

Response: Letter to the editor | Public health

Science, Skepticism & Reality

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We appreciate the attention and interest in our manuscript. The letter, "*Strange Title for a Flawed Study*" submitted by Mr. Les Rose to the *Gazette of Medical Sciences* raises a handful of issues that pertain not simply to our description of the previously unrecognized phenomenon of magnetic attraction/attachment but regarding the scientific method itself and the generation of new scientific knowledge. These issues must be carefully considered one by one.

The first problem concerns the inductive method, i.e., drawing generalizations based on limited data which, as David Hume pointed out in the 18th century makes establishment of general scientific knowledge and principles highly problematic. As no theory can ever be definitively proven, it stands to reason that it is only true until it is falsified or contradicted by later data. This forms the basis of 20th century science philosopher Karl Popper's notion of falsification. Our prospective study is the first ever to be published and the results are undeniable. We appreciate the obvious fact that it does not fit into the "scientific narrative" of Mr. Les Rose.

Establishment of valid scientific knowledge entails more than tossing out speculative theories. Science advances in a highly circuitous and often indirect manner largely through refutation of existing fact and theory. Astronomers spent twelve centuries trying to make the Ptolemaic geocentric system work and, in the process, made it so insanely complicated that no one understood it; and it all fell apart once Copernicus came along with his heliocentric astronomic theory. Instead of emphasizing what a theory explains, science would be better served by focusing more on a theory's inconsistencies and what it

doesn't explain.

In our paper two separate items come into play: (1) Description of a heretofore unrecognized phenomenon, magnetic attachment/attraction to the skin of human subjects, and (2) The theory we advance to explain that phenomenon. Based on the falsification principle it is incumbent on the science community to refute our claim. We believe we effectively excluded counter arguments such as friction and electrostatic attraction: The fact that an adherent magnet could be moved a few centimeters in any direction and would drop straight to the floor seems to resolve those questions. This, in of itself, serves as the perfect control for each patient tested. If the attachment phenomenon is nullified then obviously our explanation of it is voided as well. But if the finding is affirmed then the claims, we have made regarding its significance must be refuted. We purposely chose and cited the readily available and inexpensive materials on Amazon so that *anyone* in the world can reaffirm or refute our study.

The second issue concerns the means by which knowledge claims are adjudicated by the science community. It goes without saying that disputation of claims is part and parcel with the scientific enterprise: In order to attain a factual and accurate theory structure every item of knowledge must be subjected to careful scrutiny. On the other hand, denial and refutation are not the same. Many deny the holocaust or global climate change but to date neither has been refuted. The history of 20th century medical science is replete with claims that were outright rejected and later shown to be correct. Contemporary scientists must go to great lengths to avoid this error. The objections raised in the Letter to the Editor do not constitute bona fide refutation and amount to little more than malicious

trolling.

The third point concerns the difference between what we can call factuality and opinion. It is a fact that genes code for the synthesis of complex biomolecules but the means by which this process is regulated and orchestrated to a large extent remains unknown and as a consequence there are many conflicting opinions as to how this transpires. It goes without saying that at any point the knowledge base of the community of practitioners is a variable mixture of fact and opinion. It is incumbent upon individuals to bridge the chasm between fact-based and opinion-based knowledge. There is more than a grain of truth to the old adage 'science advances slowly, funeral by funeral.' Mr. Les Rose has freely shared a number of opinions based on his scientific knowledge but his commentary is woefully fact-poor.

The fourth point to be made concerns the question as to how scientific knowledge is supposed to advance *without* introduction of new ideas, and this brings us back to the inductive method. Mr. Les Rose critiques a comment we made in the introductory section of our paper: 'As two of the authors . . . had recently published articles . . . definitively establishing the presence of an organized energy field in the body...' for which we provided two references. He went on to comment, 'Both papers are historical reviews, not research, and provide no new data. They are speculative exercises in reinterpreting established science to fit the authors' beliefs. They are the only sources cited in the introduction, as rationale for the study. Self-citation seems inappropriate without some solid science.'

The article *Morphogenic Fields: A Coming of Age* is more than simply an historical review. In it the author (KT) reviews and summarizes evidence for the existence of an organized energy field that orchestrates fetal development and which began to appear in cell biology and embryology in the early decades of the 20th century and was *widely accepted as fact* but vehemently denied (but never refuted) by geneticists in the 1930s despite demonstration of DC currents and voltage potentials in developing organisms.

