LETTER TO THE EDITOR
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Pseudoskeptical and pseudoscientific strategies used in attacks on homeopathy

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Dear Editors,

In October 2020, a manifesto against European legislation was posted on social networks, which supports the practices of Complementary/Alternative Medicine (CAM; "First worldwide manifesto against pseudosciences in health"), written by "pseudoskeptical" associations or groups without scientific expressiveness, and which present in their associative body individuals who are assumed to have the rights to criticize the health practices that they do not accept by personal, dogmatic, and autocratic opinions, systematically disparaging and denying any scientific evidence that substantiates them. In view of its wide acceptance, use, and worldwide recognition, homeopathy was the preferred target of this manifesto.

I say "pseudoskeptical" associations because the doctrinal current of true "skepticism" (*sképsis* in Greek means "examination" or "evaluation"), founded in ancient Greece by the Philosopher Pyrrhus (4th-century BC), argues, "it is not possible to affirm the absolute truth of anything, with it being necessary to be in constant questioning."[1] The term "pseudoskepticism" emerged in the second half of the 19th century, indicating the explicit tendency toward negationism, instead of evaluation and ethical and objective questioning proposed by Greek skepticism.

In 1987, Marcelo Truzzi (1935–2003), a Danish sociologist and professor of sociology based in the USA (Eastern Michigan University), elaborated a very illuminating analysis of the term "pseudoskepticism" or "pathological skepticism," saying that it is used to denote the forms of skepticism which deviate from objectivity, dogmatically denying everything which is not known, instead of doubting, investigating, and accepting the evidence that appears with an agnostic and neutral position, with an open mind, and free from prejudice[2,3].

"Since 'skepticism' properly refers to doubt rather than denial–nonbelief rather than belief–critics who take the negative rather than an agnostic position but still call themselves 'skeptics' are actually 'pseudoskeptics' and have, I believed, gained a false advantage by usurping that label"[2].

"Critics who assert negative claims, but who mistakenly call themselves 'skeptics,' often act as though they have no burden of proof placed on them at all, though such a stance would be appropriate only for the agnostic or true sceptic. A result of this is that many critics seem to feel it is only necessary to present a case for their counter-claims based upon plausibility rather than empirical evidence. […] Showing evidence is unconvincing is not grounds for completely dismissing it. If a critic asserts that the result was due to artifact X, that critic then has the burden of proof to demonstrate that artifact X can and probably did produce such results under such circumstances."[2]

In his isolated analysis, Marcello Truzzi described the strategies used by pseudoskeptics to deny and disqualify new ideas and their respective scientific evidence: the tendency to deny, rather than doubt; double standards in the application of criticism; the making of judgments without full inquiry; tendency to discredit rather than to investigate; use of ridicule or *ad hominem* attacks; presenting insufficient evidence or proof; pejorative labeling of proponents as "promoters," "pseudoscientists," or practitioners of "pathological science"; assuming criticism requires no burden of proof; making unsubstantiated counter-claims; counter-claims based on plausibility rather than empirical evidence; suggesting that unconvincing studies are grounds for dismissing it; and tendency to dismiss *all* evidence[2,3].

Marcoen Cabbolet, researcher at the Department of Philosophy, Centre for Logic and Philosophy of Science, Vrije Universiteit Brussel, scholar of elementary particle physics[4], in his essay "Tell-Tale Signs of Pseudoskepticism (Bogus Skepticism),"[5] warned that "pseudoscepticism, which typically is portraying someone's work as despicable with scientifically

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unsound polemics, is a modern day threat to the traditional standard of discussion in science and popular science."

Thus, "where the sceptic merely states that he doesn't believe in someone else's claims, the pseudosceptic comes himself up with claims and these are always (very) negative. But pseudoscepticism is not just making negative claims: the keywords are 'dishonesty' and 'foul play'. And it is not aimed at finding out the truth, but at discrediting someone's research."[5]

In another article[6], Cabbolet addressed this "pseudoscience," clearly and objectively describing "scientific misconduct" with several classic examples that lead to "negative conclusions about someone else's work that are downright false." He clarified that "three known issues are identified as specific forms of such scientific misconduct: biased quality assessment, smear, and officially condoning scientific misconduct."

Cabbolet reiterated that pseudoskepticism is the central focus of this scientific misconduct, which has the objective of "uttering negative conclusions about someone else's work that are downright false," further suggesting that this posture may be "a calculated strategy," rather than a passionate attitude, and provides recommendations for preventing and dealing with these three forms of scientific misconduct through educational and punitive measures[6].

In the first quoted essay[5], Cabbolet explains "seven tell-tale signs of pseudoskepticism" in detail (Table 1), most of which were initially described by Marcelo Truzzi, through which the conduct and strategy of pseudoskeptics can be notably recognized.

