HRI London 2019

And the future of homeopathy is …?

by Lionel Milgrom PhD MARH RHom

Lionel has been a homeopath for over 20 years, training at the now defunct London College of Homeopathy, and taking the Orion course in advanced homeopathy. He works from home now but has laboured at Nelsons, Ainsworths, and an integrated dental practice in London's West End. He is also a scientist (chemist; cofounding an anticancer biotech spinout company), a science writer and, in his latest incarnation, a chemistry teacher. He came into homeopathy to 'find out how it works'. Heading up the one-man Programme for Advanced Homeopathic Research, he has written over 170 publications in both the scientific and CAM academic literatures on his ideas, including many rebuttals of the so-called 'sceptical' case against homeopathy. He wishes he'd trained as a mathematician, jazz/concert pianist, blues harmonica player and Ninja warrior … perhaps next time around which, since my last article published here, is getting somewhat closer.

Arguably one of the scariest cinematic moments is the last scene from Philip Kaufman's 1978 remake of the cult horror classic *The Invasion of The Body Snatchers*. Donald Sutherland's character – finally taken over by an emotionless alien life-form (aka Big Pharma, perhaps?!) – screams out unearthly cadences at the approach of a last surviving human.

Sounds familiar? No? Well, think back to the last time you tried arguing homeopathy with a 'sceptic'. Remember now? Of course you do! I've put 'sceptic' in inverted commas partly because these self-aggrandising blowhards have been able to (culturally?) misappropriate a word that actually describes their complete opposite, i.e. a perfectly reasonable state expressing doubt. But also, perhaps that person might have been a friend? Someone you took to be a normal sentient humanoid? Just like you?

Then you mentioned the 'H' word (cue crescendo-ing scary-sounding music) and all of a sudden, you're dealing with a screaming totally alien being, bearing an uncanny resemblance to the character mentioned above, who considers you worse than vermin for daring, even for one instant, to eschew the wonders and benefits of modern medicine in favour of homeopathy. So how did it ever get like this? Whatever did we do wrong? Is it too late to change?

My sincerest apologies, dear readers! This is a story that starts at the end for the benefit of those with short attention spans … So, a little scene setting: It's Summer 2019: the Homeopathic Research Institute's biennial knees-up has rolled into a surprisingly warm, but neurotically pre-Brexit, London. The Tower Hotel hosted the HRI this year: a lovely venue, on the banks of Old Father Thames.

Thank God I didn't have to fly off again to yet another expensive exotically-fashionable European location! In fact, even though on my doorstep, I hadn't even planned on going this time … too busy: places to go, people to see,

Typical response of a 'sceptic' on seeing or hearing anything that could suggest homeopathy might possibly have a scientific explanation (Taken from the final scene of the 1978 film *Invasion of the Body Snatchers)*

you know, the usual … However, ear bent, arm suitably twisted (and the humungous registration fee mercifully paid for by a very generous donor), let's just say I was 'encouraged' to put in an appearance … and a good job I did! For this was also the HRI's tenth birthday celebrations and, over the conference's two and a half days, the sell-out crowd of 330 delegates from 27 countries feasted on 34 oral and 48 poster presentations.

The HRI's organising committee definitely pulled out all the stops and put on a good show, suggesting recent rumours of its impending demise, if not a little pointed, like Mark Twain's, are perhaps somewhat exaggerated? Even so, being the thoroughly idiosyncratic individual that I am, I'll as usual just concentrate on those items that really took my fancy.

Kicking off the proceedings this year fell to a very upbeat David Tredinnick MP; CAM and homeopathy's very own Parliamentary spokesperson at Westminster. And some interesting observations he had to make, too.

For example, I didn't know that, in the private sector, homeopathy is growing at the rate of 5% per annum. Or that in the Indian province of Karnataka 22 million patients were treated last year. Or that in France 70% of pregnant women use homeopathy. All excellent stats, and something to put a spring in any homeopath's step. Sceptics: eat your black hearts out! Then David mentioned the 'B' word.

No, not Brexit – Boris. Well, apparently Queen Elizabeth II's (THE most noted recipient of homeopathy ever) 14th prime minister understands the need for a 'wider range of health options' to be made available to the British public. Whether that might include homeopathy returning to NHS provision was not made completely clear, but then David is always good for a rousing huzzah to get any function going … but, really, Boris and homeopathy? Sceptics, watch this space!

The HRI's organising committee definitely pulled out all the stops and put on a good show

An anaesthetist's wake-up call: when bad science gives science a bad name

The opening salvo in homeopathy's fight-back came next with the conference's opening session entitled 'Does homeopathy get a fair hearing?' For anyone remotely interested in homeopathy, perhaps the question should have been reframed as 'Why is homeopathy constantly getting trashed?' Professor Robert Hahn provided the answer.

First though, let's be clear: Professor Hahn is NOT a homeopath. He is an anaesthetist with an abiding interested in medical statistics, especially how they can be manipulated to make it appear that there is no evidence for homeopathy's beneficial effects. This is done innocuously enough by deciding which trials are of 'high methodological quality'.

Beginning in the mid-1990s, the current evidence-based era, for better or worse [1], ushered in the use of meta-analyses to microscopically scrutinise homeopathy for evidence of medically beneficial effects [2]. So, starting in 1997, Linde *et al* meta-analysed 89 clinical trials that showed an overall odds ratio of 2.45 in favour of homeopathy over placebo [3]. So far, so good.

The trials, however, were considered to be of varying methodological quality, so Linde *et al* took only the ten highest quality studies. Although this resulted in smaller overall benefit, there was still a statistically significant effect.

But if one starts from a mindset that 'Homeopathy shouldn't, therefore cannot, work', then Linde et al's conclusions are still total anathema. So, the 'challenge' for academics was to come up with alternative meta-analyses that, in order to demonstrate homeopathy's 'true' lack of effect, relied on further extensive exclusion of more studies.

