

Ghost-statistics, raw data and the meaning of authorship. Are we learning any lessons from scandals in pharmaceutical research?

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**From ghoulies and ghosties
And long-leggety beasties
And things that go bump in the night,
Good Lord, deliver us!**

Traditional Scottish Prayer

There is a pressing need to discuss the integrity of the scientific literature involving pharmaceuticals. Doctors and patients rely on that literature to make rational and safe therapeutic decisions. Many incidents over the past few years have raised doubts about the honesty of the pharmaceutical scientific literature. Concerns have also been expressed that those charged with regulating integrity in this area of medicine do not act in a transparent manner, and have routinely attempted to obscure matters raised.

In March 2006 I resigned from my position as Senior Lecturer in Metabolic Bone Medicine at Sheffield University. This paper addresses some of the lessons flowing from the Sheffield incident (press reports at 1, also discussed at 2), and the broader structural problems.

Products sold under the banner of science

In May 2006, Prince Charles addressed the World Health Assembly in Geneva to argue that homeopathy should be offered as part of “integrated healthcare”. Anticipating his speech, “scientific” medicine struck back with an open letter (3) expressing concern about the use of “unproven or disproved” treatments, and the need to reserve NHS funds for “treatments that are based on solid evidence”. This created somewhat of a puffer-fish effect, pitting over-inflated “solid-evidence” against untested mythology. The

argument for science would have been enhanced by at least some mention of the considerable harm that has resulted from well documented instances of misrepresentation which has tainted that “solid evidence”.

The term pseudoevidence-based medicine (PBM) has been used to define medicine based on falsehoods that is disseminated as true evidence (4), and then adopted by unwitting and well-intentioned practitioners of evidence-based medicine (EBM).

Pharmaceutical companies sell products under the banner of science. The right to use that banner relates to the use of the scientific method and acceptance of the usual safeguards of science. If industry gets involved in science, it has to balance genuine hypothesis testing and transparency against commercial interests, bureaucracy of drug regulation, and the financial consequences of dishonesty. Subtle compromises (10) have allowed the industry to develop an extraordinary stranglehold over the scientific process, academic discourse, regulatory safeguards and common sense (5-9). These subtle compromises have already had calamitous consequences for patients and for public trust in science.

Integrity under the spotlight

The integrity of pharmaceutical science has been under a spotlight (5-18). This has followed a plethora of worrying instances involving attempts by industry to control academic discourse, to suppress adverse findings, and to avoid proper scrutiny of reported findings. Many reported problems have occurred at the interface between academic institutions and industry. Corporate “sponsors” have been able to influence what research is carried out. When deleterious side-effects are predictable, they have been able to design studies which are less likely to reveal problems. Sponsors with substantial vested interests have granted themselves sole control over data codes and the study database. They may control how studies are written up, and which findings are hidden.

The implications are profound. For example in the case of the painkiller Vioxx it has been estimated that at least 50,000 people died as safeguards failed repeatedly and as risks were obscured from doctors, authoring academics, patients and regulators

(17,18). The obscuring of evidence about suicide in antidepressant drug trials and the suppression of whole studies with undesired findings (14) is something that should have induced deep shame in my profession. In one instance authors of industry sponsored trials of antidepressants in children were denied access to unpublished suicide data from their own studies (19). In these examples the drug regulators (the FDA in the USA and the MHRA in the UK) were held responsible for supporting bad science and for helping to obscure the evidence of harm when it became apparent that they had been misled (14,17,18).

Following these worrying revelations, there have been calls from many quarters, such as the British Medical Journal, to suggest that pharmaceutical companies must be divorced from any direct involvement in researching clinical aspects of their own drugs (11,15).

Authorship, ghosting and the problem of data

"the integrity of a body of literature is itself our society's ultimate temporal forum for negotiating life and death, suffering and wellness... the medical well-being of the society it serves is dependent on the question of who stands behind the word"

Fr Mark Gruber, 1999 (cited in ref 20)

The pharmaceutical industry is accused of overturning the usual safeguards of science. The most fundamental of these safeguards is the accountability of authors (20). Readers of legitimate science expect that stated authors are truly the authors, that they vouch for the work and that they would be able to defend their findings if challenged.

Readers of scientific papers expect that authors have seen and scrutinized raw data, and would be able to provide that data if asked. That it is necessary to write this indicates how much we have lost. Industry has been inclined to use universities to give tainted science a veneer of respectability, while denying the very basis of that respectability.

