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Article

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Economic and Environmental Studies (E&ES)

Provided in Cooperation with:

Opole University

Suggested Citation: Jarosz, Katarzyna (2014) : Mechanisms of counterfeiting scientific facts: Pseudoscience and pseudo-archaeology, Economic and Environmental Studies (E&ES), ISSN 2081-8319, Opole University, Faculty of Economics, Opole, Vol. 14, Iss. 1, pp. 39-49

This Version is available at:

<https://hdl.handle.net/10419/178849>

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Mechanisms of counterfeiting scientific facts – pseudoscience and pseudo-archaeology

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Abstract: The aim of this paper is to identify the mechanisms and techniques of counterfeiting science. Archaeological non-rational hypothesis seem to be very attractive for the public in spite of the fact that genuine information is widely available. I aim to verify how and why these pseudoscientific theories diffused in Polish reality, to what extent the reality influenced them and how the attitude towards such topics was changing in the second part of the 20th century. Materials for my analysis were articles about archaeology, published in Polish popular science journals in the years 1945-1999. Two different tendencies can be observed. Some authors –mostly renowned scientists- explain to the readers, why these theories are impossible to prove scientifically. On the other side, running parallel, there are many articles written by proponents of pseudo-archaeology. The most common mechanisms of counterfeiting facts are: presenting artifacts without archaeological context, distorting their scale, distorting the facts, leaving a reader in a state of uncertainty, rejection of rational argument, lack of skepticism, care and logic. Sometimes other alternatives are not checked, and the concepts of greater probability, but less attractive for the public, are not even considered, only in order to attach a reader's attention.

Keywords: archaeology, pseudoscience, pseudo-archaeology

1. Introduction:

The aim of this paper is to identify and discuss some mechanisms of counterfeiting scientific facts and scientific theories. Rise of different pseudoscientific theories can have different motivation. The pages of the daily press are spotted with such theories. Archaeology can be counterfeited for many reasons. Firstly, we have to remember that it has been a very powerful weapon for radical nationalists. Archaeology has been used by many ideologies. It is a very common motivation of distorting reality, counterfeiting artifacts or false interpretation of archaeological data, in order to present a particular version of history. Secondly, it is necessary to bear in mind that it can be and it is very often used as a tool to support different fantastic and

pseudoscientific theories. Mariusz Ziółkowski (1976, 32), a Polish archaeologist and specialist in Mesoamerican archaeology, in the article “Nazca desert geometry”: “when the science faces a particularly difficult problem to be solved, always there will be experts, who know better than the scientists and who have a ready explanation for every question”.

Archaeology has become a very democratic branch of science and easily accessible to general public. The Swedish archaeologists Håkan Karlsson and Björn Nilsson (2001: 23) write that “everybody has a right to have their own history.” They claim (2001: 39) that “archaeology is interesting for the public not as a result of professional archaeology’s successful public outreach but rather despite of it.” It can be understood clearly: it is the public who decides, what is archaeology and what shape it should take. For a long time archaeology has been a very common subject for popular culture, for television, cinema, adventure books and radio. For my analysis I decided to describe several pseudoscientific theories that base on archaeology. Interpretation of history depends to a great extent on the recipient expectations of recipients. I have tried to analyze how the fantastic theories and pseudo-archaeology have been presented in Polish popular science periodicals in the second half of the 20th century.

The aim of this paper is more than just the analysis of various developed theories. I was much more interested to examine the reasons why they had emerged, their grounds, what were the mechanisms of their creation and the ways of dealing with them.