And herein lies the rub. For if enough studies are excluded, it is possible to demonstrate

homeopathy does not in fact work! It is easily done if conclusions are based on as little as 5-10% of the trial material. And it leads to some seriously impressive statistical contortions and distortions in order to arrive at this pre-arranged result, especially if the so-called 'funnel plot' is used. This was the ultimate argument ranged against homeopathy and was published in the *Lancet* by Shang et al in 2005 [4], with great fanfare that here at last was the arrow through the heart of homeopathy.

But as Professor Hahn pointed out, it turns out that as a reliable analytical tool for processing statistics, the funnel plot is flawed when applied to a mixture of diseases. This is because studies with expected strong treatment effects are, for ethical reasons, powered lower than studies with expected weak or unclear treatment effects.

In other words, as a way of scientifically trashing homeopathy and the funnel plot, as used by Shang et al, it is a complete stitch-up. Professor Hahn says:

> To conclude homeopathy lacks clinical effect, more than 90% of available clinical trials had to be disregarded. Alternatively, flawed statistical methods had to be applied (e.g. misuse of the funnel plot and the use of virtual data).

He went on to recommend future meta-analyses should focus on the use of homeopathy in specific diseases or groups of diseases instead of pooling data from all clinical trials. But just so we're absolutely clear: Professor Hahn is not a homeopath … which raises interesting questions about how and why, in this instance, science has clearly been misused just to condemn homeopathy.

This is particularly damning when scientists are being constantly encouraged to 'speak truth to power' and engage more with the public [5]. The important proviso, however, is that it is truth that is spoken not, as Dame Sally Davies, the outgoing Chief Medical Officer, did in front of the UK Parliamentary Committee on Science and Technology back in January 2013. She simply regurgitated the tired shibboleths of well-funded campaigning organisations, and the ersatz invective of facile media commentators who use homeopathy as a whipping boy [6]. In the eyes of the public, all that does is demean science and scientists.

A proper reading of the history of science reveals that, regardless of its obvious power and benefits, science's truths are never absolute, only relative. However, when believed absolutely (aka scientism, especially when over-enthusiastically applied in medicine [7-13]), and ably assisted by lucrative commercial considerations, science descends into a bullying quasi-religious dogma [14]. With liberal democracy now under threat internationally from populists, demagogues, and the demands of globalised capital, that should worry us all [15].

So, having got that diatribe off my chest, precisely why is it sceptics hate homeopathy so much? To understand that, let me introduce you to a certain Italian lawyer, man of letters and natural philosopher, Amedeo Avogadro, Count of Quaregna and Cerreto (1776-1856).

The importance of Avogadro

There is a number which is central to a quantitative understanding of chemistry. Chemists call it Avogadro's number: 6.022×10^{23}. It is defined as the number of particles in one mole of a substance and it is one of chemistry's great unifying concepts. So, what's a mole? (No! Not a small furry, highly efficient burrowing animal that messes up people's lawns.)

A mole is broadly defined as the atomic or molecular weight of a substance expressed in grams, and it works like this:

- Consider an **atom** of carbon, C, specifically its most common isotope, C-12. This has an atomic weight of exactly 12.000. So, one mole of C-12 atoms weighs 12.000 grams and contains 6.022×10^{23} atoms of C-12.
- Now, let's consider that an **atom** of highly fissile U-235 has an atomic weight of 235. So, one mole of U-235 weighs in at 235 grams and contains 6.022×10^{23} atoms of U-235.
- Next, a **molecule** of hydrogen, H_2. This has a molecular weight of roughly 2 (H + H = 1 + 1 = 2). So, one mole of hydrogen molecules weighs just 2 grams and contains 6.022×10^{23} molecules of hydrogen, H_2.
- Now consider a **molecule** of water, H_2O. This has a molecular weight of 18 (that's H + H + O = 1 + 1 + 16 = 18). So, one mole of water molecules weighs 18 grams and contains 6.022×10^{23} molecules of water.
- We can go on: consider a **molecule** of glucose, $C_6H_{12}O_6$. This has a molecular weight of 180 (that's 6C + 12H + 6O = 6 x 12 + 12 x 1 + 6 x 16 = 72 + 12 + 96 = 180). So, one mole of glucose molecules weighs 180 grams and contains 6.022×10^{23} molecules of glucose.

To recap: one mole of hydrogen atoms; U-235 atoms; hydrogen molecules, H_2; water molecules, H_2O, and glucose molecules, $C_6H_{12}O_6$, ALL contain 6.022×10^{23} atoms or molecules of those substances. So far so good. The problems arise when we start to consider what happens when a substance dissolves in water.

It is always assumed that when water acts as a solvent, the dissolved substance is distributed evenly throughout it. Based on this assumption, if we dissolve, say, one mole of glucose in water, we know there should be 6.022×10^{23} molecules of glucose more or less evenly distributed throughout the solvent. So, if we serially dilute the solution, the number of glucose molecules should decrease.

Let's say the solution is diluted 100-fold (corresponding to a

homeopathic potency of 1cH), there should be 6.022 x 10^{21} molecules of glucose left. Doing it again (corresponding to a homeopathic potency of 2cH), there should be 6.022 x 10^{19} glucose molecules; at 3cH, 6.022 x 10^{17}; 4cH, 6.022 x 10^{15}, and so on. Notice at each dilution, the concentration decreases 100-fold. By the way, homeopaths call it *potency* because at each dilution, the solution is strongly agitated. So, as far as homeopaths are concerned, as a medicinal substance, the solution is getting stronger not weaker.

Eventually, after enough dilutions (corresponding to 12cH), we should reach a point where there are 6.022 x 10^{-1} molecules, i.e. less than one molecule of glucose left. Right? At that point we could say, as the 'sceptics' are so keen to remind us, that such a diluted solution would be no different from pure water (especially as many homeopathic remedies are diluted way beyond that point). As such, it should be powerless to do anything, let alone cure anybody. Case closed as far as the 'sceptics' are concerned, right?

