

GUEST EDITORIAL

The Homeopathic Mechanism from the Viewpoint of a Quantum Mechanical Paradoxon

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More than 200 years after Hahnemann, the homeopathic mechanism is as unknown as it was in the beginning. While dozens of studies strongly suggest the efficacy of homeopathic treatment, even with potencies whose degree of dilution is beyond Avogadro's number,^{1,2} the therapeutic active ingredient (TAI) of homeopathic medicine is a continuing mystery. Even today, measuring the TAI is impossible because nobody has a clue regarding in which quality of matter the TAI is reflected. In such a situation scientists tend to make up models that describe analogous phenomena that can be understood.

In case of the TAI, this has led us to the physics of non-local events, which is reflected, for instance, in the famous EPR thought experiment.³ EPR is the abbreviation for Einstein, Podolsky, and Rosen, and the thought experiment was an effort of Einstein and his coworkers to demonstrate theoretically that quantum mechanics can lead to implausible constellations of particles. The three scientists showed that, according to the laws of quantum mechanics, situations are possible in which two particles are correlated, independently of the distance between them. Because of this counterintuitivity, Einstein, for the rest of his life, doubted the completeness of the description of nature by quantum mechanics. It was Schrödinger who named this presumed nonlocal behavior of quantum systems "entanglement."⁴ In reply to Einstein's example, Bohr argued that the two particles in the EPR case are always parts of one quantum system and, thus, measurement of one particle changes the possible predictions that can be made for the whole system and therefore for the other particle. This was in circa 1935, and it was not until 1982 that Aspect et al.⁴ could show by an experiment that entanglement is possible in real quantum physical systems. Entanglement has become mainstream research since that time. It has been shown for instance that the number of entangled particles in a system is not necessarily restricted

to two. Furthermore, the entanglement of two macroscopic objects, each of them consisting of a gas sample of billions of atoms, has been demonstrated experimentally.³ All these research results, however, did not generalize the definition of entanglement itself to nonquantum phenomena. Entanglement in physics is still restricted to systems in which the Heisenberg uncertainty relation holds.

Therefore the question arose whether entanglement-like constellations in nonquantum systems can occur and what the conditions for such an occurrence are. This question goes back, for instance, to the findings of the famous psychiatrist Jung who found out that situations in everyday life can happen synchronically either in time or in mind.⁴ Some authors also argue that entanglement always occurs when systems that are subsystems of a more general system run into an incompatibility conflict. In these researchers' formulations, entanglement in quantum systems is only a specific example of a more general phenomenon.

In 2002 Atmanspacher et al. published a paper with the main title "Weak Quantum Theory,"⁴ (WQT) in which they proved that, by weakening the axioms of quantum mechanics, it might be possible to describe also nonlocal behavior of systems that are not quantum. This was the beginning of the application of entanglement features to basic research in homeopathy.

Walach, one of the authors of WQT, developed a model of homeopathy⁵ that is ruled by a framework that consists of two entangled pairs, potency, and a mother tincture as well as symptoms of the patient and symptoms that are the outcome of homeopathic provings. In this framework, the principle of similarity plays the role of entanglement.

In a paper I wrote,³ I suggested another way of using entanglement in basic research on homeopathy. Here amenable configurations of the molecules of the remedy itself were assumed to be entangled, also according to WQT, and this

entanglement was presumed to carry, as a modification of structure, the information that is administered during a homeopathic treatment. This model is entirely physical and works with a thought experiment that ensures that, for every degree of dilution, methods of theoretical physics are applicable.

A third way of applying entanglement features to basic research in homeopathy is practiced by Milgrom.⁶ Up to now, he has published a series of papers on entanglement as a metaphor for homeopathic action. His model is denoted as “PPR-entanglement,” which is an abbreviation for Patient–Practitioner–Remedy entanglement. Milgrom explained what he means by this in part 1 of this series.⁶ His argument was that during a homeopathic treatment, Patient and Practitioner, Practitioner, and Remedy as well as Patient and Remedy are, according to WQT, entangled. In subsequent papers, he has shown that many ideas in homeopathy (such as aggravation, miasms, simillimum, vital force, etc.) can be understood under the primacy of PPR. Milgrom’s latest paper, which is published in the present issue (pp. 830–838), focuses on the question of whether, from the viewpoint of PPR-entanglement, randomized controlled trials are an appropriate tool for testing the efficacy of homeopathy. The answer is “No” and the basic idea of his argument is, that controlled trials are observational procedures that can collapse entangled states, which means the loss of the homeopathic effect.

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