It was also very interesting to verify how and why these theories diffused in Polish reality, to what extent the reality influenced them and how the attitude towards such topics has changed over the last forty years. Five popular science, monthly magazines are the object of my analysis. These are “Problemy” “Wiedza i Życie”, “Świat Nauki”, “Wszechświat” and “National Geographic”. „Problemy”, edited in the years 1945-1993 was the main popular science magazine in Poland. The articles covered a wide spectrum of topics in the field of science and art. „Wiedza i Życie”, a renowned popular science magazine, has been edited since 1926. It features articles on a large range of subjects, mostly dealing with natural sciences, but not only. “Wszechświat”, the magazine of the Polish Nature Society, edited since 1882, has dealt with topics connected with natural sciences, such as biology, astronomy, anthropology, and geology. “Świat Nauki” is the Polish version of “Scientific American” a renewed popular science magazine. The first number of “Świat Nauki” was edited in 1991. “National Geographic”, an American monthly magazine, is edited in Poland since 1999. In all the magazines we can find long articles, essays, short

messages, books' reviews and reportages. 762 articles on archaeological topics were published in the period analyzed, 344 of which in "Wiedza i Życie" 251 in "Problemy", 74 in "Wszechświat", 51 in "Świat Nauki" and 42 in "National Geographic. It is necessary to remember, that from the nineteen forties till the end of the nineteen eighties an average Polish reader had no possibilities whatsoever to filter reality to the same extent as it is nowadays. Till the end of the nineteen eighties there were only three general popular science magazines on the Polish market. Thus, the articles published in them were largely discussed and accounted for a significant part of Polish scientific life. What more, Poles generally did not speak foreign languages and their access to scientific news, press, media was very limited. Also there were only two TV channels, and foreign popular sciences magazines were extremely difficult to get or simply too expensive for an average reader. A printed word was valued much higher than today and most of the revelations were just taken for granted. A theory, presented in a popular science magazine or periodical became instantly a fact, not only a speculation.

2. Pseudoscience and pseudo-archaeology

What is characteristic in the material analyzed, is the fact that in the nineteen forties and fifties, there were practically no articles supporting pseudo-archaeological theories. In the forties and fifties Polish scientists took the problems of science popularization very seriously. Articles were written mostly by archaeologists or specialists in the field, they popularized. All the authors treated the readers very earnestly. they explain the fantastic theories from the scientific point of view. The pseudosciences were attacked by the scientists by means of logical arguments. Till the beginning of the nineteen seventies the archaeological articles in popular science magazines were written by the professional archaeologists, historians or members of the archaeological expeditions. Therefore the weight of these articles was much greater in those days than it is today. From the end of the nineteen sixties we can notice a certain decline of writing standards, and the authors give a free rein to their imagination. There are at least two reasons of the shift of this attitude. Firstly, at the end of the sixties, many intellectuals, as being of Jewish origin, were forced to leave Poland. Józef Huriwc, the editor in chief of the most prestigious popular science periodical "Problemy" famous for its high standards, was also forced to leave and his successors

were accidental people, often without any scientific background. Hurwic (2006) mentions that from the late sixties there is a flow of very low quality articles published in “Problemy”, often reprints from the Soviet periodicals, without any scientific value.

19-23 October 1955 a special conference was held in Madrid, under the title “Conference on dissemination of science” whose aim was to discuss ways of popularization of the natural and technical sciences, methods of implementing new educational policy, role of the cinema, of popular fiction in the process of popularizing science and finally representatives from different countries, also from Poland, shared their experiences in this field.

However, the most important thing, worth mentioning here, were some specific decisions. A list of the topics was developed, which should be considered with utmost care, as impossible to solve or conflicting with the scientific assumptions. Among these issues, such as predicting the end of the world, astrological horoscopes, perpetuum mobile, or water-witching, we can find as well some archaeological problems. These are: discoveries of pre-historic giants or dwarfs, skeletons and mummies of giants, revealing of mysteries of the pyramids, sphinx and other ancient monuments, search for lost Lands like Atlantis or Mu and discoveries and interpretations of hidden mysterious signs in old books and manuscripts (Jakubowski, 1956: 24).

In spite of the warnings against the false sciences, all the topics from the above list have always been greatly popular. When talking about popularity of strange and peculiar theories, the issue which usually emerges first is the problem of the existence of Atlantis and Mu, the legendary lands on the Pacific Ocean, and their suggested locations. The problem of Atlantis appears in the whole period, the only element which changes is its expected location.

