Arch Iranian Med 2009; 12 (1): 1 – 4

Editorial

Fraud and Dishonesty in "Scientific" Publication

In recent years, a plethora of fraudulent papers have been published in medical and scientific journals, which have been retracted by the editors sometime after their publication.

The dilemma that this type of dishonesty poses for science in general, and for journal editors in particular, must give pause for reflection.

In this essay, I shall briefly review fraud and plagiarism which are serious scientific research misconducts, and dishonesty, which concerns manipulation or suppression of some data.

The topics which will not be discussed, however, are publications concerning parapsychology; alternative medicine; intelligent design, or other such subjects which do not follow a strict scientific methodology and are deemed to fall out with the mainstream of scientific worldview.

Fraud is defined as 'fabrication or falsification in performing or reporting research results.'[1]

The "Piltdown Man" hoax is perhaps the most famous case of scientific fraud in history and remained unexposed for forty years. This forgery consisted of the lower jawbone of an Orangutan combined with the skull of a fully modern Man, and touted as the discovery of the 'missing link' postulated as the intermediary in the evolution of hominids from apes. This skull was "found' in a gravel pit at Piltdown in England by Charles Dawson in 1912. It was only in 1953, almost forty years later, that it was exposed as a forgery.[2]

The next major fraudulent publication that exploded into public attention belonged to Sir Cyril Burt concerning the heritability of intelligence (as measured by intelligence quotient [IQ] tests).

Sir Cyril Burt (1883 – 1971) was an English educational psychologist who was appointed as Professor and Chair of Psychology at University College, London in 1931; was elected as President of the British Psychologic Society in 1942; and was knighted in 1946. His prestige and influence were paramount throughout his later career and life and so it was not until after his death that his earlier publications came under scrutiny and some fraudulent misconduct were exposed with regard to his twin studies and the IQ. It was Leon Kamin[3] who first noticed that the correlation coefficients of the twins' IQ scores were the same to three decimal places across various articles and different studies. Leslie Hearnshaw, a close friend and associate of Burt and his official biographer, also concluded that some of his data were unreliable or fraudulent.[4] Other accusations against Burt include the fact that he claimed "to have developed the method of factor analysis in psychologic testing, although his mentor and predecessor as Chair of the Psychology Department at University College, London, Charles Spearman had actually done so."[5] The fact that many of his alleged 'twins' were untraceable as were his alleged collaborators and co-authors; Margaret Howard and J.Conway,[6] also marred his reputation. Several of Burt's friends and students, including W.D. Hamilton, attempted to rehabilitate his reputation, but once tainted by such preponderance of accusations, Burt's name remained tarnished.

The degree of heritability of intelligence remains a contentious issue, replete with bias and controversy, involving racial supremacy, class distinction, and eugenics, the veracity and the ethical dilemmas of which still remain unresolved.[7–8]

In the last decade, several other fraudulent publications have come to light including a paper by Andrew Wakefield published in the *Lancet* in 1998 which linked autism with the MMR vaccine[11]; Jessica Lee Grol, "a neurologic surgery research project coordinator at the University of Pittsburgh in the US who had fabricated records of fifteen patients in a cerebral aneurysm study"[12]; Victor Ninov who had fabricated the discovery of two new chemical elements while working at the Lawrence Berkley National Laboratory in California[13]….. and the list goes on.

It was, however, the case of Woo Suk Hwang that shook the scientific community in December of 2005.

Hwang, a prominent stem cell researcher at the Seoul National University in South Korea, had reported stunning advances in somatic cell nuclear

transfer (therapeutic cloning) in human cells, published in the journal *Science* in 2004 and 2005. He had won great acclaim throughout the world for his pioneering research and was awarded the Research Leader of the Year by the magazine Scientific American in December 2005[14] and some observers even pondered his breakthroughs as worthy of a Nobel Prize. In November 2005, however, doubts were raised about the integrity of the results published in *Science* and on December 15, Roh Sung-il, one of Hwang's collaborators, revealed that nine of the eleven stem cell lines described in their articles had been faked. Within a short spate of time, Hwang admitted to fabrication, was dismissed by the Seoul University, the journals *Science* and Scientific American had retracted their articles and award,[15] and the scandal ended in disgrace.

