BASIC MEDICAL EDUCATION IN THE BRITISH ISLES

The Report of the GMC Survey of Basic Medical Education in the United Kingdom and Republic of Ireland, 1975–6

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Reports on the Teaching of the Component Disciplines/Specialties of the Medical Course

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Notes on the Discipline/Specialty Reports

GENERAL INTRODUCTION

This volume of the Report on the GMC Survey of Basic Medical Education consists of separate reports on the teaching of the component disciplines of the medical course. The reports are self-contained: they should however be read in conjunction with the other volume of this Report in order to see them in an over-all perspective.

Questionnaires were distributed, via 'GMC Correspondents', to the senior responsible teacher in every school in each of a predetermined number of disciplines and specialties (see 'General Introduction' to volume 1 of this report). In some cases there was considerable overlap of replies: reports on certain subjects were therefore amalgamated to produce those presented here.

These questionnaires covered teaching at preclinical and clinical stages only: the premedical and preregistration ('intern') years were deliberately excluded. The questionnaires consisted principally of open-ended questions: little or no 'prompting' occurred, therefore, and so relatively small numbers of respondents making a particular point may be more significant or telling than at first sight. (However, the corollary is that an absence of response does not necessarily mean a negative one.)

It should be noted that views expressed (as opposed to facts reported) are those of the respondents, and not necessarily the schools. There may thus on occasion be discrepancies between these reports and the other sections.

The reports are presented anonymously, by agreement with the Deans. Due to the nature of the information, and the agreement for anonymity, only a very limited amount of information is presented in tabular form. However, where regional/national differences are apparent, these are reported using the following nomenclature:

'London Schools'
The fourteen undergraduate medical schools in the University of London (strictly, twelve 'general' medical schools, and two medical science faculties in multi-faculty institutions).

'English Schools'
All schools in England and Wales, excluding the 'London Schools'.
'Scottish Schools'
The five medical schools in Scotland.
'Irish Schools'
The six medical schools in Eire and Northern Ireland ('Schools in Eire' refers just to the five schools in the Republic).

Structure of the Report

Under the direction of a special Sub-Committee of the GMC, a variety of questionnaires was used: the most comprehensive of these went to medicine, obstetrics and gynaecology, paediatrics, psychiatry and surgery, and pathology and microbiology; intermediate-sized questionnaires were completed in respect of certain subjects listed for inclusion in the curriculum in the GMC's 1967 Recommendations (for example, general practice, medical ethics); and shorter questionnaires were completed by respondents in the preclinical subjects, and other clinical and paraclinical specialties. As a result, and also because of the amalgamation of certain reports mentioned above, there is much variation in the content and length of the reports. Their general outline, however, is as follows:

Introduction. Response rate. (*Note.* Even when a school did not complete its questionnaires in respect of a particular subject, it was often possible to report upon certain, generally administrative, features by virtue of information supplied by the GMC Correspondent: information may therefore on occasion be given about a number of schools in excess of the 'field' which actually completed questionnaires.)

Teaching Arrangements. The point(s) in the curriculum when teaching is given on the subject, its nature, and, where possible, the average teaching time.

Features of the Teaching of the Subject. Aims and objectives; noteworthy teaching methods.

Student Assessment. The use of in-course and end-of-course assessment techniques; 'critical' assessment of the subject (a critical assessment might be the final 'professional' examination in a subject, but it is defined as one in which failure would prejudice a student's continued progress through the medical course), and the contribution of in-course assessment to this.

Problems and Developments in the teaching of the subject, including those in the organization and conduct of teaching, and those connected with resources.

In addition, for disciplines which completed some of the longer questionnaires, more detailed information is given about clinical teaching, the staff responsible for teaching, and course development and evaluation.

A few schools submitted reports on the teaching of topics not on the Survey's standard list (for example, cardiology, oncology); these are discussed in an addendum to the report on medicine, except for histology, which is appended to the report on anatomy.

Introductory Summary

The following is a brief introductory summary of some of the main features to be found in the reports in this section. It is provided to orient the reader, and is in no way intended to be comprehensive.

The structure of the courses in the classical 'preclinical' disciplines—**Anatomy, Biochemistry,** and **Physiology**—runs the gamut from full integration with each other to complete separation. The majority of schools favour separate, departmental teaching of basic core matters with multidisciplinary approaches for special topics such as neurosciences, nutrition, and reproduction. Widely varying teaching times were reported on each subject. Some respondents concentrate on the 'principles' of their subject, on giving a sound scientific foundation for later studies while others attempt to be 'clinical' and 'relevant' throughout. A subsidiary aim in all subjects was given as 'teaching students to think', habituating them to scientific method and a critical outlook.

A growing amount of clinical illustration is given by involving patients and clinical staff, and this feature is the one most often wished to be extended; this vertical integration is more popular than horizontal integration with concurrent subjects. As a teaching method, small-group teaching (tutorials, etc.) comes in for greatest praise: again a number of respondents want to increase its usage. Problems centre on staffing: in anatomy and physiology, the apparent virtual impossibility of recruiting medically qualified teachers. Other anxieties frequently concern the shortages of time, space, and equipment for laboratory work.

Psychology and Sociology (the 'Behavioural Sciences') occasionally appear together in an integrated course; in the newer curricula, for example, in multidisciplinary courses which also include community, environmental, and sometimes genetic studies. More often, though, the two subjects are taught separately. Teaching is concerned both with giving an introduction to the subject as a 'respectable' science and with discussing and demonstrating the application of these concepts to the behaviour of sick people, the behaviour of doctors, and the organization

of medical care. Greater dissatisfaction with the arrangements was expressed by respondents (and GMC Correspondents) for these subjects than by those for any other topic. Problems occur mainly as a result of the 'newness' of these subjects in medical schools; of trying to condense major university disciplines into a few hours of non-specialized instruction; of confronting hostility among medical school staff and students; and of trying to convey concepts, outlooks, and methodologies which are fundamentally different from those of the physical sciences. The reportedly most worthwhile teaching methods have been project work, tutorials, and clinical illustration.

Most schools now teach **Statistics and Biometric Methods** formally. Often the topic is partly or wholly combined with courses for preclinical laboratory subjects, allowing students to collect and analyse 'real' data. Generally the aim is to make students 'fluent' in statistics, able to understand the commonly used methods and presentations without requiring them to become adept at calculations. Often there is discussion of research methods and the inherent difficulties of medical research. Some respondents believe the chief value of the course should be in making students 'critical'—able to resist unfounded claims and unwarranted assumptions, and in encouraging a healthy scepticism. Specialist staff are not always available to teach the topic.

Courses in the major 'paraclinical' disciplines—**Pathology and Microbiology**—are staggered in most schools: they occur in separate portions, at intervals through the curriculum, and objectives differ from stage to stage: introductory, then systematic, then advanced/clinically integrated. There are various degrees of collaboration with clinical staff. Some respondents see their teaching as a 'bridge' between preclinical and clinical work; others concentrate on the principles of their subject, or conveying the concepts of pathogenecity and how pathological processes affect the body; others believe in maintaining a wholly clinical outlook and present their teaching as a dimension of clinical practice, not as a subject *per se*. In microbiology particularly, there is a strong feeling that the subject is increasingly a clinical one and that the teaching of laboratory, clinical, and epidemiological aspects of problems of infection should be combined in a course placed firmly in the clinical stage of the curriculum. As teaching methods, small-group sessions, television and tape/slide programmes for independent study are favoured and efforts are being made to increase the use of all of them. Post-mortem teaching and clinico-pathological conferences (or clinico-microbiological conferences) were also reported to be extremely valuable.

A fundamental difference in the structure and organization of teaching lies between those schools (the minority) where a full-time attachment to the laboratory specialties is provided over several weeks, harmonizing the theoretical, clinical, and laboratory aspects of the subjects, and those schools (the majority—approximately two-thirds) where a series of

lectures, practicals, and tutorials are provided at the same time as other courses are proceeding, over a year or so. In pathology no significant problems or developments were reported as affecting many schools, except that many courses have been, are in the throes of being, or are about to be reorganized as part of general curricular revision in their school. In microbiology the outstanding problem is the recruitment of medically qualified academic staff—a crisis has reportedly been reached. Microbiologists are also concerned at the image of their subject; as the traditional infections have been brought under control the subject is sometimes regarded as superfluous, but teaching should now focus on the new range of infection problems arising from the complexities of modern life and medical practice.

The subsidiary paraclinical disciplines **(Haematology, Immunology, Chemical Pathology)** are not always taught as subjects in their own right. Generally they are taught in several years of a curriculum, sometimes separately, more often as sub-components of major courses, and the multiplicity is reflected in the frequent lack of clearly defined objectives for the whole presentation. Some respondents concentrate on the scientific foundations of the subjects, others pursue a bridging approach, yet others attempt to be primarily clinical. The most strongly made plea was for some administrative rationality to be brought to bear, for example providing an early 'core course' given by subject specialists, succeeded by several episodes of integrated teaching with other clinical and paraclinical colleagues. Regarding methods of teaching, many respondents would like more genuine patient-based teaching on the wards and in clinics, allowing students to follow through patients in investigations. Too often teaching is stated as based upon lectures, with a few tutorials and clinical demonstrations. However, schools with full-time laboratory attachments include these subjects in them, which has reportedly proved very satisfactory. Respondents feel a particular responsibility to train students to use the hospital diagnostic services sensibly and productively.

In **Pharmacology, Clinical Pharmacology, and Therapeutics,** a continuum of teaching may be observed in some schools, proceeding from 'preclinical' pharmacology to clinical pharmacology, to therapeutics for senior clinical students. Courses are more often planned and taught independently from each other. Classes in clinical pharmacology may be included in a co-ordinated cycle of lectures or topic-teaching with the clinical specialties. In many schools it is clear that 'therapeutics' is equated with clinical pharmacology. Where there are symposia, panel discussions, or a series of 'therapeutic conferences', however, therapeutics in the full and wider sense will be under discussion. It is felt that physicians, surgeons, etc., themselves will inevitably be teaching the therapeutics of their own field during their own courses and especially in final year attachments when students are

present for long enough to observe the progress of a case, to be involved in the monitoring and to witness at first hand the taking of decisions.

Medical Physics was interpreted in two quite distinct ways: as a preclinical science and as a clinical diagnostic tool. The former view prevails in the formal timetabled teaching. Teaching of the other investigative specialty, **Radiology,** ranges from a four-week full-time attachment to a very few hours. The informal and *ad hoc* and liaison teaching, however, can be unlimited and is unquantifiable. Tutorials conducted by radiologists and clinico-radiological conferences with students on other firms appears to be increasing, as does participation by radiologists in preclinical courses, generally anatomy.

A shift in emphasis in the teaching of **Social and Community Medicine** was implicitly or explicitly described in many replies as being from 'public health' towards 'community medicine'. The themes pursued are intended to support teaching in the clinical specialties and to give an extra dimension to this teaching by considering the social, cultural, and family background of patients. Liaison teaching and follow-up studies of discharged hospital patients are popular. The roles and expertise of the statutory welfare and social services and the voluntary ones are explained and demonstrated. Students learn about the development and problems of the NHS and are encouraged to be critical of health care delivery. Staff in community medicine are often involved in (and may be responsible for) early courses in medical sociology, environmental studies, and/or statistics. They are enthusiastic about projects and field work. Generally more time has been allotted to this subject in recent years, with a trend towards full-time attachments (often coupled with general practice), focusing on 'medicine in the community' and the social aspects of ordinary medical practice. Many respondents would like closer links with colleagues who have clinical responsibilities.

In the major clinical specialties, **Medicine, Surgery, Obstetrics/Gynaecology, Child Health,** and **Psychiatry,** teaching time is measured in weeks or months, rather than hours. In medicine and surgery the time allocations are very difficult to compare—some schools schedule the subspecialties within the 'general' courses, others schedule them independently. As for clinical attachments the pattern can be: always full-time attachments; always part-time attachments; early part-time (half-time or less) attachments, followed later by full-time attachments; and (very occasionally) early full-time attachments followed by later part-time attachments. Obstetrics/gynaecology, child health, and psychiatry are more likely to have a single full-time block in the middle of the course, flanked on either side by junior and senior attachments in medicine and surgery. However, where schools provide 'junior house officer posts' and 'selective' attachments they are often taken in these five specialties.

All the major specialties may appear in co-ordinated multidisciplinary series of theoretical instruction in clinical subjects. Obstetrics/

gynaecology, child health, and psychiatry are more likely to have separate lecture courses or to incorporate all aspects of their teaching into the period of the clinical attachment.

The aims of all courses are to help students acquire and improve their basic skills of examining and interviewing patients and of making a provisional diagnosis. Each specialty can contribute something to the students' general repertoire through giving them more experience in practice as well as teaching them skills restricted to the system or the problems of its own field. Skills of communication were also referred to. Especially with gynaecological, paediatric, and psychiatric patients, it is hoped that students will learn to be comfortable in their presence and to talk naturally to them. Other objectives routinely mentioned arise from the subject matter of the specialties—information about the range and appearance of disorders dealt with, their pathology, and the preferred forms of treatment. The scope of these specialties in the 1970s is presented, and often an indication of their future growth, so that the future non-specialist will realize what services are available and will refer patients appropriately and in good time. Particular attributes of specialties—decision-making in surgery for example—are stressed in the hope that students will translate them into general application.