What is interesting, two opposite tendencies, running parallel in certain periods, can be observed. Some authors explain to the readers, why these theories are ridiculous and impossible to prove scientifically, however, on the other side we can meet many followers and believers of pseudo-archaeology. As it will be demonstrated, some scientific authorities (Skowron, 1945) felt this pressure of social responsibility and revealed nonsense of the pseudo-archaeology theories. Still, it is necessary to emphasize, that this attitude was not very common. Most of the scientists did not participate in the discussions on Atlantis. Most articles concerning Atlantis and Mu are those of the proponents of existence of these lands. There are very few authors who try to explain, why the assumptions of the theory of Atlantis existence were false. Władysław Szafer, (1947), a Polish botanist and paleobotanist, collects the arguments of both proponents and

opponents of the theory that Atlantis and Mu were a kind of land bridge linking the Central America with Polynesia and Melanesia. According to the theory created by James Churchwood in 1929, (2004), Atlantis was situated on the West Atlantic Ocean and Mu on the Pacific. The main argument of the theory supporting the existence of the continent is this of formal resemblance of ancient Egyptian, Mexican, Bolivian and Peruvian civilizations. It claims that similarities in cult constructions are a testimony of the land bridge linking these two continents. Szafer demonstrates that this theory has no scientific foundations, and that it is based on superficial, formal features. What is the most important, he states clearly, that putting the matter in the correct perspective does not impoverish the science, but on the contrary, it will rather enrich it, because instead of taking the shortcut, and instead of pointless and vain search for similarities between Egypt and of American civilizations, the scientists are forced to coordinate their efforts in order to find answers to different questions, not yet addressed. He emphasizes that the convergence evolution theory, of parallel existing cultures in distant parts of the world, is a working scientific hypothesis, which should be elaborated and developed. The scientists should rather concentrate on supporting this hypothesis by new discoveries, without necessity of resurrecting Atlantis or Mu, the existence of which has been denied by the scientific evidence. As a scientist and naturalist he bases on the facts, which prove, that the land bridges could not have existed. Shafer's article is a rare example of serious attitude towards the reader. He analyzes all the aspects, and does not hide these, which are inconvenient, but tries to explain the bias of the theory of Atlantis existence.

However most authors do not doubt in the existence of Atlantis and the only issue to be solved is the problem of its location. The articles arguing about the existence of Atlantis appear for the first time in the nineteen sixties. It seems that the Atlantis theory was for some authors a kind of dream of one, single, ancient cultural and power centre, or an ancient empire. According to the authors Atlantis was the origin of culture and civilization. It was said (Krzak, 1978) to be a cultural center on a hill surrounded by three water circles. As some authors claimed, this construction was nothing more, and nothing less, but *imago mundi*, a symbol of Cosmos, copied in many versions in numerous ancient constructions. It is quite common to refer to the formal elements of different constructions, such as shape. Very often when it comes to explain a surprisingly high level of local culture, in societies considered as less developed, the authors reach to the Atlantis theory. It is sometimes difficult for the authors to admit that African

societies might have produced culture or art works of high artistic level. A typical example will be the case of the White Lady. In „Wiedza i Życie” (Łukasiewicz, 1965) we read about a rock painting, the so called White Lady, which, according to the author, could have been painted by the Atlantis inhabitants. The author writes that the painting presents “A woman with a bow and an arrow. In her hand the white lady holds a flower. She is followed by a procession of people”(Łukasiewicz, 1965: 56). Reinhard Maak, who discovered this fresco in 1917, made a comment in his notes, that its character is surprisingly Mediterranean. Also Breuill claimed that the painting can be associated with Egyptian art, especially clothes of the people remind those Egyptian. Breuill (1955: 7) claims: “this is not Bushman painting, this is Great Art. This short note gave rise to different controversial speculations and was a source of very peculiar theories, especially concerning Atlantis and its inhabitants living on the land of Namibia. Investigation of the rock art in Namibia helped to clarify the problem of its origin (Wendt, 1972). Finally the fresco was analyzed ten years after the publication in „Wiedza i Życie” had been written. In 1975 Harald Pager, a specialist in rock painting, decided that „The White Lady” and the procession of people are in fact men in ritual dance holding their hands on their penises with white ornaments (Pager, 1975). Several studies have been conducted (Jacoson, 1980b) in the Brandberg area that show continuity and ritual practice in this region. Lewis-Williams (1981) presented arguments that the painting is strongly related to ritual activity and can be understood only from this perspective.

