TRUST IS HARD TO EARN and easy to lose. This is well known. Public trust in research is decreasing – why? Is it a problem? Have ghostwriting, salami publications, misconduct and distrust something to do with this loss? Is the reason simply that contemporary science seems to focus on productivity more than creativity?

From various perspectives the papers and presentations in this volume focus on the ways in which factors affecting distrust and trust, including criteria of quality, are identified, measured and dealt with by universities and other institutions. But the authors do not merely identify a set of problems. They also discuss what is currently being done – and what could and should be done – to deal with the problems.

Editors: *Göran Hermerén*, *Kerstin Sahlin* & *Nils-Eric Sahlin*. The volume is a collection of 11 papers and presentations by participants in a symposium at Kungl. Vitterhetsakademien (The Royal Swedish Academy of Letters, History and Antiquities).

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TRUST AND CONFIDENCE IN SCIENTIFIC RESEARCH

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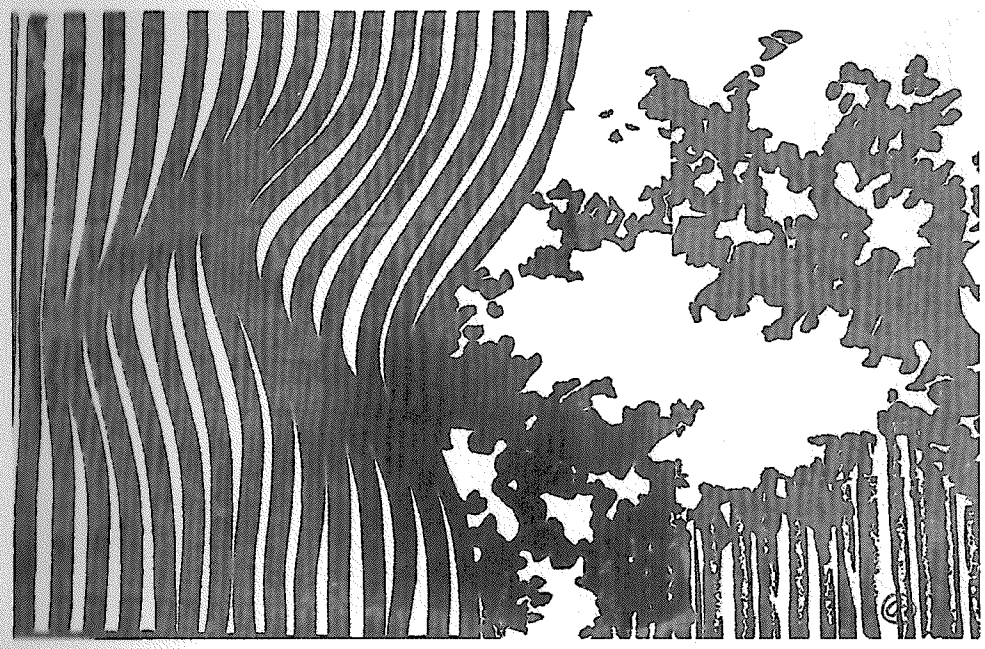


The Vulnerability of University Culture and Individual Integrity

Inge-Bert Täljedal

Today's university researchers are subject to a dilemma – a genuine dilemma from which, unfortunately, I can see no simple escape. In order to secure sufficient financial support for high-quality work, scientists and scholars may have to compromise on methodological rigour. This dilemma can be sensed at all administrative levels of a university, by individual researchers as well as by vice chancellors. I think the situation is deeply problematic. Unable to propose any obvious solution, I can only highlight the reality of the problem, and hope that I foster invigorated and wider discussion of it.

What could it mean to have trust in scientific research? Of course, it depends on what one takes to be the aim of research. I have the impression that there is increasing uncertainty in society as to how to rank the importance of various aims. This uncertainty is to be found both outside the universities and to a significant degree in the research institutions themselves.

