During the hundred years of Survey work in Scotland, seventy-two memoirs on general and scientific geology, thirty-eight economic memoirs and thirty-six pamphlets on mineral resources, and nine pamphlets on underground water supply have been published. In the thirty years between 1910 and the outbreak of the last War, sixty-nine one-inch maps and ten quarter-inch maps were colour-printed. Sales stocks were destroyed during the Second World War; but since 1945, in collaboration with the Ordnance Survey, every effort has been made to replace the lost maps, while continuing to publish new maps on the one-inch scale and many second revision coalfield maps on the six-inch scale.

As a result of growing recognition of the scope and national importance of the Geological Survey's work, increases of staff followed both World Wars. The most recent expansion is not yet complete enough to balance increased commitments. In Scotland, for example, extensive collaboration with the Scottish Division of the National Coal Board and with the North of Scotland Hydro-Electric Board, the annual incidence of some hundreds of inquiries from other government departments and the general public, and the work involved in republishing colour-printed maps destroyed by enemy action, have prevented the Survey from making rapid progress over the whole field of its activities. A. G. MacGregor

THE TRAINING OF UNIVERSITY TEACHERS

THE question of the advisability and possibility of providing new recruits to university teaching with some initial guidance in the technique of their calling has been examined by S. Radcliffe, lecturer in German at the University of Bristol (*Univ. Rev.*, 28, No. 1; October 1955).

Unlike France, little attention has been paid to the technique of lecturing in Great Britain. In general, lecturers are conscientious about the matter of their lectures, but give little thought to their form or their delivery.

That this can have a detrimental effect on students' work was borne out recently in the Vice-Chancellor's report for 1954-55 to the Convocation of the University of Liverpool. In examining the causes of failure among students taking university examinations, he includes, among "matters about which our consciences ought to be troubled", the following point: "the presentation of a subject in the lecture room, though impeccable as regards content, does on occasion leave much to be desired in the matter of elementary teaching techniques".

This is the most vital point of all. The cause of so much dissatisfaction quite often proves to be some fault in the technique of presentation, or even a mere mechanical shortcoming, which could in most cases so easily have been circumvented by some initial instruction and guidance of the lecturer concerned.

Radcliffe does not claim that teaching is a mechanical craft to be learned in a workshop, but suggests that an artist requires some basic instruction, at least in the rudiments of his craft.

The following are a few of the purely mechanical skills which might be considered desirable in a good teacher or lecturer. First, the adoption of a fitting speed and clarity of diction. Secondly, the clear formulation and appropriate stressing of the main points of the subject under review. Thirdly, the ability to use a blackboard successfully. Fourthly, the 'staging' of material to make it come 'alive'. The correct lighting and ventilation of the lecture room are of importance. A few weeks teaching in any school will bring these and many allied points home.

What is a fitting speed and clarity of diction? How many lecturers ask their students whether they can hear clearly, or whether they are speaking too quickly for them? A teacher can soon learn the correct measure in these instances with the aid of a little guidance. The undue dropping of the voice at the end of each sentence, for example, can produce both monotony and inaudibility. A person with a weak voice can be shown how to make the most of it by someone trained in these matters. This is a problem faced by teacher-training departments.

The clear formulation and appropriate stressing of the main points of the subject cover a large number of factors. Just as the potential teacher must learn how to arrange and present the various points he is intending to convey in a lesson, so must the lecturer have a clear and systematically arranged plan of what he intends to talk about. He must know which points are important or difficult enough to require particular stressing, either in the form of repetition or slower and more deliberate speaking, or even by the dictation of vitally relevant matter.

The extent to which the blackboard is used will obviously vary with the nature of the lecture; a statistical, technical or linguistic theme will call for more blackboard writing than, say, a literature or philosophy lecture. Titles of works, proper-names, unusual or foreign terms, dates—all these should be written up to ensure that students get the correct form. The writing must be clear and legible, and not scattered about in disorder on the board.

Lastly, Radcliffe elucidates his reference to the proper 'staging' of material. There is an element of the histrionic in all personal teaching; the teacher is to some extent an actor, who must make his material come to life. There are some generally recognized devices into the application of which the tyro could with advantage be initiated. A slight break before passing on to a new theme in a lecture can be most refreshing for all concerned. An occasional pause to receive questions from students will in certain cases add to the effectiveness of the lecture; it "draws the students in" more and gives the lecturer a chance to gauge their grasp of what he is saying. Learning the students' names is an essential requirement in establishing such closer contact with them. The prompt return of written work not only helps to keep up students' interest in their subject, but also gives the right to demand written work from the students within the time-limit specified.

MORPHOGENETIC STUDIES OF *DRYOPTERIS*

IN two studies, the growth, organization and morphogenetic activity of the shoot apex of *Dryopteris aristata* have been further investigated by experimental means. C. W. Wardlaw and E. G. Cutter (*Ann. Bot.*, 19, 76, 515; 1955) have observed that when the apical cell-group is damaged, leaf