Small-group clinical teaching is used to the maximum possible extent. Directed independent study is being practised in a growing number of courses and to a greater extent within these courses: projects, essays, case-studies and case presentations, tape/slide programmes are used. Television is being used to augment clinical teaching, very notably so in psychiatry.

Many developments hinge on general revision of schools' curricula; at the same time individual departments are taking the opportunity to define (or redefine) their objectives and to plan their courses more carefully than before. On the whole they report these as becoming less 'technical', and are more anxious to ensure that students have a sound understanding of basic principles and have acquired appropriate attitudes. There is less 'footnote medicine', less 'technical' surgery but as the 'core' instruction becomes restricted and fundamental, opportunities for students to stretch themselves are being extended, allowing them to investigate some patients in depth and to pursue special interests in projects and tutorial papers. Interspecialty topic-teaching is growing in popularity and a number of departments are extending their teaching into the community: several more would like to. General practitioners are often included in hospital and medical school teaching sessions.

Many problems derive from the nature of an individual specialty as well as from an individual department's circumstances. One problem which appears to be widespread, and not amenable to an obvious solution, is that of 'quality control'. Sending students to different firms (often in different hospitals) for clinical experience means that the

academic department may have little control over the detailed experience they actually receive. This is reportedly becoming more serious as student numbers continue to grow, and more clinical units, in ever more distant hospitals, are brought into the teaching programme. It is difficult to reach agreement on objectives, and it is almost impossible to impose them on all clinical teachers in a specialty.

The amount of curricular time devoted to the 'minor' clinical specialties—**Anaesthetics, Dermatology, Infectious Diseases, Ophthalmology, Orthopaedics, Otorhinolaryngology,** and **Venereology**—varies to a great extent. Some schools arrange a few weeks' full-time attachment, others will arrange a few hours' teaching here and there, for the same subject. Anaesthetics, ophthalmology, and orthopaedics are generally credited with more time than the other specialties—but this is by no means true of all medical schools. Features which they present in common are: ability to demonstrate clinical relevance of the basic medical sciences; ability to familiarize students with skills of physical examination and history-taking—partly in relation to the particular system or type of disorder, but also assessing the total medical condition of the patient, and allowing students to practise their skills as much as possible; and ability to demonstrate the importance of social and psychological factors in sickness and in health. The need for, and the methods of, rehabilitation are heavily stressed. Students are taught the management of the 'whole patient'. Concentration is on 'clinical exposure', with a minimum of formal and theoretical teaching.

The very high proportion of non-academic staff involved in teaching was frequently discussed by respondents. Many schools rely entirely upon NHS staff to teach one and often more of these specialties to all their students. Inevitably many reports of problems centre on the need for more (academic) appointments, on the unfavourable staff–student ratio (especially as in the generally short time available large numbers of students have to be taught at once), and the conflicts between the demands of patient care in these extremely busy specialties and the needs of undergraduates.

By 1978, it is anticipated that all UK medical schools will include **General Practice** in their curricula, with both formal teaching and attachments (full-time and half-time) to selected practices. (Sometimes teaching is associated with community medicine.) General practitioners are also making important contributions to other clinical courses. There is a division of opinion as to whether the course should focus on clinical medicine and on supporting the acquisition of clinical skills in general, or whether it should emphasize the role of the general practitioner and draw attention to the features and the skills which are not required in other clinical specialties (though the two approaches are not of course mutually exclusive). The logistics of establishing such a course have given rise to many problems and to many different solutions. Access to

a very large number of GPs is generally regarded as necessary to give adequate experience to students.

Geriatrics is always taught in the clinical years, though occasionally teaching on ageing and its social and psychological features is given in the early years of a course. It appears that the amount of clinical experience received by students in the same school may vary considerably according to the vagaries of rotational schemes, and the interests of teaching firms. Often geriatric medicine is scheduled within 'general medicine', though it is possible for it to be timetabled separately. There is no consensus of opinion about the desirability of regarding it as a separate specialty. Indeed most respondents are less concerned to teach 'geriatrics' as a specialty than to teach students the special techniques for examining and interviewing old people, to explain the problems of multiple pathology and of therapeutics in this field, and how physical ageing affects the 'normal' course and treatment of disease, and especially to foster in them positive and sympathetic attitudes towards old people.

The replies to **Medical Ethics** and **Legal Medicine** have been combined with those on **'Forensic Medicine'** in a single report. Three partially distinct areas were reported upon: 'pure' ethics, the law relating to medicine, and forensic (pathology) matters. Courses in traditional forensic medicine appear to be diminishing in the UK but there is disagreement as to how to replace them. Developments include—joint topic teaching by forensic specialists with clinicians in clinical courses; final year briefings on the hazards likely to be encountered by the young doctor; special all-day teach-ins on legal and ethical dilemmas; meetings of a 'local medical group' which students may attend, with doctors and other local health professionals; informal and sometimes extracurricular small-group discussions of ethical problems often on topics proposed by the students themselves; talks by speakers invited from one of the defence societies, and/or lawyers, coroners, and policemen. There is a body of opinion which maintains that medical ethics cannot be 'taught': they can only be 'learnt', in that suitable attitudes can only be promoted by the example of clinical staff in everyday clinical practice.

The Reports

Anaesthetics

All thirty-five schools offering (or soon to offer) clinical courses answered the questionnaire on anaesthetics. One school which is as yet only planning its new clinical course was able only to give administrative details (teaching time, etc.) and could not comment about features of its teaching.

TEACHING ARRANGEMENTS

In the majority of medical schools the specialty forms a discrete part of the curriculum, featuring in the timetable in its own right. In only three schools—in Scotland and Ireland—is it not timetabled separately, being taught in sessions 'borrowed' from another specialty's allocation.

Position in the Course: Teaching Time

The main teaching effort occurs in the clinical years. In four schools the main effort is in the first clinical year, in eight schools in the second clinical year, and in five schools in the final clinical year. In the other schools students rotate through anaesthetics over more than one year of the course.

In addition, it has become not uncommon for anaesthetists to take part in 'preclinical' teaching: five schools have anaesthetists regularly teaching in both the physiology and pharmacology courses, and at a further six schools they teach regularly in pharmacology.

Relationships with other clinical specialties can be established by anaesthetists being given sessions in a co-ordinated multidisciplinary series of lectures and symposia. This happens definitely at eight schools. Anaesthetists may also take part in topic-centred discussions with other specialists, either within a co-ordinated series, as above, or in a less wide-ranging programme. In this way anaesthetists help to build up for

the student the total picture of a system or a problem; a possible disadvantage is that the 'theoretical' instruction is separate from practical instruction. At other schools all aspects of anaesthetics teaching, in the wider as well as in the restricted 'specialty' sense, are contained within the separate anaesthetics course. The opportunities to marry theoretical and clinical, and to cover every relevant facet of the subject in a coherent programme, are 'obviously greater' when students come on a full-time attachment. A total of eighteen schools have full-time or virtually full-time attachments: four weeks' duration at four schools, two weeks' duration at eleven schools, and one week at three schools. (In eight cases these attachments are supplemented by formal teaching such as lectures outside the period of the attachment.)

At another twelve schools, students undertake part-time attachments over a period of time varying from the full-time equivalent of one to three weeks: usually this is on a half-time basis, such as 'mornings only', and frequently within a surgical attachment. (In six cases, these attachments are supplemented by other formal teaching on the subjects.) In three schools (all Scottish) teaching is limited to time spent on the specialty within other disciplines, and there is no attachment. Two further schools found it impossible to estimate what teaching time is devoted to the subject, but it is probable that the same situation obtains, ie occasional sessions only.

In the thirty-three schools able to give an estimate of teaching time, the mean is 65 hours (SD 28·5), treating a week's attachment as the equivalent of 30 hours. The mean for London (80 hours) is higher than for the rest of the British Isles.

FEATURES

Aims and Objectives

Many respondents justified the place of anaesthetics in the undergraduate curriculum by reference to their role in the general education of students—what they can contribute to their total clinical training. Indeed, eleven schools specifically explained that they do not believe in teaching 'anaesthetics' *per se* to undergraduates: competence at practical anaesthetics requires postgraduate training. Four schools mentioned their hope of arousing sufficient interest in a few students for them to go forward to make it their career, but these two aims are not incompatible.

The theme pursued in no less than twenty-two schools is the demonstration of the 'relevance' of students' earlier learning in the basic medical sciences. Anaesthetics *par excellence* can translate earlier studies into practical terms and show how patient care depends on knowledge of normal biological function. Thus anaesthetics may be put over as

'applied physiology' (fourteen schools) as the anaesthetist must maintain blood levels, circulation, respiratory function and fluid balance, and/or it may be presented as 'applied pharmacology', in demonstrating the variety of drug reactions, the range of choice of anaesthetic agent and the need to choose appropriately for the individual patient and circumstances. Both objectives may be met at the same time by 'using patients in the recovery room to demonstrate acute drug effects and the clinical features of disturbed physiology'.

Seven of the schools which present their subject in this light also present it as a medical discipline in the widest sense, synthesizing not only basic scientific knowledge but also the principles and practices of clinical medicine as a whole. They feel it important to show anaesthetics as a therapeutic specialty, as having more than a technical role (in, for example, assessing the fitness of a patient for operation and making recommendations for or against and in aiding the recovery of a patient after operation or trauma). This theme of the 'whole patient' is pursued by three other schools.

Anaesthetics as a clinical specialty—but not an isolated or merely technical one—is implicit in an aim of six schools: to enlighten students as to the role and range of modern anaesthetics. Students must be taught in the general and specialized surgical theatres of activity, and in the non-surgical ones, wherever anaesthetic expertise or opinion is called for. This will help them to appreciate how anaesthetic expertise is required (whether personally or by means of consultation with colleagues) in many varied branches of medical practice, and how the anaesthetist fits into the clinical team.

A corollary of the above, in the sense of introducing students to an area in which they will not subsequently be directly involved and of which they must take away a balanced and up-to-date impression, is the objective of enabling all future doctors and especially primary care doctors to explain to their own patients accurately and confidently what an anaesthetic is and what an anaesthetist will and will not do to them when they go into hospital. In this connection, four schools aim to ensure that students become familiar with the vocabulary peculiar to anaesthetics. The specialty should be comprehensible even to its non-practitioners.

Finally, and of possibly greater immediate relevance to undergraduates, anaesthetics can be an ideal medium for developing manual and mental skills. Twelve schools (including three Irish ones) stress the opportunity they provide 'to acquire certain practical skills and experience in the observation of patients with rapidly changing clinical states'. The need for constant monitoring and for prompt, informed decision-making is easily taught by example. For one school this is the overriding objective.

The three interrelated topics of intensive care, resuscitation (after cardiac arrest, etc.), and care of the unconscious person were mentioned

most frequently by respondents as the most important parts of their teaching. Twenty-five schools listed at least one; three schools specifically listed all three. However, there is less agreement about other matters which should or could be emphasized: relief of pain (five schools); the apparatus in current use, and possible future advances (three schools); pre- and post-operative care (three schools); 'first aid anaesthetics': emergency measures when qualified help is not available (three schools); and obstetric anaesthesia (two schools). In the schools where one or more of these topics is considered important or interesting they may be dealt with either in the clinical programme or in the tutorials, lectures, or topic talks given to all students. However, six schools explicitly drew attention to recent changes of emphasis in their courses, which they have tried to make more appropriate for undergraduates by eliminating much of the 'clinical' or' surgical' anaesthetics, reducing or eliminating the need for students to spend time on specific tasks and techniques, and stressing instead the medical and general aspects of anaesthetic care.

Some schools described the way in which their course is planned or conducted as worthy of note. Fourteen schools draw attention to the fact that they assist their students to practise and improve manual skills. The progress of each student in acquiring such skills, and also of course in accumulating other knowledge and experience can be monitored in: a one-to-one teaching situation, which four schools (all with attachment schemes) were pleased to report; 'before and after' MCQ tests, used by one London school; and individual topic teaching sheets or record cards on which items are ticked off as the course proceeds (two schools).

Other arrangements for teaching which were highlighted are: topic teaching sessions conducted jointly with other specialists as a regular feature (five schools find this exceptionally useful); subject matter for tutorials being chosen by students, to fill in gaps they perceive themselves or to elaborate upon topics they find interesting (one school); formal anaesthetic teaching in district ('non-teaching') hospitals where students find themselves on other attachments and where experience of 'routine' anaesthetic practice and problems can be gained (one school); and encouragement for students to see anaesthetic work in emergency conditions (two schools). One school remarked upon a particular advantage the anaesthetist has in teaching students—time, to demonstrate physiological, pharmacological, and other phenomena to them.

Seven schools offer additional elective appointments to students who are particularly interested in anaesthetics.

STUDENT ASSESSMENT

As might be expected, the majority of schools where a full-time attachment is given also have some form of in-course assessment during the attachment. However, at least four schools where exposure is much less also assess the students in this way. Seven schools put on a separate written paper, usually MCQ; four schools include anaesthetics in a general multi-subject MCQ class examination; and nine schools give a report (or mark up a progress record card) on each student. Three schools added that their in-course assessment is 'critical', in that it could be taken into account at the time of Final examinations or at the point when records of performance in all attachments are considered together; five schools added that poor performance in the attachments or the assessment could lead to a student being required to repeat it. Six schools reported that they definitely did not conduct any in-course assessments.