Expanding the tell-tale signs of pseudoskepticism, Cabbolet also warned of the fact that "pseudosceptics never publish a retraction": "Usually in science, if researcher A publishes a claim and researcher B refutes the proof, then A publishes a retraction of the claim. But not so the pseudosceptic. Even when confronted with conclusive proof that his allegations are false, he will refuse to publish a retraction or to publicly acknowledge that the claims were fabricated: the typical pseudosceptic will stick to his fabrications as if not a word has been said […]"[5].

As Cabbolet described[5], pseudoskepticism is also observed in the reports of peer reviews of scientific publications, in all areas of knowledge, when the prejudiced and pseudoscientific opinion of a reviewer denies the publication of an article which disagrees with their dogmatic view, even if it fulfills all the requirements of the scientific method. This is commonly observed when we forwarded homeopathic scientific articles to non-homeopathic journals. Paradoxically, following a pseudoskeptical ruse (#7: straight to the mass media)[5], the biased and prejudiced allegations against homeopathy are repeatedly transmitted through articles and opinion interviews in newspapers and various popular media, refraining from following the usual scientific path of submitting them to a peer-reviewed scientific journal.

Therefore, pseudoskeptics act according to two weights and two measures: they require homeopathic researchers to publish their studies in non-homeopathic scientific journals (although studies related to any medical specialization are published in specialized journals), but they discard this premise, disseminating their criticisms of homeopathy, propagating them in nonscientific mass media as "double standards in the application of criticism."

Brazilian homeopathy also suffers constant attacks from pseudoskeptical groups just as in Europe. In order to demystify the pseudoskeptical fallacy that "there is no scientific evidence for homeopathy," the Technical Chamber for Homeopathy (TC-Homeopathy), Regional Medical Council of the State of São Paulo (Cremesp, Brazil) prepared a Special Dossier in 2017 entitled "Scientific Evidence for Homeopathy"[7,8], which is available online in Portuguese and English in the *Revista de Homeopatia,* the scientific journal of the São Paulo Homeopathic Medical Association (APH).

The dossier encompasses nine narrative reviews in several lines of homeopathic research (i.e., historical, social, medical education, pharmacological, basics, clinical, patient safety, and pathogenetic) and two randomized clinical trials developed by TC-Homeopathy members contain hundreds of scientific articles published in several peer-reviewed and indexed scientific journals; it seeks to highlight the state-of-the-art in homeopathic research[7,8].

Bothered by the excellence of these lots of evidence, in November 2020, a group of Brazilian pseudoskeptics disclosed a derisory and fallacious manuscript ("Counter-dossier of Evidence on Homeopathy") in the media and social networks to evaluate some of the articles published in the referred dossier according to "the best scientific rigor" and "inform the population about what science says about the supposed effectiveness of Homeopathy."

Unfortunately, none of this happened in the aforementioned manuscript. Contrary to the announced "best scientific rigor" in the analysis of the articles of the dossier, what is observed throughout the text is a set of criticisms based on "pseudoskeptical strategies" to debunk and disqualify any scientific work: the tendency to deny, rather than doubt; double standards in the application of criticism; the making of judgments without full inquiry; use of ridicule or *ad hominem* attacks; presenting insufficient evidence or proof; pejorative labeling of authors; assuming criticism requires no burden of proof (absence of proof); making unsubstantiated counter-claims (nonspecific comments); suggesting that unconvincing studies are grounds for dismissing it; tendency to dismiss *all* evidence; vitriolic tone;

Table 1. Seven tell-tale signs of pseudoskepticism according to Marcoen Cabbolet[5].

