Those whose business is education have, in recent years, been examining the fundamentals of their trade. To some extent their conclusions have been the codification of the obvious. Equally, however, their approach to their problems throws into relief the danger, which attaches to any educational process, of continuing to teach something just because it has been traditional so to do. The need for critical examination may apply more to general "education" as it is practised in schools and the Arts Faculties of Universities than it does to the vocational part of the training to which the medical undergraduate, and even perhaps the medical postgraduate, is submitted. Nonetheless, it does no harm to go back to fundamentals and to review the education of anaesthetists in the light of the currently practised methods.

The first need is to define the broad aim. Most of those concerned with such matters would accept that the end-product of the process is a man, or woman, who is able to take his or her place as a consultant anaesthetist in a district general hospital on an equal footing with consultants in other specialties. Indeed such an appointment will be obtained by some 80-90 per cent of those who pass through the educational process to which we submit our juniors.

The next stage in the analytical process is perhaps related more to management studies than to education as such. In order to see how this broad aim is to be achieved it is necessary to look at the content of the work of the consultant anaesthetist. To a large extent this has already been done by the Faculty of Anaesthetists in relation to its Higher Training Programme, which lays down that those who seek accreditation must have had a wide general training and some experience of the various special fields of anaesthesia, such as thoracic, neurological and paediatric work, intensive care and the relief of chronic pain. The consultant must be able to organize his department so the trainee must have experience of administration and he must be able and willing to teach if his hospital is to be recognized by the Faculty of Anaesthetists for the training of junior staff. Finally, if the consultant anaesthetist is to retain the respect of his colleagues in other specialties he must have a comparable knowledge of the less uncommon rarities which may effect his work and must know where to lay hands on necessary information about the really rare case. Other aspects of his achievement of consultant status relate to the development of his personality. This, however, cannot be defined readily nor is it clear how an educational process can help to this end.

The educationalist would probably next wish to take each of the broader aims outlined above and to convert them into specific problems for study by the trainee—he would like to draft a syllabus. In a rapidly advancing specialty, however, a syllabus is inappropriate, for it creates a situation where something like three or four years must elapse between the realization by the examiners that some new development in anaesthesia or in a related field is relevant to the practice of the specialty and its inclusion in the material examined. The traditional situation is that a knowledge of current literature is expected of those who present themselves for the Final FFARCS examination. And it is accepted by those who train anaesthetists that part of their responsibility is to select from the current literature those matters which are likely to be of interest to examiners.

This analytical approach to education of anaesthetists is, however, only the preliminary groundwork. The answers it produces immediately provoke the question of how these aims and objectives are to be achieved. Are systematic lectures best? Whatever else they do they provide the trainee with a clearer idea of what he should study, and in what depth, and with the minimum expenditure of the trainee's time. The fact that any worth-while lecture is the product of hours and hours of preparation is something which is all too often lost sight of. The virtues of the tape-slide presentation and of the videotape are extolled by others, for these methods have the virtue for the trainee that, provided he has the necessary hardware, he can study at a time to meet his own convenience. Clearly too he can go over material repeatedly until he has mastered it. Such educational aids are, however, prepared at an even greater cost in time and possibly in material also. The Socratic method of question and answer tutorial is favoured by others, but if a tutorial is not to become a lecture with a smaller number present...
the trainees themselves must possess some knowledge of the subject to be discussed before the class begins. Yet others favour presentation of a problem as the basis for teaching and no doubt there are other methods which could be applied to the teaching of trainee anaesthetists.

The Faculty of Anaesthetists has gone far in defining the aims and objectives which underlie its training activities and which incidentally are the basis of the FFA examination. Others must convert these aims and objectives into detailed training programmes.

A. R. Hunter

LEARNING OBJECTIVES AND EDUCATIONAL GOALS

The use of learning objectives as a means to improve learning was introduced over 40 years ago. A learning objective can be defined as a "... precise statement of what a student should be able to do in order to demonstrate that he has learned successfully" (Engel, 1975). It defines both what is to be learned and how learning is to be measured and may describe also the circumstances under which measurement will be done. For example, a reasonable learning objective might be: "The student will measure the respiratory minute volume in an anaesthetized patient and will describe which portion of that volume influences PaCO2 directly." This statement leaves no question as to what the student is expected to learn, nor as to how he will demonstrate that he has learned. It can direct his learning so that important or difficult aspects of a particular problem will be highlighted. It does not dictate how learning is to be done and leaves the teacher and student to select suitable techniques.

Learning objectives are a means to learning and are based upon the educational goals of a course of study. The goals are formed from a list of the skills and knowledge the student is expected to acquire during the course. If related goals are linked in a logical manner from the general to the progressively more specific the course of study will acquire a form from which the student can determine both the knowledge and skills that he is expected to learn and how each goal relates to others. The form can provide also a guide for the student's approach to his studies. A number of learning objectives can then be stated for each goal to help the student to attain it. There have been a number of attempts to assemble goals in a logical manner (Bergman, 1966; Hodgkin, 1966; Miller, 1968; Glaser, 1973; Korst, 1974; Burg, 1975) although none has been entirely successful.

Recently the Faculty of Anaesthetists held a seminar entitled "Learning Objectives in Medical Education". The conscious use of educational goals and learning objectives in medicine has been limited to a few specific departments in isolated medical schools and the seminar provided a forum for discussion among interested teachers. It became clear that the problems involved in constructing a medical course using this approach require much study before such a course would be acceptable generally.

In anaesthesia an investigation is continuing to identify and inter-relate the goals of postgraduate training so that it will be possible to state learning objectives in a useful way. While many advantages could result from this approach a great many pitfalls must be avoided—especially any tendency to produce, via an arbitrary selection of learning objectives, a packaged "qualified anaesthetist". If successful, however, it could provide a guide through which the student could be sure he has obtained the knowledge and skills needed for the independent practice of anaesthetics. The guide would be helpful in the District General Hospitals where the majority of postgraduates in the General Professional Training Schemes will work.

R. D. Jack

REFERENCES