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# STRANGE IDEAS: USING THE HISTORY OF IDEAS FOR THE UNDERSTANDING OF PSEUDOSCIENCE

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ABSTRACT

The article explores how the history of ideas can be utilized as a methodological tool for understanding pseudoscience and addressing its prevalence in contemporary society. Despite high scientific literacy rates, pseudoscientific beliefs persist, underscoring the need for new approaches in science communication and public understanding. By examining how socio-cultural contexts influence the reception and transformation of scientific ideas, the history of ideas provides insights into the genesis of pseudoscientific theories. Drawing on Arthur Lovejoy's concept of 'unit-ideas' and their evolution, the articles highlights how ideas are reshaped by cultural contexts, leading to concept drift. Examples, such as quantum mysticism and ancient astronaut theories, demonstrate how scientific ideas are distorted in their transition to popular culture. We suggest that integrating a historical-genealogical approach into science communication can help counteract pseudo-science by retracing the original meanings of scientific concepts. This approach complements traditional debunking strategies, addressing not just factual inaccuracies but also the cultural determinants that fuel pseudoscientific beliefs.

KEYWORDS: Science communication, History of science, History of ideas, Scientific imaginary

## 1. INTRODUCTION

The spread of pseudoscientific conceptions has always characterized the way popular culture appropriates the ideas formed within the scientific community. As the historian of science Micheal Gordin writes: "Each use of pseudoscience is tied intimately to its historical context. If you want to know what science is

or has been, show me contemporary pseudoscience" (Gordin 2012). With the growth of scientific literacy in recent decades, the traditional view of science communication assumed that pseudoscientific beliefs would decline in inverse proportion (Hilgartner 1990). Despite this, pseudoscience is now very much alive even in countries with very high rates of scientific literacy; this has imposed new research to understand in more detail the processes of formation of pseudoscientific beliefs, shedding light in particular on how socio-cultural contexts and beliefs shared by particular groups can influence the reception of scientific ideas (Greco 2008; Wagner-Egger et al. 2018).

In this field of research, the history of ideas can represent a particularly useful but little exploited 'methodology.' In this essay I intend to show how the methods typical of the history of ideas can be successfully applied to the study of the processes of transformation of scientific ideas over time and according to the different socio-cultural contexts of reception by popular culture. My suggestion is to extend the history of ideas to the understanding of the genesis of pseudoscientific theories, also exploiting it as a tool of science communication, i.e. by developing programs to counteract the spread of pseudoscience in the public through a historical-genealogical approach.

## 2. History of ideas and the formation of pseudoscientific conceptions

The history of ideas can be defined as a meta-discipline: although it is very widespread and has now acquired all the characteristic elements of a real discipline, yet it is usually frequented by scholars from different fields. Arthur Lovejoy (1873-1962), the founding father of the history of ideas, identified twelve different disciplines in which historians of ideas operate: the history of philosophy, the history of science, ethnography, some areas of linguistics and especially semantics, the history of religions, the history of literature, comparative literature, the history of the arts, the history of economic theories, the history of education, political and social history and finally sociology (Lovejoy 1960).

Facing this situation, it is reasonable that rigorous scholars may refuse to consider the history of ideas as a discipline capable of providing reliable results, much less as a 'methodology.' Nevertheless, the history of ideas today enjoys a sort of 'revival.' After a first phase of development, when the discipline was founded in the United States through societies and academic journals, a second phase followed starting from the early 1970s with a peak around 1990 or so in which the history of ideas was nearly eclipsed by social and cultural history. The third phase, which still lasts today, was favored by the

increase in interdisciplinarity and by the limits of the previous paradigms used in intellectual history and in the study of mentalities (Megill & Zhang 2013).

