymore), which according to classical homeopaths are the most reliable, still remain a problematic issue for mainstream science. How can such a solution have any effect if all the original chemicals are diluted out during the preparation? The so-called "memory" of water, a concept introduced by Benveniste, supported by experiments that caused a lot of commotion, only evoked irony within the scientific world (Davenas et al., 1988, and any following reactions in Nature among others). "Luckily" the experiments proved to be impossible to duplicate in other laboratories so the good old statement "it contains no chemical compounds therefore it cannot

work" was saved. A good argument was made by Popp, who had spent many years on fundamental research in the realm of homeopathy, he stated: "It doesn't concern a difference in chemistry, but a difference in physics. Both cold water and boiling water are chemically alike yet no one doubts the different effects they have on an organism." But, within the framework of physics, what is the difference between water and for example the homeopathical substance Phosphorus C1000, a preparation in which the original substance is diluted to 10^{-2000} , a standard preparation for a classical homeopath? Apparently it isn't the temperature, could it be some form of energy?

This has been a popular idea for a long time.

Hahnemann, the founder of homeopathic medicine, called his preparations "dynamisations", and their point of impact would be the "dynamus", otherwise known as life force or vital force. Nowadays we speak of the self-healing ability that can be specifically stimulated by a certain homeopathic preparation. The homeopathic remedy is not so much viewed as being an energy transmitter but as an information transmitter, a "message in a bottle". By providing the organism with information concerning a specific poison (while the toxin itself is barely or not at all present) it corrects itself in order to deal with it, and takes on certain adaptations to cure itself of a different disease (of which the symptoms are comparable to the symptoms caused by the toxin in the remedy in high doses). It would appear an impossibly unlikely story, but is widely acknowledged by many classical homeopaths that achieve positive results due to using high potencies in their daily practice. So it cannot simply be dismissed.

There are a number of aspects to this story that need to be further explained:

- What is this vital force or that self-healing capacity?
- What is meant by conveying information as opposed to transmitting energy?
- How can specific information on a poisonous compound remain in, or with the "carrier" (the homeopathical preparation), after many dilutions?
- How does an organism react to a poisonous compound and the "information" concerning this?

This article doesn't intend to deal with all these aspects in great length; too much is still unknown to do this. I am only trying to give an impression of my line of thought along which I have set out, in accompaniment of literature- and experimental research, to try and gain

a greater insight into these remarkable phenomena. In this article I will only deal with the theoretical background; the actual experiments will be dealt with in another article.

2. The concept of vital force

The "vital force" or "principal of life" stems from followers of the vitalism hypothesis within biology, a movement that states that life is more, and can do more than that which can be understood and described in physics or in chemistry. The opposite movement, mechanism, stated that life purely operates according to the laws of physics/chemistry. He who looks further into the implied assumptions that are generally maintained in the practice of science presently, will find that mechanism is the dominant movement, even though this choice is based on ideological grounds rather than scientific grounds (Hein, 1972). Biology has barely paid any attention to the specific living aspects of organisms for a long time. Instead it has had its focus on the chemical "building blocks" and the prior conditions set by chemistry and physics. But this has changed in the past few decades. Presently there are roughly two ways of bridging the gap between the two opposite's vitalism/mechanism, to make it possible to acknowledge and discuss that which is specifically living in nature and to exceed the reduction to building blocks as mentioned in the above:

- 1) System theory (can be found in Bateson, Lewin, Wijk/ Wiegant, and Prigogine/Stengers a.o.). This strongly accentuates the hierarchy in and complexity of living beings, because in every level of complexity new characteristics have shown to come into existence, that amount to more than the sum of the characteristics of the different parts (like lichens, a plant organism composed of fungus and alga in association, can conduct metabolism processes that are impossible for both the alga and the fungus separately).
- 2) Animism (can be found in Berman, Davies, Sheldrake, and Zohar a.o.). This questions whether the subject matter is "dead". "Do electrons have consciousness?" is a question provocatively asked by the physicist Zohar.

The Gaia hypothesis, as formulated by Lovelock and Margulis, is in line with the first line of thought, but is placed within the second line of thought by several authors. In Capra's work you can also find a mix of the two. It is remarkable (but understandable because of the priorities maintained by most biologists as described earlier) that a lot of theoretical work in this field comes from physicists and chemical analysts. When I was a biology student (in the 1970's) and

posed the question "what is life?" I was advised to read Schrödinger (1945!), a little booklet that had settled the discussion by defining life (as f.e. Bergson had done also) as the accumulation of negative entropy. And everybody was happy and went on studying life as if it were dead.

