Universities and Industry:
Marriage or Co-operation between Independent Partners?

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Abstract

Michael Gibbons, the present secretary-general of the Association of Commonwealth Universities, published in Nature 402 (2 December 1999) an article on ‘Science’s new social contract with society’. Gibbons argues that “the old image of science working autonomously will no longer suffice”: the clear demarcation lines between university science and industrial science are disappearing. According to the new “social contract”, not only can science speak to society as a contributor of “reliable knowledge”, but “the society can now ‘speak back’ to science” by demanding “various innovations” and “socially robust knowledge”. Such knowledge should be “transparent and productive” in the sense that its acceptability is tested “not only against nature, but against (and hopefully also with) other people”.

In my view, Gibbons refers to important developments within the relations between science and society, but his main conclusion is somewhat misleading. Academic research has for a long time had an impact on society through the applications of the results of basic research, as well as through the education of professional skills. In spite of the new prospects in co-operation between universities and industry, it still is important to distinguish basic and applied scientific research (which is open to public criticism within the scientific community and thereby accessible also to the society at large) from such forms of industrial or military research that serve economic or other practical interests and are not published in scientific journals.

It is a fact that university science is today only a small fraction of all research activities. For example, in Finland, where the total R&D expenditure is about 3.1 % of GNP, almost 70 % of this R&D is financed by private corporations. Of the publicly funded 30 % of R&D, about one half consists of support for technological development in industrial firms and sectorial research carried out in governmental institutions under the auspices of different ministries. About 40 % of the public resources go to the universities - either directly or via the Academy of Finland. Today academic research work in the universities increasingly relies on external funding - its sources include contract research with companies and the mission-oriented research programmes of the Academy of Finland and the European Union.

Even though the residue of “free” academic basic research, founded upon the duties of university professors and research groups financed on a competitive basis, may seem to be small in comparison with other areas of R&D, it still has very important tasks in promoting science-based world views and education. Academic research should still serve as a source of new theories and innovative methods. The autonomy and integrity of academic research are important for the universities also in order to maintain their critical potential towards dominant cultural and social trends.

Sectorial and mission-oriented research can be directed towards goals that are useful in planning the future, improving administration, protecting environment, and making rational decisions - and thereby they are instrumentally and socially relevant for the satisfaction of human needs. Many national programmes of science and technology policy look at the benefits of research only in terms of technological progress and economic wealth. Technology is seen as a way producing and distributing commodities in the free market. Science, both “strategic” basic research and applied research, serves as a basis of technological development. This motivates the treatment of scientific research and higher education as “investments” which should yield economic profit in the short or at least not-too-long run. This means that both science policy and technology policy are understood to be parts of the “national innovation system” which ultimately aims to promote commerce and industry.

I agree that the universities, too, have a role in the creation of technological innovations - and this is one way in which they can be socially relevant for human life. But, in my view, the rationality of scientific inquiry should not be reduced to the commercial principles of technology policy. It is still significant to make a distinction between technology and science: technology does not produce knowledge by inquiry like science, but rather designs new artefacts, tools, and machines. Artefacts are not constrained by truth in the same way as knowledge claims, but by what is physically and economically possible. We do not decide what is real in nature, but we can choose what artefacts we wish to produce.

For these reasons, I think it is misleading that Gibbons does not distinguish between the acceptability of a research project (e.g. the Superconducting Super Collider), a knowledge claim (e.g., whether genetically manipulated organisms or GMOs affect our health), and a technological artifact (e.g., whether GMOs should be allowed to be sold in the market).