It is becoming increasingly apparent that many critical scientific papers have not been written by the named authors of those

papers. “Ghost-writing” has been repeatedly criticized. However professional "medical writers" may sometimes have a legitimate role if clearly acknowledged. By emphasizing the “writing” aspect we divert attention from the far more important problem – that of “ghost-science” of which “ghost-writing” is only a part.

The ghosting of statistical analysis forms a substantial part of the problem, is far more important than ghost-writing, but has received little attention. This is where a company statistician, not always a named author conducts a statistical analysis, but where other named authors are disabled from repeating or verifying any aspect of that analysis or the underlying data. Authors simply have to accept what they are told with blind faith. This is not a part of legitimate science.

It is sometimes stated that industry “owns” the data and conclusions underlying research because they have funded it. It is even stated that this “ownership” means that industry has the right to misrepresent findings to suppress findings deemed to be undesirable, or to hide data from authors. Such arguments are untenable if companies wish to sell their products as “science”, or if they wish to engage in public scientific discourse.

The usual definitions of scientific misconduct do not apply to pharmaceutical research. In February 2006 Gerald Schatten was accused of research misconduct (21). His crime was to have co-authored a stem-cell publication with the discredited Dr. Hwang Woo Suk while shirking the “responsibilities of verifying the data”. Schatten might have been irked to discover that at the same time, Procter and Gamble Pharmaceuticals (P&G) were responding to criticism of their actions in Sheffield, and declared to the media that it was “standard industry practice” (1) to deny authors of publications access to raw data about which they were “writing”.

International standards were adopted by many scientific journal editors following embarrassing disclosures. ICJME standards (22) reassert the obvious - that authors should state in writing that they have full control of all primary data, controlled the decision to publish, and will supply raw data upon request. The World Association of Medical Editors (WAME) in its guidelines (22) states that “Authors should state in writing that they have had full control

of all primary data,” and “agree in writing to allow the journal to review their data upon request.

Semantic arguments about the meaning of “data” and the meaning of “access to data” are not helpful. The pharmaceutical industry has through its trade lobby group PhRMA attempted to redefine the meaning of the English language. It is implied in these guidelines that the fact that an author has seen company tabulations, company statistical outputs and company interpretations somehow means that the author has had access to data (19). This type of gobbledygook ignores the obligations of an author, ignores all international guidelines and turns journals declarations on their head. It implies an expectation that authors would lie in their declarations to journals. It means that an author who has access to the same information as a reader of his publication would be deemed as having had access to data. This is not science as generally defined.

In the case of the Sheffield affair, authors were refused access to randomization codes, event codes, and details relating to some confounding variables. This made it impossible to interpret data we ourselves had generated. Access to data by an author means that you have those codes. It’s as simple as that. Access does not mean that someone else has told you as author what those codes might mean. It’s like being offered a hamburger when what you need is the original cow.

Access to data means whatever an author deems it to mean. It means that an author can seek by whatever means to confirm that information presented in his name as author is not misrepresented. It means that the author is able to repeat the entire statistical analysis from scratch. It means that the author can construct whatever exploratory plots of the data he deems necessary to ensure that the assumptions of statistical tests are not violated, and that there are no unexpected influential outliers, that data are plotted correctly, and that statistical analyses have been performed as stated. It means that the author should be able to ask questions if the reported findings are discordant with common-sense visual inspection of plotted data. It means that the author should feel free (and indeed obligated) to explore the origin of individual items of data that appear to be discrepant. It might mean asking why suicidal ideation in an individual patient in an antidepressant drug

trial was recoded as “nausea”, or why a particular item of data is “missing”.

The right to ask questions applies to any author. Any author who feels that he or she has no right to question the origin of findings to which they ascribe their name has no right to be an author. Clearly if questions are asked about a scientific publication, all authors bear responsibility, although some might bear more responsibility than others. Sometimes this responsibility is for the death or mistreatment of other humans. All authors of published scientific work have the obligation to understand fully that publication within the limits of their expertise, to agree with its contents, to review the paper fully, to understand the hypothesis methodology and data analysis, to participate in that analysis, and to ensure that they would have the opportunity to replicate that analysis and produce the raw and original data if so asked.

Clinical medical researchers have the same obligations in that role as doctors in general - "to attempt to cure disease, to relieve suffering and to do no harm". When conditions imposed prevent physicians from fulfilling these duties the research is unethical. Reporting misconduct is also an obligation and is part of the clinical responsibility of doctors doing research. Physicians have an obligation to publish research, even if the findings differ from those desired by the sponsor.