The values and norms of conduct that characterize university culture are not static; they are more or less responsive to political and other forces in society. The individual scientist cannot be expected to have unshakable intellectual and moral integrity in the midst of cultural change. University culture and the integrity of individual researchers are vulnerable things that interact with each other. It is a moot question whether, and if so to what extent, they are presently being compromised.

I guess I am fairly typical of my generation of scientists inasmuch as I take it for granted that the utmost aim of science is to seek non-trivial, new truths about the world. Time does not permit me to dwell on the question of how to understand the concept of truth. I am aware of its philosophical intricacies. Suffice it here to say that I believe that science, as a practical enterprise, must accommodate the common-sense idea that there is an objective reality, whatever it might be, and the notion that truth involves some kind of correspondence with that reality.

Non-trivial truth is rarely overt. It is often elusive and difficult to come by. Over the years, I have taught my students to view the social machinery of science as a gigantic spiritual threshing mill – a machine that separates intellectual wheat from chaff through relentlessly critical discourse, most importantly in the form of published texts. This threshing mill is expressive of a supreme norm that cannot be overridden by any other norm, or purpose, without loss of the whole idea of science proper – that is to say, the norm of truth as the final value, or end, of scientific endeavour *qua* science. Science is certainly of instrumental value in other important ways. For example, politics, business, art, or health care can gain from it. However, in my old fashioned view, such things as power, profit, promotion, beauty, or even health, can never, without self-contradiction, justify any compromise on the truth-seeking aim of science. Indeed, the much-discussed perversion of so-called scientific fraud has to be understood as a kind of oxymoron, applying to persons who are merely posing as scientists.

It is because of the elusive nature of non-trivial truth that some basic methodological rules have evolved to ensure as far as possible that research is in fact directed and geared toward its supreme aim. A cardinal methodological principle here is to shun sources of bias. In other words, one should stay away from interests, or interest groups, that can interfere unduly with the research process. Bias has to be carefully avoided simply because it deflects from the very aim of science. If by "scientific research" one understands the most effective pursuit of truth possible, and bias makes this pursuit less effective, then for logical reasons biased researchers must necessarily lose in trustworthiness – more or less.

Bias can influence the direction of research, and this can mean that scientifically suboptimal problems are attacked instead of more fruitful ones. It can also influence the evaluation of results. Within the scientific community it is well known – or at least it used to be – that expectations, hopes and fears on the part of an experimenter are liable to introduce error in the interpretation of data. For example, that is the reason why so-called double-blinding is a *sine qua non* in the testing of new medical drugs. That unconscious bias is always a threat to the reliability of results is a very basic insight in all kinds of experimental science. Because our subconscious psychology functions as it does, one may very well be seriously biased without being consciously dishonest. One need not be a deliberate liar to be disqualified as a witness to truth.

What I have just said may seem self-evident, especially in a context like the present one. However, my life at the university has gradually led to a degree of disillusionment about the general understanding of these matters, both in society at large and in universities. I certainly do not wish to imply that lecturers and researchers are not usually honest. We probably are, at least to the same extent as people in general. Yet, with time I have begun to worry over the apparent growth of complacency, in the academic world, about the risks associated with bias. These risks threaten both the very quality of university research and the general public's confidence in it.