In the mean time physical chemistry put some thought into "negative entropy", and above all work by Prigogine was granted a special place, because it was inspired by the vitalist Bergson. Prigogine defined life as an open system, a dissipative system (leaking entropy into the outside world). He could even create such systems of a chemical nature by providing fluids with a constant energy flow. He created more or less stable oscillating structures (order from chaos). But this is of course not actual life. Structures are created when a pan of water boils, but these structures do not evolve like life does: they do not multiply, nor do they interact with their environment. Life tends to find its place in every niche created by physical or biological circumstances. Life is an open system, but every open system is not yet life (although this is often suggested in connection to the Gaia-hypothesis, f.e. Sahtouris, 1989).

Due to the new perspectives offered by defining life as an "open-system" cybernetics came into view. Perhaps life could be properly defined with the help of Berthalanffy's system-theory. This is a theory on complex machinery (like robots and computers) and the regulation processes that can be built-in to them. Life of course also has these aspects (like an eye also has camera-aspects). Complex machinery has, as well as an information-input and entropy-output, a physical/chemical interaction with their environment (for example: raw materials and oil go in; goods and smoke come out). So energy is absorbed, entropy is lost, it reacts to changes in its environment and stable structures come into existence (build a robot that can build other robots and you could even say it can reproduce). No difference with living beings anymore, or is there? Trinchler (1975) rightfully commented that there is one difference between such machines and living creatures. A machine works due to its construction (structure). As soon as it wears down due to the continual production of entropy it stops working, whereas life uses structural changes (like damage or loss of structure) as a non-energetic starting point for structural adaptation. The term "information" refers to this non-energetic stimulance. And so it would seem that dealing with information is an essential aspect of life, which might offer a starting point to theoretically explain homeopathy. For it is difficult to give meaning to the previously used term "energetic-life-concept"

since “energy” has been defined and researched at length, including the previously mysterious forms of magnetism. Above all energy is directly connected to “mass” (which would not be found in the high homeopathic potencies).

It is not at all surprising that concepts concerning the relationship between “life”, “entropy”, and “information” have begun to play a roll in the discussion on evolution. For despite of many reductionism approaches to the evolution-process (molecular genetics and mathematical models) evolution seems to play with the second law of thermodynamics. According to this law the passing of time would always cause an increase of entropy and lead to a constant temperature (molecular speed) and a random dispersion of molecules (chaos). Evolution of life however would seem to go in quite a different direction. Producing strange coalitions like trees, birds and humans. Is the evolutionary process therefore decreasing entropy?

Brooks and Wiley (1986, 1988 and 1990) claimed to have found a way out of this dilemma. They say evolution does not accumulate negative entropy, but only slows down the development of negative entropy, compared to a non-living world. What we think to be negative entropy is still increasing entropy but at a lower speed, according to them. Cleverly thought (see for comments and criticism on their work: Wicken, Weber and Nitecki). But is the problem solved by introducing the parameter “time” that maybe is even harder to define than “information”? Time, that seems to only exist in human consciousness?

3. The concept of “information”

The term information is difficult to describe scientifically. On the one hand this is due to the fact that everyone has a certain understanding of the term through use in daily life, and in this the term has been greatly simplified in comparison to it’s original meaning. On the other hand contemporary natural sciences are fixated on handling quantities (mass/energy), so they struggle with the non-quantitative aspects of information. Bateson gives us the example of the letter you didn’t write but still caused a hostile reaction. How’s that for something! We’re not used to concepts that are not tangible.