‘This is indeed a mystery’, I remarked.

‘What do you imagine that it means?’

‘I have no data yet. It is a capital mistake to theorize before one has data.

‘Insensibly one begins to twist facts to suit theories, instead of theories to suit facts’.

From ‘A Scandal in Bohemia’ in: The Adventures of Sherlock Holmes, 1892

Sir Arthur Conan Doyle

Lessons from Sheffield

The problem

In 2002 I signed a research agreement with P&G in collaboration with another academic, Professor Richard Eastell. The consequences of my disagreement with the company and with my collaborator have been widely discussed in the media. (1,23) and some original documents and tape recordings have been disclosed on a blog (2).

There has been much discussion about appropriate contracting (19) between universities and industry in medicine, particularly following the Olivieri scandal (6,8). Industry cannot buy the right to results they want or the right to suppress undesired findings about a drug intended for human use. The contract we signed in Sheffield was however entirely appropriate. It specified that authors would interpret the data, produce a report, and publish that report without interference from the company.

Four years later, in February 2006 *The Journal of Bone and Mineral Research* (JBMR, 24) placed an undated "Statement of Concern" on its website. The statement relates to one of three intended P&G publications (25) about change in bone turnover and fractures in patients taking the osteoporosis drug Actonel. The other two publications (one based on an extended set of the same data and another based on new data) have only been published in abstract form because I declined, as first author to sign journal declarations while being refused access by the company to randomization and event codes (1,23,2).

The research involved an important secondary endpoint in the key randomized trials used to gain regulatory approval for Actonel (annual sales ~\$1 billion). P&G repeatedly refused to provide data

codes to academic “collaborators”. This breached the terms of its contract with the University. Data were required by the academics to verify scientific reports, statistical analyses, meeting abstracts, and draft publications “ghost written” in their names. Over time, increasing information and some data emerged to suggest that the analysis and data presentation had been incorrect and misleading, but underlying data were still not disclosed.

The first of the three intended publications was submitted by my collaborator to the *Lancet* in 2002 and upon rejection was published in *JBMR* in 2003 (25). The *Lancet* prescribes that an author must “state that he or she had full access to all the data in the study”, and “at any time up to 5 years after publication authors may be asked to provide the raw data”. *JBMR* has similar guidelines. Academics at Sheffield would not have been able to provide data if asked (and were indeed not able to) - because they never had them. Despite the fact that P&G were repeatedly refusing to supply raw data to authors at the time this paper was submitted, authors signed a false declaration to the effect that “all authors had full access to the data and analyses” and this was repeated in the published manuscript.

The defense

Various statements made by P&G officials in their defense are illuminating (1,23,2). They claimed that “*we don't need to ask an independent person to analyse the data just to make a few people happy*” (the independent person being the intended first author). They claimed that by supplying authors with data “*industry loses the opportunity to demonstrate its ability to be a true partner in scientific endeavours*” (1). They suggested (2) that refusal to supply data to authors was in accordance with “PhRMA guidelines” (PhRMA is the main US lobby group that represents pharmaceutical manufacturers). They defended their actions in the press (1) by saying that it is “*standard industry practice*” to limit authors access to data, and that “*occasionally the researcher is given temporary and limited access to data to perform the analyses directly*”. In “legal” correspondence P&G attempted to redefine the meaning of “access to data” suggesting that showing an author company outputs or statistical interpretations somehow constitutes access to data. When some data was acquired by one author

through an accident in 2005, P&G issued legal threats to Sheffield University that the data had to be returned.

In response to media scrutiny P&G produced a new “Bill of Rights” governing its relationships with academics in February 2006 (1). The bill stated that *“research authors will define and control the content and direction of any publication resulting from their work”* and will have *“final authority”* over all publication content. It stated that, although P&G would retain ownership of data researchers will *“own the analysis and conclusions”* and will be *“in no way restricted”* from publishing their findings. It says that researchers will have *“full access to all relevant data to confirm the accuracy of statements and conclusions”*. Despite this Bill of Rights, when some data was acquired by one author through an accident in 2005 P&G issued legal threats to Sheffield University that the information belonged to them, was obtained without their consent, and that all copies had to be returned to them (Sheffield University response to FOI, October 2006 and communication with the BMA).