Only fourteen schools stated that anaesthetics is or can be part of the 'critical' assessment system, but only four schools stated that it is definitely not. Five of the fourteen added that an anaesthetic presence in a written paper or in the oral examination is occasional rather than guaranteed. Furthermore, where anaesthetic questions are included they may not be compulsory. The usual examination link is with surgery: eleven schools include anaesthetics in their Final surgery examination or in the surgical quota of Finals questions. At three schools anaesthetics questions may appear with other specialties or in other papers.

PROBLEMS AND DEVELOPMENTS

Resources

Seven schools are concerned over the staff–student ratio or the student–staff–patient ratio. One solution has been to spread out into other hospitals, but though this has positive advantages, it has brought other problems of ascertaining and standardizing the quality of the teaching. Six schools would like an academic appointment/s (or a further academic appointment) in anaesthetics, to take some of the load off the NHS staff who in addition to medical undergraduate teaching have very full patient care commitments, in addition to postgraduate and perhaps dental teaching commitments. One of these six and another two schools express a wish for an academic department, which would enable access to funds for secretarial and technical assistance, and equipment for teaching (one London school is getting such a department). Three schools are dissatisfied with the accommodation available and would like a seminar room in which to teach. Lack of resources also prevents the development of teaching aids in three schools at least.

Other practical difficulties can arise through geography—where students are scattered in more than one hospital or hospital wing and cannot easily be gathered together for seminars, case conferences, or anaesthetic teaching rounds (three schools). Insufficient residential accommodation also prevents students gaining in-depth or emergency experience which the staff are willing to give (three schools).

Organization of Teaching

Many of the complaints centred on anaesthetics' place in the timetable. At some schools it is merely inconvenient, at others it is a serious handicap and prevents the staff fulfilling the objectives they have set for themselves. Nine schools feel they have generally insufficient time allocated to them; six of them have full-time attachments lasting either a week or two weeks, a seventh has a half-time attachment. Schools with a smaller and intermittent allocation of time were more often found to complain of the difficulties inherent in 'sharing' with other specialties. Three schools described the problems of maintaining students' concentration and of planning a really useful course while competing with other 'special' or 'minor' subjects, and seven schools pointed out that though the connection with surgery is a necessary one, surgical events are too unpredictable for anaesthetists to be expected to base their teaching on (or between) them, and even where the anaesthetics teaching is a small full-time oasis within a larger surgery attachment, students and surgeons alike may resent the interruption. One school whose anaesthetics course occurs in the first clinical year finds this unsuitable: it would prefer it to be later.

Five schools (including three Scottish ones) would like to have a distinct place in the curriculum for a clinical attachment of consecutive days, half-days, or ideally weeks, which none of them has at present.

The teaching of anaesthetics is also affected by two problems concerned with the subject itself. Firstly, five schools expressed the dilemma that, as a mainly postgraduate specialty in its 'pure' form, anaesthetics may be regarded by many students and other staff as irrelevant to undergraduate needs; and if anaesthetists can justify their place in the undergraduate curriculum they still have to avoid giving the impression that rigorous postgraduate training is not required for the specialty. Secondly, four schools find that students' motivation is weakened by the absence of formal or critical assessment in the subject (not realizing that a sound grounding in anaesthetics can enhance their performance in their assessment in other related subjects). Improvements which respondents would like but are unable to make to their teaching include more tutorials (one school), increased teaching and the introduction of the principles and techniques of intensive care (three schools), the opportunity for more or all students to carry out practical techniques such as

intubation on patients, and also monitoring techniques (five schools).

One respondent suggested that students be given much more responsibility for patient care not only in anaesthetics but in the whole clinical course: learning through 'total commitment' is the best way, but this cannot be operated in only one specialty and not in others.

Linking up with other specialties and disciplines is advocated by a total of twelve schools, six of whom would like to experiment with or expand joint teaching sessions with other clinical specialties, for example in topic discussion. Eight of them are interested in developing combined teaching with preclinical departments: four do so already. Anaesthetists in one English school wish to integrate vertically *and* horizontally, with physiology, pharmacology, and medicine (particularly in the fields of respiratory problems and acute intoxications), and with surgery (with particular reference to trauma and pain relief).

A total of twenty-seven schools reported changes which had recently taken place or were about to do so, affecting the way in which anaesthetics is taught. Eight schools reported the possibility of future changes, only two of whom have not already experienced some recently. Five schools were unable to indicate any noteworthy developments. Most changes concern organizational matters: timetabling and relationships with other courses. If the whole curriculum is being redesigned this subject is likely to be involved, with others, in new developments: six schools gave this as the reason for anticipating changes in the immediate future. Most changes too have been welcomed, or carried out on the initiative of anaesthetists themselves. However, in two schools the period occupied by anaesthetics has been reduced significantly, though possibly not permanently. At another, the separate lecture course in anaesthetics has ceased. At five schools the standard of anaesthetics course has, it is felt, risen, with more structured and conscious teaching being facilitated by the allocation of a longer or more concentrated time-span. At a London school for example, the course has become a full-time one and can now incorporate practical instruction, seminars, and topic teaching, to cover a wider range and in better balance than before. At two other schools some clinical experience in the subject has been formally introduced into the curriculum, where previously it was less well recognized, and although the programme cannot be as broad or continuous as in the schools described above, the situation is clearly regarded as an improvement. In addition, one of these two will soon offer an elective attachment. Interdisciplinary teaching and 'guest speaking' are significant developments in several schools: four note this as the innovatory feature of the last few years; two expect to establish links with basic science courses and three are planning for less 'separate' teaching by anaesthetists in favour of joint teaching with surgeons on selected topics or selected cases. Two English schools intend to relate all the work in their 'full-time' attachments to the care being given by

obstetricians, surgeons, etc., in partnership with anaesthetists: this 'clinical team work' concept of teaching will follow separate 'core' teaching by anaesthetists.

Other developments relating to ways and means of teaching included: greater individual attention for students (one school); in-course assessment to show students in an objective but informal way how much they have learnt (four schools have introduced this as an essential part of their attachment schemes and a fifth is to introduce it both at the beginning and end of the programme); and anaesthetics teaching being arranged in hospitals other than the parent teaching hospital (one school).

In summary, in London, England, and Wales, anaesthetics has become a well-recognized element of the curriculum with a full-time attachment as the normal occurrence. In Scotland and Ireland, students more often receive a sessional exposure to it, with a higher proportion of lectures to clinical work. The specialty's potential contribution to students' general medical education has become accepted, in adopting policies of 'applied pharmacology' and 'applied physiology', in lecturing and demonstrating in physiology, pharmacology, and clinical pharmacology courses, in slotting into co-ordinated lecture series, in sharing topic talks with other clinical teachers, and in encouraging wider discussion on such issues as intensive care and resuscitation. However, in the field of clinical teaching, most anaesthetists are anxious to retain their new separate identity. Furthermore, the majority of anaesthetists who teach undergraduates are non-academic. As student numbers expand and as a wider net is cast for hospitals which will take in students, this proportion will probably increase.

Anatomy (including Histology)

Questionnaires on the teaching of anatomy were completed by thirty-three medical schools. The four 'clinical-only' schools were not asked to reply, and the one remaining medical school did not complete its questionnaires on the subject; information on this school is thus limited to basic details.

The teaching of histology, frequently included within the teaching of anatomy, is described at the end of this report.

TEACHING ARRANGEMENTS

Anatomy as a major subject reflects in its organization the policy which a medical school operates for the basic medical sciences as a whole.

If teaching in the early years is structured around 'systems', the teaching of anatomy will be integrated with other subjects: if on the other hand the structure of the teaching is departmentally or subject-based, then anatomy will be a self-contained independent course. Thus, in two schools anatomy is fully integrated with other subjects, and in a third it is consistently co-ordinated with other subjects though not fully integrated in terms of actual teaching activities. In ten schools anatomy is timetabled and taught entirely separately, with little or no direct relationship with other courses or departments, although in some of these schools interdepartmental planning committees are attempting to harmonize the various separate courses, to achieve some temporal co-ordination of content.

The majority of schools lie between these two extremes. In nine, anatomy is partly integrated with other preclinical subjects; in seven, there is partial integration with clinical subjects: five further schools have both arrangements.

Total integration is almost always based on the 'systems' approach: all facets of a selected body system are taught in close sequence by teachers from the relevant disciplines. However, there are two standard patterns

of 'partial integration', which can sometimes be found together in the same school. In the first pattern, the first year (or first stage) of anatomy teaching is a 'separate' affair, but the second year (or stage) sees the subject combined with others. The first stage is often described as 'basic', with the second stage being 'applied', especially where clinical teaching is incorporated. This gives students a chance to absorb the fundamental principles before more complicated, cross-referencing demands are made of them; it is practised by five schools. In the same way, some anatomy can be taught in the clinical years: in five schools, anatomists join clinical staff to extend the anatomy course beyond the confines of the preclinical curriculum by integrating 'upwards'.

Secondly, fourteen schools have special sub-courses devoted to certain topics such as neurosciences/neuro-anatomy, or reproduction. More than one department has a share in teaching them although anatomy may well be the senior partner in terms of time or responsibility for co-ordinating the contributions. Some schools have only one of these courses; others have several.

Histology may also be timetabled independently, and can be an inter-disciplinary course to which anatomists and physiologists (and even pathologists) contribute. In a few cases it is timetabled with physiology, but twenty-two schools include it firmly in their anatomy courses. (The arrangements for teaching histology are described in greater detail at the end of this report.)

Two medical schools also offer special one-year 'transfer' courses in anatomy to students from Cambridge who wish to enter a clinical course, and are qualified to do so except for a 'deficiency' in anatomy, through having chosen other subjects during their preclinical course before they finally opted for medical studies.

Position in the Course; Teaching Time

Except for the comparatively small amount of clinically related teaching conducted in the later years, all teaching of anatomy takes place in the first two years of the medical course—traditionally, the 'preclinical' years. Generally, the bulk of teaching is given in the first preclinical year; however, in two schools the main effort takes place in the second year, and in five schools teaching time in the discipline is distributed more or less evenly between the first and second years.

The actual amount of teaching time varies considerably—details are given in the table below. Two sets of figures are shown: the first (Row A) classifies the total amount of anatomy teaching given to students in the thirty-three schools replying, whether histology is taught as a part of anatomy or not. Only twenty-three schools were able to give a figure for anatomy teaching time *exclusive* of histology teaching: these figures are classified in Row B. While both sets of figures must be treated

	A Total anatomy teaching (n=33)	B Anatomy exclusive of histology (n=23)
No. of schools with teaching time (hours) between: 210–50	0	3
251–300	6	5
301–50	5	6
351–400	8	6
401–50	4	3
451–500	6	0
501–50	4	0
Range (hours)	264–530	229–450
Average (hours)	394	333
SD	81·6	60·1

cautiously—as always with estimates of teaching time—there is no doubt that great differences exist between schools.

Several respondents estimated the amount of time spent on 'clinical teaching'. This can be teaching by clinical staff with or without patients, or by medically qualified anatomists using patients or their case-histories to illustrate a point. Six schools give up to twenty hours of such clinically related teaching and four have more than twenty hours; a further eight have a fairly regular amount each year but which could not be estimated in terms of hours.

FEATURES

Aims and Objectives

Perhaps the strongest theme to emerge from replies to the questionnaires is that of the 'living body'. Fifteen repondents believe they should teach human biology in the full sense, and they therefore focus on structure and function, with functional anatomy being considered very important. This group of schools contains some whose courses are fully integrated, some with partly integrated ones and some with completely 'independent' courses.

Another group of eight respondents sees the principal role of anatomy as that of an intellectual training ground. It is ideal for developing abilities of observation, analysis, independent thinking, correlation, and problem-solving—in other words, scientific thinking. These skills are regarded as essential ones for doctors (and indeed undergraduates) to possess, and are best taught at the earliest possible stage, using the

human body itself. Anatomy is thus a rigorous, scientific mental discipline.

In contrast to this academic approach, sixteen respondents regard the subject in a more vocational light: they are very conscious of being involved in the training of future doctors. Clinical relevance is therefore emphasized wherever possible and the importance of 'applied anatomy' steadily increases towards the end of the course. The clinical emphasis is an integral part of the whole course, and not just a matter of incidental demonstrations or isolated guest speakers. Three of these schools belong to the group whose staff takes some part in the teaching of clinical students. Four reported that the majority of their staff are medically qualified, and at one school all full-time teaching staff are medically qualified, with some part-time teachers in the department being practising surgeons with contractual obligations to teach anatomy classes. At another school, all members of the anatomy department have established research or teaching associations with appropriate clinical departments and the head of the department himself is an honorary consultant with clinical commitments.