The information theory, a new branch on the tree of contemporary science, should help us out. Unfortunately it has based itself on the feeble assumption that low entropy means high order and that higher order contains more information (Giancelli). Like many other new scientific branches it does not

contribute to science by forming impressive roots, but starts off in a small base and tries to work it’s way up to the top quickly. So it will have to be lopped, and a lot of good lopping has already been done by Wicken. He states that the use of entropy in this theory leads us to two “entropies” in modern day science, and that is one too many! He suggests “entropy” in the information theory should be called “complexity” because that is what it really means here. Berezin (1988) writes: the use of the word “information” as a term in physics will always remain somewhat ambiguous; this is due to the in physics common over-emphasizing of energetic aspects in systems. Energy-units can be added-up to their sum, or dividable to for example half of their quantity. This “law of conservation” doesn’t go for information: two maps of the same town do not give more information than one. Information has a redundancy aspect and when divided by two the quantity doesn’t decrease, but stays the same. As an example of informative action Berezin mentions the working of a catalyst, because a catalyst aids a reaction, but isn’t involved in it. He uses this as a “model” for contemplating the effect of homeopathic remedies. This is very interesting, but sadly enough he allows it all to depend on one very specific phenomenon, namely stable isotopes, that could be formed as information carriers in a liquid.

I shall try to explain where I think this misinterpretation of the term “information” stems from.

The old Greek philosophers called the beginning of everything, when there was nothing yet: chaos, a word that later got the meaning “no structure” or “no order” or “formless”. The counter pole to chaos, then, was “cosmos”, the word indicating form, order, structure, etc. Creation (and later evolution, the development into something preformationally planned, Richards 1992) was seen as the change from chaos into cosmos, a process we could also describe as coming into form: information. Just like many other words, that describe processes, the meaning underwent a change towards defining the start- or end- “state”. In the case of information the modern use of the word information stands for the trigger that leads to a change of (often a more complex) structure. The problem is finding a material definition for these kinds of triggers. Also the absence of a material thing can be informative. Bateson suggests: information is every difference that makes a difference. The way we use the term information now, we forget all about the process and mean the starting-point (the newspaper someone is about to read contains “information” for the reader) or the end-point (the “information” that results from the evolutionary process is stored in DNA).

The basic definition (for the information theory) of information by Shannon and Weaver comes from the statement that a probability can be given to represent the possible knowledge about a certain question. It refers to information as anything that causes a change in this probability; as the difference between two entropy values, two statistical uncertainties. This counts as a kind of "scrabble" model of reality. It always concerns coded information, something you can grab hold of, record (for example in writing or in DNA), but there is more to the process of "coming into form" than is stated by the manual, the material and the end-product. Every report is also a reduction, as every scientist who has tried to put months of research down into one small report will know; but even if the report was not restricted in length it could never mirror all the experiences the scientist has had while conducting his/her research. There is a part that cannot be expressed in words. There is a difference between being informed about something by another person (or a book) and coming to a certain conclusion through personal experience. In relation to this we can also use the terms "analogue" or "pictured" information as opposed to "digital" or "proverbial" information (Asseldonk/Vandeursen, 1995). None the less a form of coding plays an important part in this as well: our senses code the differences they perceive, the table we see doesn't travel to our brain as a table but as small pulses sent by the optic nerve. The process of building the table involves wood, tools and a carpenter as the integral part (compare Bateson, 1972) and we have no senses to perceive the process, but we do take part in it. We can describe it, but must always be aware that that description is *not* the process. Berman (1981) gave us the wonderful example (from Korzybski) of the man in the restaurant that eats the menu lists as he was told that these were the things you could eat over there.

Coded information can have a high "information-level" in both low and high entropy-values. The letters of a game of scrabble all jumbled up and put into sequence don't seem very informative to us, but an interesting comment is made by Robert Shaw, one of the mathematical chaos-pioneers cited in Gleick's book (1989): "chaos *is* information". He explains that in an ordered sequence of numbers the next number to follow-up doesn't give any additional information (when I say 2, 4, 6, 8... you know what will follow), but in an unorganised sequence every new number adds new information. William Bateson studied abnormalities caused by damaged DNA and found that this often lead to symmetry (while asymmetry would be normal); because it needs less instruction. But still people usually spontaneously find symmetry more informative

than asymmetry.