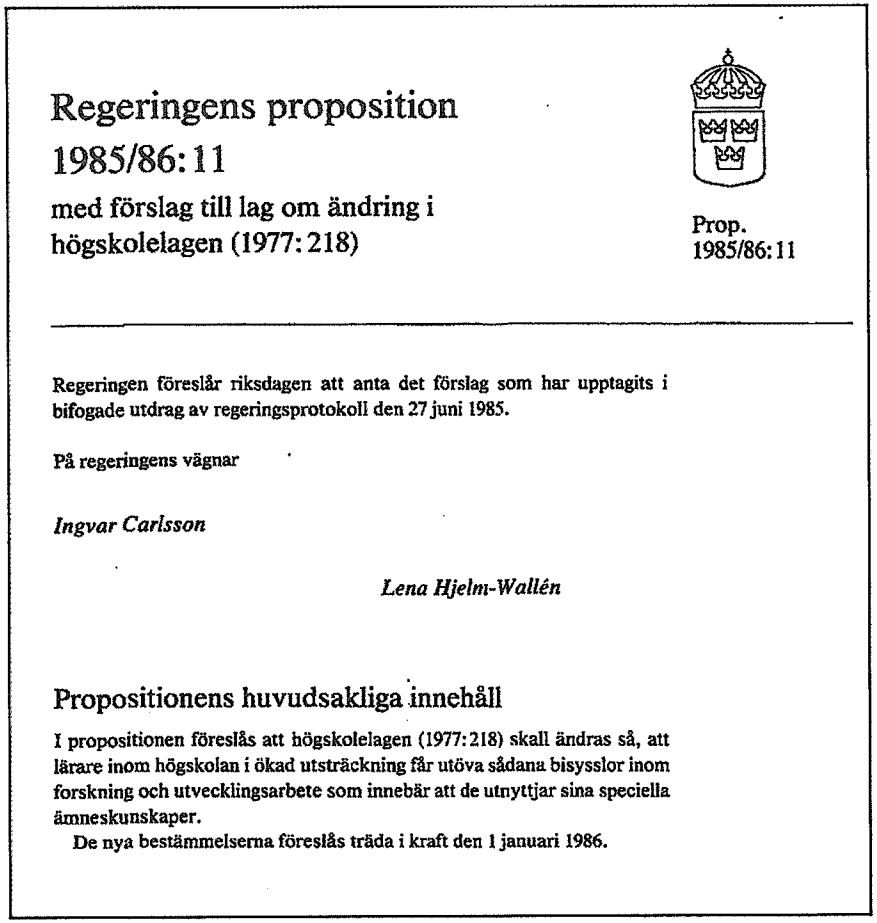
What I have in mind is this. Outside the academic world, public and civil administration is governed by legal as well as informal rules of conduct that serve to prevent various types of bias in decision-making. For example, civil servants are disqualified by law from making decisions on matters that involve their own personal interests and those of close relatives or friends. Section 7 of the Swedish Law of Public Employment (*Lag om offentlig anställning*) is a general statement of the importance of preserving trust in the impartiality of civil servants:

> An employee may not have any employment or any assignment or exercise any activities that may adversely affect confidence in his or any other employee's impartiality in the work or that may harm the reputation of the authority. (English translation of the law provided by the website of the Government Offices of Sweden.)

In Sweden most university lecturers are state employees. Until a quarter of a century ago the legal prohibition against bias set out above applied with equal force to all public servants alike, professors and other university lecturers included. In those days a professor could not combine his or her academic research with remunerated similar work for a commercial firm without running a serious risk of breaking the law. Not only could such behaviour be illegal because it might involve partiality disadvantaging other firms. In those days, for reasons of scientific method, university researchers generally looked with some suspicion upon parallel, or secondary, employment in the private sector, simply because commercial interests may be a real source of bias in one's research.

A fairly radical breach with this way of looking at things occurred in 1985. The change was ushered in by the publicised case of a professor and a research engineer who had collaborated closely with a private company of their own while at the same time being employed by a university. A commercial competitor filed an official complaint. As a result, the university chancellor ruled that the commercial collaboration was illegal. The minister of education, on behalf of the government, was forced to draw the same conclusion in an official decision, but in a separate statement also expressed concern that the law appeared to be unduly restrictive given national interest in industrial and economic development.

So, in 1985 the Swedish parliament, the *Riksdagen*, enacted into law an amendment of the Swedish Higher Education Act (*Högskolelag*). Figure 1 shows the front page of the government's bill. This bill was meant to encourage collaboration between university academics and commercial firms. Generally speaking, such collaboration can take many forms – for example, contracts between firms and the university as an organization – in which no additional remuneration of the researchers is involved. However, by means of the 1985 bill the government wanted to encourage university scientists to combine their work for the university with a side-line in work as consultants or contractors, or as the employees of other employers. The explicit purpose expressed in the bill was to stimulate industrial development and Sweden's international economic competitiveness. What had previously been forbidden by law as destructive was now encouraged as constructive.



