



## European Physical Society: Position Paper

### The Brain Drain

The European Physical Society (EPS) is an independent body funded by contributions from National Physical Societies, other bodies and individual members. It has over 80,000 members and can call on expertise in all areas where Physics is involved.

The declared aim of the EPS is to help Physics and Physicists in Europe.

#### 1. The aim of this Position Paper

Although mobility of scientists (and others) has some desirable features, the present situation is getting out of hand and is damaging some national economies. The purpose of this Position Paper is to alert policy formers and others to the problem, and to make some tentative suggestions for a reduction in the damage.

#### 2. Mobility and Migration

Human beings have always been somewhat mobile, leaving their homelands to discover new places and to gain new experiences. Through this movement, people have been able to improve and expand their skills and ideas. Mobility and migration have helped to equalise differences in knowledge among geographical areas and among cultures. One has to emphasise that “mobility” and “migration” do not necessarily imply unidirectional movement, but rather multi-directional movement.

#### 3. Accelerated Flow from Europe to the USA

The European Physical Society has observed the flow of talented young scientists from European countries to the United States over a long period of time. While the migration of people from Europe to America started almost with the discovery of the new continent, the flow of scientists to the US is a phenomenon typical for 1930's and later.

#### 4. The Central and Eastern European Problem

Over the last decade or so a significant number of scientists from institutions in Central and Eastern Europe have moved as post-docs to institutions in Western Europe and in North America. Post-doctoral work abroad is, of course, always an important part of the career of a scientist, but this one directional flow is causing a significant loss to the home countries and is disadvantaging many areas of research there.

## 5. The Main Cause of the Present Brain Drain

Unlike previous surges of emigration, caused largely by religious persecution and famines, now it is mostly the comparatively low standard of living in the post totalitarian countries that is the reason. Although one needs to emphasise that devoted scientists are willing to live in low standard surroundings as long as they find satisfactory conditions for their research, the inducements offered abroad are increasingly hard to resist.

## 6. Further Causes of the Brain Drain

The low level of governmental R&D expenditures, decreasing prestige of scientific activity, lack of the up-to-date scientific equipment, worsened work atmosphere and even the uncertain perspectives of science and scientific institutions, are further causes of the brain drain.

Most worrying is the fact that in some countries emigration of the most talented individuals is becoming the norm, and North America (and a few other well-developed countries) make considerable effort to recruit the best young people. To these causes should be added the shortage of homebred scientists in North America caused by the reduced attraction of science for the young. The availability of well-educated and intelligent young scientists from impoverished countries is an obvious attraction.

## 7. The Cost to the Home Countries of the Brain Drain

Although the calculation of the actual cost to a nation of losing one of its best young scientists is difficult to make, some general remarks can be made. There is the obvious cost of education of an individual from childhood to graduation. This is not negligible and is typically some tens of thousands of dollars. However, this is only the “tip of the iceberg”. Some estimate the total to be often approaching one million dollars. Certainly, investigation of the wealth generated by some particularly talented individuals shows it to be very large; there is also the value of the contribution to national security in some cases.

## 8. The Role of Science in National Development

We agree with the conclusions of the UNESCO World Congress on Science (Budapest, 1999) that without science and without good scientists it would be difficult to imagine sustainable development and improvements in the quality of life in the future, and that science and science applications are crucial foundations for the development of any country.

## 9. The Ultimate Idea to Counter the Brain Drain

Only when the disparity between salaries and the quality of facilities in the home country, and that in the host country, is reduced considerably will the problem be eased. The measures to be taken are manifest and can now be considered.

## 10. The Measures Needed

There is need in the home countries, to

- Improve education in science.
- Provide special grants and salaries.
- Make more active use of EU programs.
- Support international networking.
- Update and improve the research infrastructures, not least that for basic science.
- Improve career prospects in scientific life.
- Give opportunities for regular training abroad.
- Increase the prestige and public understanding of science.
- Involve the activity of the private sector.

## 11. The Source of the Necessary Funds

There seems to be no other solution to the funding problem than for North America (and the other brain-drain-recipient countries) to reimburse one way or another, the home countries. A United Nation Agency could act as the “bank”, abstracting funds from North America and elsewhere, and channelling it to the home countries, where it must be used to improve the ‘science base’. That “the problem is difficult” is no excuse, after all science in general is difficult but scientists persevere.

Scientific endeavours, and, indeed some national economies, are at the crossroads.

The EPS Executive Committee, 1999