That is why I would like to suggest the following: we speak of coded information (in spoken or written language, digital codes, DNA, or sensory perceptions) or of information as a process (experience, interaction, history). We no longer try to define "information" as a "particle", a "structure" or anything like that, but try to realise that all matter has an informative aspect, as well as a chemical, spatial, in physics, and who knows how many more aspects (compare Rucker, 1986)

4. The homeopathic preparation as "information carrier"

When we try to keep an open mind for "informative" aspects of matter the debate on low or high potencies and simplex or complex-remedies would be less heated. The preparation of a homeopathical remedy consists of step by step diluting and shaking. With this people assume that after the D24 or C12 no molecules of the primary substance are left. This however has never been proved; there is simply no measuring equipment in physics that could determine that. A physics professor once pointed out the possibility to me that this specific way of preparation might prevent the last molecules of the primary substance to disappear. That organisms can be extremely sensitive to a single molecule with a strong informative value is no news (from which distance can butterflies smell each other; and how few molecules are necessary for them to do that?). The enormous dispute about "remedies that contain nothing" is ludicrous. Water that "contains nothing" hardly exists. If you stir or shake milli Q water whilst measuring the pH value and you sigh you will see the pH value shoot up. And all kinds of metals let go of the glass sides of the bottles. Despite classical homeopath's preference for "simplex" remedies it is hard to imagine how these "simplex" start (the available "pure" primary substances are always slightly contaminated) and stay. This is one of the theoretical problems I will leave unanswered for now.

The homeopathy-manufacturer is not the only one making homeopathical preparations, nature does it as well: a plant falls into the sea, the waves shake it back and forth on the beach, and all the fish are administered a preparation (see Schwenk, 1988). There could be a lot of information going around in nature that we have no knowledge of. Which aspects of this rotting plant remain as information and still have a relationship to the original "image"? (compare Asseldonk/Vandeursen, 1995). I am under the impression that researching this further could grant us greater insights into explaining certain mysterious

phenomena, like for example reincarnation-witnesses (every breath we take also includes a few nitrogen molecules that Napoleon and Paracelsus have breathed in and out as well), the extreme examples of evolutionary adjustments in plants and animals that seem to taunt Darwinian doctrine, and also a number of phenomena that are very hard to explain for which Sheldrake formulated the hypothesis of the "morphogenetic fields".

5. Reaction to a poisonous substance or information thereof

The way an organism reacts to a poisonous substance does of course depend on the dosage. Just about every poisonous substance has a range within which it has no visible effect on the organism, a range within which it does, and a range within which it is deadly quite quickly. Time also plays an important role (when something is administered during a longer period of time). At the same time many substances have been noted in which the effect reverses when administering a higher or lower dosage. For example plant hormone 2,4 D is a substance (auxin) that stimulates plant-grow in low dosage and in high dosage is used to kill them (defoliant, used in agent Orange). These phenomena can be found in mainstream-literature as "hormesis".

That a small dose of a damaging agent can offer protection from a larger dose later on, is a well known occurrence (vaccination, immunisation). Less well known is that a small dose, administered during the recuperation process of a large (but not lethal) dose, can benefit recuperation. This has been demonstrated on cellular/molecular level at Utrecht University (van Wijk and Wiegant, 1994). Can a small amount of a substance (homeopathical low potency) still be of influence when at the same time the substance is present in a more normal dose? Speciani's research (1987) has shown that this is sometimes possible. He experimented with bean-sprouts that were infected with a fungus. Administering 2,4 D (1/10000 M) slowed down the infection, but the infection slowed down a lot more when administering a C5, C6, C7 or C8 potency of 2,4 D at the same time. This remarkable result suggests that the preparation does make a difference. It would be interesting to repeat this research and, if it works, expand it to higher potencies.

If it were so, that all matter has an informative aspect that can be strengthened by the homeopathical way of preparation, then this could help explain the phenomena known in homeopathy as "temporary initial aggravation" (after administering a preparation that chemically contains "nothing" the physical symptoms sometimes get worse temporarily but improve lastingly afterwards). This phenomenon also occurred in the

verum and not in the placebo group in Reilly's study (1986), which to this day is seen as the best conducted clinical trial. It's a pity that the chance of a reoccurrence of this phenomenon is so small, due to the fact that most people are aware of this phenomenon in homeopathy, so it can be expected that if people know that they are taking part in a homeopathy-experiment they will experience temporary initial aggravation with the placebo as well.

It occurred to me that, given the above thoughts of the role of information in the process of evolution, the use of homeopathy in plant breeding could be of interest. Our crops are evolutionary young and they need to get adapted to their new environments. To do so maybe the administration of "informative" homeopathic remedies could be useful. I did some laboratory research into the possibilities of "homeopathic crop protection", comparing symptoms of plant poisoning and treatments of plants with the highly diluted homeopathic remedies, but I had to stop this work because of a total absence of funding and lack of interest in this subject by any other members of the Dutch scientific community.

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