Should Proven Efficacy and Results Be Dependent on Scientific Evidence?

In Defense of Homeopathic Therapy

Nowadays, it seems that dogmatism is prevailing over any sort of reflection, hypothesis and experimentation and imposes its own truths. And yet, **empiricism** remains the primary method people use to understand themselves and the world around them.

Empiricism refers to knowledge or sources of knowledge acquired by the five human senses, particularly through **observation** and **experimentation**. The word "empirical" comes from the ancient Greek word ἐμπειρία (empeiríā), meaning "experience".

Using a number of examples, our intention will be to rehabilitate empiricism and give it prevalence in the observation, understanding and factual application of phenomena or solutions without so-called formal scientific explanations or approval.

1. Observation, hypothesis, experimentation

Holding that the Earth revolves around the Sun (heliocentrism), in 1533 N. Copernicus recorded his predictive mathematical models in his book *De revolutionibus orbium coelestium (On the Revolutions of the Heavenly Spheres).*

Johannes Kepler verified the accuracy of Copernicus' work, defended heliocentric theory and, using his own mathematical models, inferred that the planets move in elliptical orbits around the Sun.

In 1610, Galileo Galilei used a revolutionary instrument—the refracting telescope—to defend the work of his two predecessors.

The discoveries made by these three astronomers not only broadened people's knowledge of the universe but also undermined the power of the Roman Catholic Church by shattering the dogma that the Earth is the center of the universe (geocentrism).

In 1847, the Hungarian obstetrician Ignaz Semmelweis demonstrated that deaths from puerperal fever could be reduced tenfold simply by making doctors and medical students wash their hands before performing deliveries. Twenty years later, Louis Pasteur confirmed Semmelweis' suspicions that these practitioners were transmitting an infectious agent. The role of bacteria had just been revealed thanks to the microscope.

In 1928, the physician and microbiologist Sir A. Fleming accidentally discovered penicillin. In his papers he attributed a major role to chance, which he transformed, through observation and experimentation, into a therapeutic application that turned the field of infectious diseases on its head. The antibiotic age was born.

2. Scientific evidence and reality

Evidence is said to be scientific when it is used to confirm or disprove a theory or hypothesis. It must nonetheless be empirical from the start, that is, based on observation and experimentation while respecting reality and facts without making a so-called scientific interpretation that ensures any extrapolation. Evidence is based on the modeling and reproducibility of an observed and analyzed phenomenon.

Science must acquire and use the existing technology on which it depends to support its work with the knowledge that technology itself is ever changing and that its reality at any given moment is only a derivative of space-time.

Moreover, in view of the insufficiency of its degree of development, it has no right to invalidate facts or observations.

"Absence of evidence is not evidence of absence" — M. Jouvet, neurobiologist

3. Argumentation:

Galileo's telescope confirmed Copernican heliocentrism.

The development of increasingly powerful ground-based telescopes and the advent of space telescopes—first promoted by the astrophysicist Lyman Spitzer in 1948—has made it possible to confirm the existence of galaxies and nebulae that had only been predicted using supercomputers.

In molecular biology as well as in chemistry, laboratory glassware instruments have enabled scientists to understand and spatially structure the most complex molecules. This shows us the intimate and obligatory relationship between a container and its contents, with instrumentation involved in the confirmation of evidence.

Until penicillin's chemical structure was definitively determined in 1945 thanks to X-ray crystallography, large-scale production of penicillin, which began in 1942, helped to save the lives of millions of people (especially those wounded during World War II) simply through the observation of Petri dish cultures. The only scientific evidence was extremely simple and obvious. Experimentation alone, first on mice and then on humans, was able to reveal penicillin's extraordinary efficacy without the use of double-blind experimentation that is recommended today.

We will end with the history of aspirin, or acetylsalicylic acid. First synthesized in 1853, aspirin is famous for its analgesic and antipyretic properties and its use was completely empirical at the start. Patented in 1899, it was not until 1971 that John Vane explained its mechanism of action on prostacyclin, establishing its pharmacological efficacy as an antiplatelet drug.