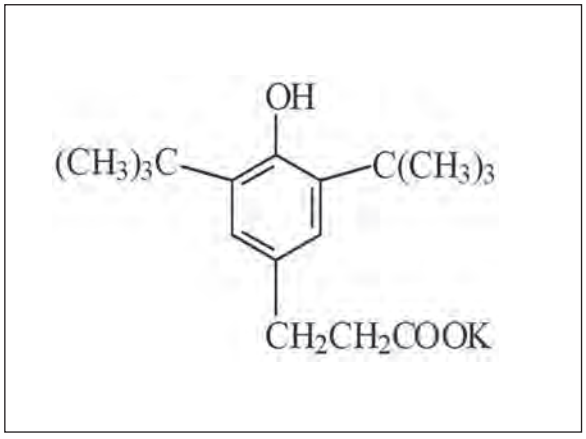
Wrong! Because various researchers around the world are repeatedly finding that such ultra-highly diluted solutions (or UHDs: they are succussed at each dilution step) do NOT behave like pure water. Unlike Galileo (who supposedly whispered, 'And yet it moves!' under his breath), with UHDs, we can shout out loud and proud 'Something remains, AND it is active!' Let's see how.

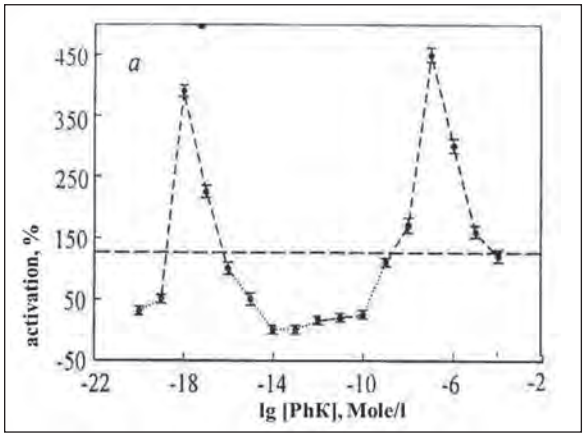
Solutions 'diluted out of existence' are NOT pure water!

A small collective of Russian scientists have been working on precisely this problem since the 1980s. Professors Alexander Konovalov, (the late) Elena Burlakova and Vladimir Voeikov have consistently demonstrated that UHDs contain water structures they call 'nano-associates', observable via a variety of physical techniques, including dynamic light scattering, nanoparticle tracking analysis, and precision conductometry.

After Professor Vladimir Voeikov's stunning presentation to Lord Ken Atherton's highly successful New Horizons conference last year (July 2018: see https://www.thesciencetheevidence.co.uk/ and https://www.youtube.com/watch?v=kVJIbR1usQA&list=PL_ZfccmzItE0gZZUdOQHqxZWBZCB4r_wm&index=6&t=0s), the HRI's organisers couldn't wait to get Vladimir back to speak again. Giving a somewhat truncated version of his more detailed New Horizons talk, suffice here to give just an overview of his main conclusions [16, 17].

It all started with Prof Burlakova's observation that a small molecule called potassium phenozan (PhK, an antioxidant with a wide spectrum of biological activity) still managed to affect the enzyme protein kinase C, at incredibly low concentrations [16].





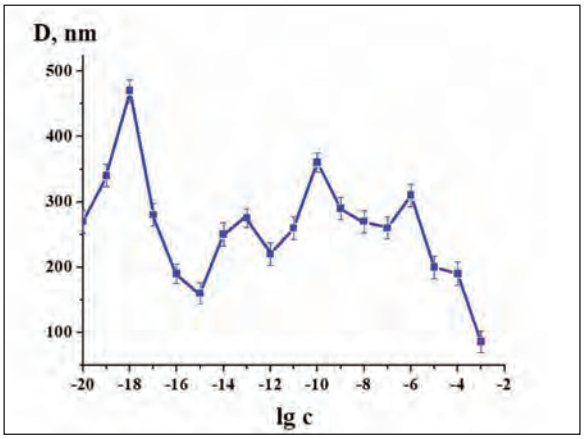
Below left: The structure of PhK and changes in its antioxidant activity with concentration

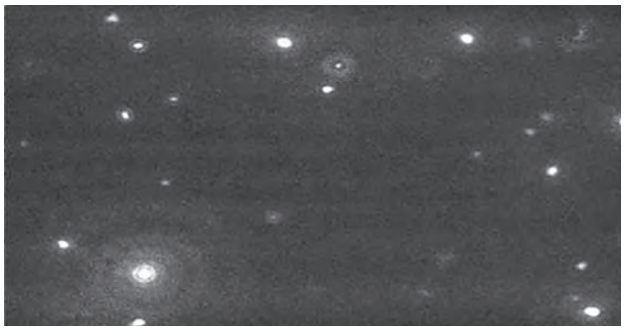
Below: How can conventional biochemistry's LOCK & KEY mechanism explain why up to a billion enzyme molecules can be activated by just 1 ligand molecule? That is what the peak on the left of this diagram is asking

What the diagram (below right) shows are the maxima in antioxidant activity of PhK. Take note of the left-hand peak because even down to the incredibly low concentration of 10^{-18} moles per litre (not that far from Avogadro's Number and typical of the low potencies used by homeopaths), PhK is still active.

So what? Well, if we take the standard biochemical lock-and-key mechanism for granted, then this means that just one molecule of PhK (left), incredibly, is capable of reacting with around a billion protein kinase C molecules! How can this be? This spurred Prof Konovalov and his group to look further [11, 17].