Regeringens proposition
1985/86:11
med förslag till lag om ändring i högskolelagen (1977:218)

Prop.
1985/86:11

Regeringen föreslår riksdagen att anta det förslag som har upptagits i bifogade utdrag av regeringsprotokoll den 27 juni 1985.

På regeringens vägnar

Ingvar Carlsson

Lena Hjelm-Wallén

Propositionens huvudsakliga innehåll

I propositionen föreslås att högskolelagen (1977:218) skall ändras så, att lärare inom högskolan i ökad utsträckning får utöva sådana bisysslor inom forskning och utvecklingsarbete som innebär att de utnyttjar sina speciella ämneskunskaper.
De nya bestämmelserna föreslås träda i kraft den 1 januari 1986.

Figure 1. First page of the Swedish government's epoch-making bill amending the Higher Education Act. The bill relaxed the previous prohibition of commercial bias in academic scientific research. At the bottom of this page the purpose of the 53-page bill is stated as that of extending the right of university lecturers to exploit their expert knowledge in secondary employment for research and developmental work.

In the national interest of economic development scientists should no longer be restricted by the general prohibition of bias. However, the commercially induced bias that was now being encouraged only pertained to research and related work. It did not apply to any other decisions that the scientist may have to make, for example, in his or her role as examiner of students. To stress that the new license given to commercially justified bias was limited to research, the bill prescribed that the secondary employment must not damage trust. The wording of the new legal clause (Chapter 3, Section 7) is as follows:

> In parallel with their teaching posts, teachers at higher education institutions may undertake employment or assignments or pursue activities relating to research and development work within the subject area of their posts, if in doing so they do not undermine the confidence of the general public in the higher education institution. (English translation provided by the website of *Högskoleverket*, the Swedish National Agency for Higher Education.)

The bill, and the resulting change in the law, set an additional official aim for university research. It did so by deliberately weakening the legal demand for objectivity and impartiality in science. Of course, the two goals – i.e. non-trivial new truths, on one hand, and industrial international competitiveness, on the other – are not formally, or necessarily, contradictory. However, the legislation backing the second goal certainly plays down the risks of bias in a way that could well be counterproductive vis-à-vis the first.

The law makers assumed that removing a legal barrier to bias in science would not necessarily damage the general public's confidence in universities. This assumption was a daring one. Why should the general public trust scientists who make themselves vulnerable to sources of bias that would make other public servants patently unreliable? Indeed, the Swedish Chancellor of Justice had strongly advised the government against proposing the bill precisely because it is important to maintain trust in university research, and because the proposed reform would weaken the defence of that trust. In response to this objection, the then minister of education argued that the demand for objectivity and impartiality in research does not need legal protection because it is a characteristic of the scientific community itself. I am inclined to think that this argument disclosed either naivety or a certain hypocrisy on the part of the government. It fails to take into account the fact that university culture is vulnerable to external political and economic pressure. As a result, the actual clause of law came to seem a bit confusing, or fuzzy – if not actually contradictory. On the one hand, it permits secondary employment, which is normally forbidden as trust-damaging. On the other, the secondary work must not damage trust!

Confusing or not, the law has been successful in the sense that today many university researchers undertake commercial work of a kind that would have been illegal, or

for other reasons atypical, just a quarter of a century ago. In preparation for this lecture I wrote to the vice chancellors of seven well established, prominent universities in Sweden, asking how many of the lecturers in science and medicine have a side-line in work for other employers. I also asked how often the university prevented, or counselled against, such a secondary employment in order to preserve the public confidence. Finally, I wondered aloud whether the vice chancellors considered the 1985 legislation lucid, contradictory, helpful or harmful for research, and helpful or harmful to confidence. Briefly, the answers can be summarized as follows:

1. Secondary employment is a common phenomenon. Expressed as median values for these prominent universities, one-fifth of academics in science and technology have a second employer. In medical faculties the corresponding figure is as high as four in ten. In some departments, the figures are, of course, substantially higher.
2. Vice chancellors and their representatives do not in general feel unhappy about the legal regulations on secondary employment. Four universities expressed sympathy with the law, and one believed it was okay, while two thought the rules are none too clear. In general, the vice chancellors declined to give detailed answers to the questions about lucidity and the impact on research and trust.
3. It very rarely happens that any secondary employment is forbidden or actively advised against.

The results suggest the following conclusion. Either university leaders do not think that the many secondary employments represent any threat to confidence, or, more probably, they are willing to accept a certain loss of trust in return for something else. The idea of a kind of trade-off between confidence and more material gains was neatly summarised by a senior manager at one vice chancellor's office: "It creates problems when a university employee owns a company and wants it to collaborate with the owner's university department. Such collaboration entails a considerable risk of damage to confidence, while at the same time benefiting the innovation process greatly."

In two vice chancellor's offices it was pointed out that confidence is not threatened by ancillary employment alone. Long-term research support (*i.e.* funding) from industry to certain individual researchers, teams, and departments may be even more damaging. In response to my inquiry, it was stated that such relationships, which are sometimes maintained for many years, certainly raise questions of dependence and partiality.

Clearly, in today's university culture the emphasis on commercial success is felt by many to create a dilemma of confidence. If not flatly denying it, scientists and university leaders seem to handle the dilemma by accepting a certain loss of confidence, pre-

sumably while hoping that the encouragement of bias will not also influence the actual quality of research. Whether or not that hope is realistic is an interesting and important question deserving analysis and discussion. As much as science is about truth and hard facts, this question, too, is factual and not merely about laudable aims, or wishes, and opinions.

It seems likely that the gravity of the problem varies, differing from one project, or area of research, to another, depending on the specifics of the collaboration – its transparency, the nature of the products aimed at, and the money involved. For example, research supporting the production and sales of goods for the mass market, notably food and pharmaceuticals, may have greater bearing on the confidence of the general public than collaboration with firms operating in narrow niche markets with expert users. However, in general terms, there seems to be no ground for blind optimism about the innocence of the bias associated with collaboration driven by commercial purposes.

Images of (Some) Scientists in (Some) Movies

Inez de Beaufort

Some Introductory remarks: Why fiction?

> Literature does not merely hold up the mirror to nature and express more eloquently what is already well known and understood; it allows the exploration of what is perceived only dimly, if at all, the subversive anxieties that cannot be directly stated, because they challenge too vigorously the mores and taboos of society. (Roslynn Haynes 1994.)

People have all kind of ideas about scientists and scientific research, and about the consequences of research for societies and individuals. Those ideas are formed through popularized information from the research world, talks on television, articles in magazines, the modern mass media, scandals and incidents, and also by images provided by fictional forms such as novels and films.

I have always been impressed and intrigued by the impact of imaginary persons, worlds and scenarios on people's thinking, and by the influence the imaginary realm has on moral arguments about technological and scientific developments. However hard philosophers try, the unfortunate and unfair truth is that most of their cherished and profound writings are usually not read by wide audiences – with a few exceptions, such as Peter Singer. The general public knows Michael Crichton and Robin Cook.

Fiction plays a role in societal debate over the ethical questions raised by scientific developments and/or the behaviour of scientists. Fiction may intrigue or scare people. Sometimes it is loaded with a predictive meaning, sketching dystopian scenarios and warning of scientific developments. The role of fiction is interesting in relation to ethical analysis in various ways. It can "translate" abstract ideas and hard to envisage possibilities into images and cases that are more familiar and "accessible", and therefore make people wonder. Fiction can raise questions. It can confront us with the complexity and tragedy of human choices and deliver a warning sign: do not think you can morally dissect everything. Life is too complicated and too tragic.