Aspirin antedated science, which explained its mechanism of action only at a very late stage.

4. Discussion

Today, science is characterized by its distinctive method of searching for indisputable "truth". The temptation of absolute truth decreed by some, is also its weakness.

Yet medicine studies living organisms, which by definition are changing, protean and imply that natural laws have a propensity for randomness, hence a logic of conjecture that includes a degree of uncertainty.

Science cannot claim itself as truth; it is subject to conjecture.

In the field of medicine, evidence-based medicine (EBM) is the only method currently recognized and everything beyond its scope has no evidential value.

The paradigm of EBM, which is predicated on evidence, relies on statistical models in which disease is no longer viewed from the perspective of the individual but from that of the group or population of individuals.

Underpinned by Aristotelian logic, EBM leads to decisions made based on evidence that is often conceptual rather than contextual. However, disease is often connected with a paradoxical logic that involves contextual data; namely emotional, sociocultural, socioprofessional, family, socioeconomic and environmental arguments.

In 1968, doctors Donald Pinkel, an American pediatric oncologist, and E. Donnall Thomas, an immunologist who performed the first successful allograft and received the Nobel Prize for Medicine in 1990, radically changed the tragic fate of patients with acute lymphoblastic leukemia (ALL) by inducing a 50% cure rate without using randomized controlled trials (RCTs).

Today, the evaluation of drug efficacy is inexorably subject to the intangible evidence of double blindness, wherein a molecule is randomized in two groups of patients who are tested and numbered without taking into account the particular circumstances of each individual patient.

However, for the same disease, homeopathic medicine is distinctive in that it individualizes a medicine to the specific clinical expression of that disease in each patient. The double-blind method thus completely and definitively invalidates any possibility of evidence of efficacy of a homeopathic medicine.

While it is currently difficult for homeopathy to offer so-called scientific evidence of its efficacy (particularly regarding its mechanisms of action), its opponents are unable to produce evidence of its inefficacy except by claiming, in bad faith, a placebo effect or lack of response of the double-blind method.

However, the therapeutic results observed and documented in people are undeniable and verifiable facts that have evidential value and could, if the desire were there, be endorsed by the French health insurance system (*la Sécurité Sociale*), which is in a position to meaningfully analyze the health benefits to France's population as well as the related costs.

That said, after commissioning a report on the efficacy of homeopathy from Peter Matthiessen and Gudrun Bornhöft[1], Switzerland's health authorities concluded that homeopathy is a legitimate therapy and makes an undeniable contribution to the health system.

Similarly, homeopathy's efficacy in veterinary medicine, where it is increasingly used and the subject of published studies, cannot be explained by the placebo effect!

Although homeopathic medicines have been the subject of experimentation based on the systemic modeling of pharmacologically active substances, homeopathy is the target of violent attacks on its efficacy, the very foundation of its conception.

The culmination of the ostracism against homeopathy is the French government's announcement that it will stop reimbursing patients for homeopathic drugs. This is tantamount to a complete negation of the reality of homeopathy.

At a time when therapeutics are making the shift to personalized medicine—where research is conducted to develop, for example, a targeted cancer treatment (contribution of genetics) or make a vaccine tailored to each patient's unique needs—it is unacceptable that homeopathy should be shut out.

If the validation of personalized medicine is subject to double-blind verification, it too must urgently be refuted, for this would immediately be a negation of these promising therapies and they would (and why not?) suffer the same fate as homeopathy—the end of their reimbursement.

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Doctor Henri Carrée

Member of the Scientific Committee of the Diploma of Higher University Studies in Homeopathic Therapeutics at Aix-Marseille University:
Prof. Y. Frances, Prof. B. Granel, Drs. G. Rougier, B. Poitevin, MC. Vergnet.
and the collaboration of Dr. Geneviève Ziegel, neuropsychiatrist, and Claire Laurent, Doctor of Anthropology.

[1]Bornhöft G, Matthiessen PF, editors. Homeopathy in Healthcare.
Effectiveness, Appropriateness, Safety, Costs. Springer; 2011.