Using a technique called dynamic light scattering, they found that the small molecule PhK (about 2 nanometres across) doesn't just dissolve in water. It forms what can only be described as 'clumps' of water molecules around itself, and that surprisingly on average these clumps increase in size as the dilution (AND agitation) of the solution increases. Dynamic light scattering can image these clumps. Even down to a supposed concentration of 10^{-18} moles per litre, the clumps, or 'nano-associates', as Konovalov and his team christened them, can reach sizes of around 500 nanometres across, much bigger than the original PhK molecule. But that's not all.



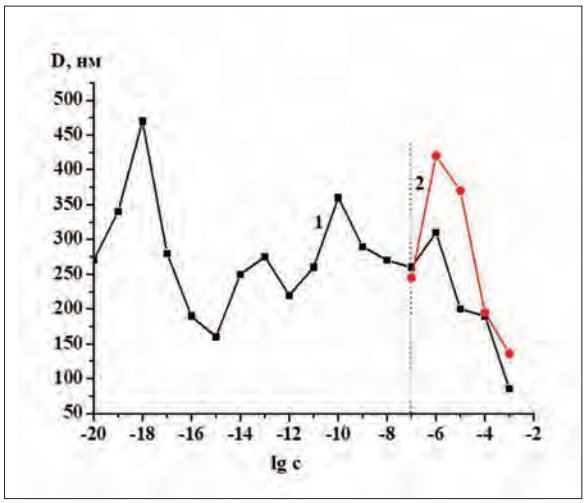


Nano-associates: changes of average diameters with dilution (left), and their dynamic light-scattering images (right)

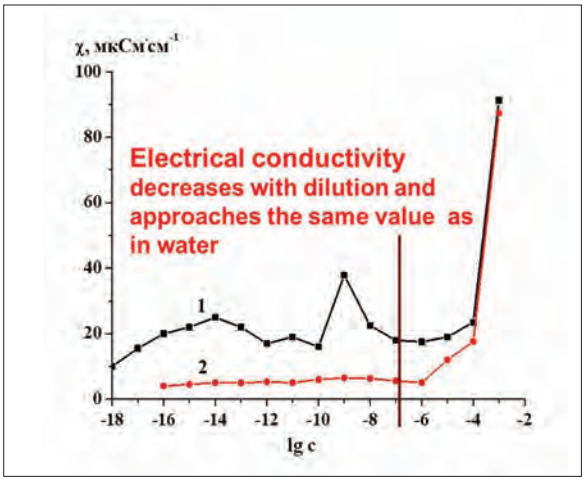
The nano-associates in UHDs are negatively electrically charged (whereas the original particles in the 'normal' range of concentrations are positively charged) and exhibit other 'non-classical behaviours'. For example, the electrical conductivity of UHDs is higher than that of pure water; the surface tension of some UHDs may differ significantly from that of pure water, and these parameters change with serial dilutions in a totally non-linear manner.

The Russian research group made another unusual discovery when they tried to determine if there is a boundary between 'normal' solution concentrations and UHDs. Not only does this boundary exist, but it depends crucially on the presence of ambient electromagnetic fields (EMF). This was found when preparations with different concentrations of solutes were carefully shielded from ambient EMF using a permalloy screen (a Ni/Fe magnetic alloy, consisting of approximately 80% Ni and 20% Fe content).

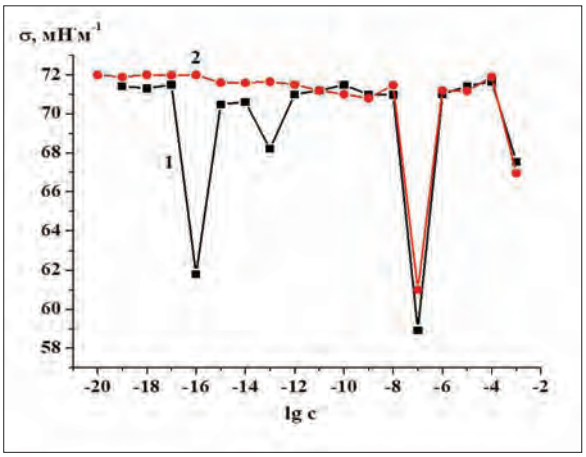
The funnel plot is flawed when applied to a mixture of diseases



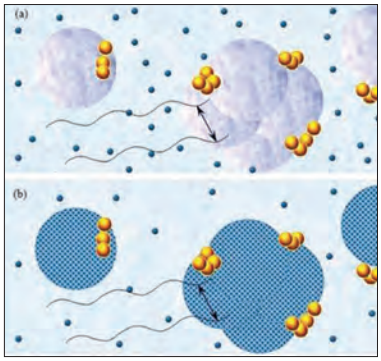
Left: Nano-associate particle size. For PhK, nano-associates not formed below 10-7M

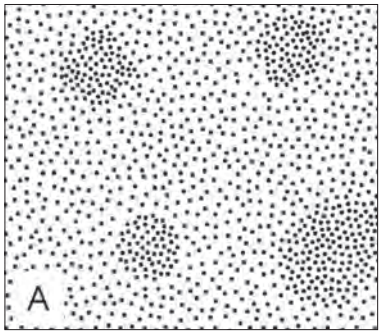


Below: Electrical conductivity decreases with dilution and approaches the same value as in water



Above: Surface tension is constant and is the same as in water





Below: Representations of an aqueous two-phase non-equilibrium heterogenous system: nano-associates are the larger coherent 'clumps' (disperse phase), while less organised molecules in both diagrams represent the dispersion medium

It turns out there is a critical concentration for each substance below which nano-associates of shielded preparations (the red segments in the graphs above and right) do not emerge. For PhK, this is around 10^{-7}M. What is more, Konovalov and his team found so-called 'normal' aqueous solutions of virtually all known substances from solutions of salts to solutions of high molecular weight compounds can also behave like this.

