



Not to be Mentioned but Impossible to Keep Quiet About

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The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Many people find scientific publishing is immune to fraud, but unfortunately this is not true. This paper reports some cases of scientific fraud detected in Brazil. It has to be pointed out that there is no crisis of ethics in Brazilian science, but since cases of misconduct have been reported, the Brazilian National Council of Scientific and Technological Development formed on March 27th 2012 a Commission for Integrity in Scientific Activity. It is therefore expected that procedures for prevention and punishment of fraudulent activity in science are discussed in Brazil more openly.

Keywords: Scientific fraud; integrity in scientific activity ethics.

Fraud is as old as mankind. When it occurs in politics, business or marriage, we pay less attention to it than when it occurs in science [1]. Notwithstanding, the logic is always the same: to deceive others and, in doing so, to take advantage of them. However, until the middle of the last century, scientific fraud was unheard of.

Society thought of scientists as wise and honest people in search of nothing more than "the effective truth of things" through the rational and competent reading of reality. However, scientific research is subject to fraud like any other human activity and scientists, professors and researchers can also lie. In Brazil, the subject still

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causes uneasiness in academic circles, but the first step to face the problem has been taken. On March 27th 2012 a special committee was formed, called Commission for Integrity in Scientific Activity, which is part of the Brazilian National Council of Scientific and Technological Development [2].

Yet what does scientific fraud amount to? According to the *Dictionary of American History*, the term “scientific fraud” is used to describe intentional misrepresentation of the methods, procedures or results of scientific research. “It includes plagiarism, fabrication or falsification in proposing, performing, or reviewing scientific research or in reporting research results”.

Of the three main types of scientific fraud, however, the most dramatic nowadays is perhaps plagiarism [3] – so easy to find out by internet. A researcher commits plagiarism when he or she publishes, under his or her name, a paper written by someone else. Traditionally, definitions of plagiarism do not take into account self-plagiarism, which is a writer’s republishing of his or her work. None the less, self-plagiarism is unethical, especially when it infringes on the publisher’s rights [4].

Forgery, or the fabrication of data, is the situation in which the researcher presents fictitious data that were never collected, or describes experiments which he or she never carried out. Fabrication of physical evidence – a less common occurrence – means the production by the researcher of a false piece of evidence, a photograph or other kind of image intended to demonstrate that he or she has made a scientific discovery. Falsification – also called fudging or melting– means the manipulation of research records, data, images or statistics by the researcher and used by him or her to support his or her point of view. Probably, this is the most common of fraudulent proceedings.

Yet, how can the reader of scientific articles distinguish between experimental errors which are inherent to inductive science, and premeditated fraud? This is definitely not an easy task. Traditionally, error is seen as part of the experimental process: there are errors caused by the equipment and by the appraisers, errors in the design of the experiment itself, random errors caused by unpredictable factors and human errors, as mistakes in data entry.

Moreover, the researcher who works in a field not yet covered by others tends to be more prone to errors, either because of his or her lack of familiarity with the path or because of an excess of passion (or vanity) which impairs judgement. In most cases, these errors are a slip or merely an error, but sometimes they are committed consciously and on purpose. Data are falsified or fabricated to produce evidence that does not in fact exist –all in the researcher’s benefit.

Some say science is becoming a ruthless business, increasingly accused of fraud in the pursuit of useful research findings, applications and profits [5]. Others insist that “big frauds” are an exception in the scientific milieu and smaller frauds are no more than that – “smaller”. The truth is that there are no statistics on the frauds perpetrated in Brazil. Anyway, the first time it was heard a scientific fraud had occurred in Brazil was in 1979 [6]. Maria Lúcia Teixeira, from the University of Brasilia, considered papers by Maria Artemisia Arraes Hermans to be plagiarism.

