European Union's peripheral countries and its neighbours to the east so as to increase significantly Europe's overall strength and potential to adjust to world competition.

The remarks by J.C. Phillips on the value and effectiveness of small-scale science as opposed to large-scale projects must be endorsed. Europe should build efficient networks of research groups and laboratory facilities, taking full advantage of the richness and diversity existing in the different countries. Recent European Union networking and mobility programmes should be encouraged. In parallel, a programme could be launched to create a network of strategic medium-size research facilities in the various European regions, with adequate interfaces with industry and conditions that promote an efficient transfer of scientific knowledge to new applications.

I also support the need to introduce new approaches in teaching and training science at the university level. In particular, we must learn how to integrate high-level science with technologically oriented knowledge in order to formulate "science with a purpose". An overly academic and removed science, although very formative and of universal validity, is generally ineffective if it is not complemented by (simultaneous) information on the applied aspects of science and the basic principles behind modern technology. Students should also be trained in the use of science for solving concrete problems, in an open environment and through interaction with non-academic people. As J.C. Phillips pointed out, most of industrial practice consists not of profound inventions and carefully prepared discoveries, but of quick and timely incremental steps which either enable new methods, or which control quality to stabilize and improve the yield of older makeshift methods. Here, acute awareness and mixed experience (science/technology) are crucial factors for success.

We Need the Whole of Physics

J.T. Devreese from the University of Antwerp points out the danger of trivializing parts of physics.

J.T. Devreese

The analysis by J.C. Phillips at CMD-EPS '96 of solid-state physics was certainly stimulating. But remarks such as "high-energy physics has been dead for 30 years" and a strong opposition to the SSC that were perhaps intended to enliven the discussion. They should be taken *cum maximo grano salis*. First of all, high-energy physics remains a vigorous field with some of the best minds at work. In the period referred to we have seen the discovery of the J/psi, of the W and Z bosons and of the top quark, as well as the development of the standard model of particle physics which constitutes a great step forward towards realizing the dream of unification. These achievements have not only contributed to our understanding of the "building blocks" of Nature but also shed light on the evolution of the early universe. Think of the marvellous "first three minutes" of Weinberg; the fact that the structure and dynamics of the universe is correlated with the fine details of elementary particle physics is a fundamental insight with a major cultural dimension. Furthermore, the methods of theoretical high-energy physics have been most fruitful for condensed-matter physics, notably path integrals and Feynman diagrams, and concepts such as scaling, universality and symmetry breaking have been useful in many fields of physics. The unique tool of synchrotron radiation, so dear to solid-state physicists, is a by-product of high-energy physics.

We need all of physics: the beauty of celestial mechanics, the depths of phase transitions, the excitement of understanding the hydrostatic paradox or the colour of the sky, the joy of calculating the Lamb shift or measuring the 21 cm line. It is counterproductive to minimize the significance of areas other than one's own. It is also hard to see how to attract students by trivializing the value of parts of physics. What we must convey is the the richness of the entire subject and, indeed, of the whole of science.

So-called small science is indeed invaluable: the work of Müller and Bednroz on high-T_c superconductivity was realized with modest budgets, and the same is true for the Binnig-Rohrer scanning tunnellng microscope. On the other hand, detection of the quantum Hall effect was facilitated by the availability of high magnetic fields. So we should open up the full potential of both large and small science.