So, to sum up this reproducible Russian work so far:

- Nano-sized (100 – 400 nm) negatively charged particles (nano-associates) are present in UHD preparations of most substances.
- The dominant content of nano-associates is water.
- The size and charge of nano-associates, as well as the electrical conductivity, surface tension, and pH of UHD preparations, vary in a multi-phase pattern with serial dilutions.
- UHD preparations of most substances possessing these peculiar physico-chemical properties demonstrate specific functional activity in test systems.

In fact, most aqueous systems do not at all represent 'proper' solutions in the classical sense. They are best described as **self-organising disperse systems** – non-equilibrium heterogenous systems consisting of at least two phases with a highly developed interface and multiple potential differences between the phases. Representations of an aqueous two-phase non-equilibrium heterogenous system: nano-associates are the larger coherent 'clumps' (disperse phase), while less organised molecules in both diagrams represent the dispersion medium.

The properties of these disperse UHD systems are as follows:

- The disperse phase consists of electrically charged nano-associates composed mainly

of hundreds of millions of water molecules (aka, coherent domains [18])
- These nano-associates only emerge (self-organise) in the presence of ambient EMFs
- Properties of nano-associates are defined by the original compounds, and they carry information characteristic of them
- The dispersion medium is represented by less organised water [19]
- The paradoxical properties of disperse systems, represented mostly by the dispersion medium, are also defined by ambient EMFs and the original compounds
- Much of this work has been reproduced.

What this means is that serially agitated UHDs of a 'mother tincture' do differ in their activity and physico-chemical properties from the pure solvent when, in conventional terms, the concentration of an active substance becomes negligible. As far as these Russian scientists are concerned, therefore, the conclusion is obvious: homeopathy has a scientific basis, and we need to rethink what we think we know about water.

Can homeopathic remedies be detected?

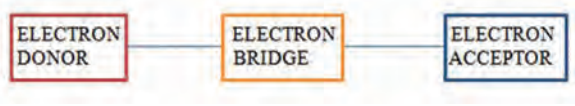
UHDs contain 'nanoparticles' or 'nano-associates', strongly indicating they are NOT the same as pure water. Dr Steven Cartwright in the UK has shown that it is possible to see the effect that even the most highly potentised substances (e.g. *Arsenicum* 10M and *Glycerol* 50M) have on the solvent in which they are dispersed [20]. To do this, Cartwright used the light-absorbing properties of certain dyes.

The visible spectrum of certain dyes vary when they are dissolved in different solvents. This is called solvatochromism and it depends on the electrical polarity of the solvent molecules (measured as the solvent's dielectric constant) and how good these solvent molecules are at hydrogen bonding to the dye molecules. It works like this:

When a dye molecule is excited by light of the right wavelength, the light photons promote electrons out of the dye molecule's ground state – the electron's 'comfort zone' if you like – into its excited state. So, if the dye absorbs photons of red light, the colour of the solution looks blue, because these wavelengths are not absorbed. If on the other hand, the dye absorbs blue photons then the solution looks red because it is now these photons which are not absorbed.

However, certain dyes also have an overall polarity with electron donor and electron acceptor groups at opposite ends of the molecule (see below). Promotion of these dye molecule's electrons out of their energetic comfort zone changes the electrical polarity of the dye. This, in turn, changes its interaction with the surrounding solvent especially if, like water, that solvent's molecules have appreciable polarity and the ability to hydrogen bond. Dyes that have this effect are called solvatochromic.

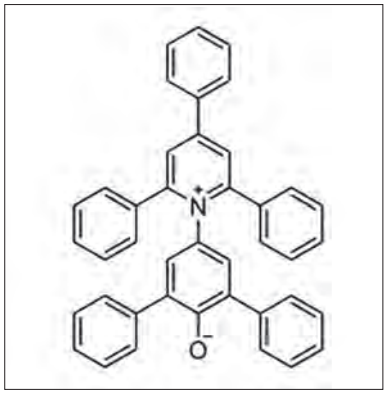
Below: Schematic structure of a solvatochromic dye



What this means is that the solvent interacts with the dye's ground or excited states, altering their relative energies, and so changing the colour of the dye depending on the solvent.

So Reichardt's dye (which has one of the largest solvatochromic effects, and is one of the dyes used by Cartwright – see below) is a deep blue-green in chloroform (moderate polarity) but is red in methanol (larger polarity).

Below right: Chemical structure of Reichardt's dye: notice the positive and negative signs indicating that the molecule is highly polar. This polarity changes when the molecule is excited by light, leading to the solvent-dependent solvatochromic effect



This effect can have interesting applications for use in sensors and molecular electronics and switches. What Cartwright discovered, however, is something altogether different.

If a substance is added to water that might somehow affect its overall polarity, could the same solvatochromic dyes be used to detect that effect? And what if that substance, Cartwright reasoned, is a highly potentised homeopathic remedy? Cartwright thought he might use the solvatochromic effect to detect the presence of *Arsenicum* 10M in UHDs that would otherwise be considered pure water.

Cartwright did indeed observe slight shifts in wavelength of his

A proper reading of the history of science reveals that, regardless of its obvious power and benefits, science's truths are never absolute

dyes when comparing a solution of *Arsenicum* 10M with pure water. But he questioned what exactly was happening. Potencies are affecting – reproducibly – the spectra of solvatochromic dyes, but how? Are potencies making water more polar, or are they somehow producing an electric field that then has an effect on the dye shifting its spectrum. If the latter, then this is not solvatochromism but a different phenomenon called electrochromism. Here the colour of a material changes simply by applying a voltage (as used in smart windows to control a building's internal environment).

Cartwright found that by encapsulating the dyes within special molecules that exclude water, it was a field emanating from the potentised substance that, however small, was shifting the spectrum. In other words, the effect of high potencies on the dyes is electrochromic not solvatochromic. By repeating the measurements over time, he was also able to assign an approximate field strength generated by the *Arsenicum* 10M. It came in at roughly 1.2 x 10^7 volts / metre.