The data revealed

In March 2006 I resigned from my academic position at Sheffield University. In April 2006, after a three-year delay, P&G supplied me and Eastell with the data codes underlying the three intended publications. These data, as well as many documents and dozens of tape recordings confirm that the conclusions of the three publications were not in accordance with the data. Discrepancies were obvious. For example, in all three manuscripts, the x-axis of a critical graph was scaled so that about 40% of the data would not have appeared within the scale of the graph. Smoothing curves appeared to have been drawn through truncated data using fortuitously chosen smoothing parameters, yielding curves which did not provide a good fit to the underlying data (some discussion at 26 based on incomplete data). A key conclusion of all three papers was that there was plateau at a commercially convenient point in the response relationship for the drug -- a matter of practical clinical relevance (23 explains how this would have benefited P&G). The data provided no credible evidence to support this conclusion in any of the three publications (1,26, 27). When the first of several corrected meeting abstracts was submitted based on the supplied data (Blumsohn and Hutton, 2007) P&G officials attempted to arrange for the conference organizers to alter

the abstract without permission of the authors (abstract and incident at 27). P&G have also declined to allow the authors to reveal the raw data in the public domain despite a request by the authors to permit this.

A telling “investigation” by the drug regulator (the MHRA)

The Sheffield dispute was discussed in the UK parliament in December 2005 and was transmitted by the Health Minister to the UK drugs regulator (the Medicine and Healthcare Products Regulatory Agency, MHRA) for “investigation.” The MHRA is itself accused of failing to examine or to secure raw data in drug licensing applications, simply accepting the word of industry with blind faith (14,9). Since this was precisely the problem in Sheffield, its disinclination to investigate was hardly surprising.

No investigation (or at least anything fitting that definition) took place. The MHRA have failed to produce any report, and declined to accept any documentary evidence (1, MHRA response to FOI request #06/115). They stated that the matter was of “low priority” (1), and that the agency does not have any procedure for investigating research misconduct (MHRA response to FOI #06/188). Astonishingly, it claimed that the drug regulator has no remit, nor any necessary obligation to be interested in the integrity of the scientific literature about drugs (1, MHRA FOI #06/188) unless related to licensing (and collected using documentation appropriate for licensing). It even agreed with the company view that it is “illegal” for a scientist to have data pertaining to information written in his name without the consent of the company “owning” that data (1, MHRA FOI #06/115).

Most importantly, the MHRA refused to compare data it was sent from Sheffield with the original data it should have received and examined as part of the licensing process for Actonel. Initially, this refusal was on the basis that it would be “too much work” (MHRA FOI #06/059). Later, it admitted that that it had not in fact seen or retained raw data or electronic data files prior to approving the drug for human use (MHRA FOI #05/404). With governments setting the standard for scientific conduct, it is hardly surprising that independent science has encountered such difficulties.

The problem of academics who don't acquiesce, whistleblowing, and the failure of watchdogs

Some important cases

There have been many cases where academics have refused to acquiesce. A dispute arose between James Kahn of UC San Francisco and Immune Response Corp. over effectiveness of an AIDS vaccine in a multi-center trial. The company objected to publication of the analysis of data (which was incomplete since the company refused to supply the rest to the researchers). When UCSF researchers refused to interpret the data more favourably, the company threatened legal action. The study was published with incomplete data (28). The company maintained that because it paid for the trial, it somehow owned the data and therefore the mode of presentation.

Many other cases happen beneath the radar. A recent example involves the drug Famciclovir used to treat herpes. A 1997 study comparing Famciclovir with its main competitor was funded by the manufacturer (then Smithkline Beecham). Study findings were not beneficial to the sponsor. They were published only a few months ago after a nine year delay, with a disclaimer that the authors were denied raw data and were forced to accept the company's own partial summary of findings (29). Scientists may disagree about the presentation of data. There can however be no legitimate debate when that data are not available for scrutiny even to the authors. Should we prescribe a drug knowing about such "missing" data? What of the patients who volunteered to take part in these studies?

Other disputes have related not so much to access to data but the right of authors to publish or speak about what they believe to be true. These include the celebrated cases of Nancy Olivieri (6,8), Betty Dong (30), David Healy (6), David Kern (6,31) and many others. These instances should be discussed and analyzed so they are not repeated.