The history of ideas analyses the way unit-ideas change over time. By 'unit-ideas,' the founder of this metadiscipline, Arthur Lovejoy, meant the units that make up the history of thought and that remain immutable over time despite the social context they act in is transformed in a radical way, to the point of making the unit-ideas almost unrecognizable, if not in the eyes of the historian of ideas (Lovejoy 1964). This conception, which identified ideas as the atoms that make up matter (in this case the 'intellectual' matter), was later criticized and dismissed, because if one accepts the principle that ideas do not change over time it becomes impossible to think of an evolution of thought, nor it is possible to understand the processes of distortion and transformation of unit-ideas (Betti & Der Berg 2014). To understand how ideas change over time, it is necessary to understand how they are transformed within different contexts. A 'context' can be defined as a network of beliefs shared by a group (Bevir 2004). In the case of pseudoscientific conceptions, for example, a network of beliefs can be the so-called 'quantum mysticism' (Paura 2018). In his studies, the historian of science David Kaiser focused on the activities of the Fundamental Fysiks Group, established at the University of Berkeley in 1975 by a group of physics students belonging to countercultural movements (Kaiser 2011). Starting from the study of the paradoxes of quantum mechanics, they adopted a very heterodox approach, intending to study psychokinesis, the observer's role in creating reality, time travel, telepathy and extra-terrestrial communications. They were strongly influenced by the climate of counterculture and the New Age conceptions in vogue in those years; this network of beliefs shaped their conceptions about quantum physics, which in turn influenced rigorous theoretical physicists such as David Bohm or John Wheeler.

An idea coming from a specific context (for example, an idea produced within the scientific community) and perceived in a different intellectual context, is no longer the same idea. The idea A in a complex ABC is not the same idea A in a complex ADE (Betti & der Berg 2014). This conceptual change can be better understood if we assume that an idea can be divided into two components: for 'intention' we refer to its meaning, provided by the author(s) of the original idea, while the 'extension' is the reference, and is therefore closely related to the context. While the intention remains unchanged, the extension changes, thus transforming the whole idea (Wang, Schlobach & Klein 2011). This mechanism has been called concept drift.

It is useful to point out here that when we talk about ideas we do not refer to mathematical concepts, but to utterances, i.e. words that express a meaning. A mathematical concept does not change its meaning according to the context (at most it can happen to the symbols that represent it), and this also explains why theories, expressed in mathematical language, cannot be subject to pro-

cesses of concept drift and semantic distortion. However, while in many areas of science – such as contemporary theoretical physics – new ideas emerge and are disseminated internally through mathematical expressions, their external dissemination (the so-called 'science popularization') is almost exclusively based on words, in the form of metaphors and analogies (Bucchi 1996). Since words are by their nature polysemantic depending on the context of reference, the concept drift is an inevitable, characteristic phenomenon of the reception of scientific ideas within popular culture. As the philosopher Mark Bevir explains: "Although we have only a finite number of words, each with a finite set of linguistic meanings, the creative nature of our linguistic faculty enables us to use this finite set to express an infinite range of ideas" (Bevir 2004).

Therefore, the duty of the historian of ideas is first of all to understand the original meaning in the author's intentions when they use a particular term. An example is the original meaning of the term 'hologram' for the theoretical physicist David Bohm, which he introduced to solve some paradoxes of quantum mechanics, in particular the interpretation of quantum entanglement (Bohm 2002 [1980]). Subsequently, authors of pseudoscientific texts, from New Age writer Micheal Talbot to best-selling conspiracy author David Icke, took up Bohm's idea to propose that the universe is a computer-generated simulation, a concept completely different from that of Bohm (Paura 2017). In the field of semiotics, 'intentionalism' is defined as the approach that bases the interpretation of a text exclusively on the author's original intentions, to the extent that they can be reconstructed (Eco 1990). The historian of ideas can therefore try to recover the original interpretation of an idea by reconstructing the intention expressed by its proponents within the context of reference, purifying it of subsequent distortions that may have occurred in the process of transmission and reception.