Different authors place Atlantis in different locations. It is set on the Atlantic Ocean (Zajdler, 1979) or on the Bahamas archipelago (Carnac, 1977). In 1968, pilot R. Brush, flying over the island Androsin in Bahamas archipelagos, discovered some mysterious constructions at its shore, which gave assumptions to speculations and press revelations. Very often the lack of evidence against the existence of Atlantis is considered as the evidence of its existence. The authors speculate, that the megalithic centers on the East Atlantic, in France and Pyrenean Peninsula side in North-West Africa, as well as on the other side of the West Atlantic, may prove Atlantis existence, from where megalithic culture would radiate to both sides of the Atlantic Ocean. Also the Soviets joined the race in search for Atlantis. According to some authors (Anonymous, 1955), there is a connection between Atlantis sinking and the Ice Age. We can read that the ice age might have been caused by Atlantis sinking. The Soviet researchers discovered that the Gulfstream waters flowed into the Arctic Ocean about 10 thousand years ago.

It was the basis of a hypothesis that the reason of these waters flowing was Atlantis sinking, which caused the Glacial Age.

However, the most popular place to locate Atlantis is a Greek island of Santorini. The myth of Atlantis on Santorini dates back to the nineteen sixties. In 1966 the first conference on the Thera volcano eruption in the second millennium BC and the destruction of Minoan civilization was held. Spirydion Marinatos, the main organiser of the conference believed, that Thera eruption was also responsible for the destruction of the Minoan civilization on Crete. In 1967 Marinatos started excavations of the bronze settlement, buried in the volcanic ashes, situated on the Santorini Island. Speculations on Atlantis were additionally engraved in peoples' consciousness because of theories created by J.V. Luce (1987). Classic philologist and participant of the first archaeological expedition to Akrotiri, Luce was deeply convinced that Atlantis should be placed not in Plato's writings, but on the Santorini coast. The theory of the volcano eruption adds the sensational character, so often used by the authors and so much appreciated by the readers. The theory of destroying Atlantis by the volcano is not the only existing. We can meet another one (Zajdler, 1979) saying that it was sunk by a planetoid, which hit the Earth on the 5th of June 8499 B.C.

It is necessary to mention, that in spite of the fact that Polish archaeologists attach much importance to archaeology popularization, there are surprisingly few articles, we might even say there are only single articles, showing absurdity of such theories (Ziółkowski, 1976; Skowron, 1945; Wolański, 1959).

Speculations on anthropogenesis are the themes present especially in the nineteen forties and fifties. Two major topics were touched. One is the problem of giants- man's ancestors. It has its explanation. In 1939 on Java, Gustaw Heinrich Ralf von Koenigswald discovered a fragment of a jaw. After its reconstruction the teeth seemed so enormous that, on the basis of following Koenigswald's discoveries, Franz Weidenreich propounded the hypothesis, that anthropogenesis began from the giants who then evaluated into a middle-height man. It was very quickly seized on and trivialized to such extent, that Weidenreich (1944) in his article in „Science” renounced the press sensations. However, the information on the theory of ancestor-giants engraved deeply in peoples' consciousness. It was such a strong phenomenon, that Polish scientific authorities decided to explain this problem. A series of the articles were published on this subject and what is interesting, we can observe the change of their attitude towards the problem. In 1947,

