

But of all control methods, herbicides have the brightest future. Among those listed by Mr Robson as having been cleared under the Pesticides Safety Precaution Scheme are 'Dalapon', which is especially active against reeds and other grass-like weeds on river banks; 'Diquat', which is active against submerged weeds; and maleic anhydride, which inhibits plant growth without actually killing the plants.

## Comprehensive Planning

"GOING comprehensive" raises considerable building problems. Following up the Department of Education and Science comment (circular 10/65) that the "disposition, character and size of existing schools" must be taken into account when the change is made, the Architects' Department at the DES has devoted its latest bulletin to the problems, architectural and educational, involved in such a change (*Comprehensive Schools from Existing Buildings, Building Bulletin 40, HMSO, 16s.*).

The bulk of the bulletin is taken up with five case studies which cover the possibilities of amalgamation of two or more schools with some new buildings, the enlargement of schools of different sizes, and the first stage of a new school which, until further building is possible, uses some old buildings on a different site. The bulletin also briefly rehearses various problems of organization of pupils into groups; accommodation for pupils, administration, and staff; sites; and circulation and storage space. Considerable emphasis is laid on the importance of examining all the possibilities in detail, even though some of them may eventually be rejected. This preliminary section covers a lot of ground but is necessarily short on detail.

As well as suggestions to architects about possible alternative uses for space, there is a plea for the educators to give clear guidance to architects on future teaching requirements. The document stresses that the problem of working accommodation has to be examined as a whole and cannot merely be a sum of the requirements of the individual teachers. Compromise is inevitable, and it is up to the staff, knowing the limitations of time and supply of teachers, to work out a balanced curriculum before sensible accommodation schedules can be produced. If, as is recommended by the DES, the form of reorganization of secondary education in a particular area is to depend on the suitability of existing schools for amalgamation and adaptation, then local authorities should be aware of the factors involved, and it is hoped that this bulletin will indicate some of the questions which should be asked before reorganization is begun.

## Persuading Postgraduates

LAST week saw yet another of the courses aimed at persuading the academically minded that work in industry is not so bad after all. The course is the third graduate school to be organized by the Science Research Council and the Careers Research and Advisory Centre, and was attended by 100 science and technology PhD students working in the universities. It was held in association with the Manchester Business School at the University of Manchester, and is meant to introduce the PhD students to the variety of problems existing in industry and administration, and the ways in which

they are solved. The organizers hope to do this by using the methods of the business schools—the business game, project work and a case study.

The latest graduate school is the first in the series to be run in association with the Manchester Business School; previous courses have been associated with the London Business School. For this reason the Manchester course has a slightly different emphasis. It relies less on case studies, and has as its central exercise a research project on the implications of the introduction of the electric car. Mr Alan Pearson, of the Manchester Business School, who is Director of Studies at the graduate school, says the work done on the electric car project by the PhD students may well be worth publishing. The course membership also includes 28 science and technology PhDs already working in industry and public service organizations, from whom the organizers hope the students will gain a favourable insight into the industrial situation.

One of the difficulties in holding a course of this kind is to judge how successful it has been in changing what are often firmly fixed prejudices. Some information about this may shortly become available. The London Business School, at a similar course held last year, used a questionnaire to gauge the attitudes to industry among the participants both before and after the course. The results of the investigation should help in evaluating the success of the venture.

## Risks of Radiation

THE use of radiation techniques is becoming increasingly common in industry, medicine, research and teaching. But, like other industrial risks, the dangers attached to radiation are subject to legal controls which set acceptable limits. The instruments used to monitor radiation must be accurately calibrated, not because the measurement of radiation needs to be extremely accurate but because it is important that any errors associated with instruments, or any interpretation they require, shall be known. This task of calibration is carried out by the Central Electricity Generating Board Dosemeter Calibration Facility at Berkeley Nuclear Laboratories in Gloucestershire.

The facility was built in 1961, and its primary function is to calibrate the instruments used to monitor radiation at CEGB power stations. The capital costs were high, principally because they included a 400 kV accelerator and a 250 kV X-ray set. The facility is run by Mr I. M. G. Thompson and a staff of three, who calibrate nearly 1,000 instruments a year. Arrangements are now being made to make the service available to anybody who needs it, for a charge of about £60 for a complete calibration; already more than 50 instruments a year are calibrated for outside organizations.

The standards and techniques used for calibration for radiological purposes are a little unusual, because the risks of radiation are related to dose in different parts of the body rather than to any fundamental properties of the sources or materials involved. For electromagnetic radiation it is possible to relate dose to the unit known as exposure with only limited accuracy, and only in the range between 20 keV and a few MeV. Accurate estimates are therefore rarely justified, but an approximate upper limit to dose is usually sufficient. For neutrons, there is no simple