However, it is naive to expect that, through intentionalism, one can prevent the concept drift. Since the message's decoding by a receiver does not take place in a neutral context, but it is always culturally situated (Hall 1980), the reception of an idea can often be distorted by the pre-existence of presumptions. As Bevir explains: "A presumption exists when X is conceptually prior to Y. To say that X is conceptually prior to Y is to make a logical claim based on a study of our concepts, not a factual one based on a study of the world" (Bevir 2004). Presumptions come from our personal network of beliefs: an example is a person who personally considers wrong some theories at the basis of contemporary physics, such as general relativity or the standard cosmological model, and therefore, when faced with scientific ideas from these fields, will be oriented to reject or modify them; this attitude is based on personal belief systems such as those investigated by French sociologist Alexandre Moatti (2013) shared by engineers who remain tied to the physics they studied at school.

Even wider collective mentalities typical of certain historical ages can produce presumptions. For instance, mechanical philosophy, which spread in the 17th century, did not favor, but indeed slowed down, the development of the theory of universal gravitation, since the notion of action-at-a-distance forces (as in the case of gravitational force) seemed, to the natural philosophers of the time, an attempt to return to animistic thought (Rossi 2000). The history of mentality plays an important role in the wider field of the history of ideas, precisely because of its capacity to highlight the 'complexes of ideas' shared by collective mentalities. However, it is important to remember that in a given historical epoch several types of mentality can coexist. The conspiracy mentality, for example, coexists more or less peacefully, in contemporary times, with the dominant scientific mentality. The clash between different mentalities produces inevitable contrasts in the interpretation of ideas, as is evident in the field of politics. Scientific ideas, to a lesser but no less importantly extent, are also affected by this phenomenon.

By studying mentalities, it is possible to better understand a particular belief. Since mentalities are made up of more or less logically interconnected sets of webs of beliefs, we will observe a peculiar pattern: X believes A because X also believes B, C and D (Bevir 2004). For instance, a subject who shares the American neocon mentality will certainly question the anthropogenic nature of climate change, and for the same reasons may be inclined to distrust evolutionist theory (Rutjens et al. 2017). Adherents to the New Age mentality believe in some interpretations of quantum physics because they adhere to their presumptions, as for instance a holistic view of the universe, the determining role of consciousness in the shaping of reality, or quantum healing (Kaiser 2011).

## 3. History of ideas and scientific imaginary

In the classic example by Arthur Lovejoy of John Milton's *Paradise Lost*, he shows that only the historian of ideas can interpret the meaning of some of the most difficult passages in the work, thanks to her/his ability to reconstruct the author's underlying mentality. For instance, when Adam addressing the Creator points out that, while God can be self-sufficient because there is no better company than himself, he instead needs a companion, the episode refers to Aristotle's thought and Milton uses it to clarify his interpretation of Aristotle's thought, his idea of God, and his distance from the orthodox Christian theology for which the main good of man is the imitation and contemplation of God (Lovejoy 1960).

In his introduction to *The Great Chain of Being* (1936), his most famous study, Lovejoy stresses the importance, for the study of the history of ideas,

to do not just analyze great masterpieces or the thought of great philosophers, scientists or writers, but to delve into the so-called 'popular culture,' i.e. the sociological dimension of collective imaginary. Actually, unit-ideas mainly appear "in the collective thought of large groups of persons, not merely in the doctrine or opinions of a small number of profound thinkers or eminent writers" (Lovejoy 1964). When the unit-ideas are shared by large groups of persons, they become a mentality, namely ideas that produce large-scale, long-term effects. In this regard, Lovejoy quotes the opinion of the American philosopher and writer George Herbert Palmer: "The tendencies of an age appear more distinctly in its writers of inferior rank than in those of commanding genius" (quoted in Lovejoy 1964).

This is even truer when it comes to analyze the way scientific ideas are transposed into the popular culture. The studies of the famous historian Robert Darnton demonstrate, through the reconstruction of the body of French best-sellers in the second half of the 18th century, that it was neither the Encyclopédie nor Rousseau's texts to shape public opinion in the years immediately preceding the French Revolution, but satirical, political, and even pornographic pamphlets, whose existence has almost been forgotten today but which enjoyed enormous popularity among the general public and played a decisive role in undermining trust in ancient institutions such as the monarchy and the Church (Darnton 1995, 1996). Darnton's intellectual history studies shed light on how opinions take form within popular culture.