Unfortunately universities are inclined to brush problems of pharmaceutical integrity under the carpet and even collude with misleading research in an attempt to maintain decorum and funding. Although not involving pharmaceuticals directly, a

noteworthy incident involving Christopher Gillberg (34) underlies the attitude of universities and scientific journals towards the critical importance of raw data. Gillberg was Professor of child psychiatry at Gothenburg University, in Sweden, and is currently visiting Professor of psychiatry at the University of Strathclyde. In 2002 he was accused of research misconduct in critical research involving a psychiatric concept known as “DAMP”. Following an almost farcical series of events, raw data was destroyed by Gillberg’s colleagues before it could be subject to proper scrutiny by other scientists (for a detailed discussion, original documents and references relating to this incident see 34). The approach of Gothenburg University was subject to extensive criticism (as detailed in 34). Despite the destruction of data, the relevant publications have not yet been retracted. Such a situation is untenable. Gillberg retains his association with Strathclyde University.

Ghost drug regulation

Much discussion and internet traffic have been devoted to the behaviour and attitude of the MHRA, the UK government drug regulatory agency (10,11). Many have accused it of colluding with or ignoring industrial scientific misconduct, and of severe conflicts of interest. In 2005, an extensive report of the House of Commons Health Select Committee raised many concerns about the MHRA. The report pointed out that the agency fails to properly scrutinise data before licensing drugs (showing the same reckless disregard for patients as do academics who front company interpretations of data in the journals). It pointed out that the MHRA is 100% funded by the companies it supposedly regulates. It pointed out that user reports of often serious problems had been systematically discounted or ignored. It recommended a fundamental review of the agency. No such review has taken place.

What the Select Committee appear to have missed is that this is incompetence by design. Some clues as to the reluctance of government to act can be found in a recent article by Evans and Boseley in the Guardian (33).

"Documents obtained by the Guardian under Freedom of Information legislation reveal that": The world's biggest drug company, Pfizer, warned ministers that it could take its business elsewhere. "Pfizer ... noted that there is complacency in some quarters of Whitehall regarding their continued investment in the UK," the minutes of the meeting record." Bristol-Myers-Squibb director of external affairs stated "companies want to invest in countries with a 'favourable environment.'"

The full Parliamentary Health Select Committee of report of 2005 (9) is mandatory reading. Below are some citations from the report pertaining to the inclination of the regulator to ignore actual data (9):

Page 31: The MHRA relies on company data, presented as a series of detailed assessment reports, in its decision whether or not to licence a drug. Raw data is very rarely analysed.

Page 49: The consent forms do not inform patients that the raw data may be maintained by the industry, not made available to the general public or even reviewed by the regulatory authorities.

Page 79: The MHRA Chairman suggested that trust underpinned the stance of the MHRA towards the companies they regulate. We inferred that this extended to the routine acceptance of companies' summaries of the results of tests on their drugs as true reflections of the raw data on which they were based.

Page 79: The evidence indicated that the MHRA examined primary (raw) data on drug effects only if it suspected some misrepresentation in the summary data supplied. It was argued that such trust in regulated companies goes too far This is particularly indefensible in the light of evidence that regulatory agencies, supposedly established to protect the public, are acquiescing in biased later publication of the information they hold.

Page 96: A statement to the effect that heart problems were associated with Celebrex was issued by the MHRA in December 2004. In the statement, the Agency made it clear that it had not seen the actual data from the drug company but that its advice was based on information from Pfizer's website.

Page 103: The MHRA does not routinely examine raw data submitted with the licence application but is dependent on summaries provided by the applicant. The Expert Working Group on SSRI's report of December 2004 showed that summaries of information may not provide the detail required to assess drug risks adequately.

The UK panel for research integrity – In whose interest?

To the naïve, it might make sense that a national "Research Integrity Panel" should be established. University science is conducted in the public interest, and existing integrity bodies such as the MHRA and the General Medical Council have become increasingly implausible. Such a panel might ensure that attempts to distort the scientific record are properly investigated, exposed and corrected, and that institutions adhere to their own rules in terms of research integrity.

Most other developed countries have bodies which (at least to some extent) profess to do exactly that. Plans for a "UK Panel for Health and Biomedical Research Integrity" – (UK-PRI) have been in gestation for a decade or more. The "fathers" of that panel, Professor Sir Ian Kennedy and Professor Michael Farthing understood very well why such a panel was needed. Both are individuals of great integrity and wisdom. They understand the nature of the problem, the implausibility of internal university investigation, the attempts at obfuscation, and the very difficulties experienced by those who have attempt to state the truth in the face of considerable power. They have both written about these problems extensively.