Teaching Methods

The question of general dissection was discussed by several respondents: it is clearly very controversial. Seven respondents reported dissection as the most effective way of learning anatomy, and it is a feature of their courses both in the time devoted to it and in the weight placed upon it: indeed, it is central to their teaching philosophy. Students acquire familiarity with the human body through working on it, their hands become more sensitive and dexterous and they grow in awareness of the relationship of one part of the body to another through direct tactile and visual contact. At the other extreme, one school as a matter of policy requires no dissection by students: all teaching is conducted on prosected material. A compromise approach has evolved at four schools where dissection is carried out, but on a selective basis: there is no comprehensive dissection through all areas and systems—certain areas and systems are selected which have significance for the diagnosis and clinical examination of common afflictions, and they are supported by prosected material. The view taken is that dissection is valuable but should not be an end in itself; time and students' technical skills must impose limitations.

Students at two schools are invited to come for 'open house' dissection. This is reported to be eagerly accepted, and they can be found in the anatomy dissecting rooms in the evenings and on Saturdays, supplementing the official diet at their own pace and on sections of their own choosing.

Several other features of the teaching of anatomy which respondents consider valuable or interesting were reported in the questionnaires.

Small-group teaching is practised to a notable extent in eight courses. It may take the form of tutorials on prearranged topics or of small-group practical work under the supervision of designated members of staff. Students are often assigned to the same tutor for a section of the course or, in one school, for the whole course. Staff–student discussion and assistance for individual students are therefore encouraged.

Audiovisual aids are widely used. Ten schools used recorded video-tapes or live closed-circuit television programmes, for example to demonstrate dissecting techniques. Two schools use cine-films. Models and artificial reconstructions have been produced in three departments: some are life-size, and some are made of Plasticine or paper cut-outs. One respondent mounts the models on standing displays for students; five other schools have displays, variously consisting of coloured slides and photographs, mounted and preserved specimens, reproduced text, and audiotapes. Students consult them for self-instruction and self-assessment in their free time. One school drew attention to the free access which it permits students to have to them during evenings. The X-ray is also a popular visual aid: in nine courses radiologists regularly appear to teach radiological anatomy and to illustrate normal and abnormal structure and composition. Co-operation with pathologists has been developed by two respondents, who borrow specimens and museum pieces for teaching purposes, especially in histology.

One respondent draws students' attention to the current research activities of his department and to the directions which anatomy is likely to take in the future. He feels it makes the course more exciting for the students who might otherwise see anatomy as a 'dead' subject.

STUDENT ASSESSMENT

All medical schools with 'preclinical' courses examine students in anatomy as part of their system of 'professional' or 'critical' assessment. In seventeen schools, anatomy always has a separate examination; in seven schools it is always combined with other subjects in integrated format. Not infrequently there is more than one stage of professional assessment in the subject and at four schools anatomy is examined separately at one stage and in combination at another. If integrated topic courses are taught then they may be assessed in their own right rather than within anatomy.

Most schools gave some information about in-course assessment. The methods used vary considerably. Conventional class examinations are held at the end of a term or a year; practical class work may be noted; tutors may write subjective reports; students may write essays; and informal oral tests may be administered. 'Spot' assessments are given in three schools which serve as measurements of a student's grasp of an

idea and ability to correlate: a high degree of refinement can, it is asserted, be achieved in designing 'spots' and building up a collection of them. In-course assessment can be a separate operation for anatomy (sixteen schools): or conducted entirely in combination with other subjects (three schools). Here it is similar to the pattern for the major critical assessments and generally corresponds to the organization of teaching.

Some or all of the in-course assessment is 'critical' to the students' progress in sixteen schools. Marks are forwarded to be added to the marks of 'end-of-course' assessments, or they can form the basis for exemption—partial or total—from 'end-of-course' assessments. In a few cases, students are only required to take an end-of-course examination covering the work of the whole course if the sum of their in-course assessments is below some predetermined level, and in these schools only a small minority of students will take the end-of-course examination. However, staff in one anatomy department where an 'accumulative' system of in-course assessment modules has been introduced say they find it too complicated to understand.

PROBLEMS AND DEVELOPMENTS

Resources

The most prominent cause for disquiet is the difficulty in the recruitment of medically qualified anatomists, due to pay differentials between preclinical and clinical departments. No less than twenty-two respondents referred to it; they represent all geographical groupings (except Northern Ireland) but with a preponderance of English provincial medical schools. As older members of staff retire, the problem becomes more acute. As a potential solution, a number of respondents would like anatomy posts to carry a part-time sessional appointment in a clinical department. Such appointments would have the double benefit of financial incentive and the opportunity to maintain a foothold in the clinical world through clinical and research activities. One medical school is definitely planning just such an arrangement, and one school already permits full-time medically qualified preclinical staff to contract for extra-sessional work (normally one to two paid consultant sessions with the health authority). According to one respondent, trainee postgraduate radiologists could be seconded to anatomy departments on a part-time basis to help with teaching.

Seven of these schools and six others have a more general staffing problem. As student numbers increase, the load on existing staff becomes heavier, yet the creation of new posts has virtually ceased. Small-group teaching is therefore inhibited and staff are too busy to give time

to the preparation of audiovisual and other teaching materials for independent study which in the long run might alleviate the strain on personnel. Nevertheless, teaching aids are coming into widespread use. Seven schools have recently introduced audiovisual aids, or significantly increased their stock, and four schools have begun to issue handouts. In future two of them and four other schools hope to rely more on teaching aids and especially on tape–slide programmes for independent primary learning and for revision. One school is to make greater use of television. Five respondents deplore the lack of audiovisual material and wish there were more of it available to suit the students taking their own course: they point out that home production is very time-consuming.

Four departments have reluctantly come to rely on part-time, temporary staff as demonstrators, and, sometimes, as tutors. Usually they are postgraduate doctors studying for higher qualifications, and their interest in and aptitude for teaching is variable—they are a floating population. Their main advantage is that they are medically qualified.

Finally, with respect to staff, at one school a shortage of technicians is said to be seriously handicapping the teaching of anatomy.

Accommodation on the other hand is the main cause for complaint by five respondents: teaching facilities are cramped, old-fashioned, uncongenial, and totally unsuited to modern teaching styles. One of these schools is particularly lacking in space for students to practise independent study—space for carrels, display stands, quiet areas.

Organization of Teaching

Many schools have recently been through a major curriculum overhaul which has had repercussions on anatomy. Ten respondents not only had their courses re-timetabled but also took the opportunity to reconstruct them to meet new objectives. Indeed, remodelling was particularly necessary in the six departments left with a reduced time allocation. Thirteen schools altogether have reduced the teaching time devoted to anatomy over the last few years, and a fourteenth is about to do so. However, following re-timetabling and other pressures on anatomy in recent years, seven respondents feel their courses are too short and intensive. As we have seen, many anatomy courses are concentrated in the first preclinical year, and a heavy workload at that stage does not necessarily lead to optimal outcomes. Thus, six respondents propose that their courses should be stretched: the actual amount of time would be unchanged but would be spread over a longer period to help students to assimilate and retain what they are taught.

Anatomy courses in five schools are likely in the future to become integrated with other courses to varying degrees, with less independent teaching, as part of general reorganization of preclinical curricula. Their teaching will be co-ordinated mainly with that of other 'preclinical'

departments. Two more respondents would like to arrange closer links with the teaching of physiology and possibly other subjects but are unlikely to realize their ambitions very soon. On the subject of integration, two respondents propose a radical change in the course structure. They would like to plan a two-tier course. The first level would consist of basic principles, taught solely by anatomists; the second level—possibly after a gap of a year or so—would be a multidisciplinary course of 'applied anatomy' and topographical anatomy, taught by anatomists and clinical specialists together. This is not unlike the scheme now operated by one English school where lecture courses in surgical anatomy, orthopaedic anatomy, and neurological anatomy are given equally by clinicians and anatomists in the junior clinical year (beginning in the summer term of Year 2) when students are on part-time clinical attachments. An intensive basic course is held in the first year.

The question of anatomy's relationship with clinical subjects is a difficult one. Four respondents feel themselves isolated from the rest of the medical school; students perceive the subject as irrelevant or as something to be 'endured' before the interesting 'real' training can begin. Ten respondents altogether expressed a wish for closer links with clinical departments, which could be achieved either by reshaping course structures or, more easily and informally, by the use of integrated teaching sessions and by inviting in 'visiting' colleagues.

Teaching Practices

A stronger clinical flavour is being given to some anatomy courses by judicious use of the second, 'informal integration' practice mentioned above—namely, referring to clinical examples in lectures, bringing clinical specialists to take some classes and demonstrating patients or case-material at special sessions. Three schools reported this to be a significant recent development and two others intend to do significantly more of it in future. However, some respondents point out the difficulties: even when the clinical specialists have formal commitments to the anatomy department they may be unable to conform to the necessarily rigid preclinical timetable when they have overriding patient-care duties. Also, unless the clinicians are well-chosen and represent several different fields, the 'applied anatomy' will be uneven and (unintentionally) biased.

Two courses now include visits to the mortuary in the pathology department where pathologists teach 'morbid anatomy' on post-mortem cases to the anatomy students. One of these schools would take this collaboration further. Two schools have plans for some joint teaching with pathologists, initially for histology and histopathology, and another 'preclinical-only' school would like to have such arrangements made possible for them.

It is difficult for an anatomy department to plan its teaching unaided and to decide whether to risk criticism and to determine what should be included and what could be excluded. Four respondents expressed this dilemma: they would like more guidance from the medical school about objectives or alternatively greater authority to define and follow their own objectives. One of these respondents claims 'this constitutes the greatest problem which we face': a policy on what is essential for the undergraduate to learn must be agreed and accepted by the whole profession. Nevertheless, one department has carried out a 'study-in-depth' of the amount of factual knowledge which should be required of the student to achieve the desired result. Course objectives have been defined and are issued to all students.

Several schools have managed to reach a consensus of opinion on planning modern anatomy courses, and the courses have been remodelled accordingly. In seven schools (an eighth has definite plans to accomplish the same purpose within the next year or so) the various components of 'anatomy' have been reshuffled into better relationships *vis-à-vis* each other: the course has now a more satisfactory internal organization. Indeed this is a problem mentioned in two reports: how to relate the 'old' anatomy and the newer related sub-disciplines to each other, when they are really separate entities, each of the latter growing in importance as progress in research continues. Another solution to the question of the 'sub-sections' is to hive off these awkward offspring and to share with other departments responsibility for them. Two schools described how they have recently established separate, multidisciplinary neuro-science or neuro-biology courses; one of them at the same time established a similar separate and multidisciplinary course covering embryology and aspects of reproduction.

With regard to course content four schools—two of them involved in planning whole new curricula—expect to give more attention to the topics of human reproduction and human growth and development in the 'preclinical' period. More time and more stress will be given to them, as topics in their own right. There is also a continuing trend towards functional anatomy: two schools reported that a deliberate change in emphasis has taken place and two more schools will take this direction as matter of major policy.

Following retimetabling and re-evaluation of anatomy courses, the amount of dissecting done by students has diminished in six schools. Prosected material is increasingly used instead and so instruction is more intensive as far as staff–student contact is concerned. In contrast, there is probably now more dissection done by students in two Irish schools where a greater supply of cadavers has been arranged, overcoming a previous problem. 'Open-house' dissection is to be introduced at an English school.

Two other schools intend to increase the opportunities for

self-instruction and independent learning, for example with problem-solving exercises. Another has developed small-group teaching into one of its significant basic teaching methods.

Important changes were reported by a total of twenty-eight respondents in relation to the immediate past. Sixteen respondents described changes which they are on the point of implementing: some important ones which have been mentioned here, and also relatively minor or miscellaneous ones (five cases). The possibility of change was indicated by a further five respondents from schools where proposals for curriculum reform have not yet been finalized.

Histology

Three schools returned unsolicited supplementary questionnaires on histology. Although the subject is not one of the listed disciplines and specialties which the Survey chose to investigate, it was thought useful to comment briefly upon the information made available in them, and also, *en passant* in other questionnaires. This sub-report should however not be regarded as comprehensive.

TEACHING ARRANGEMENTS

Most often histology is taught allied to anatomy: this applies in twenty-three schools. In seven schools it is part of the physiology course. Two schools have made histology a joint teaching responsibility of both parent disciplines, who each set aside time and staff for the subject (although very recently—summer 1976—one of these schools has abandoned the arrangement and teaching the subject is the responsibility of the anatomy department now). In the two remaining schools it is a component part of a larger multidisciplinary course in, for example, 'Cells and Tissues'.

Six of the schools have separate courses or sub-courses in histology, lasting from 50 to 100 hours. One of these is within the framework of physiology, and the three others are under the aegis of anatomy, and the other two are the separate 'joint' courses. Generally the teaching of histology is principally in the first preclinical year.

STUDENT ASSESSMENT

The 'critical' professional assessment of histology can be either 'separate' or, in two cases, combined with that of anatomy or physiology. Only one

of the separate histology courses has in-course assessment which is critical in its effect on students' progress. The others rely upon end-of-course examination exclusively. The school with in-course assessment tests students on their knowledge of each system as soon as it has been taught; histology and physiology have an equal share in the total marks available and students must reach a minimum of 40 per cent in histology and an average of 50 per cent of the combined marks. Only if they do not reach this standard by the end of the course is a supplementary 'whole-course' examination compulsory.