Stanisław Skowron, biology professor at the Jagiellonian University, in the article of a very meaningful title „Were the giants the ancestors of humankind?” presents the current state of knowledge and writes that the discoveries on Java “are for the science not less important and interesting than penicillin (Skowron, 1957: 484).” He describes what the genealogical tree of mankind looks like, who man’s ancestors were and what position might the Koenigswald’s *Gigantopithecus* and *Meganthropus* occupy in it. What is interesting, Skowron leaves the question of potential belonging of *Gigantopithecus* and *Meganthropus* to mankind open. Twelve years later this problem seemed to be solved and did not raise any doubts. Napoleon Wolański in the article “Were in fact our ancestors giants?” (Wolański, 1958: 513) explains, why it is highly unlikely, that giants were man’s ancestors. Referring to the researches he conducted, and giving very detailed statistic data on fossils, he rejects theories on human giants. He explains that from the Lower Paleolithic till the historical times, human’s height increases, therefore ancestors-giants are improbable. A next fantastic theme connected with anthropogenesis was the one dating human ancestors more than ten million years ago. Again we can find an article on this topic.

The authors of “The Mysterious form in Grosetto” (Wolański, 1958: 919) refer to the world press revelations about finding mythical human ancestors dating 12 million years back. These fossils were discovered accidentally by two miners and announced to belong to human’s mythical ancestor. Wolański explained, that the discovery had been known to paleontologists for a very long time, it was the so called *Oreopithecus bambolii*, extinct Primate, whose first fossils had been discovered in 1872. These articles seem very significant. It is an example of cooperation between the science and the public. Authors, the scientists of great reputation, do not feel ashamed of speaking on the topic and of explaining to the readers step by step, the scientific point of view.

At the end of the nineteen sixties and in seventies one more, strong trend appeared. Theory of Aliens visit and their traces on the Earth is the next theory using archaeological material and juggling the facts. There was a reason of the Aliens interest emergence. The nineteen sixties were the beginning of Space fascination. On 12.04.1961 Jurij Gagarin had his first space flight and on 20 July 1969 Apollo11 with Neil Armstrong, Edwin Aldrin and Michael Collins landed on the Moon. The end of the sixties was at the same time the beginning of Erich von Däniken’s activity. In popular science periodicals we can see clearly this fascination with Space. In the nineteen seventies we got a series of the articles about the presence of Aliens on the

Earth. One group of authors tries to explain existence of certain phenomena, culture or artefacts by Alien interference. Others reveal what Daeniken's and his supporters' manipulations and show, what half-truth they used, to prove their theories. A very common theme are Nazca geoglyphs. They are located in Peru and cover about four hundred and fifty square kilometers. They depict creatures, mostly from both the existing world but also imaginary. They present animals: hummingbirds, spiders, monkeys, lizards, pelicans. They also depict trees, plants, flowers and geometrical figures, spirals, triangles, rectangles and wavy lines. The earliest lines, created with piled up stones, date as far back as 500 BC, which is the period when Nazca people inhabited the region. Nazca culture was very successful in systems of bringing underground water to the surface in order to water and irrigate the earth (Johnson, 1997). However, in the articles the same patterns can be observed. Very often only one element is analyzed, without reference to the whole context. Often the scale of the artefact is distorted, like it is in the case of the Nazca geoglyphs. We can often read, that one of the geoglyphs, a bird's foot reminds a contemporary airport. In most articles there is no information, that this foot has a diameter of only four meters. Dogu figures are presented without a continuum of representations, starting from those very much like the natural human figure, going to the most stylized ones with geometrical shapes. Only the final, most stylized figures are presented, as wearing space suits.

Next example of misinterpretation based on the pseudo-scientific theories will be the story of the so called great Martian god from Jabbar in the Sahara (Lhote, 1959). During his expedition in 1948 Henri Lhote discovered about 5000 rock paintings. He cataloged and described them. In his memoirs he jokingly put the words, which were later taken literally and transferred out of their context by the sensation hunters. Lhote (1977: 48) wrote: „explaining their contour is simple, inartistic, and with rounded heads; their only detail is the double oval at the figure's center, which evokes the image we currently have of Martians! Martians! What a great title it would be for a tabloid article!” Lhote wrote these words with reserve and his specific sense of humor. However they were interpreted literally, the readers did not learn, that the famous Martian is one of the 5000 painted figures. What more, Lhote, writing about the Martians, put the quotation mark, in order to emphasize the distance to what he said and express his ironic attitude towards the extraterrestrial origin of the Martian god. In the press articles this quotation mark disappears and the only thing which remains is the one of the extraterrestrial god. The issue of the rock painting, its provenance and authenticity was analyzed and the results given