Teixeira was listed as co-author on several of these papers without having had any contribution in them at all, according to her. Then, Teixeira sued Arraes on two fronts: one at Brasilia Court, the other at the University. The Court considered the case unenforceable because Teixeira was not the author of the original papers which she declared had been plagiarised. The University produced three reports demonstrating that plagiarism had indeed occurred: Herman’s works were mere plagiarism of papers published by the Swedish researcher G.Utter. Nevertheless, the Dean of the University filed the case “for lack of proof”.

Another case of plagiarism occurred at the University of Pernambuco [7]. In 1985 Doctor João de Albuquerque Rocha presented a thesis to the Academic Faculty in order to be appointed as Full Professor of Paediatrics. He was appointed. Doctor Magda Carneiro Sampaio, who was given second place, sued the Academic Faculty because she considered that Rocha’s thesis was a plagiarism. In court, Rocha’s work was declared plagiarism. Rocha’s work was partly a copy of the doctorate text written by Helena Benício, defended in the University of São Paulo in 1983, and partly a copy of a work produced by the Brazilian Society of Pediatrics, published in the *Jornal de Pediatria* in 1985. However, the University did not corroborate the judge’s verdict, arguing that the Academic

Faculty is sovereign in its decisions. This recalls the ironic comment of Umberto Eco, who said it was all right to copy in Milan a thesis written in Catania, as long as the members of the committee had never worked in Catania [8]. Be that as it may, academic institutions are beginning to change their attitudes.

Two members of the Department of Clinical Analysis, Toxicology and Bromatology of the School of Pharmaceutical Sciences at the University of São Paulo were punished on grounds of plagiarism: Andreimar Martins Soares, who was a professor, was dismissed and Carolina Dalqua Sant'Ana, a researcher, had her PhD title annulled [9,10]. Soares was the first author of the paper

Antiviral and antiparasite properties of an L-aminoacid oxidase from the Snake Bothrops jararaca: Cloning and identification of a complete DNA sequence. *Biochem. Pharmacol.* 76 (2008) 279–288]

but, according to the University, Sant'Ana was the one responsible for the contested parts. A retraction notice to this paper was published in *Biochem. Pharmacol.* 80 (2) 2010, page 288 and says "The authors have plagiarized transmission electron microscopy figures published by others in *Antimicrob. Agents Chemother.* 47 (2003) 1895–1901". The imbroglia also involved a former Dean of the University of São Paulo and a co-author of the paper, Suely Vilela, who was not punished because, according to the University, she was not responsible for the transmission electron microscopy figures plagiarized [11]. Soares' demission was published and announced by the newspapers all over the country. Anyway, the punishment inflicted on Soares by the University sounds excessively severe considering Brazilian standards [12], as it can be seen in the following two cases.

In the first one, Rui Curi, a member of the Brazilian Academy of Sciences, ex-Director of the School of Biomedical Sciences of the University of São Paulo and researcher with a senior grant from Brazilian National Council of Scientific and Technological Development, an award for his high productivity, was involved in scientific fraud [13]. Two papers of him published in 2007 were one retracted and the other withdrawn, according to Elsevier policies, because of denouncements of fraud.

Rosemari Otton, Danielle Oliveira da Silva, Thais Regina Campoio, Leonardo R Silveira, Maria Oliveira de Souza, Elaine Hatanaka and Rui Curi. Non-esterified fatty acid sand human lymphocyte death: A mechanism that involves calcium release and oxidative stress. *J Endocrinol* 195(1):133-43. In October 2007, retracted.

Gorjão R, Hirabara SM, de Lima TM, Cury-Boaventura MF, Curi R. Regulation of interleukin-2 signaling by fatty acids in human lymphocytes. *J Lipid Res.* 48 (9):2009-19. Sep 2007. e-pub 2007 Jun 25. On December 28th, 2012, withdrawn.