In the early 1990s Jacques Le Goff, discussing the fields of application of the history of ideas, encouraged to deal with the scientific imagination. As a great medievalist scholar, Le Goff studied the medieval imaginary in many of his books (Le Goff 1981, 1985, 2005) and was therefore aware of the value that such a study could bring to the understanding of the way in which popular culture transposes scientific ideas. He wrote about it:

> From the four elements or the four humors theories to relativity, waves, atoms, etc., the scientific reference (most of the time without a true knowledge of the facts and without a pertinent use) has always betrayed the intention of mentalities to find the support of scientific notions capable of impressing the interlocutors. What we need to know, therefore, are the relationships existing between the real scientific realities and the altered allusions carried by mentalities' narratives, and then measure the weight and evolution of this component of mentalities. (Le Goff 1990)

In this sense, an excellent example of the application of the history of ideas to the study of scientific and pseudoscientific imagery is the work of the Italian historian of science Marco Ciardi. Ciardi is a firm advocate of an historical approach to the study of the genesis and evolution of scientific ideas;

the absence of such an approach "can only lead to a serious distortion of the meaning and values of scientific endeavor" (Ciardi 2014). To prove this, Ciardi has studied in detail the way in which popular pseudoscientific beliefs such as the myth of Atlantis (Ciardi 2011) and the ancient astronaut theories (Ciardi 2017) take shape and spread. He noted that the imagery behind the legends of the lost continent is the same at the basis of the success of pseudo-archeology theories, noting that studying the metamorphoses of these ideas can prove to be an excellent tool for understanding the structure of pseudo-scientific theories.

At the origin of the ancient astronaut theories, Ciardi identifies theosophy and its belief of the existence of an ancient and hidden knowledge, handed down by the ancient inhabitants of the Earth to a few elected members of subsequent civilizations, far more inferior than the previous ones. In particular, one of the main sources of inspiration for Helena Petrovna Blavatsky, founder of the Theosophical Society, was the influential novel by Sir Edward Bulwer-Lytton (author of *The Last Days of Pompeii*) *The Coming Race*, published in 1871. This novel can be considered the forerunner of the 'Hollow Earth' theory, based on the idea that beings with enormous powers and knowledge would live in the bowels of the earth: the novel's main character stumbles on Ana, inhabitants of the interior of our planet, descendants of a lineage that in the past inhabited the earth's surface before a great upheaval. Bulwer-Lytton "showed that he knew how to move in the debate on the relationship between new geological, paleontological and archaeological discoveries and biblical chronology", as well as the "discovery of electromagnetism, in 1819, and Michael Faraday's research" on the unification of physics (Ciardi 2017). Indeed, the Ana control a mysterious source of energy, the *vril*, the result of "the unity of natural energies, hypothesized by many philosophers of the outside world" (Bulwer-Lytton 2006).

When Madame Blavatsky opened the Theosophical Society in 1875, she began writing a series of essays raiding recent archaeological discoveries such as the *Popul Vuh*, Maya's sacred text, and the Trojan ruins uncovered by Heinrich Schliemann, using them to support the theory that the memory and knowledge of other unknown past civilizations may have been lost in the course of history, citing also *The Coming Race* to support Thomas Alva Edison's research that "could have opened a new way to understanding the unique energy that governed the universe", namely the *vril*. Ciardi notes that this working method "will characterize most of the esoteric and pseudo-scientific studies during the twentieth century: the continuous revision of myths and stories from ancient times, read not in their historical context, but on the basis of the advancement of scientific and technological discoveries by contemporaries" (Ciardi 2017). This is a clear example of how the 'extension' of an idea change its meaning through times, regardless its original 'intention.'