Now this compares with roughly 7-8 x 10^6 volts / metre for the electric field across the membranes of human neurones, and of cell membranes in general (4-8 x 10^6 volts / metres). So, the strength of the field created by *Arsenicum* 10M in water – a potency which conventional bioscience says there is far less than nothing existing in the solution – could conceivably result in physiological / biochemical changes inside cells. The question now, Cartwright thinks, is why potencies generate these electric field strengths in the first place. At the moment, he suspects they might be in some metastable state in which charges are somehow separated but, before he can be sure, more experiments are necessary.

Perhaps we are at last approaching a mechanism by which UHDs, even the incredibly high potencies used by homeopaths, could produce profound changes in living creatures. As if to underline the success of Cartwright's work, some Brazilian scientists have applied it environmentally. We'll come back to that in the next section.

When solutions are diluted and succussed way past Avogadro's number, they are NOT diluted out of existence!

Homeopathy and the environment

A stand-out feature at this year's HRI Conference were several presentations on how homeopathy could be effective in coping with various levels of environmental stress.

Thus, using duckweed as a laboratory model, Stephan Baumgärtner and his group in Germany have been studying the effects of various environmental stressors (e.g. arsenic and mercury) on the growth of these plants. Then they studied the effects of potentised *Arsenicum* and *Mercurius corrosivus* on these stressed plants. Depending on the original stressor's toxicity, the potentised remedy can reverse or enhance the toxic effects [21, 22].

It turns out that environmental mercury is a much more toxic stressor than arsenic. Thus, the retarded growth experienced by duckweed poisoned with arsenic, is reversed by *Arsenicum* 24x-30x. Poisoned with mercuric chloride, however, the same potencies of *Mercurius corrosivus* have a further inhibitory effect on duckweed growth.

In order for *Mercurius corrosivus* 24x-30x to have a positive recovering effect on the duckweed, the original level of mercury poisoning had to be much less. In other words, what this work seems to suggest is that for homeopathy to be beneficial and to have positive effects, then levels of environmental toxicity in patients need to be taken into account.

This suggests two things. First, depending on the case, environmental toxicity could be a 'maintaining cause', and detox prior to homeopathic treatment should be considered a necessary pre-requisite in order to ensure a successful outcome. Second, it raises the exciting possibility of using man-made toxic substances in highly potentised forms as a way of combating those substances' environmental pollution. Work along these lines, using potentised glyphosphate (Round-Up) is already in hand.

For me, however, THE presentation of note and a dramatic new development came from Professor Leoni Bonamin and her team in Sao Pãolo, Brazil. They found that *Phosphorus* 30cH, added to a natural water source used by a troop of monkeys, healed them of yellow fever.

But here's the most amazing thing. Using Cartwright's solvatochromic dyes and taking samples of the water from different and distant locales in the surrounding lake, they detected the presence of the *Phos* 30cH 72

hours after the remedy had been put into it! [23]

Conclusion: and the future of homeopathy is …? Be less Galileo!
It seems that from the evidence of this, arguably the HRI's most successful biennial yet, homeopathic research has certainly stepped up a few notches. But HRI are also heavily committed to homeopathic advocacy and in challenging reports (e.g. the Australian 2015 and the 2018 EASAC reports) – not inexpensive pursuits.

It could be argued that perhaps they are spreading themselves a little thin, which is why they need all the funds they can get. As if to answer this demand, the strong contingent of Chinese homeopaths – a regular welcome feature of HRI conferences since Rome 2015 – made a generous and highly public donation of £35K to the HRI's coffers. Apparently, this money had been collected from grateful patients over the previous year, as a donation towards keeping homeopathy research alive. Nevertheless, it didn't stop one wag declaring during the tea break, 'The future of homeopathy is most definitely porcelain!' (Whatever could he / she have meant?)

Maybe, but that would be to discount that great big homeopathic Lord Ganesha in the room, India. For as we all know, homeopathy is hugely popular there. Many thousands of cancer sufferers have benefited from homeopathic treatment [24]. Known as 'The Banerji Protocol' these physicians used *Ruta* 6c in combination with *Calcium phosphate* to kill brain tumours.

In many respects, that such advanced research is going on in India should hardly be surprising as there are over 350,000 homeopaths and similar numbers of homeopathic hospital beds. Prime Minister Modi has just been guaranteed another five years in office and his and the Indian government's support for AYUSH (an acronym standing for the Indian Ministry of Ayurveda, Yoga and naturopathy, Unani, Siddha and Homeopathy) in general and homeopathy in particular are well known. Homeopathically, this makes India THE 1st World nation, as this anecdote makes clear.

Homeopathically, this makes India THE 1st World nation

Consider the plight of a recent president of an American homeopathic professional association. A well-trained and experienced Indian homeopath, looking to come to America, had sent an email requesting help finding a hospital job. 'You don't understand,' the hapless president tried to explain. 'As far as homeopathy is concerned, ***you*** are in the developed world, while ***we*** are in the third world!' The president could have added that the would-be immigrant's native land – along with parts of Latin America and China – is fast becoming a dominant economic power.

First introduced to India from the UK around 1810, homeopathy is legally now on a par with conventional medicine, with scores of homeopathic colleges (including some that give postgraduate training and degrees in homeopathy), and homeopathic hospitals. Mahatma Gandhi promoted homeopathy as part of the Indian medical system after achieving independence in 1947.

The government promotes it with ads on TV [25], and it has attracted great support not only because it is seen to work, but also because its philosophy meshes well with the cultural and spiritual traditions of the Indian people. And, as a result of Dr Raj Manchanda's (former head of India's Central Council for Research in Homeopathy under AYUSH) efforts over the years, the sub-continent is beginning to flex its not inconsiderable muscles as possibly the next world leaders in homeopathy research. HRI, take note!