FEATURES, DEVELOPMENTS, PROBLEMS

At a general level respondents view histology as a 'bridge' between anatomy and physiology. It therefore has an important correlating role in the curriculum. It also provides a natural lead in to pathology and can arouse students' interest in the latter and prepare them for it. Secondly, histology affords an opportunity to train students in microscopy. All doctors, it is felt, should be reasonably adept at using microscopes and moreover they must be trained in accurate observation: a histology course can develop their powers of visual discrimination and description.

At a more specific level, certain aspects of their courses were mentioned by some respondents who regard them as particularly useful or interesting. Collaboration with pathologists, for example, has developed in a few schools in the form of fresh or preserved specimens from the pathology department being used for laboratory analysis in histology classes. Electron microscopes have often been introduced into undergraduate courses; at one school use of the electron microscope and of light microscopes is equal and material analysed by each method is brought together in comparative problem-solving exercises.

Voluntary seminars for overseas students are run by one department to help them overcome language difficulties with the special terminology. This department also holds additional voluntary laboratory classes in the second preclinical year; those in the first year are compulsory.

The most pressing problems are those faced by many anatomy and physiology departments, particularly relating to staffing and accommodation. The staff–student ratio is often regarded as unsatisfactory and inhibits the development of small-group teaching. Furthermore, histologists are a rare breed; those with suitable background for teaching medical students are even more rare, though the problem of medical qualifications is not so acute. With respect to physical resources, histology is space- and equipment-intensive. Laboratory accommodation

is inadequate in some schools, and microscopes used by students may not be replaced when they ought to be, for lack of funds.

If the staff and equipment were available, one respondent would be introducing more practical procedures—such as simple histochemistry—into his course.

Biochemistry

Thirty-three medical schools returned their questionnaires on the teaching of biochemistry—that is, all schools offering preclinical courses except one. This latter school supplied information only about 'Teaching Arrangements', omitting to answer the more general questions.

TEACHING ARRANGEMENTS

In most medical schools biochemistry is timetabled separately for the bulk of its teaching and so on the whole is regarded as an independent subject. However, several schools have one or more special sub-courses on such topics as human reproduction, nutrition, the nervous system, and so on, which run in the early years of the curriculum and which contain a significant portion of biochemistry among the contributing disciplines. Secondly, while the actual teaching may be conducted separately, there are frequently 'joint planning agreements' between the main preclinical disciplines so that their courses are 'harmonized' with each other: they proceed in parallel and deal with the same system at the same time and may occasionally fuse for joint symposia or demonstrations. The risks of imbalance and unwarranted overlap are thus avoided.

'Separate' and fully 'integrated' teaching arrangements cannot therefore be viewed as the only possibilities: they are the two extremes of a continuous spectrum, between which most courses will be found. It is possible to identify on this continuum eight schools where biochemistry is timetabled almost completely separately; and five where integrated timetabling is the rule, though individual teaching sessions may of course be 'separate' within an integrated course structure. A third possibility which is practised in four schools, is for the first stage of students' experience of biochemistry to be 'separate', and for the second stage, once the roots of the subject have been firmly planted, to be taught integrated with other subjects. Other schools are to be found more centrally in the spectrum.

In a number of English provincial schools and Scottish schools, biochemistry is a separate subject but taught as a single course to both medical and non-medical students, veterinary and/or dental and/or 'pure' science students—with a few additional and alternative classes, tutorials, and demonstrations, for example, for the medical students.

Position in the Course: Teaching Time

Biochemistry remains firmly a 'preclinical' subject: teaching is concentrated in the first two years of the medical course. In twenty-two schools, it is concentrated in the first year; in two schools only does the main teaching effort take place in the second year, with much less in the first year. Other schools distribute biochemistry more or less evenly between the first two years. Some biochemistry is taught in a subsequent 'middle year'—the first clinical year—at one school, but even here the majority is given during the first two years.

The figures for identifiable teaching time on biochemistry are given below: as with all such estimates, however, they are not as precise as one might wish. Five schools are not included; they are those at which, either because of significant amounts of integrated teaching or due to variations in student experience, firm estimates cannot be given.

Teaching time (hours)	*No. of schools*
101–50	4
151–200	9
201–50	10
251–300	2
301–50	3
351–400	1
Not estimable (see text)	5

The over-all average teaching time in the twenty-nine schools in the table is 216 hours (SD 58·7). The London medical schools devote noticeably more time to biochemistry (mean 260 hours, SD 67·5) than do the rest (mean 197 hours, SD 43·0).

FEATURES

Aims and Objectives

Most respondents described the aims or guidelines which underlie the way their course is planned. These themes relate to the course as a whole and justify the decision to teach one way rather than another; they are not all mutually exclusive and some respondents subscribe to more than one.

A common approach (fifteen schools) is to divide the course into two stages. In the first, teaching focuses on the basic principles of biochemistry, and may be similar to courses given to students not following a medical course. In the second stage, teaching is 'vocational' and directed towards the clinical application of the information being imparted; it is structured quite differently from the earlier stage.

Fourteen courses are given a clinical slant from the very beginning. The material is selected for its relevance to a medical career and the subject thus taught could be called 'human biochemistry'. Clinical references are made whenever appropriate and great efforts are made to prepare students for their courses in subsequent years and also to make the classes interesting. The clinical bias can increase from a minor to a major feature as the course progresses and six of these fourteen schools present the two-tier structure described in the previous paragraph: they have eliminated unnecessary 'chemical' matter to produce a course which leads from normal to abnormal human biochemical functions.

Eleven respondents believe it very important to make their students fluent in the biochemical approach to problems. This is synonymous with the scientific approach, from observed evidence to justifiable conclusions. Students must acquire rigorous mental habits of accurate measurement, unprejudiced observation and interpretation, to carry with them in all that they do in later life. Four respondents believe that the 'relevance' of this approach can only be appreciated over a lifetime. Medicine is developing rapidly and unpredictably, and so it would be wrong to prepare students only for what are now accepted or foreseeable practices; they must also be equipped so far as possible to understand advances in medicine which may occur years hence, so that they will be able to evaluate for example potential improvements in the care of their patients. A sure foundation in biochemistry will provide the essential framework to absorb new developments. One respondent added that a valuable though perhaps secondary feature of biochemistry is the opportunity it provides to learn manual skills. Students are able to handle complicated equipment and various substances—sometimes precious or dangerous ones. This in itself is useful experience—they should become more dexterous and attuned to codes of laboratory practice.

Three courses begin with handouts being given to all students, detailing the objectives for the course and for each component section of it.

Teaching Methods

Where clinical teaching is a feature of the biochemistry course, it is generally strongly emphasized and praised. Often, its introduction has been a recent development, but it is not only popular with students but

is said to make biochemistry more popular with other staff in the medical school who are often pleased to see biochemistry's relatively large allocation of teaching time being used—as they see it—more fruitfully. These clinical sessions can be divided into two types: those where clinical staff only are involved and those where patients are involved. Sixteen courses involve clinical teachers on a regular basis; usually physicians or chemical pathologists. They teach aspects which the 'pure' biochemists feel unqualified to tackle. At one Irish school almost the whole biochemistry course is taught by a medically qualified clinical biochemist (the professor himself), who maintains service responsibilities in a general hospital and directs a metabolic research unit. However, this is a unique position, as the normal arrangement is for clinical staff to be grafted on to the basic 'non-clinical' course. At a Scottish school for example, four 'Medical Seminars' each lasting 1–1½ hours have been added to the course, on such topics as phenylketonuria and vitamin deficiency diseases: students are encouraged to join in the discussion, and 'the main speaker is a guest clinician from one of the local hospitals who is usually an Honorary Lecturer in the Biochemistry Department. The seminar topics are chosen to complement information given in the formal lecture programme, and the relevant Biochemistry staff member is also present.'

Patients are demonstrated in ten courses. They are used to illustrate a point which requires emphasis and serve to make the course seem less remote and abstract. The amount of time given to this clinical illustration is difficult to estimate and may vary from year to year; some courses contain more than ten hours but none more than twenty hours. In four schools some teaching is actually conducted in hospital; students are taken to ward rounds, special clinics or on visits to laboratory departments. Both clinical staff and patients are likely to be involved.

Combined sessions with pathologists are held in three schools. Biochemists and chemical pathologists join together in topic-teaching sessions which are a scheduled part of special multidisciplinary courses (for example, cell biology, endocrinology, etc.). Two of these schools plus a third one run similar topic-teaching sessions by biochemists and physiologists together. One school where a large and 'separate' course in the first year is succeeded in the second year by several special interdisciplinary courses, stresses the relationships with other subjects even in its early independent course and explicitly deals with the molecular aspects of genetics, medical physics, and so on, in preparation for these subjects' later solo appearance.

Three courses introduce students to research methods and to research programmes which are currently in hand: they may be interesting to students, who can see in what direction the subject is moving, and they may help students to evaluate later discussions on the subject.

Students without A-level chemistry are catered for by some initial 'remedial' teaching at one school before the biochemistry teaching proper begins. (At this school the premedical year was recently discontinued but some of its functions have been incorporated into the first preclinical year.) This ensures that all students are brought up to the desired level.

Of all the teaching methods employed, small-group activities appear to be the most popular and most successful: seventeen respondents mentioned them. They include tutorials and also group practical work—as opposed to individual experiments—with several students working as a team, designing, carrying out, and writing up an experiment under the supervision of a designated staff member.

Four courses particularly emphasize staff–student contact. Students retain the same tutor for long stretches or even all of the course, or are taught by only a few staff who get to know them well; again, certain teachers may be appointed 'course co-ordinators' and are personally involved in counselling students, smoothing the administrative arrangements and so on, beyond their primary teaching duties.

Two courses have invested fairly heavily in independent learning aids—tape–slide programmes, audio-tutorials, etc.—and have correspondingly decreased the amount of more formal teaching. One of these schools has a considerable amount of timetabled free-study time in which students can use these facilities.

Four schools issue handouts and summaries of 'core' subject-matter to students, and one of them and another school invite comments from students in return by giving them each a questionnaire to fill in at the end of the course; yet another has an active staff–student departmental committee and a students' biochemical society. Project work is required of all students in at least four schools.

STUDENT ASSESSMENT

All medical schools examine students in biochemistry as a major element of their system of professional or 'critical' assessment. According to the structure of the preclinical course as a whole, biochemistry may be assessed separately or in combination with other subjects. It is assessed separately, as a subject in its own right, at sixteen schools, while at eight schools it is always assessed jointly with other subjects. At four schools, where the subject is examined at more than one stage, it is examined separately and jointly on different occasions. Five schools do not conduct end-of-course examinations in biochemistry at all, except as a supplementary event for students who have performed badly at in-course assessments.

Twenty-seven respondents supplied information about their in-course assessment. In sixteen cases, this is entirely an intradepartmental

process, whereas at five other schools the in-course assessment is entirely or almost entirely of an amalgam of a number of subjects linked by a 'theme'. Three schools where students undertake a project or an extended essay, assess the end product formally, awarding a mark to it as part of the in-course assessment.

In-course assessment contributes marks to the end-of-course or professional assessment in twenty-two schools, and in ten of these a sufficiently high score for in-course tests can lead to exemption from end-of-course examination. In five schools the exemption is partial, but in the other five schools complete exemption is possible and students face no further assessment in the subject. In other words the in-course assessments—usually held termly or more frequently—themselves constitute the 'critical' assessment. At one Scottish school, for example, a cumulative system is operated. There are three class examinations, covering respectively the work of the first three terms, the work of the first four terms, and the work of all five terms. Marks from these examinations are summed with marks awarded for practical class-work and for students' laboratory reports: students gaining 60 per cent or more of the total possible are exempted from the Professional Examination, covering the whole five-term course, which the other students must take. (Students gaining 70 per cent or above are invited to an oral examination with the external examiner to select students for Distinction.) This system is considered a 'very valuable method of encouraging a student to work steadily throughout the year'.

PROBLEMS AND DEVELOPMENTS

Resources

Several schools report matters relating to staffing as a problem. Seven have either found difficulty in recruiting medically qualified staff or would like to have more medically qualified staff in post. However, fewer biochemists mentioned this as a problem than did representatives of the other major preclinical disciplines; it is possible that biochemistry departments no longer believe it desirable or worthwhile to have a high proportion of medically qualified staff, or perhaps, being a rapidly expanding discipline, it has been able to attract suitable personnel more easily than the older-established ones. Three respondents have a slightly different concern about their staff: they have found it difficult to recruit people, especially at senior level, who are 'gifted scientists *and* gifted teachers', who will bring equal enthusiasm to teaching undergraduates and to research. Pressure on staff from large and growing numbers of students is a widespread problem. Ten respondents claimed that their staff–student ratio is highly unsatisfactory, stretching teaching time to the limit, and preventing more small-group sessions which by subdividing

the class into manageable numbers would help to solve the problem. One of these departments finds that large classes make it almost impossible either to know what progress individual students are making or to be able to establish personal contact with them. Problems in recruiting technicians were reported twice. No school reported any recent or foreseen improvement in their staffing situation.