From 1888 Blavatsky also published *The Secret Doctrine*, a three-volume work based on an alleged secret text from the Hindu tradition that recounted the succession of seven historical cycles preceding the present one, each of them populated by ancient and evolved civilizations destroyed by tragic cataclysms. In his 1900 novel *The Kite Trust: A Romance of Wealth*, the American businessman, inventor and theosophist Lebbeus Harding Rogers took up this thesis imagining the apparition during a spiritual session of Blavatsky's ghost, who tells the protagonists that the first cycle of Earth's colonization came from Mars and lasted 4000 years; that a new landing of extraterrestrials from Saturn followed, leading to the building of the Pyramids and the Sphinx; that then came the inhabitants of the Moon who settled in Atlantis, then from Venus and so on. But the decisive step comes with Charles Fort's *The Book of the Damned*, where "the transition from theosophical speculation to extraterrestrial mythology comes to fruition: the role of Madame Blavatsky's unknown masters is now attributed to the aliens who in the past visited and conquered the Earth" (Ciardi 2017).

The revival of the ancient astronaut theory takes place at the turn of the 1960s and 1970s. Although the foundations have been developed during the 1950s (the flying saucers boom, the first books of the Italian writer Peter Kolosimo, science fiction stories on pulp magazines and comics), the real success occurs in the years of counterculture, which saw the success of Immanuel Velikovsky's theories. In his best-selling book *Worlds in Collision*, published for the first time in 1950, Velikovsky claimed that the great catastrophes told in ancient myths and in the Bible were produced by cosmic clashes due to the passage of a comet into the orbit of the Earth, which would later become the planet Venus. Velikovsky became a cult author of the 70s, fairly later than his book first appeared: he too found fertile ground in American counterculture, which enthusiastically support his theses and spread them through magazines, associations and conferences (Gordin 2012).

Velikovsky was able to enjoy his late success thanks to the coincident release of others similar texts in those same years, in particular the books of Erich von Däniken, whose *Chariots of Gods?*, published in German in 1968 and soon translated all over the world, sanctioned the popularity of the ancient astronaut theory. The two theses were mutually supportive, since cosmic catastrophes and landings of extraterrestrials in historical or pre-historic epochs are closely related. Both authors identified in the biblical text elements supporting their hypotheses, and von Däniken proposed that, after the catastrophe produced by the Venus 'comet,' aliens from Mars landed on Earth coming to the aid of the affected terrestrial populations. Today von Däniken is much better known than Velikovsky; but "the continuing life of alien-astronaut theories should not obscure their very particular emergence in the countercultural soup of enthusiasm for the Space Age, the trippiness of astronomy, the quest for

spirituality in ancient texts, and the desire of a universal explanation for everything" (Gordin 2016).

## 4. Using the history of ideas in science communication

Debunking has always been the main strategy of science communication to cope with pseudoscience (Zollo et al. 2017). It is based on deconstructing wrong arguments by revealing their logical and scientific fallacies. Debunkers must usually be well-versed in the scientific issues concerning the beliefs they intend to demystify, and show through practical examples, observational evidence or demonstrations of logical fallacies and theoretical misunderstandings why the belief in question is unfounded. For example, if they want to show why the Flat Earth theory is wrong, debunkers will cite proofs such as the Earth's shadow on the Moon, the sight of ships coming on the horizon, the changing of constellations moving towards the equator, the shadow of a stick planted in the ground (the sundial) through which Eratosthenes first calculated approximately the Earth's circumference, the possibility of looking further if you move upwards, the curvature of the planet that can be appreciated on board a transatlantic flight. The problem is that all these observations are well known to the public, in some cases since ancient times. Historians know that already in Ancient Greece the idea of the spherical Earth was widely accepted, and it is only a myth that medieval man had lost this notion and was convinced that the world was flat.