to the public: “a number of the paintings were faked, and the copying process was fraught with errors. The 'discovery' can only be understood within the political and cultural context of the time, [...] expedition's methods caused extensive damage to the rock art while the accompanying looting of cultural objects effectively sterilized the archaeological landscape”(Keenan, 2004: 238).

3. Conclusions and suggestions of further research

Analysis the phenomenon of presenting pseudoscientific theories in the material analyzed, several patterns are observed. The reader of the article never gets a clear and firm answer, how all these phenomena and artifacts should be interpreted, however he or she is supposed to have a vague feeling of uncertainty, that the scientists do not tell the whole truth. The reason of this lack of involvement seems clear and simple. Histories about cosmic ancestors immortalized on Mayas geoglyphs or about the lost Lands are so peculiar, absurd and preposterous, that discussion on these theories is at the same time insulting the intelligence of the reader. As it has been observed, most scientists do not engage in discussion, probably because the slightest cogitation about this problem may result in being labeled as the “Atlantis specialist”, which would ridicule and discredit them in scientific society. Whereas in people consciousness appear a deep conviction that Atlantis must have existed, and the scientists take part in a global complot, the aim of which is, for mysterious reasons, hiding the truth.

Further, comparative studies can be carried concerning false theories in other sciences, in what way they are presented and what are the mechanisms of their creation. It would be very useful to verify if the mechanisms such as simplification, manipulation with facts, distorting reality and presenting facts without context are also used in order to create improper economic theories, physical laws or in other sciences, such as medicine or biology.

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Mechanizmy fałszowania faktów naukowych - pseudonauka i pseudo-archeologia

Streszczenie: Celem artykułu jest przedstawienie, jakie są techniki i mechanizmy fałszowania faktów naukowych. Archeologiczne pseudonaukowe hipotezy wydają się bardzo atrakcyjne dla społeczeństwa, mimo faktu, że z naukowego punktu widzenia są one niemożliwe. Istotne zatem wydaje się zbadanie, dlaczego i w jakim stopniu te pseudonaukowe teorie istniały i rozwijały się w polskim społeczeństwie, do jakiego stopnia rzeczywistość pozanaukowa wpływała na ich tworzenie i jak zmieniał się stosunek do pseudonaukowych teorii w drugiej połowie XX wieku. Materiałem badawczym były artykuły dotyczące archeologii, opublikowane w polskich czasopismach popularnonaukowych w latach 1945-1999. Można zaobserwować dwie przeciwstawne tendencje, często występujące w tym samym czasie. Część autorów- najczęściej naukowców i specjalistów w określonej dziedzinie- tłumaczy czytelnikom, dlaczego pseudonaukowe fakty, zjawiska i teorie nie są możliwe z naukowego punktu widzenia. Z drugiej strony jednak ukazało się wiele tekstów pisanych przez zwolenników pseudonaukowych teorii. Wśród najczęściej stosowanych technik fałszowania naukowych faktów i zjawisk wymienić należy: przedstawianie artefaktów bez archeologicznego kontekstu, zmiana ich skali, pomijanie określonych faktów lub fałszowanie ich, odrzucanie racjonalnych argumentów, brak logiki w rozumowaniu. Zdarza się, że przedstawiana jest tylko jedna możliwość zaistnienia określonego zjawiska. Często fakty i zjawiska bardziej prawdopodobne, lecz mniej atrakcyjne medianie, a zatem mniej przyciągające ewentualnego czytelnika, nie są brane pod uwagę.

Słowa kluczowe: archeologia, pseudonauka, pseudo-archeologia