It is generally assumed, and it is usually true, that science is a self regulatory system with its own 'checks and balances' to discover and eliminate fraud from scientific publications, even though it might take several years to accomplish such a task. It has recently become clear, however, that this procedure is more difficult than previously assumed. If the onus of discovering fraudulent data falls on the shoulders of the editorial staff of reputable journals, then it is a heavy cross to bear. In 1977, journal editors formed the Committee on Publication Ethics, or COPE to deal with "breaches in research and publication ethics" and the BMJ discussed this problem in two editorials in 2005 and 2007[16,17] and came to no firmer conclusion than to recommend constant vigilance of peer reviewers for unsound and suspicious data and the reporting of that suspicion to the relevant institutional authorities where the research took place for further investigations. As the editorials revealed, this came to little avail when the institutions were in far distant lands. Although in the US, in the 1970s and 1980s an 'Office for Research Integrity' was set up to help universities and other research institutions in the investigation of such misconducts, yet it did not stem the tide as evidenced by recent events.

Whither will this scientific hubris lead? Why do some scientists, whether novice or well established, resort to such fraudulent misconduct? Is it just weakness of character or is it purely for kudos and glory, or for both? Is it in the hope of career advancement or just gaining recognition in a highly competitive field? Most probably the answer is a combination of several of these factors. The adage 'publish or perish' remains paramount.

Plagiarism, however, is a different kettle of fish. The offenders are usually from developing countries whose mother tongue is not English. In its grossest form, it involves plagiarizing an entire paper (tables and graphs included) from one journal and sending it for publication to another less well-known journal under their own name. This type of 100% plagiarism, though not common, yet it occurs; witness the paper by an eminent Australian botanist published in the Journal of Experimental Biology in 2007 that was plagiarized verbatim in two online Medwell publications in 2008 under a different author.[18–20] A further example was reported in *Nature* in 2008.[21] Lesser degrees of plagiarism, where 'cut-and-paste' of chunks from several papers are combined, are much more common.[22]

Recently, a text matching search engine, eTBLAST, has become available from the University of Texas Southwestern Medical Center in Dallas, which has helped to 'ferret out' duplications in the scientific literature and help expose plagiarism by forming a 'Déjà vu' database which might discourage this practice.

It is regrettable that in some developing countries the university and government institutional systems are such that they unwittingly encourage greater degrees of plagiarism and the faking of doctoral certificates for personal gain, high office, and other vainglorious ends.

Dishonesty, which involves manipulation or selective suppression of data, when practiced by governments for misguided political ends, or by large multinational companies such as giant pharmaceutical, oil, or tobacco industries, will spell disaster for the world at large, and for future generations. Two examples will suffice to highlight this point.

It was estimated by IMS Health (imshealth.com) that the total worldwide sales of prescription drugs in the year 2002 was $ 400 billion dollars, half of which was in the US.

The largest single item in the budget of drug companies is euphemistically called 'marketing and administration' which is usually around 36% of total sale values as compared with11% for 'research and development'. Marcia Angell wrote in the New York Review of Books that "the industry uses its wealth and power to co-opt every institution that might stand in its way, including the US Congress, the FDA, academic medical centers, and the medical profession itself."[23]

Selective publication and selective reporting in studies sponsored by the pharmaceutical industries,

can exaggerate the efficacy of some medications while minimizing their side effects. In two papers published in the BMJ[24] and in the New England Journal of Medicine[25] a comparison of the results of clinical trials of several antidepressant medications, between published reports and those trials that were not published by the pharmaceutical industries, demonstrate the influence of this type of bias on the apparent efficacy of the drugs.