Poor accommodation was mentioned by four respondents; laboratory space in particular is regarded as insufficient. Three departments would like more laboratory equipment to enable students to conduct more experiments themselves. One department has recently acquired some sophisticated apparatus and now students are recording measurements, etc., which it had previously not been possible for them to do.

Five schools mentioned particularly that they have introduced audio-visual aids into their courses recently, including tape/slide and other facilities for independent self-instruction. Four others expressed the desire to do so, but are lacking in the time or the facilities required to produce material.

Organization of Teaching

Fifteen schools have recently reorganized their curricula, and the re-timetabling and re-definition of approach has brought about totally new courses in these schools. In two schools, the time allocated to biochemistry has been reduced. However, only three respondents feel the time allowed to them is insufficient to do justice to the subject. A fourth would like a better distribution of the time, with longer periods available for laboratory work: the slower students do not have time to complete their work, and long-drawn-out experiments are impossible.

Six respondents have come to the conclusion that no worthwhile further progress in the biochemistry course is possible until the whole preclinical course is revised thoroughly. All the courses should be 'spring-cleaned', the irrelevant content pruned, and each component subject closely correlated with the others.

Collaboration with other departments is developing in several areas, both formally and informally. Five schools have definite plans to establish or extend liaison teaching with other preclinical departments and a sixth has some grounds for expecting to do so. Two of these schools also expect to collaborate with clinical chemists, and another is hoping to do so. Already seven schools have developed integrated activities, and in some cases these have become special courses. For example, one school runs short courses in haematology, genetics, immunology, and nutrition, each involving no fewer than two other departments besides biochemistry, and sometimes more; there is also a course in endocrinology, shared between the Department of Biochemistry and a Cancer Research Institute. Clinical staff of several

different specialties participate in these courses, and in the special series of eight weekly 'Biochemical/Clinical Seminars' for second-year students. (Topics for these Seminars have included prenatal diagnosis, bile and cholesterol, dust diseases, aspects of the cancer problem, radio-immune assay, megaloblastic anaemia, fatness, thinness, myeloma, and the mucopolysaccharides.)

Other respondents recognize the potential benefits of liaison teaching but present circumstances conspire to prevent them achieving it. Five would like to join forces with chemical pathologists, four to join physiologists, three to join pharmacologists, and one to collaborate with pathologists. The activities envisaged range from completely integrated courses to occasional topic-teaching sessions. The disciplines envisaged are 'horizontal' neighbours or those with close subject-matter affinities.

A perhaps more ambitious type of vertical integration is proposed by nine respondents. They would like some biochemistry to be scheduled in the clinical course and to see biochemists teaching with clinical staff on clinical problems. Only one (London) school has achieved this so far, and only to a limited extent.

Inevitably, respondents are concerned as to what to include and what to exclude from their courses. The subject is expanding while available student learning time is often diminishing. Should they teach only what students perceive to be relevant? Should the advice of people currently engaged in clinical practice be sought? Should a view to the future be sustained and students prepared to cope with advances ten, twenty, or thirty years ahead? Nine respondents are perplexed: are they forced to choose between relevance and basic education—or can the two approaches be combined?

One factor which often inhibits departments from designing the ideal, balanced course, is the uneven standard of first-year students' knowledge of chemistry. Almost all students will have studied chemistry but in very different courses and to varying levels. Seven respondents (not geographically related) mentioned this. Others however reported that the high academic quality of the present generation of students is making their task easier and more rewarding.

Over the last few years, there has been a shift of emphasis towards 'relevance' in spite of the dilemmas it poses. Ten respondents described enthusiastically how their courses have been adapted in this way to the needs of medical students. Course content has been revised and biochemists, with or without help from clinical colleagues, have given their teaching a clinical orientation. For example, an Irish school has introduced 'laboratory rounds' for biochemistry students in the two major teaching hospitals, and computer-linked programmed learning which gives students access to 'real' case-histories on which they can test and reinforce their knowledge of biochemistry. At another Irish school students have been attending regular hospital clinics run specially for the

biochemistry course, and the week's teaching leading up to each clinic has been restructured to focus on the problem to be seen there. Furthermore, as an experiment the entire course is to become 'case-oriented' during the coming year.

Three schools definitely and two schools possibly will increase the number of clinically related sessions, using patients, clinical staff and case-histories. One of them intends to expand the number of small-group hospital classes which have proved extremely popular, and to build similar preclinical/clinical bridges in general practice settings. This school would like greater opportunities for contact with patients than is possible at present, as would one other. Videotapes are suggested as an alternative. One respondent would like to offer a separate course in nutrition, under the auspices of the Biochemistry Department, which he regards as a linking topic *par excellence.*

The nature of practical work has also undergone adaptation. Ten courses report a decrease in the amount of practical work done by students and one of these and one other will include less again in future. While traditional practical work is in decline, there is more experimentation with human material—students may frequently experiment on themselves instead of with animals and *in vitro* material. Methods are more likely to resemble those used in hospital laboratories for standard diagnostic investigations. In seven courses there are now more demonstrations by staff to the whole class of students—saving on time, equipment, materials. They relate to experiments and procedures which students need to understand without needing to be able to perform. Four courses now lay greater stress on skills of interpretation and problem-solving: the analysis of data and the ability to appreciate its meaning is reckoned more important than the painstaking acquisition of technical skills. This is reflected in the assessment systems, which involve scrutiny of laboratory notebooks with marks awarded to accurate reporting and sensible interpretation.

Four of the schools who have reduced the time spent on laboratory work have replaced it with tutorials and discussions: seven schools altogether now devote more time to this form of teaching. Often a problem arising from experimental work, or the result of an experiment, is the subject of discussion. One of these schools and three others would prefer more small-group teaching activities if staff time and student time permitted.

Project work has been introduced recently in three schools; another intends to arrange it soon. Opportunities for independent learning (for example, studying audiovisual programmes) are being developed in five schools.

Altogether twenty-nine courses have experienced changes during the last few years. Thirteen respondents supplied information about changes major and minor which will take place soon, and twelve indicated possible developments which have not yet been finally planned and accepted.

Chemical Pathology, Clinical Chemistry

Full replies to the questionnaire were received from thirty medical schools; three schools could not reply, as they were in the process of establishing new clinical courses—although one of them was able to provide an outline of the projected teaching arrangements; one medical school could not give a specific reply in respect of clinical pathology, regarding it as a component of general pathology, but not one which could be meaningfully identified on its own in the undergraduate curriculum; and three 'preclinical-only' schools treated the subject as 'not applicable'.

TEACHING ARRANGEMENTS

In the majority of schools (25), chemical pathology—treated for the purposes of the Survey as equivalent to 'clinical chemistry' and 'clinical biochemistry'—is taught partly as a separate entity and partly in concert with other subjects or in other subjects' courses. Thus teaching arrangements may vary with the stage of the course. In only four schools is chemical pathology taught entirely independently, while in two schools it has no independent existence and is always taught as an integral part of other subjects. Most frequently it is associated with general pathology.

Position in the Course; Teaching Time

Chemical pathology is a somewhat ubiquitous subject and is probably taught incidentally and informally in every year of a curriculum. Even with regard to formal teaching, there are fifteen schools where it is spread throughout the curriculum with teaching on several occasions, throughout the course. However, two schools have timetabled teaching in one year only. Significant amounts of teaching of chemical pathology in the preclinical years is regularly provided by fourteen schools, while at eleven schools all teaching is confined to the clinical years. Eight

schools (seven of them London schools) offer revision classes in the subject which can be either lectures or tutorials; four of them and four other schools bring practising chemical pathologists into their Introductory Clinical Courses (or equivalent) to introduce themselves and their work briefly. At ten schools chemical pathology takes part in the full-time laboratory medicine 'clerkship'. This is usually a two- or three-month attachment in which histopatholoy, haematology, microbiology, and immunology are also studied and when theoretical, practical and clinical instruction are interwoven. At least two schools reserve a portion of the full-time block to chemical pathology for exclusive use: one has two weeks part-time (mornings only) on this basis and the other has two weeks three-quarter time. Two further schools run part-time courses spread over a fortnight in which the clinical laboratory subjects excepting the two major ones, are studied in depth. These are hospital-based attachments, occurring in one school in the final year, and in the other, in the penultimate year.

Treating a (full-time) week as the equivalent of 30 hours, the average teaching time of chemical pathology is 43·1 hours. However, the standard deviation is high: 25·7; nine schools give less than 20 hours teaching, and nine more give over 50 hours teaching, one of them in excess of 100 hours.

FEATURES

Aims and Objectives

Educational aims vary in emphasis rather than in kind, often only subtly: not all of them conflict with each other.

Although the chemical pathologists in one school aim to ensure that students have a sound biochemical training, in the others they see their role as more of a 'paraclinical' or even a clinical one. Seven schools try to impart an understanding of the biochemical basis of disease and a 'scientific' attitude to clinical problems: students should be trained to search for evidence ('clues') of biochemical malfunction in the early detection of disease and in the monitoring of treatment, as 'biochemical estimations provide the rationale for and the response to many aspects of patient treatment. Occasionally results provide diagnostic as well as confirmatory information to the clinician.' The objective or scientific attitude and the habit of regular, accurate measurement and precisely recorded information 'will be even more necessary in future medical practice, especially if automated diagnostic, screening and management methods are introduced, and therefore it is important for doctors to acquire them while students'.

Seven schools deliberately make their teaching clinically oriented, and as far as possible relate all of it directly to patient care. Chemical

pathology is presented as a partner in the clinical team, intimately involved in the management of individual patients—as an active helper rather than a passive tool. Nine schools interpret their position in the curriculum as a 'bridge'. They can provide a link in the chain leading from preclinical to clinical, and serve to make the transition easier by explaining how and why abnormal values and disorders appear in the 'normal' chemistry of the human body. Teaching builds upon earlier learning of basic sciences and prompts students to apply this knowledge in clinical situations, and specifically to the clinical problems faced in chemical pathology.

During the courses at ten schools, particular stress is laid on demonstrating the use (and possible abuse) of the laboratory services. It is thought important that students should be taught the role of clinical investigations, how to request them and what are the purpose and limitation of particular tests, rather than having to learn of these procedures by later trial and probable error; furthermore, they should be explained by chemical pathologists rather than other clinical staff to whom students are attached. Two schools in particular stress that hospital laboratory results must be interpreted: they must not be taken to mean more or less than that which they properly represent; they must be matched and compared with evidence from other sources—students must learn to know when further information is necessary and when more expert advice must be sought before a decision can be safely reached.

Teaching Methods

Eleven schools make great use of small-group teaching and find it valuable. Tutorials may be held in isolation, with students seconded from other work; alternatively, when students undertake a clerkship in rotating groups, all teaching takes this form. When the teaching is actually conducted in a department of chemical pathology, the small numbers allow a good idea to be gained of both the routine and the research work in progress, and staff can become acquainted with the students individually.

Clinico-pathological conferences and organized case discussions are also popular—ten schools praised them. Indeed, several types of multidisciplinary teaching activity were described: clearly, the general opinion of the respondents is strongly in favour of liaison teaching which has been reported to benefit the staff themselves as well as students. At fourteen schools relationships have been forged with 'preclinical' colleagues, and chemical pathologists take part in the courses in the early years. (*Note.* This does not refer here to 'general' or introductory pathology courses which are timetabled early.) In some cases, biochemists accept invitations to take part in the chemical pathology

course in the clinical years. Ten schools also have special topic courses or sub-courses—nutrition, endocrinology, etc.—with chemical pathology contributions: often individual teaching sessions are multidisciplinary.

In eleven schools chemical pathology is integrated with clinical medicine, in various ways. Lectures can be interpolated in a lecture series given by the department of medicine; chemical pathology tutorials may be given to students doing medical attachments because this is considered the most appropriate time; or chemical pathologists may join physicians in teaching the group of students attached to them. General or internal medicine is the clinical specialty with which chemical pathologists are for teaching purposes most closely involved. Four other schools however place great value on their link with (general) pathology and the integrated programme which together they offer. The main body of teaching is given during the pathology course or full-time clerkship; one school in particular described the many positive advantages of this system.

Very little practical work of the traditional type was reported. Instead, clinical work is the preferred way of demonstrating the principles of chemical pathology in action, and in relation to real patients. Six schools have ward rounds and bedside teaching as a regular element of their chemical pathology course, and they are very popular. Two schools include post-mortems in their courses, the teaching value being again felt to lie in the use of real cases. One Scottish school reports that 'clinical chemists are invariably present at post-mortem teaching sessions and bring with them the subject's biochemical laboratory findings, organized into a form suitable for presentation to the students attending. In addition to the purely clinical history and the morbid anatomical findings, therefore, the student gets a dynamic picture of metabolic events leading to death, and also a pattern of laboratory findings which led to a clinical diagnosis but which the post-mortem findings do not always confirm.'

Elective programmes and optional study projects are available in chemical pathology in at least four schools.

STUDENT ASSESSMENT

Some form of in-course assessment is reported by twenty schools. Chemical pathology may be assessed exclusively on its own (four schools) or together with other disciplines, generally with pathology (thirteen schools). The most frequent technique used is that of written papers of MCQ or essay questions, but some schools make a subjective end-of-block report. At one school students may undertake a project on a chosen topic in chemical pathology: if they do this, it will be assessed within the in-course assessment system. In three cases, marks from

in-course assessment make a critical contribution to the 'final' or 'professional' results.