The question to be asked is then another: how is it possible that in the 21st century, with all the photos produced outside the Earth's orbit that incontrovertibly demonstrate the sphericity of the Earth, there are a number of people convinced of the contrary, and serious organizations such as the Flat Earth Society committed to questioning this assumption? Mere scientific debunking cannot provide adequate answers. We can't really believe that science education has become so poor that the notion of the spherical Earth is no longer taught in schools, and that it is therefore necessary to increase the level of scientific literacy to counter the myth of the Flat Earth. The problem is another, and it has to do with the cultural determinants that generate pseudoscience. Christine Garwood, who studied the history of this idea and the modern community of Flat Earth believers in her book *Flat Earth: The History of an Infamous Idea*, explains:

> Their reasons for launching a radical challenge to one of the most fundamental tenets of human knowledge were diverse, ranging from a desire to safeguard a literal interpretation of the Bible, the word of God, against the inroads being made by science, to a wish to undercut the increasing professionaliza-

> tion and cultural authority of scientific experts, or a perceived need to defend freedom and democracy, and the rights of the general public to make their own knowledge about the natural world. (Garwood 2008)

Debunkers who ignore these aspects are doomed to fail their efforts to 'convert' believers and convince them that they are wrong. Misunderstanding a scientific concept is very easy, and the problem can be solved by correcting misconceptions through an educational approach. But when the scientific concept is voluntarily misunderstood, to develop a concept different from the mainstream one, maybe to support a conspiracy theory or an alternative scientific theory, scientific debunking is not enough, on the contrary it is useless.

The history of ideas offers two main advantages in the study of pseudoscience. First, it focuses on the cultural context in which ideas emerge, and thus on the networks of beliefs shared by the groups in which ideas are proposed and developed. Without necessarily endorsing social constructivism, investigating the collective mentalities and webs of beliefs shared in a given epoch can help to understand why scientific ideas were developed in that way and in that historical context. For example, understanding that the pioneers of the scientific revolution shared many ideas of natural philosophy, alchemy and magical concepts aids to reconstruct more precisely the chain of ideas that led to the birth of modern science (Rossi 2006). As Marco Ciardi writes:

> For a historian, verifying that a scientist has beliefs, or is influenced in his work by beliefs of a metaphysical and religious nature, or by traditions typical of his time, is quite natural. To highlight it does not diminish in any way the strength of science, which is the best tool we have for the understanding of reality and the only one able to correct with exceptional frequency its own mistakes. (Ciardi 2014)

Secondly, the history of ideas provides tools and methods for following the evolution of an idea in its historical course and during its transformations within popular culture. It allows historians to reconstruct the concept drift that occurs when the original meaning of an idea is transformed as a result of the change in the cultural contexts of reception. The historian of ideas can retrace the genealogy of ideas and thus the different stages that lead a conception to become a misconception. More actively, with the history of ideas it could be possible to reconstruct the original meaning of a concept, that is, the meaning shared by those who first elaborated and proposed it, purifying it of the changes and misconceptions that have accumulated over the years and the transformations within popular culture.

The main argument against this proposal could be that a historian of ideas does not have the necessary scientific expertise to debunk pseudoscientific ideas. To respond to this objection, it is useful to specify the difference be-

tween ideas and theories. While theories are complex conceptual structures able to produce predictions about the subject of their study based on the proposed explanatory mechanisms (the typical case is the theory of general relativity), ideas are concepts or judgments of a speculative type. Therefore, a theory is a set of logically interconnected speculative and observational concepts and judgments (Campa 2014). This distinction is fundamental to understand how historians of ideas can deal with the study of scientific ideas even if they do not share the whole discipline a particular scientific theory is part of, and way, on the contrary, an approach based exclusively on scientific facts is doomed to failure, as Campa explains:

> A researcher in the history of ideas does not have to be an astronomer to understand the idea of the big bang and trace its genealogy. Instead, one needs the disciplinary competence of an astronomer to understand the theory of the big bang, in all its astronomical, physical and mathematical details. Just as the historian cannot be improvised as an astronomer, the astronomer cannot replace the historian, at least without adequate preparation – which would mean becoming a historian. To trace the history of the idea of the big bang we need specific skills that usually the astronomer does not possess. (Campa 2014)

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