There are others papers for which he is suspected of misconduct and involve students and collaborators working at other institutions. However, the Commission for Integrity in Scientific Activity (CIAC) of the Brazilian National Council for Scientific and Technological Development concluded, after six months of investigation, that although no "falsification of results" had been found in Curi's duly examined publications, "failure to exercise rigour, indispensable to high quality research" had been observed "in the design and divulgation of the projects results" [13] – that is to say, according to the evaluation of the Commission, Curi's errors could be explained not by fraud but by the poor quality of his work. Even so, Curi still holds a researcher financial support, according to his curriculum [14]. The University of São Paulo also acquitted Curi [15]. It is interesting to note that, in 2007 Curi published an average of three papers per month and it is worth remembering what the American sociologist Patricia Woolf [16] said that there is a kind of "pathologically prolific publishing", and that "there is considerable evidence that fraud is its by-product".

The second case of misconduct was perpetrated by Denis de Jesus Lima Guerra. He was dismissed from the University of Mato Grosso in January, 2014. Elsevier chemistry journals have retracted eleven papers linked to Guerra and co-authors. Elsevier editors alleged the authors had fabricated nuclear magnetic resonance images used in articles published in the following journals:

- *Journal of Colloid and Interface Science* 337 (2009) 122–130
- *Inorganic Chemistry Communications* 12 (2009) 1145–1149

- *Journal of Environmental Radioactivity* 101 (2010) 122–133
- *Process Safety and Environmental Protection* 88 (2010) 53–61
- *Journal of Physics and Chemistry of Solids* 70 (2009) 1413–1421
- *Applied Surface Science* 256 (2009) 702–709
- *Inorganic Chemistry Communications* 11 (2008) 20–23
- *Inorganic Chemistry Communications* 12 (2009) 1107–1111
- *Journal of Hazardous Materials* 172 (2009) 507–514
- *Journal of Hazardous Materials* 171 (2009) 514–523
- *Journal of Colloid and Interface Science* 338 (2009) 30–39

One of the co-authors of Guerra's articles was Carlos Airoidi, Full Professor of the Department of Inorganic Chemistry at the University of Campinas, Brazil. In 2009, Airoidi's name appears in thirty four articles, almost three per month, which is "pathologically prolific publishing". The University of Campinas punished Airoidi with forty-five days of suspension [17], but he still holds a researcher financial support from Brazilian National Council of Scientific and Technological Development [18]. The three year delay in the administrative process was partly due to the dilatory measures taken by Guerra's lawyers.

It has to be noted that scientific frauds are not committed by people alien to the academic context. On the contrary, they are committed by people who are working hardy at research institutions and conducting scientific investigations. When accused of fraud, the authors react with indignation, as did Rui Curi, whose lawyers threatened Science-Fraud.org, a site that openly tackled plagiarism and scientific misconduct [19,20]. Nonetheless, punishment is necessary. Moreover, there must not be double thinking - two weights, two measures - as is common in Brazil.

Scientific fraud needs to be fought because academic titles are the basis for evaluating academic personnel for promotion, gratification, financial support and tenure. The subject deserves therefore more research, more discussion and more dedication than that which it has received so far. We do not mean by this that there is an ethical crisis in present day Science

but rather that the organizational system still has failings. After all, a well-informed scientific community is well able to face such challenges. Nonetheless, it must be understood that fraud is prone to be discovered sooner or later. As Francis Bacon wrote, "Truth is not the daughter of authority, but of time".

CONCLUSION

Brazil is a huge country with high inequality in income distribution. It is rare for high-profile Brazilian people to be punished. Politicians, businessmen, artists, soccer players and even some researchers are a caste of people immune to punishment. Consequently, scientists learn very early in their careers how to cut corners in order get papers published and pursue research findings for grants, public recognition and money. This is the easy way but it is fraudulent.

Scientific misconduct is a threat to the reputation and reliability of the scientific community. Fraud cannot be tolerated and double standards in the process of punishment are even worse because these keep honest people away from the field. A change in behavior is urgently required in the Brazilian scientific community.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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