Combining all this homeopathic research and practice from disparate parts of the globe with increasing economic parity in what at the moment are considered third-world nations, one can already begin to discern a pattern. It is that of cheap and effective healthcare expanding rapidly throughout the developing world, while the developed world languishes in expensive pharmaceutical-industry-inspired ill health.

Then there is Latin and South America as well, where homeopathy suffers far less abuse from Big Pharma-backed so-called sceptics. Could it be that, as these developing economies are set to outstrip those of the developed world [26] in the not too distant future, that all the anti-homeopathy huffing and puffing we are so used to hearing and seeing will simply become irrelevant? One can but dream …

The sceptics are being well-funded and supported in their efforts to destroy homeopathy by the economic might and global reach of Big Pharma

… And the future of homeopathy is … HRI's New Romantics team up with Hong Kong's finest. Cathay Society or Murder on the dance floor …?

But wait! What this article has tried to demonstrate is that time and again (and contrary to 'common sense'), when solutions are diluted and succussed way past Avogadro's number, they are NOT diluted out of existence! No matter how dilute, something always remains. Boom! A central plank of the so-called sceptics' argument destroyed! And a new impetus to direct research effort towards understanding that most common of all fluids – water (see https://www.thesciencetheevidence.co.uk/).

Trouble is, it seems to my very jaundiced, glass-half-empty, possibly by now overly ancient organ of hearing, that nobody's listening. Like the medieval Inquisition against Galileo, homeopathy's enemies are deaf, dumb and blind to anything based on rationality and proper scientific reason.

This is particularly so when it comes to all the RCTs, observational studies and meta-analyses of homeopathy in various clinical situations, conducted by people such as Drs Robert Mathie, Elizabeth Thompson, and Clare Relton, to name but a few [27, 28].

Here, I have to admit massive reservations about the whole practicality, ethos, even philosophy of the RCT in evidence-based medicine in general and homeopathy / CAM in particular [29]. Nevertheless, I have huge admiration for those in our community who subject themselves to the rigours of this form of testing. Their hard, painstaking work sets a benchmark of probity and candour that so-called sceptics can't even dream of.

Having said that, perhaps you'll forgive me if, in coming away from this conference, I do not share David Tredinnick's introductory optimism. It is becoming clearer by the day that the sceptics are not working in a vacuum. Surprise! Surprise! They are being well-funded and supported in their efforts to destroy homeopathy by the economic might and global reach of Big Pharma [30]: the real body-snatching villains of the piece [31]! So, something a little more forceful than RCTs and / or pleas for reason is going to be required in order to wrest homeopathy from the hands of so-called sceptics.

What about this then? As was so excitingly indicated in HRI 2019, why not pick up and run with how homeopathy could help deal with the consequences of the environmental mess we've made? Surely that's an idea worth sending straight to Greta Thunberg, Green Peace, and green parties everywhere? Could it therefore be time to emulate Extinction Rebellion? Because let's face it: if standing in Parliament Square and outside Number 10 gets people's attention, why not join the bandwagon?

In other words, while the so-called developing world gets on quietly with pursuing research and popularising homeopathy, let us in the now homeopathically underdeveloped world take its healing message to the streets! Don't whisper your defiance like Galileo! Shout it out, loud and proud! 'Homeopathy works! What's more, we're really close to finding out why!' And b***er the bloody body snatchers!

REFERENCES

1. Greenhalgh T, Howick J, and Maskrey N. Evidence-based medicine: a movement in crisis? *BMJ* 2014;348:g3725.
2. Hahn RG. Homeopathy: Meta-analyses of Pooled Clinical Data. *Forsch Komplementmed* 2013;20:376-381.
3. Linde K, Clausius N, Ramirez G *et al*. Are the clinical effects of homoeopathy placebo effects? A meta-analysis of placebo-controlled trials. *Lancet*. 1997; **350**: 834-843.
4. Shang A, Huwiler-Muntener K, Nartley L, *et al*. Are the effects of homeopathy placebo effects? Comparative study of placebo-controlled trials of homeopathy and allopathy. *Lancet* 2005;366(9487):726-32.
5. See, http://royalsociety.org/news/2012/richard-dimblebylecture/
6. Liddle R: Homeopathy? Let's save £4 million and hire a witch doctor instead. London, *Sunday Times*, 25.03.2012. Aaronovitch D. Enough

placebo politics. Vote for the geeks. *The Times*, http://www.thetimes.co.uk/tto/opinion/columnists/davidaaronovitch/article3416779.ece
7. Sackett DL, et al.: Evidence based medicine: what it is and what it isn't. *BMJ* 1996;13:71–72.
8. Leggett JM: Medical scientism: good practice or fatal error? *J R Soc Med* 1997;90:97–101.
9. Sikora K: Complementary medicine does help patients. *Times Online*, 3.02.2009. www.timesonline.co.uk/tol/life_and_style/court_and_social?article5644142.ece.
10. Smith GCS, Pell JP: Parachute use to prevent death and major trauma related to gravitational challenge. Systematic review of RCTs. *BMJ* 2003;327:1459–1461.
11. Holmes D, et al.: Deconstructing the evidence-based discourse in health sciences: truth, power, and fascism. *Int J Evid Based Healthc* 2006;4:180.
12. Devisch I, Murray SJ: 'We hold these truths to be self-evident': deconstructing 'evidence-based' medical practice. *J Eval Clin Pract* 2009;15:950–954.
13. Rawlins M: De Testimonio: Harveian Oration Delivered to the Royal College of Physicians, *Lancet* 2008;372:2152–2161.
14. Baum M, Ernst E: Should we maintain an open mind about homeopathy? *Am J Med* 2009;122:973. Smith K: Against Homeopathy: A Utilitarian Perspective. *Bioethics* 2011; doi:10.1111/j.1467-8519.2010.01876.x. Milgrom LR, Chatfield KC: Is homeopathy really 'morally and ethically unacceptable'? A critique of pure scientism. *Bioethics* 2012; doi: 16.1111/j.1467-8519.2012.01948.x. Milgrom LR: Homeopathy and the New Fundamentalism: a critique of the critics. *J Altern Complement Med* 2008;14:589–594.
15. Ryder M: Scientism. Entry in the *Encyclopaedia of Science, Technology, and Ethics*. Toronto, ON, Macmillan, 2008. Feyerabend P: *Science in a Free Society*. London, Routledge, 1979.
16. Maltseva E.L. et al. Biological Membrany 1998;15(2):191-198. *Membrane & Cell Biology* 1 Jan 1998, 12(2):251-268.
17. Konovalov AI, Ryzhkina IS.