In 1998 Professor Sir Ian Kennedy wrote (Cope Report 1998, ref 35):

"There has increasingly been the stated perception that the public interest means not staying quiet in the face of wrongdoing.....The witness fears that if s/he risks speaking out s/he will lose his/her job, promotion, or prospects of ever working again in the field. And it does not seem to matter to whom the witness chooses to speak--whether it is to the researcher whose work is in question, or to the line manager, or to the head of the institution. Abundant anecdotal evidence suggests that this fear is not misplaced". "it is suggested that they report their concerns to the "responsible authority." But herein lies a major problem. Currently, there is no institution which can fill the role of the "responsible authority"..... "Clearly, any whistleblowers protocol will be stillborn unless an appropriate "responsible (investigative) authority" is created at the same time. In the USA, this role at the Federal level is fulfilled by the Office of Research Integrity. The Danish Committee on Scientific Dishonesty was created precisely to serve as the agency to which complaints of research misconduct could be referred. ...It investigates allegations of misconduct at arms' length from the editor, the researcher, and the organisation in which the researcher works. A similar body is urgently needed in the UK. Its creation would give both the whistleblower and the editor an independent arbiter to which they could turn. As a public body, its primary remit would be to act in the public interest."

That was an excellent summary of the problem and the required solution. As the new body continued gestating, these principles were forgotten. After a further five years of gestation, it was finally announced (36) in March 2005 that the birth would take place in October 2005. October came and went. In April 2006 UK-PRI emerged. The headlines screamed "Panel to expose fraudulent medical research", "Watchdog eyes scientific fraud", "New panel calls on researchers to blow whistle and stamp out complacency over cheating" (37).

But what was born was not quite what was expected. UK-PRI is hosted by Universities UK, the body that promotes the interests of

UK Universities. The body immediately faced criticism. Peter Wilmshurst, a consultant cardiologist who has exposed a number of research fraud cases, said "Your stakeholders have a stake in keeping research fraud under cover" (36) and "My concern is that this is set up under the auspices of UUK. If you look at the record of the universities, they have consistently concealed research fraud and protected the crooks." (37) The body has reportedly received some funding from the pharmaceutical industry - a critical mistake.

I am disappointed that we have moved so far from Sir Ian's vision and his clear understanding of where the problems lie. In March 2005 the University of Sheffield declined to allow UK-PRI to get involved with the problem in Sheffield, stating that UK-PRI was not an investigatory body, but that the MHRA (the UK drug regulator) would investigate. This was despite the fact that the MHRA had already stated they have no remit to investigate scientific misconduct in research involving licensed drugs. This is the way problems and those raising them get bounced from implausible pillar to implausible post.

It is not clear whether UK-PRI will be yet another such pillar or post but initial indications are that it will. UK-PRI now states that its major role is to "develop a programme of training" and "guidelines" and to "develop a robust national procedure". The body has no investigatory powers nor teeth of any description. What we now have is potentially worse than nothing at all. UK-PRI may assist to provide an impression that "all is well" and that those wishing to raise concerns really have somewhere to turn. That will cause others to offer even less support than they already do, and will surely cause further harm. I wondered whether they spoke to even a single person who had tried to raise concerns during their long gestation? There are already many perfectly good "procedures" and "Codes of Good Conduct" and other such cozy documents. These documents may not be perfect, but that is not where the problem lies. What we need is courage and some guts.

Having met with UK-PRI, I must report with some sadness that those raising concerns should not yet be encouraged that it is any easier to do so since April 2006.

The problem of journals

The problems of medicine could not happen without the complicity of medical journals (16), most of which receive substantial advertising and “reprint” income from industry. Anyone interested in the functioning of journals might wish to peruse my collated correspondence with the editor of *The Journal of Bone and Mineral Research* that I have placed online (38). Initially polite correspondence became confused as I encountered the endless distortion of reality that is part and parcel of pharmaceutical science.

Final thoughts

The ethical challenge in research involving human participants is to use available data in the best possible way. Data is derived from human participants who subject themselves to risk in the public interest. They have the right to know that the data derived from their assumption of risk are used properly. When data are closed to scrutiny even by the supposed authors of research, this cannot constitute an appropriate or ethical use of that data. Patients have to be involved in solving the problem.

Most importantly, as academics we need to reassert the importance of data and the meaning of authorship. We also need to assert “old fashioned” ideas of academic freedom, our right to speak the truth as we see it, and to allow that truth to be subjected to open debate. The problem of how best to do this remains a mystery. Given the current state of the General Medical Council, the MHRA, and UK-PRI, the most plausible port of call for those raising serious issues of research misconduct remains the national press.

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