Chemical pathology is represented in 'final' or 'professional' examinations at twenty-eight schools, for certain. One school, however, states that the subject is definitely not represented. All the London clinical schools and nine others include it in the examination of pathology and its branches. Ten schools (including four of the preceding group) include the subject in the examination of clinical subjects: with medicine and its specialties or in papers integrating all clinical subjects, according to which general teaching arrangement obtains.

PROBLEMS AND DEVELOPMENTS

Resources

Too low a level of staffing was the most frequently reported problem. Nine schools want more staff to help with teaching so that classes of a satisfactory size can be achieved; these schools would like more staff—as yet, three other schools have no academic staff whatsoever and rely entirely on NHS haematologists for the teaching of chemical pathology. There is also the burden of heavy service and administrative commitments, described by four schools as diverting energy away from teaching even when at least some staff hold university appointments. A desire expressed by four (non-London) schools is the establishment of a separate academic department with a chair in the subject. One school has very recently achieved this.

The recruitment of medically qualified staff has become an acute problem, especially in London: six of eight schools disturbed at current trends are in London. One school would like chemical pathologists to have recognized clinical responsibilities so that they could have their own patients and their own beds and take students to their own clinics for teaching.

Although two schools have managed to develop the use of audiovisual aids and handouts, funding, storage space and preparation time for audiovisual aids are reported as short in two schools. Two schools reported that a shortage of space in their departments seriously inhibits teaching. One Irish school would like a computer as a diagnostic aid which at the same time could be used in teaching and simulation exercises.

Organization of Teaching

Clinical pathologists at three schools have recently developed completely new courses and in six have been allocated more time for the teaching of their subject: two of the latter benefited from reorganization of the whole curriculum.

Two schools intend to strengthen chemical pathology as a subject taught in the preclinical years. In contrast, five respondents believe the main body of teaching should be towards the end of the clinical course and would like to teach later in the course than they do at present so that students can bring a more 'mature' perspective to the subject: students could then appreciate for example a concentrated short laboratory medicine course in the final year. Three other schools (two of them in Scotland) would like to see formal teaching of the subject in every year of the course, starting as biochemistry but swiftly developing into chemical pathology in a continuum.

The relationship with biochemistry is a paradoxical one: eight schools would prefer closer ties, with chemical pathologists making significant contributions to the biochemistry teaching, while others feel that the link can be harmful. Students too often dismiss the subject as a 'dead laboratory discipline' (three schools) and being presented as 'applied biochemistry' does not make it any more acceptable. The suggested answer of clinical pathologists in these schools is to have their subject firmly identified as a clinical one. This in turn reflects the need for chemical pathologists themselves to teach chemical pathology: five schools report the problem of misleading notions being planted in students' minds by well-intentioned preclinical teachers attempting to make their classes more 'relevant'—not realizing that chemical pathology is now a very specialized clinical discipline.

Seven schools have made the subject more clearly a part of the clinical course: integrated teaching has been developed and the content of the chemical pathology course has become more patient-oriented. Three more expect to do this: one new school especially will make great efforts in this direction although it is unlikely to realize all its ambitions for fuller clinical integration for a while. A total of four schools desire more integrated teaching with individual clinical specialties than is presently possible, and two have the desire (so far frustrated) to take part in clinical theoretical systems-based courses. Meanwhile, one London school has linked chemical pathology and immunology together for teaching purposes.

Chemical pathologists in three schools find the whole medical course—its structure and compartmental philosophy—a hindrance to their teaching, and state that their own improvements can go no further until the whole course is changed. One of these schools lost its separate course in chemical pathology following curricular reorganization and the discipline now feels 'submerged'. However, two other schools have recently instituted a separate autonomous course in chemical pathology. Three further schools, while not deprecating the value of integrated teaching (either as a method or in blurring 'artificial' subject distinctions), would prefer some independent teaching—perhaps a 'core' course to establish the basic principles of the subject followed by later

ad hoc integration. The new arrangements at a medical school which is presently revising its course, however, will bring the reverse situation with integrated teaching preceding the independent teaching, and emphasizing the 'bridging' paraclinical philosophy. The summer term of the second preclinical year will be a transitional period with sessions to illustrate the applications of biochemistry to medicine, and in the next year (the first 'clinical' year) a course on 'biochemical mechanisms of disease' will be held.

With respect to teaching methods, practical classes are generally not considered important: two schools voiced doubts about their usefulness but were unsure whether total abandonment would be advisable. The use of another traditional teaching method, the lecture, has diminished in four schools, two of whom (together with a third) have correspondingly increased less formal intensive teaching, through using problem-solving exercises, self-directed work, and tutorials. Three schools plan to offer more of this type of learning—for example, discussions based on case-histories—and one school would do more if students could be attached in small groups in rotation, rather than coming all at once. Eight schools are anxious to undertake bedside teaching and to demonstrate patients in their seminars and tutorials, but circumstances do not permit.

Altogether, recent changes were reported in nineteen schools, seven of whom are intent on further changes and three of whom are considering making them. Altogether, a dozen schools have definite plans for changes in their teaching over the next few years and another five have more tentative plans. In three cases these definite plans will expand the teaching of chemical pathology and extend its scope, and two schools are to implement minor adjustments which will improve their existing courses. Various measures, therefore, are being taken to tackle the underlying problem expressed by four schools but facing all of them: what to teach and what to exclude from teaching: what of a rapidly expanding and sophisticated subject should be conveyed to undergraduates; how it should be presented; and how the 'clinical' and the 'chemical' aspects can be balanced.

At one Scottish school, as reported, a unique development is taking place: here a new course in chemical pathology will be introduced—'a purely vocational *ad hoc* course for final-year students on how to use the investigative facilities of the hospital to the best advantage'. This will be a joint exercise between all the laboratory and other investigative departments.

Child Health, Paediatrics; Human Growth and Development

Two sets of questionnaires were distributed to medical schools within this subject area: one inquired into the teaching of the specialty of 'Child Health' (or paediatrics) and the other asked about the teaching of 'Human Growth and Development', a topic specifically mentioned in the GMC's 1967 Recommendations. The first questionnaire was longer than the second, the principal difference being that it inquired in greater detail about clinical teaching and organizational matters, though many questions were identical. The replies to the questionnaires overlapped to a far greater extent than had been anticipated: in many cases the same respondent completed both of them. It was therefore resolved to report on both areas together in the same report, though they will be treated separately in some sections.

All thirty-five medical schools offering clinical courses were asked to complete a questionnaire in child health, except one school, whose clinical course will not begin until 1978. Four replies referred to courses which will not come into operation until 1976/7 and some answers were perforce rather sketchy. A 100 per cent response was achieved, and the 'field' thus consists of thirty-four schools.

All thirty-eight medical schools were invited to complete a questionnaire on 'Human Growth and Development'. In five schools the topic is not included in the curriculum in a formal sense, they have no plans to introduce more positive arrangements, and (in three cases) the replies to 'child health' were felt to describe the situation adequately. The 'field' therefore consists of thirty-three medical schools, thirty-one of them completing both questionnaires.

TEACHING ARRANGEMENTS: CHILD HEALTH

Structure

There are two teaching structures to be considered: that of the theoretical teaching and that of the clinical teaching. Both aspects may be

combined in the same period of time in a single integrated course or they may be given separately and at different points in the curriculum.

In fourteen schools all (or almost all) the formal theoretical teaching of child health is carried out at the same time as and usually within the (normally rotating) clinical attachment to the specialty. In ten schools some theoretical instruction is given as an integral part of the schools' main systems-based courses in which most clinical subjects are involved, and in three schools the specialty is given portions of the major topic-teaching cycle. A few schools have a separate course of lectures in child health for the whole class of students which is held at approximately the same stage as that in which groups of students are rotating through clinical attachments to the specialty, but is not directly linked to them.

The structure of the clinical attachments shows a variety of patterns. Eighteen schools give a single full-time attachment (three also have brief clinical periods in the following year but most clinical experience occurs in the main full-time block): four others give single, almost full-time attachments where the majority of time is taken by child health, but a small proportion—one day or half-day per week, or an hour each day—is taken up by a 'minor' specialty or a lecture course in other subjects. These two categories include all the London schools. Nine schools provide a two-tier clinical experience: seven give an early part-time period followed by a later full-time period, while two have the full-time period first and a subsequent part-time one. Three of the seven treat the second, full-time period as one of their final year 'junior house officer' posts. In three schools all clinical experience is part-time, though in two of them the period is shared with obstetrics and gynaecology and students are full-time in hospital. At six schools altogether the child health experience is linked in the timetable with the obstetrics and gynaecology experience: there is not necessarily joint teaching but the two courses are adjacent to each other. In twenty-two schools neonatal medicine is taught by paediatricians during the obstetrics course.

There are two instances of joint teaching programmes being developed between medical schools. In Dublin, two schools are beginning to use the same hospital facilities and are exchanging students and sharing staff for clinical teaching. In London, the whole programme, clinical and theoretical, at two schools is unified, and there is a joint department with one professor: the only major difference is that students from one of the schools have five weeks longer attached to the specialty than the others.

Position in the Course; Teaching Time

It is most often the second clinical year or the middle stage of the clinical course when the major part of clinical teaching on child health is given (twenty-one cases, of which twenty are London and other English

schools). In seven schools paediatricians also teach in the Introductory Course in Clinical Method, or the equivalent.

The average full-time equivalent length of attachment to child health is 8·8 weeks (SD 1·9): it is slightly higher in London and other English schools than in Scotland or Ireland.

Course Organization, Development, and Evaluation

Eighteen schools reported relatively formal and positive arrangements for co-ordinating their teaching with respect to other departments and combined courses, and also the different aspects of their own teaching. Thirteen schools have partial arrangements for co-ordination while three do this only informally. Involvement in co-ordinated lecture and topic teaching courses has already been mentioned: a child health representative might be involved in planning the series or the section in which the specialty appears. Similarly, a representative of the specialty would attend meetings to plan the introductory course in clinical method if the child health department contributed to it. Various degrees of liaison are operated with psychiatry departments in the schools (twelve of them) where child psychiatry and/or mental handicap is taught within the child health course; and with the obstetric departments, especially where neonatal medicine and foetal development is a joint teaching responsibility. Some schools have a board of studies, stage committee, or block committee with membership drawn from both child health and obstetrics and gynaecology, planning their section of the timetable together.

With regard to co-ordination between schools, it has already been noted that a joint department of child health now exists between two London medical schools. In Dublin, the departments at the two co-operating schools retain their identity and remain based at different hospitals but the sharing of resources has been supported by students—attendance at combined illustrated lectures is as high as 80–100 per cent, and the cross-over hospital teaching will continue: the purpose is two-fold—to give students more varied clinical exposure and to involve more specialist teachers, by pooling the resources of two departments.

In five schools the child health staff are heavily involved in courses in 'Growth and Development' for preclinical students: these are multidisciplinary courses but child health staff appear to have the chief responsibility for planning and organizing them in at least some instances.

Within the child health course itself, it is perhaps easier to co-ordinate the theoretical and practical aspects if they are being taught to the same group of students at the same time: this is the case in fourteen schools. In eleven, there are regular meetings of the clinical teachers—the heads of clinical units to which students are attached who may or may not have academic status. One English school for example, emphasizes the

value of such meetings: they are held half-way through each clinical attachment and are attended by all consultants, senior registrars, and registrars. They serve 'as a forum for the interchange of ideas as to what and where changes in the teaching programme should be made to enable all students to have access to any type of clinical material'. However, contact, both formal and informal, between teachers is easy there because the university department is housed within the hospital.

Six departments have a designated member of staff who organizes the course for undergraduates. Two of these departments and ten others appoint tutors for the duration of an attachment: these people will know what their students have seen, and what they have missed or do not understand, and make arrangements to counter the deficiencies. Another way of ensuring that all students, to whichever unit they are attached and whatever lectures they fail to attend, receive the same core of teaching, is to run a series of tutorials or seminars on set topics during the attachment, bringing together all the students and covering topics theoretically and clinically. One department does not attach students to a single unit for the duration of the course but rotates each student around several units so that they all gain exposure to a variety of interests, and styles and clinical material. Three departments do not find the question of standardization a problem—they have comparatively few students who all spend at least some of their time in the academic unit.

Four schools mentioned their use of more than one hospital for clinical teaching: there is a high degree of co-ordination between the different units within each hospital but it is not possible to co-ordinate the programmes at the different hospitals. However, one very large school which uses many hospitals for the main attachment runs a brief and intensive revision course in the final year, based on local teaching hospitals, which refreshes the students' knowledge and ensures that they have all reached the standard required.

Ten departments give a short intensive orientation course at the beginning of the main clinical attachment, before the students scatter to the various units. This type of course outlines the objectives of the course as a whole, teaches the features of the normal infant and child, and the common disorders and abnormalities, and shows students how to handle and examine small children.

The procedures for reviewing and evaluating courses are frequently the same as those for planning and co-ordinating them. Eighteen departments have relatively formal and regular procedures for review; twelve have more informal or irregular procedures; and three have none. Ten respondents indicated that all aspects of teaching are reviewed; in other cases the scope is perhaps less wide.