Highly Diluted Aqueous Solutions: Formation of Nano-sized Molecular Assemblies (Nano-associates). *Geochem Int* 2014;52(13):1207-1226, and references therein.
18. Yinnon TA, Liu ZQ WATER 2015;7:33-47: Sedlák M. large scale supramolecular structure in solutions of low molar mass compounds and mixtures of liquids *J. Phys. Chem. B* 2006:*110;*4329–4338.
19. Del Guidice E, Tedeschi A, Vitiello G, Voeikov V. Coherent structures in liquid water close to hydrophilic surfaces. *J Phys.: Conf Ser 2013*;442:012028.
20. Cartwright S J, Solvatochromic dyes detect the presence of homeopathic potencies. *Homeopathy* 2016; 105: 55-65: Cartwright S J, Interaction of homeopathic potencies with the water soluble solvatochromic dye bis-dimethylaminofuchsone. Part 1: pH studies. *Homeopathy* 2017; 106: 37-46: Cartwright S J, Degree of response to homeopathic potencies correlates with dipole moment size in molecular detectors: Implications for understanding the fundamental nature of serially diluted and succussed solutions. *Homeopathy* 2018; 107: 19-31: Cartwright S J, Homeopathic potencies may possess an electric field (-like) component; evidence from the use of encapsulated solvatochromic dyes (in press).
21. Jager T, Scherr C, Simon M et al. Development of a test system for homeopathic preparations using impaired duckweed (Lemna Gibba L). *J Altern Comp Med* 2011;17(4): published online 17th April 2011.
22. Jager T, Wurtenberger S, Baumgartner S. Effects of homeopathic preparations of mercurius corrosivus on the growth of severely mercury-stressed duckweed Lemna Gibba L. Homp 2019;108(2):102-138.
23. Mota, H M G, Aparicio A C, Oliveira L H, Rossettini R, Pedro P, Pinto S A G, Santana F R, Sufredini I, Cartwright S, Bonamin L V. Cartwright's Method as a Physico-chemical Marker of Antimonium Crudum Biological Effect. *International Journal of High Dilution Research* 2018;17(2);14.
24. Pathak S, Multani AS, Banerji P, Banerji P. *Ruta 6* selectively induces cell death in brain cancer cells but proliferation in normal peripheral blood lymphocytes: A novel treatment for human brain cancer. *Int J Oncol* 2003; 23: 975–982: Banerji P, Campbell DR, Banerji P. Cancer patients treated with the Banerji protocols utilizing homeopathic medicine: A Best-Case Series program of the National Cancer Institute USA. *Oncol Rep* 2008; 20: 69–74.
25. Bhatia M, cited by Kaplan B in: *Homeopathy in India*, July 24, 2011. Online document at: http://drkaplan.co.uk/2011/07/homeopathy/homeopathy-and-india/ Accessed March 9, 2012.
26. Milgrom LR, Ringo MR, Wehrstein KM. Emerging Economies Need for Cheap, Efficient Healthcare Makes Western Anti-Homeopathy Rhetoric Irrelevant: Observations from the Canadian Homeopathy Conference, October 2011. *J Altern Comp Med* 2012;18(7):723-726.
27. Mathie RT, Lloyd SM, Legg LA et al. Randomised placebo-controlled trials of individualised homeopathic treatment: systematic review and meta-analysis. *Syst Revs*. 2014;3: Article number 142. Mathie RT, Rampasad N, Legg LA et al. Randomised, double-blind, placebo-controlled trials of non-individualised homeopathic treatment: systematic review and meta-analysis. *Syst Revs*. 2017;6: Article number 63. Mathie RT, Ulbrich-Zurni S, Viksveen P, et al. Systematic review and meta-analysis of randomised other-than-placebo-controlled trials of individualised homeopathic treatment. *Homp* 2018;107(4):229-243.
28. Spence DS, Thompson EA, Barton SJ. Homeopathic treatment for chronic disease: a 6-year, university hospital outpatient observational study. *J Altern Comp Med* 2005;11:793-798. Thompson EA, Relton C. Designing clinical trials of homeopathy for menopausal symptoms: a review of the literature. Menopause Int 2009;15(1):31-34. Relton C, Cooper K, Viksveen P, Fibert P, Thomas K. Prevalence of homeopathy use by the general population worldwide: a systematic review. *Homp* 2017;106:69–78
29. Milgrom LR. 'Living is easy with eyes closed …' On blinded RCTs and specific and non-specific effects of complex interventions. *Eur J Integ Med* 2014;6:552-559.
30. See https://homeopathyresource.wordpress.com/2019/08/05/pharmaceutical-industry-funded-skeptics-attempt-to-stop-sale-of-homeopathic-remedies / and references therein, including an on-line petition. Accessed 05/08/2019.
31. GlaxoSmithKline to pay $3bn in US drug fraud scandal. BBC News On-line, 2 July 2012, http://www.bbc.co.uk/news/world-us-canada-18673220. Titus SL, Wells JA, Rhoades LJ: Repairing research integrity. *Nature* 2008;453:980–982. Fanelli D: How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data. *PLoS One* 2009;4:e5738. Naish J: Faking it. *Prospect* August 2009:63.

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