

SWEDISH students are losing interest in research, especially in mathematics and the natural sciences. The change is part of a general movement away from full-time, examination-oriented university students straight out of school to older, part-time students who have already been employed for a number of years and who take short courses immediately relevant to their jobs and interest. The percentage of part-time students enrolling for the autumn term in Swedish tertiary educational institutions has grown continuously from 12% in 1969 to 29% in 1974.

Students used to compete for a place in a Swedish university. With increasing graduate unemployment, however, the situation began to change, and university applications have been declining since the 1968-69 academic year. This has stimulated the universities themselves to find a new type of student. Members of the new group are, on average, between 27 and 30 years old, have worked for a few years and want to study to enrich interest in the job, without necessarily taking an examination at the end of the course. A typical example is of company employees taking a short course in the economics of the firm. Of all the students who enrolled for this course in the spring term of 1974, only 15% intended to take the examinations.

The trend towards shorter courses has been institutionalised in 'distance teaching': a scheme rather like the UK's Open University except that, instead of centralising the courses under one authority, each of the six Swedish universities runs its own programme. Experiments with these courses have been running on a small scale for a couple of years. But with facilities established for the part-time student without daily access to an educational institution, the trend towards more short courses will probably continue.

All this is obviously beneficial for the new part-time students, but the general trend raises serious questions about the future of academic research. Although short courses in ecology and

environmental protection are popular, biology as such has very few takers. There is no lack of applicants for short courses in electronics, energy forms and protection against radiation, but the number of students in mathematics and

## Letter from Sweden

from Wendy Barnaby, Stockholm



the natural science faculties has fallen off. Although the surplus of university graduates has been forecast to persist throughout the 1970s, it is predicted that demand from the labour market will catch up with and outgrow supply early in the 1980s. This could have serious consequences not only in the general labour market but also within the universities themselves, in maintaining the number and quality of teaching staff. And it looks as though the country's capacity for scientific research may suffer.

● How would you get rid of your old car if you lived in the countryside far from a scrapping firm, and transportation costs were high? Many Swedes faced with this problem leave cars to rot in country dumps or simply abandon them on by-roads. A recent report commissioned by the Swedish Department of Agriculture suggests measures which could be taken to stop such understandable neglect. According to the report, recirculation of metal and other wastes could save an increasing

proportion of the total energy used in Sweden.

The report foresees that recycling could save energy equivalent to 31,000 cubic metres of oil annually, or somewhat less than 1% of the country's total energy requirements. That such a small proportion is seen as justifying a reorganisation of the waste system is indicative of the current energy-consciousness in Sweden. In this affluent, packaged country, where the average household produces 270 kilograms of waste a year a person, scrutiny of energy saving measures is no longer confined to nuclear reactors, wind trappers and sun catchers—it also includes the humble kitchen bin.

The report estimates that more than 20% of household waste could be recycled. At present 70% of the average Swedish kitchen bin is filled with paper, and together these bins produce 780,000 tons of paper a year. The report recommends that householders should be made to separate out the paper from their other garbage, making it easier and cheaper for the municipalities to collect and recycle it. Chemical wastes should be recycled, dumped or deposited on a long term basis by a company jointly owned and run by the government, municipal authorities and industry. And to discourage the dumping of cars, the report proposes a co-operative system of authorisation for scrapping yards and a levy on new cars. The levy, suggested to be Skr.400 (about \$US90), would be placed on every new car sold in Sweden after July 1, 1975. When the last owner of the car wanted to dispose of it, he would take it to an authorised scrapping firm (one that met conditions for car disposal, re-sale of spare parts and so on) which would issue a receipt. On presentation of this receipt to the local authorities the owner would be refunded the levy plus a bonus of Skr.100. Since the average life of a Swedish car is 9 years, the system would pay for its own administration as well as providing subsidies to municipal authorities for cleaning up old junk-yards and abandoned cars.

broadcast during the one year experiment. Following the 1969 Indo-US agreement, the SITE Group, specially created in 1970 at Ahmedabad, was charged with the full responsibility for planning, management, operation and evaluation of the experiment. If SITE proves successful, ISRO has its sights set on a multipurpose satellite for providing nationwide television coverage and telecommunication links between Delhi, Bombay, Madras and Calcutta.

In practice, one of the most challenging tasks that SITE is likely to come up against, when the experiment actually begins, will be to keep all the

6,000-odd television receivers (the conventional ones as well as the more expensive direct-reception type) in good working order. This is going to be far more formidable a job than it might appear at first sight. The Haryana government a few years ago installed community television sets in villages within reach of the television station in bordering Delhi. But a check after a short while revealed that most of the receivers had gone wrong because the authorities had not taken steps to ensure proper care, handling, upkeep and maintenance of the sets that were installed. The SITE managers will, one

hopes, not allow this to happen.

The SITE project will in many ways be a unique venture. It will, for the first time, demonstrate that relatively inexpensive receivers (the ones built by the ISRO are said to cost about twice as much as the conventional sets) can be used to receive television programmes directly from a satellite. Moreover, such a system could open up immense possibilities and greatly enhance the chances of reducing illiteracy within a relatively short period of time. That is why, ISRO officials believe, SITE results will be of interest to many other countries. □