The author (KT) then showed that the very same evidence has resurfaced in the past several decades in developmental biology and is now an established and widely accepted fact. These currents have been shown to play a central role in cell functions as well as gene induction. He cites dozens and dozens of references in support of such facts. This article can be called historical *only* in the sense that it corrects a longstanding historical error embedded in scientific knowledge and synthesizes (via the inductive method) a trove of 20th century research that has lain largely unacknowledged in the scientific literature because its factuality was offhandedly denied by geneticists. To date there has been no formal refutation of claims made by the author (KT) regarding the morphogenic field.

By the same token, the two authors (JT & KT) published *Ozone Preconditioning: Waking Up the Dragon* recently in the *Gazette of Medical Sciences* which is among a small handful of articles to specifically tie the documented therapeutic benefits of ozone into the preconditioning (PC) phenomenon and the first to specifically tie the beneficial effects of PC phenomenon into a blood-borne energy field, all of which was documented by numerous references.

The PC phenomenon, discovered in 1986 by Murry et al., is now recognized to be the most powerful protective phenomenon ever discovered in the human body. Despite thirty-five years of research and tens-of-thousands of reports in the literature, scientists have yet to explain its effects on the basis of cellular and molecular mechanisms. We show conclusively that it is related to the release of energy into the blood by RBCs and, again, provide a compelling explanation for how this energy field is generated. And yet how would most scientists recognize the veracity of our account unless they were already familiar with the PC phenomenon? For Mr. Les Rose to dismiss this as just another historical review reveals his own ignorance of the medical literature. And, again, to date there has been no refutation of our claims.

Our use of the term 'field' bears special mention for it has deep roots in the established scientific literature and knowledge of its nature and behaviors allows one to make inductions regarding its presence in living systems. In the mid-19th century, Michael Faraday wrapped a metal wire connected to a galvanic battery around one side of an iron ring and another wire connected to a voltage meter on the opposite side. When he flipped the switch a potential registered in the meter indicating current flow. Later Faraday repeated the experiment without the intervening iron ring, i.e., with two spirally coiled wires separated in space, and obtained the same result. Based on such experiments Faraday coined the term 'field' to indicate a wider causal nexus beyond current flow in the wires. His field concept later formed the basis of James Maxwell's laws of electromagnetism.

A virtually identical phenomenon was observed with the introduction of the ECG by Einthoven around the turn of the 20th century: electrodes placed upon the skin surface over various bodily regions registered the characteristic depolarization-repolarization wave tracings of the cardiac cycle indicative of current flow. By the same token, the recent development of wireless non-contact ECG technology must indicate the presence of a field if, in fact, Faraday's and Maxwell's work is accepted as being correct. Add to this over three decades of heart rate variability (HRV) data showing heart rate patterns to be a leading predictor for health and all-cause mortality, or that all electromagnetic field activity in the body immediately ceases (so-called flatlining) during cardiac arrest (along

with vital functions like consciousness), and one is hard-pressed to deny the presence of an organized energy field in the body or that it is generated during the cardiac cycle.

Finally, we feel obliged to comment on Mr. Les Rose uncritical acceptance and overly simplistic view of how the experimental method plays into the generation of new knowledge or in establishing the legitimacy of fact. It is one thing to perform an experiment but quite another to interpret its results correctly. Experiment establishes the existence of a fact but does not explain its basis. Experimental reproducibility, as in Koch's postulates, is only one criterion for validation of a fact but contributes little to how a fact is rationalized. For this an overarching theory is necessary which can *only* be reached through induction. And once a concept is generated and associated with a phenomenon its veracity can, in most cases, be

easily established by simple observation.

Energy fields, by nature, are invisible and cannot be directly observed; only their effects are amenable to observation. Unless one has the energy concept firmly established in their view of bodily process many events may appear incoherent and confusing as they do not have a cellular and molecular basis. Instead of making his dogmatic and polarizing pronouncements, Mr. Les Rose should ascertain for himself whether the energy concept is a valid and useful heuristic tool. In the absence of this a simple refutation of our claims would suffice.

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