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Scientists (of the World) Behave!

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"Why don't you publish our scientific results?" was the complaint a young scientist recently addressed to her two former scientific advisors in the presence of the German Research Ombudsman.[**] The young scientist needed our support to settle the dispute. The data were sound and could be published in a journal with a lower impact factor, however the supervisors only wanted to publish excellent results in journals with high impact factors (a tool for monitoring journals: E. Garfield, *Science* **1972**, *178*, 471–479). However, the consequence of their behavior meant slowing down the career of the younger researcher who needed publications to achieve the next step on the career ladder. A deliberate slowing down of other people's progress is a form of scientific misbehavior and furthermore, there is in fact a requirement to publish the results of publicly funded research.

Similar conflicts like that described involve authorship problems. These involve the order of the author list, who should be corresponding author, who has been left out of the author list, or who has the right to publish the data. Often younger scientists who have left their institution before their data could be published file complaints of this nature. Such problems belong to our daily ombudsman work. They are related to an increasing role of publication metrics as tool to evaluate researchers. More severe conflicts we deal with involve forms of scientific misconduct such as the invention of results, falsifications, the picking out of only the desired results, theft of the ideas of others, plagiarism, or deliberate destruction of data.

Angewandte Chemie expects more than 10000 communications this year, which is not only related to the fact that the journal is open to a broader field and has a more interdisciplinary character, but also that the high impact factor of the journal encourages scientists to try to publish as many articles as possible there. Scientists are more and more preoccupied with improving their *h*-index (publication-based impact of a single person's output: J. E. Hirsch, *Proc. Natl. Acad. Science USA* **2005**, *102*, 16569–16572), as highly cited publications may help to increase their research budget or even their own salary, and also to boost their careers.

Honor Authorships

With the steep increase of competition for publications in journals with high impact factors, a worrying trend is noticed. At the end of the 1970s, the typical number of authors was two to three, probably the PhD student who did the work, his advisor, and maybe a further postdoc. Since then the number of authors in a paper in *Angewandte Chemie* has linearly increased with the growing impact factor of the journal (often five authors and more, sometimes even more than ten). A coincidence? This trend may in some part be related to the larger research teams necessary for interdisciplinary work, or the requirement of more complex research settings for high-tech experiments. However, there is also the suspicion that we have to deal with the scientific misbehavior of honor authorships in some cases.

The reasons for this may be manifold. Young scientists may feel obliged to put the name of the esteemed leader of the research institution onto the list of authors either as a matter of respect or simply because the big name of the director may shine light onto oneself, or because they fear disadvantages. Journals have reacted to this situation that famous people involuntarily became authors without knowing by asking for the agreement of every single author. However, the tolerated honor authorship cannot be excluded in this way. The leaders of an institution may even insist to see their and/or their favorites' names on author lists in order to improve their number of top-class publications.

Whatever their motivation is, these authors have violated Paragraphs 1 and 6 of the "Singapore Statement of Research Integrity" developed as part of the 2nd World Conference on Research Integrity in Singapore in July 2010, as a global guide for the responsible conduct of research. These paragraphs read (I cite):
Integrity: Researchers should take responsibility for the trustworthiness of their research.
Authorship: Researchers should take responsibility for their contributions to

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[**] The German Research Ombudsman is an institution of three independent scientists and was inaugurated by the German Science Foundation upon the recommendations of an international committee of the German Research Council in 1997 as a consequence of an investigation into a spectacular case of scientific fraud in Germany.

all publications, funding applications, reports, and other representations of their research. Lists of authors should include all those and only those who meet applicable authorship criteria.

Plagiarism

Plagiarists are often to be found amongst freshmen students when they have to write their first reports. University teachers should make it clear right from the beginning that this is a case of severe scientific misconduct and intellectual theft by uncreative people. In Germany there was a strong discussion in the media when four famous politicians including, our Minister for Research, had their doctorates revoked because parts of their theses were found to be plagiarized. It is not rare that scientists find passages of their own papers in other people's publications, sometimes even in a wrong context, without being cited. Even worse is when reviewers steal ideas from other publications or proposals under review and deliberately suppress their competitors with negative reviews.

Fraud

The ever-increasing pressure in science will also foster the worst cases of scientific misconduct: fraud. This is not a new problem: A spectacular case in the 1970s with a lot of media attention was the case of William Summerlin who declared to have succeeded in transplanting a piece of fur of a black mouse to a genetically unrelated white mouse. It was discovered that he had simply used a black marker pen to dye the fur. He attributed his misconduct to the fact that he was under extreme pressure to produce surprising results. As the social psychologists Stroebe, Postmes, and Spears have shown in an analysis of 40 of the most spectacular international cases of fraud, seven of the scientists were young researchers with the reputation as the up-and-coming superstars of tomorrow who were thus particularly prone to try to succeed by all means (W. Stroebe, T. Postmes, R. Spears, *Perspectives on Psychological Science*, **2012**, *7*, 670–688). They cite a number of investigations claiming that the number of fabricated papers may even be around 1–2% of all published articles. The reason of the failure of the peer reviewers and even the co-authors to spot fraud may be attributed to the fact that the referees normally only see the article itself and that they are not thinking the unthinkable—that the data may be manipulated.

What Can We Do?

What can we do to deflate the increasing pressure? There are numerous pleas by well-known scientists to give up the the evaluation of individual scientists by bibliometric data as some damage can already be noticed in fields like the life sciences. In the UK, where regular evaluations are part of budget allocations, universities started to prioritize laboratory-based life science, the results of which can be published in the journals with highest impact factors. This did substantial damage to clinical research (H. Brown, *British Medical Journal*, **2007**, *334*, 561–564), and is something we certainly do not want! It is alarming how rapidly the *h*-index conquered our scientific life—in less than 10 years. According to a number of investigations, the need of finding a simple formula to ease scientometric evaluations is an important function in public policy and management. As a reaction to this trend, a group of editors and publishers of scholarly journals have most recently developed a set of recommendations during the Annual Meeting of The American Society for Cell Biology (ASCB) in San Francisco in December 2012: the "San Francisco Declaration on Research Assessment". They pointed out that "the outputs from scientific research are many and varied, including: research articles reporting new knowledge, data, reagents, and software; intellectual property; and highly trained young scientists". Over three pages they give very detailed recommendations about how to better evaluate our scientific system. An alternative, fairer measuring system may also help to decrease the cases of scientific misconduct. The most desirable way, however, is to put pressure on politicians to better balance the finances of universities and research institutions, although this is difficult to realize in view of the continuing worldwide financial crisis. This formula is the simplest to minimize the temptations for fraud and put back the joy of creativity to research.

Good scientific practice is more than the moral of a majority within a group of people, it is the sound and fundamental ethics of a scientific community acting worldwide. We need to be able to trust and rely on each other as a matter of care and responsibility towards our society. My further personal plea is that we have to give our students an awareness of good scientific practice and help them to find self-confidence. Young scientists may think that they have to meet the expectations of their mentors by achieving certain results. They should learn about honesty and responsibility in all aspects of research, professional commitment, and fairness in the interaction with others and their work. This should be the basis of research for all of us.