Seven tell-tale signs of pseudoskepticism	
#1: *Ad hominem* attacks	Typically, a pseudoskeptic is so eager to portray the author of the targeted work as an amateur that he resorts to *ad hominem* attacks: this is a rhetorical technique that is absolutely inadmissible in a scientific discourse, and therefore this is the number one tell-tale sign that a piece is nothing but a pseudoskeptical attack. It is thus a real giveaway when the author of the targeted work is called "incompetent," an "amateur," a "charlatan," a "crackpot," "ignorant," "only out to brag about it in a pub," etc. So, the occurrence of any of these words alone is already an indication that the entire piece is of doubtful merit.
#2: Vitriolic tone	Typically, a pseudoskeptical attack portrays the targeted work as despicable: usually this is done by riddling the text with belittling phrases and strong pejoratives. Consequently, the piece has a vitriolic or even libelous tone that is immediately evident even from a quick superficial reading: that tone is the tell-tale sign of pseudoskepticism. The archetypical belittling phrase is "every first-year student could have come up with the same thing." Illustrative examples of strong pejoratives are "nonsense," "perverse," "a disgrace," "worthless," "meaningless," "inferior," "devoid of content," "complete rubbish," and the like, which are then typically said about the targeted work as a whole.
#3: Nonspecific comments	In science, when commenting on someone else's work, one very specifically addresses the details of the work in question. A pseudoskeptic, however, typically doesn't go through the hard work of really understanding the targeted work. This feature manifests itself in superficiality of the comments. It is therefore a tell-tale sign of pseudoskepticism when a piece concerns nothing but negative allegations at the metalevel, that is, negative allegations about the targeted work as a whole, without going into the details of the targeted work.
#4: Absence of proof	Another typical feature of pseudoskeptics is that they have no shame: one of the most shameless ways to attack someone else's work is to put forward outright fabrications, which, if true, would imply gross incompetence of the author of the targeted work. But fabrications cannot be proven by their very nature. Consequently, absence of proof of the (usually grave) allegations in a piece is a sure tell-tale sign of pseudoskepticism at its worst, and a strong indication that the piece may contain fabricated allegations. An illustrative example is an absence of proof of the one statement that is probably the most abused phrase of all in modern science: "this work is of insufficient scientific quality." In a pseudoskeptical attack, this is typically said of the targeted work without specifying which criteria of scientific quality are not met, and why or how they are not met–there are peer-reviewed reports that consist of just this one phrase.
#5: False metaphors	In science, comments on someone else's work remain confined to that work: one doesn't indulge oneself in metaphors. In a pseudoskeptical attack, however, often the targeted work is compared with a theory that is known to be false or that is obviously ridiculous, as if it is the same thing. Illustrative examples are phrases like "this is the same as saying that the earth is at," or "this is the same as saying that the phenomenon is caused by angels": these are tell-tale signs of a pseudoskeptical attack. There are more sophisticated cases, but the point is that this use of metaphors is a rhetorical technique that is absolutely inadmissible in a scientific discourse. The error is the same in all these cases: contrary to what is stated by the pseudoskeptic, it is not at all the same.
#6: Contradiction with history and basic principles of science	When attacking a new theory that has not yet been experimentally tested, a pseudoskeptical piece often blatantly contradicts well-known facts from the history of science, as well as basic scientific principles. The three archetypical examples that turn up time and time again are i. stating that scientific discoveries are nowadays only made by large international collaborations, to insinuate that the work of a single author cannot be a scientific discovery; ii. stating that scientific theories are always developed from experimental facts, to insinuate that anything else cannot ever be a scientific theory; and iii. using an accepted model (other than Einstein's Special Relativity) beyond its established area of application as a criterion of truth, to insinuate that a work that contradicts that model cannot be a scientific theory. The arguments (i) and (ii) completely ignore that virtually all of modern science is built on the work of individuals, who more often than not theoretically predicted phenomena before these were experimentally observed (Einstein: time dilation and curvature of space; Dirac: antimatter), and who often did their groundbreaking work in relative isolation (Einstein, Bohr). The argument (iii) ignores the fact that historical breakthroughs in science often went squarely against the accepted model of the time, and contradicts a basic principle of science, put into words by Feynman as follows: "experiment is the sole judge of scientific truth."

Continue...

Table 1. Continuation.

Seven tell-tale signs of pseudoskepticism	
#7: Straight to the mass media	It is a bad sign when a scientific claim is taken straight to the mass media (e.g. the cold nuclear fusion case), but it is an equally bad sign when an attack on someone else's work is taken straight to the mass media. When writing a scientific critical comment on a work, the right method is to first contact its author and discuss the criticism with him/her. When submitting the critical comment for publication in a scientific journal, one is often required to present evidence of such a prior contact with the author of the targeted work. But not so the pseudoskeptic. Typically, he doesn't contact the author of the targeted work, nor does he attempt to publish his "findings" in a peer-reviewed journal: he takes his allegations straight to the mass media. So an editor of a newspaper or university weekly who sees that an attack on someone's work is submitted for publication, can—especially when the piece contains grave accusations—simply ask for evidence of contact with the author of the targeted work: any failure to provide such evidence is then a tell-tale sign that the piece is nothing but a pseudoskeptical attack, and an indication that it may contain fabrications.

false metaphors; and straight to the mass media among others ("Pseudoskeptic and pseudoscientific fallacies of the 'Counter-dossier of Evidence on Homeopathy'")[9].

In highlighting these pseudoskeptical strategies in the detailed analysis of the presented criticisms[9], we unmasked these pseudoskeptics disguised as pseudoscientists as the false and hypocritical image of being the "defenders of science," as they call themselves in the aforementioned contra-dossier. The blindness caused by pseudoskepticism or pathological skepticism caused "experienced and renowned researchers in their areas of concentration" to incur childish errors in their prejudiced analyses, such as simple attentive reading of the texts they attacked in a fallacious way, denoting noncompliance with basic premises of the scientific method.

"The first was never to accept anything for true which I did not clearly know to be such; that is to say, carefully to avoid precipitancy and prejudice, and to comprise nothing more in my judgment than what was presented to my mind so clearly and distinctly as to exclude all ground of doubt" (René Descartes, "Discourse on Method").

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