God, how embarrassing...

... How well do you recall that mortifying moment when the teacher realised you had copied your friend's chemistry homework? Or, even more embarrassing, the moment you got caught cheating in your maths test by "borrowing" your neighbour's results. The grade was down the drain, you blushed deep red within a second and your classmates sneered at you maliciously for days.

Despite the likelihood of being caught, cheating is apparently a growing problem in schools today. A 2001 US survey of 5,000 high school students, for instance, concluded that "by the time students hit middle and high school, cheating is, for many, like gym class and lunch period, just part of the fabric of how things are." The survey stated that 74 percent admitted they had cheated at least once on a big test; 72 percent reported serious cheating on written work by plagiarizing from the Net, or from books and magazines; 97 percent reported at least one questionable activity, like copying someone else's homework or peeking at someone else's test. More than one-third admitted to repetitive, serious cheating.

Surprisingly, few appeared to feel ashamed. "You do what it takes to succeed in life," wrote one student. "Cheating is part of high school," claimed another and they often get away with it because recent technology has made cheating even easier.

Does anybody wonder why the problem is also a growing one in science? Of course, there have always been loose reports of plagiarism (incidentally, a derivative of the Latin word for kidnapping) in scientific research. Meanwhile, the frequency at which new plagiarism cases are detected is also rapidly increasing.

Take, for example, the paper "Mitochondria, the missing link between body and soul: Proteomic prospective evidence", written by Mohamad Warda from Cairo University of Giza in Egypt and Jin Han from the Inje University of Busan in Korea. As soon as Proteomics published the peer-reviewed (!) piece online as "Epub ahead of print" it immediately sparked an extensive web discussion in several science blogs and forums (catalysed, of course, by the odd title). It took the community only a few days to reveal that the presumed review article not only contained some very doubtful content but also extensive passages lifted from others (for more details see *Lab Times online* at *www.labtimes.eu*).

An even greater and more blatant case of plagiarism emerged only last month in analytical chemistry. Pattium Chiranjeevi, chemistry professor at Sri Venkateswara University in Tirupati, India, was found guilty of plagiarizing and falsifying more than 70 research papers, which had been peer-reviewed and published by five different Elsevier journals between 2004 and 2007. Gary D. Christian, who is editor-in-chief of *Talanta*, one of the journals concerned, was quoted as saying that Chiranjeevi's tactic was to flood journals with manuscript submissions in the hope of wearing down editors, who would eventually publish some of his work. "He published 70-plus papers in 25 journals over three years," said Christian, "The case is unprecedented."

Although this extreme case casts a damning light on the rigidity of peer review, it also demonstrates how the use of new technology makes the discovery of such "plagiators" increasingly easier. It was mainly due to the application of a new Web-based tool called eTBlast that the investigators were able to detect and undisputedly prove the infamous actions of Mr. Chiranjeevi.

This free service, developed by Mounir Errami and Harold Garner at the University of Texas Southwestern Medical School, performs a similarity search for text that someone inputs with papers in Medline or other online databases. Applying eTBlast to 7 million Medline abstracts, Garner and Errami obtained 70,000 hits on potential duplicates (*Nature*, 2008, vol. 451, p. 397). Relating to their experience to date, the authors estimate that about 50,000 of these will turn out to be true duplicates.

Meanwhile, Garner and Errami have also developed a free duplicate submission database called "Déjà vu" (*http://discovery.swmed.edu/dejavu/*). Of course, the 70,000 suspected duplicates from the initial study are already listed, each together with the presumed "master copy" for comparison. One preliminary result: the lion's share of suspected articles comes from clinical medicine.

Thus, new technology apparently makes life a lot harder for "copy-pasters" to get through undetected. Not to mention that, in parallel, awareness in the science community has also been considerably raised.

Nevertheless, you can be sure that in this technological arms race the "other side" is already acquiring their next tool. Philip M. Parker, a professor of management science at a French business school, has just invented and patented a "method and apparatus for automated authoring and marketing". The "apparatus" is essentially another software tool that, when fed with a specific subject, selects data from the Internet and writes and formats it into book form. That way, the machine is able to produce one complete book every 20 minutes. Imagine this machine in the hands of scientific cheaters...

On the other hand, this scenario doesn't come without a grain of irony: In the days of automated high-throughput biology, it goes without saying that one day soon, automated high-throughput authorship might well become inevitable.

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