Inaugural Symposium for the Centenary Year of the Finnish Academy of Science and Letters

23rd November, 2007

Pitfalls in science

Background

Given that a critical attitude is one of the guiding principles of science, it is natural to suppose that scientists will also adopt a critical attitude towards the way in which science is carried out and everything connected with this. Science in every age has experienced its own problems, pitfalls and risks, but people have not necessarily wished to speak about these for fear that the discussion might undermine the credibility of science itself. In fact exactly the opposite is true. The ability to look at itself in a mirror is one of the fundamental requirements for any science that strives to achieve impartial truth.

There are many pitfalls in science. There are obvious problems that everyone realizes, although people will not necessarily wish to discuss them in public, and there are issues which represent the tip of an iceberg, which have far more serious questions hidden beneath them. There are also submerged reefs which you can run into quite suddenly. It is nevertheless worthwhile stopping to think about all these pitfalls from time to time. We decided to gather the issues together into four main themes:

Theme 1: Ever tighter competition

The academic world has always been one of competition, in which scholars, schools of thought and nations have competed among themselves in matters of reputation, honour and sometimes even financial success. And the competition has become more severe than ever in recent times. Most research nowadays is carried out at least in an atmosphere of competition for external funding, in which the universities attempt to augment their finances by 'producing' more doctorates than ever before and all manner of quantitative measures are derived to determine and compare their 'productivity figures'.

- Does this tightening competition entail a risk of dishonesty and abuse?
- Do citation indices guide research in the right direction?
- Does competition force scientists to avoid risks and study only topics for which established methods and approaches are already in existence?
- Does the competition between research teams retard the progress of science, as the teams are interested in gaining qualifications for themselves rather than collaborating with each other?
- Does the low percentage of project applications that are accepted discourage scientists?
- Has the competition between universities and departments lowered the standard of doctoral theses?
- Do senior researchers have enough time to supervise all their postgraduate students properly?

- Does the state of competition lead supervisors to put too much pressure on their doctoral candidates?
- Is a research career an attractive proposition for a young person?
- Is a short-contract working essential to the research system?

Theme 2: Tensions within the academic community

The academic community has traditions of its own which are reflected in the work and methods of its scholars. They decide for themselves what is good science and what is bad science – and what is not science at all. They stand guard over the publishing forums as peer reviewers, supervise appointments, and even determine salary scales. The world of research also has its own unspoken hierarchies that define what fields, topics and methods are more prestigious than others.

- What risks are entailed in peer reviews?
- Does the standardization arising from majority pressure detract from researchers' freedom to develop their own methods and perspectives?
- Are scientists inclined to follow fashions?
- Should efforts be made to preserve diversity in science?
- Do scholars gain more prestige by studying rarities and deviations (such as wolves or reading difficulties) than by studying ordinary everyday things (such as mosquitoes or reading skills)?
- Is it more meritorious to study things for which spectacular new methods are required (such as disease-related gene mutations) than things for which traditional methods will suffice (such as the common cold)?
- Are there some fields in which everything of importance has already been found out, so that researchers are forced to study inessentials?

Theme 3: Pressures from outside

Scholars throughout the ages have been ready to question the prevailing ideologies, outlooks and world-views, so that there have been many occasions in history on which the church or a totalitarian government has placed restrictions on academic freedom. The fact that the state is nowadays by far the largest provider of support for research in the western countries implies a risk that it might also interfere in the performing of this research.

- Is the mixing of politics with science only a problem for countries run by dictatorships?
- Do the topics of research tend to be decided upon by the interests of those providing the finance?
- Would all the things that are important for people and society at large become topics of research if science were allowed to develop quite independently?
- Is there such a thing as value-free, objective research?
- Is private sector cooperation desirable or undesirable?
- Does the fact that the rich nations of the world and their industries will only finance research into things that are of interest to them endanger global equality?
- Is it really important to do multidisciplinary and cross-disciplinary research, or do we do it only because of pressure from above?
- How much elective research funding should there be, as opposed to thematically directed programmes?

Theme 4: Is science becoming isolated from its public?

Research is one of the functions that individuals perform in a human society, from which society expects answers to questions that are of importance to it and its members. The assumption is that these answers will be clear and unambiguous, but this is not generally the case, although both decision-makers and representatives of media would like it to be. The demands for simplification exert pressure on the use of language, for instance, and increase the danger of misunderstandings.

- Should basic research have an impact on society?
- Is science concerned with studying things that are important or things that fit into its own paradigms?
- Is media publicity a good or bad thing for a researcher or for science in general?
- What can one, may one or should one communicate to the media: banalities, informed opinions or established scientific facts?
- Does popularization endanger the credibility of science, or is the opposite the case?
- Do scientists build protective walls around themselves by using different terminology from other sciences?
- Do the clichés employed by the media hold good in reality, e.g. the 'ivory tower', or the bearded, incoherent research scientist?
- How does the image of science projected by the media affect young people's interest in a research career?

Programme

Welcoming address
Kari Raivio and Arto Mustajoki

Theme 1: Ever tighter competition
Chairman: Jorma Sipilä
Panel: Paavo Pelkonen, Anna Rotkirch and Ragna Rönnholm

Theme 2: Tensions within the academic community
Chairman: Sirpa Jalkanen
Panel: Mart Saarma, Tuula Tamminen and Seppo Zetterberg

Theme 3: Pressures from outside
Chairman: Ilkka Hanski
Panel: Per Ashorn, Risto Eräsaari and Olli Tahvonen

Theme 4: Is science becoming isolated from its public?
Chairman: Ulla-Maija Kulonen
Panel: Ullamaija Kivikuru, Jari Mäkinen and Esko Valtaoja