A further problem that surfaced during the law suit against Merck Pharmaceutical Company with respect to rofecoxib, (Vioxx) involved *guest authorship* and *ghost writing*. The drug, Vioxx was withdrawn worldwide in 2004 after it was shown to double the risk of heart attacks and strokes if taken for more than eighteen months. An article in JAMA[26] disclosed that "the clinical trial manuscripts related to Vioxx were authored by sponsor employees but often attributed first authorship (*guest author*) to an academically affiliated investigator who did not always disclose industry financial support." Furthermore "review manuscripts were often prepared by an unacknowledged author (*ghost writer*) but subsequently attributed to an academically affiliated investigator who often did not disclose industry financial support."

The Bush Administration has been attempting to suppress an FDA reform legislation, passed by the House of Representatives, which requires drug companies to publicly post all clinical results in their entirely so that the medical profession and the public at large can make an informed choice.

I will refer to the problem of *global warming* as my second example of suppression of data by governmental institutions. It is a historical fact that the US did not sign the Kyoto Protocol, and in fact the Bush Administration "…had refused to even acknowledge *global warming* as a serious human problem, and its Environmental Protection Agency removed the section on climate change from its annual report to avoid offending the White House" as Bill McKibben mentions in his article in the New York Review of Books.[27] In the same article McKibben alludes to the advice given to President Bush by his adviser Frank Luntz "…not to use the phrase *global warming* which has catastrophic connotations" but to use instead the less dramatic phrase '*climate change*'. Luntz "also advised the president to emphasize the (false) statement that there was no consensus among scientists on this issue".

In a similar vein, the Bush Administration pushed an 'Ethanol Mandate' through Congress in 2007. The mandate was the production of nine billion gallons of Ethanol or other renewable fuels in 2008, which would be increased to 36 billion gallons by 2022, thus reducing 'green house gas' emissions as well as the reduction of the US dependence on foreign oil. In addition, Ethanol producers in the US receive a 51- cent per gallon tax break as well as a provision of large subsidies for corn growers in the US.

This mandate turned out to be a true 'sword of Damocles'. Scientists now believe that the production of Ethanol from corn not only creates more harmful emission of green house gases than it was thought to prevent,[28] but has also caused an increase in food prices globally.

In February of 2004, The Union of Concerned Scientists issued a report by the title of "Scientific Integrity in Policymaking", which accused the Bush administration of manipulation and distortion of scientific findings in the interest of its own ideological and political ends as well as favoring industrial profits over public health and safety. By February 2005, this 'manifesto' was signed by over five thousand scientists, including forty- eight Nobel laureates.

This phenomenon of manipulation and suppression of data is not confined to the Bush Administration but it is a global occurrence. It is only a reflection of American democracy that such matters can be published and discussed in public forums.

So much for a very brief survey of fraud, plagiarism, and dishonesty in 'scientific' endeavors.

But how can science extricate itself from this quagmire of dishonesty in which there is not even 'honor among thieves'? The word honor derives from the Sanskrit word 'hoo-nar' meaning 'good men' (cf. modern Farsi 'honar' from the same root). There are many 'good men'(the chauvinism is not mine) in science and it must be concluded that only through their vigilance and effort, armed with new tools, will the scientific community be able to weed out and expose the few 'bad apples' or ' bad men' from amongst their community.

Touraj Nayernouri MD*
*Academy of Medical Sciences of I.R. of Iran, Tehran, Iran.
Telefax: +98-212-293-8051,
E-mail: tnayernouri@yahoo.co.uk

