

## Universities

# Going back to basics by network

ONE of the criticisms in the 1985 OECD report on Norwegian science policy was the imbalance between the emphasis on applied as opposed to basic research. According to Arnhild Hole, director-general of the Department of Science Policy at the Ministry for Cultural and Scientific Affairs, "there has been a famine in basic research at the universities for the past ten years", and it is one of the new Labour government's aims to encourage and revitalize basic research — and provide a broad base on which to build applied research.

Basic research in Norway is performed at the universities and regional colleges. There are four universities, of which the University of Oslo, established in 1811, is the oldest. The University of Bergen was set up in 1946, and both Trondheim University (which includes the Norwegian Institute of Technology) and the University of Tromsø were established in the late 1960s.

The regional colleges are part of a regionalization policy followed by successive Norwegian governments in every area of national life. The aim is to stabilize scattered populations and counteract the attraction of towns, some of which are growing particularly fast because of activities related to oil production. Measures have been introduced to equalize incomes and working conditions and to decentralize industry. The regional colleges have been created since 1969 as centres of vocational training and higher education, and have since entered into the research arena. There has been criticism, particularly from the universities, that the regionalization of the research system is excessive, dissipating resources among establishments some of which have difficulty attaining a critical mass. The government's intended solution to the problem is to improve existing networks of communication between research institutes and to create new networks, says Hole. A university network has already been established (see below) and Norsk Data (a Norwegian information technology company) is working on a network to link the regional colleges.

Another problem is how to keep flesh on the bones of the country's regionalized system in the face of the 'brain drain' to Oslo, where much research and industry is located. Somehow incentives have to be provided to encourage people to remain in other regions of Norway. Also, two of the research councils (NTNF and NAVF) have scholarship schemes to encourage scientists to study abroad or elsewhere in Norway for a while before returning to their own institutes. And special scholarships to encourage people to stay in

Tromsø while giving opportunities for travel are included in a research support plan established for northern Norway with the aim of strengthening the University of Tromsø.

For Professor Nils Stenseth of the Biology Institute at the University of Oslo, one of the problems of basic research policy in Norway is that "a little money is given to everybody" as part of the philosophy of an egalitarian society. Once NAVF, responsible for funding much of university research, earmarks some of its budget for national priority areas, there is little left to be spread thinly among too many other research areas with the result that even good research projects are inadequately funded.

His other major complaint is about the tenure position at universities — it is a permanent position for life "with the free-

dom to do either anything or nothing". This has resulted in the generation gap so commonplace in universities, with ageing professors and no room for the young and talented people who should form the basis for the future. In an attempt to alleviate the situation, the government has created about 130 new research posts.

There are also problems lower down the scale. Norwegian undergraduates are funded by a combination of a stipend from the government and a loan from the state banks. The stipend is small, however, and according to Per Kofstad, vice dean of the Faculty of Mathematics and Science at the University of Oslo, "many students take part-time jobs to ease their financial situation". The high salaries offered by industry are then a powerful incentive for the deeply in debt student. There is, moreover, a shortage of qualified people choosing to teach, due to low pay and poor working conditions. All this, says Karl Schjetne of SINTEF, has led to a shortage in PhD students. □

## SINTEF

# Campus partners in technology

OF the several private research institutes in Norway the Stiftelsen for Industriell og Teknisk Forskning (SINTEF) or Foundation for Science and Industrial Research, is particularly interesting for its close links with a public institute of higher education. Because SINTEF and the Norwegian Institute of Technology (NTH) share the same campus at Trondheim, they can also share laboratories, equipment and specialist staff. Research staff at the institute participate in research projects in the foundation group whilst SINTEF staff often lecture at NTH and are very positive about the collaboration and its beneficial effects on their research activities, which include information technology, fish farming, civil and structural engineering, biotechnology, fluid dynamics and electronics.

The SINTEF group, which operates on a not-for-profit basis, consists of the SINTEF Foundation and three research companies: the Continental Shelf and Petroleum Technology Research Institute; the Norwegian Marine Technology Research Institute; and the Norwegian Institute of Electrical Supply. In 1986 the group's income was NOK 843 million, of which 63 per cent came from industry and most of the rest from the research councils.

Information technology is one of SINTEF's major interests, as befits the proud keeper of Norway's only supercomputer, a Cray installed in late November 1986. The universities, research institutes and parts of industry have access to the Cray. Finland is currently negotiating access. SINTEF sees itself as playing an important part in helping the Norwegian

information technology industry to become internationally competitive, says Karl Georg Schjetne, director of the foundation's computing centre, RUNIT. He feels strongly that more government support is needed for SINTEF in general, to increase capacity and encourage even greater collaboration with NTH.

Much of the work at RUNIT is concerned with database management, computer networks, expert systems and parallel processors. The network group helped to establish UNINETT, which interconnects Norwegian university data networks and links them to international research centres. The network became operational in 1987, and is part of the government's drive to improve communication between research centres.

In addition to RUNIT, two other groups give SINTEF a strong base in information technology. These are ELAB (the electronics laboratory) and the Division of Automatic Control. ELAB is closely involved with most industrially orientated R&D projects in electronics and telecommunications in Norway. It also performs some contract work for the European Space Agency in the field of satellite communications. The Division of Automatic Control works on such projects as a dynamic positioning for floating vessels (for example, oil rigs) and ultrasonic Doppler measurement of blood flow.

Research at SINTEF has to be geared to the demands of the clients it serves. Although this could be a cause of conflict with the NTH, which has no such constraints, few complaints are heard. □