References

1 The United States Office of Science and Technology Policy. Federal Misconduct. Federal Register 65, no.235: 76260 –

76264. Available from: URL: http://www.ostp.gov/ (Accessed December 6, 2000)
2 Museums Correspondent. Piltdown Man Forgery. *The Times*. November 21, 1953; November 23, 1953: 8.
3 Kamin LJ. *The Science and Politics of I.Q*. Potomac, MD: Lawrence Erlbaum Associates; 1974.
4 Hearnshaw L. *Cyril Burt; Psychologist*. Ithaca, NY: Cornell University Press; 1979.
5 Cyril Burt. Available from: URL: http://en.wikipedia.org/wiki/Cyril_Burt
6 Gillie O. Crucial data faked by eminent psychological. *Sunday Times (London)*. October 24, 1976; 1 – 2.
7 Go*uld SJ. The Mismeasure of Man*. New York: Norton; 1981.
8 Lewontin RC. The inferiority complex. *New York Rev Books*. 1981. Available from: URL: https://www.nybooks.com/articles/article-preview?article_id=6867
9 Kaplan J, Sulloway FJ. How to inherit IQ: an exchange. *New York Rev Books*. 2007. Available form: URL: http://www.nybooks.com/articles/19985
10 Hernstein R, Murray J. *The Bell Curve; Intelligence and Class Structure in American Life*. New York: Free Press; 1994.
11 Wakefield AJ, Murch SH, Anthony A, Linnell J, Casson DM, Malik M, et al. Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *Lancet*. 1998; **351:** 637 – 641.
12 Rubin R. Science takes hard look inward. *USA Today*. January 10, 2006. Available from: URL: http://www.usatoday.com/tech/science/ethics/2006-01-10-journal-fraud_x.htm
13 Crace J. Peer trouble. How failsafe is our current system at ensuring the quality and integrity of research? *The Guardian, London*. February 11, 2003. Available from: URL: http://www.guardian.co.uk/education/2003/feb/11/highereducation.research
14 The Editor. Dr. Hwang dropped from scientific American 50 for faking. *Research Scientific American*. December 15, 2005. Available from: URL: http://www.sciam.com/article.cfm?id=dr-hwang-dropped-from-sci
15 Editorial, Scientific American, March 2006.
16 Smith J, Godlee F. Investigating allegations of scientific misconduct. *BMJ*. 2005; **331:** 245 – 246.
17 Young C, Godlee F. Managing suspected research misconduct. *BMJ*. 2007; **334:** 378 – 379.
18 Passioura J. The drought environment; Physical, biological, and agricultural perspectives. *J Exp Bot*. 2007; **58:** 113 – 117.
19 Dadashi MR. The drought environment; Physical, biological ,and agricultural perspectives. *Research Journal of Agronomy*. 2008; **2(1):** 18 – 22.
20 Dadashi MR, Ahmadzade AR. The drought environment; Physical, biological ,and agricultural perspectives. *Research Journal of Biological Sciences*. 2008; **3(5):** 504 – 508.
21 Butler D. Entire-paper plagiarism caught by software. *Nature*. 2008; **455:** 715.
22 Butler D. Iranian paper sparks sense of déjà vu. *Nature*. 2008; **455:** 1019.
23 Angell M. The truth about the drug companies. *The New York Review of Books*. 2004, July 15; 52. Available from: URL: http://www.nybooks.com/articles/17244
24 Melander H, Ahlqvist-Rastad J, Meijer G, Beermann B. Evidence b(i)ased medicine---selective reporting from studies sponsored by pharmaceutical industry: review of studies in new drug applications. *BMJ*. 2003; **326:** 1171 – 1173.
25 Turner EH, Matthews AM, Linardatos E, Tell RA, Rosenthal R. Selective Publication of Antidepressant Trials and Its Influence on Apparent Efficacy. *N Engl J Med*. 2008; **358:** 252 – 260.
26 Ross JS, Hill KP, Egilman DS, Krumholz HM. Guest authorship and ghostwriting in publications related to rofecoxib: a case study of industry documents from rofecoxib litigation. *JAMA*. 2008; **299:** 1800 – 1820.
27 McKibben B. Crossing the red line. *New York Rev Books*. 2004. Available from: URL: http://www.nybooks.com/articles/17179
28 Wald ML. Is Ethanol for the Long Haul? *Scientific American*. January 2007; 28 – 35.