All academic staff in child health take part in the review at sixteen schools. At thirteen schools all teachers—academic, part-time, and

honorary clinical teachers—take part. A smaller group of the professor and the senior teachers—or the staff most actively involved in teaching students—reviews the course in three schools. One department has a special departmental sub-committee acting as a working party to review and improve undergraduate teaching. Students are brought into the 'official' evaluation process in seventeen departments. Six respondents reported staff–student meetings to discuss the course that has just finished, and six mentioned questionnaires and written reports in which students submit their comments anonymously: one department obtains feedback through both methods.

Five departments conduct their review annually: twelve conduct theirs more frequently, usually at the end of each clinical attachment. The English school quoted earlier, which holds meetings for all teaching staff in the middle of each attachment, reports 'this allows both changes in the teaching programme to be made under certain circumstances and also the student who is not performing well to be "picked-up" well before the terminal examination'. A dual purpose thus emerges.

In four cases, minor modifications are made easily and often, but a major review procedure takes place annually, biannually, or triannually. One department (the two 'paired' London schools) scrutinizes the results of in-course assessment to see what areas of teaching call for improvement. A further two departments are planning to evaluate their teaching programme more regularly and more formally.

TEACHING ARRANGEMENTS: HUMAN GROWTH AND DEVELOPMENT

Respondents to the questionnaire on 'Human Growth and Development' were not asked to describe in detail their arrangements for course development and evaluation; the information relates principally to the structure of the teaching.

The topic of human growth and development covers a very broad spectrum: it will feature to some degree in almost every course in the medical curriculum. The questionnaire inquired only about timetabled and 'acknowledged' teaching; this must be borne in mind, as must the apparently somewhat arbitrary choice of courses which were mentioned in connection with the topic. However, eleven schools offer special courses focusing specifically on human growth and development: some of them also include topics such as reproduction and sex, genetics, and senescence. Typical titles are 'Human Reproduction and Development', 'Embryology and Development', 'Reproductive and Developmental Sciences', 'Human Growth and Ecology', 'Growth and Ageing', 'Growth and Development', and 'Human Developmental Biology'. These courses—all part of the 'required' curriculum—are all held in the

early or preclinical years, but one English school offers a course entitled 'Human Growth and Variability' after the examinations of the summer term of the second preclinical year, immediately before clinical work starts: it is non-examinable and about 25 per cent of students attend.

Fifteen respondents supplied information about the teaching in anatomy and embryology which corresponds to growth and development: there may be a special sub-section of the anatomy/embryology course highlighting the topic. Five of these respondents also mentioned teaching in the behavioural science courses in their schools: these cover the psychological and emotional development of children, and socialization. Aspects of the topic are formally included in eight courses on behavioural and social studies altogether; some of them are multidisciplinary and community-oriented courses, for example, 'Man in Society', 'Man and his Environment', 'Medicine in the Community'.

Human growth and development is also taught in the course in child health in the clinical stage of at least twenty-six schools. Indeed, an understanding of the topic may be a principal objective of the clinical course in child health. In addition to the four medical schools which have only a clinical course, five further schools (four in Ireland) teach the topic solely in the clinical stage. A significant amount of teaching on the topic is included in the course in obstetrics and gynaecology or 'reproductive medicine' in seven schools: the questionnaire from one school did not discuss any teaching on it apart from that given in obstetrics.

TEACHING STAFF

Both questionnaires inquired about the professional background of the staff who teach these courses. In the child health questionnaire it was assumed that paediatricians and specialists in the various branches of paediatrics would bear the main load of teaching, and the question asked about other staff involved in teaching.

Paediatricians and paediatric specialists in, for example, neonatalogy and developmental paediatrics, teach human growth and development in twenty-eight schools. In some cases they are responsible for planning and administering the early 'topic' courses, and of course individual paediatricians may appear in basic medical science courses to discuss developmental themes. At one 'clinical-only' school the staff of the assessment centre for children play a large part in teaching; they are experts in psychological assessment and in the care of handicapped children and one is a senior lecturer in social child health. Five schools use community paediatricians—doctors with responsibility for child care in the community—in their child health courses.

General practitioners are involved in eleven child health courses and in one growth and development course (when they supervise students' family attachments). Obstetricians help to teach growth and development in eight schools. Psychiatrists help to teach child health in six schools and growth and development in three of these and six further schools. Some are specialists in child, adolescent, or family psychiatric care. Behavioural scientists feature too: psychologists or clinical psychologists (nine schools) and educational and social psychologists also in one of them. Anthropologists, sociologists, and biostatisticians were mentioned by two schools.

Social workers, medical social workers, and psychiatric social workers and/or health visitors, help to teach in twenty-three child health courses and four growth and development courses. They may give lectures or tutorials, or take students with them on domiciliary visits. Occupational therapists, speech therapists, and physiotherapists were mentioned in three 'growth and development' questionnaires. Two schools involve geriatricians, who teach about the normal ageing process, and one has an audiologist who teaches in both child health and human growth and development.

The basic medical sciences are well represented in the teaching of growth and development courses: anatomy and embryology teachers assist in fifteen schools (one 'preclinical only' school relies upon an emeritus professor of anatomy, a distinguished scientist who single-handed gives a comprehensive lecture course entitled 'Introduction to the Study of Man'), teachers of physiology and reproductive biology or reproductive physiology help in nine schools, biochemists are involved in three schools, and teachers of human genetics, nutrition, and dietetics were also mentioned. Paraclinical disciplines are more frequently involved in the teaching of child health than 'Human Growth and Development', though a radiologist does take part in developmental anatomy at one school: they are pathology and radiology (seven schools), haematology (two schools), microbiology (two schools), and forensic medicine (one school). This latter school involves all these disciplines in its paediatric teaching programme.

In growth and development, it appears that some teachers in all the schools are medically qualified. One school uses only medically qualified teachers, with knowledge of and commitment to human biology. It appears that almost all child health courses bring in non-paediatric and non-medical staff to teach. A list of all additional personnel would be very long; some of those not already mentioned are dentists, teachers at special schools, ophthalmologists, nurses (for example, the sister in charge of the milk kitchen), cardiologists, anaesthetists, orthopaedic surgeons, oncologists, probation officers, local authority housing officers, chemical pathologists, speakers from the NSPCC and adoption societies, and the local Director of Social Services. Several departments

are able to use the resources of a child development or assessment centre, or a community-based child care team.

AIMS AND OBJECTIVES

Both questionnaires asked for a statement of aims and objectives. Thirty-one respondents for child health stated objectives, and two more indicated that no learning objectives have been formulated. One further school did not report any objectives: the clinical course had not begun and no professor had yet been appointed. Twenty respondents for growth and development stated their objectives in some form, and seven others made a general statement to describe the nature of the course. Sixteen schools reported objectives in both questionnaires.

Child Health

At the outset of four courses, all students are handed a document presenting the objectives of the course and explaining the structure and the sequence of teaching. At most other schools, objectives are less detailed and explicit. Thirteen respondents indicated a role for the child health course in drawing together and drawing out the students knowledge of the basic medical sciences and their knowledge of normal physical and behavioural features in children, in order to apply this knowledge to the problems of unhealthy children. They must learn to distinguish a child who is ill from a child who is not and to recognize an abnormality which requires clinical investigation.

A major objective is to teach students to examine a child (twenty-two schools) and a baby (twenty-two schools), with confidence and without causing undue distress. Students should by the end of nineteen courses be able to take a reasonably useful history from parents and from an older child. These are basic skills which, it is suggested, it is fair to expect all students to acquire. Only four respondents expect students to acquire diagnostic skills to a similar standard. They expect students to make differential diagnoses in a problem-oriented format, to make suggestions for tests and investigations and for management, and to be capable of making appropriate clinical decisions—though not of course to take responsibility for them. In a more general way, four other courses aim at training students in an appreciation of the different approaches to management and, in particular, of the importance of the family background as a factor in the decision how to manage a case and what therapeutic setting to recommend (home, hospital, etc.) for individual cases: medical considerations are not the only ones to be taken into account.

Twenty courses are designed to cover the major and the common diseases and disorders of childhood. They are designed to be comprehensive without being too detailed; they indicate the pathological and

clinical features of each type of disease, and the likely outcomes at an introductory level. Four cases specifically aim at teaching the main themes of child psychiatry so that students will appreciate the main problems and the methods in this field. In general, the emphasis is on diagnosis and pathology, and less on therapy.

In eleven courses communication skills are an objective. This is something which it is felt students can and should acquire at this stage of their training. It is hoped they will be able, by the end of the course, to communicate with parents, to extract information from and relay information to them effectively, recognizing their natural anxiety for their sick child and helping to reassure and comfort them. Ideally, the students will be more sensitive and mature when they finish the child health course.

It may not be desirable for students to learn much about therapy and management, but in a more general way nine respondents hope that students will gain an idea of what is the scope of modern paediatrics. The course should survey the whole field of paediatric activities so that students know what can be offered to parents with children in need of help and can understand why paediatricians take pride in the range and achievements of their specialty.

More specifically, eleven respondents hope that students will learn about child care in the community and will appreciate the scope and value of these activities. Their courses emphasize community care and make a feature of introducing students to the services that are available outside hospital and to the resources that can be called upon.

In the responses to the questionnaire a number of 'unclinical', non-paediatric objectives were reported. Seventeen respondents are anxious for their course to initiate or to strengthen students' understanding of normal growth and development from infancy to adolescence and of the normal variations in the progression. The emphasis is strongly on health. Fourteen of these respondents and two others are equally anxious that apart from knowledge, students should acquire healthy attitudes towards children: they should appreciate the total needs of children, including their emotional, environmental, and educational ones—for example, 'an understanding of the feelings of children, especially in illness and in hospital, and an increased knowledge and understanding of children (who constitute a quarter of the population)—their normal activities, schooling, ways of spending their time, their rights and what the community provides for them'. (One respondent mentioned particularly the 'threat' which small children pose to the new clinical student.) Seven of the same group plus two other respondents try to convey positive attitudes to health care. They stress the importance of promoting the healthy development of all children through health education for parents, sensible advice about up-bringing and developmental screening at prescribed intervals. They are teaching preventive medicine.

Three respondents hope that students will be enabled to set a good example themselves when they become parents and to use what authority they may by then have as doctors to encourage good child care among their friends and neighbours. It is recognized that although very few students will become paediatricians, they will be in contact with parents and children in whatever branch of medicine they take up, and particularly if they choose general practice. They all require a basic fund of knowledge and an appreciative understanding of children and their routine problems (four respondents).

Finally, an objective of five courses is to arouse enthusiasm in students. They should enjoy the course, they should feel welcome in the unit to which they are attached and feel stimulated by the special interest of the staff, they should see how different is the atmosphere in a children's ward from that of adult medicine, and above all they should learn to like children, to relax and talk to them as individuals and to enjoy their company.

Human Growth and Development

The most frequently mentioned objective in the replies to this questionnaire was an 'appreciation of normal development'—what constitutes normality, and an understanding that change is the normal biological state of man. Generally they focus on the growth of children in the early years of their life and the teaching is very child-centred; a few however focus on man as a species and treat development from an evolutionary and more zoological and anthropological viewpoint. In spite of the variations of scope and approach, the common factor is the aim to present the physical, psychological, intellectual, emotional, and social features of childhood development, and to help students to understand the importance of each one of these aspects and the relationships between them.

The aim reported from one school is an appreciation of the genetic and the environmental factors in human life and their interaction in producing the physical and behavioural make-up of each person. The approach is multidimensional—students must learn not to think in terms of black and white, cause and effect patterns, but to see an individual as a complex of responses and mechanisms, the result of a long chain of events.

Two courses also focus on the family as worthy of study in its own right. The child is observed in the natural habitat of the first few years of its life and the parental role is explored. It is hoped that students will learn to 'achieve a positive human relationship with families' and to understand 'the structures, stresses and strengths of the family'.

In nine schools the teaching of human growth and development is regarded principally as a preliminary to a subsequent course in child

health. The purpose is to ensure a grasp of normal physique and behaviour before studying abnormalities and diseases. In particular students must grasp what is normal for each age group and what is the permissible range of normality. Consideration of the child at home, the child at school, and so on, will also forestall students relying entirely on their impressions of children in hospital as their model for all children. One of these schools also regards the course in growth and development as a useful preparation for the later course in obstetrics and gynaecology in outlining normal reproduction, child-birth, motherhood and child-rearing practices.

Respondents were also asked to indicate something about the content of their course/s in order to demonstrate the themes on which they are based: an examination of these replies provides further information about the aims and objectives of the teaching. The range of topics covered is of course wide and determined partly by the context in which they are taught—whether the course is multipurpose, or whether teaching about growth and development is well integrated into a larger course.

In outline, thirteen courses are planned to teach growth and development from before birth onwards, while four courses begin at birth and proceed from there. Generally teaching appears to cease at the onset of adolescence or at the early teens, but four courses (at least) continue to adulthood, and three courses devote attention to 'negative growth' and proceed through to old age and even death, covering the whole human life-cycle.

Eight courses include teaching about the female reproductive system and four of these include teaching about the male reproductive system in the course concerned with growth and development. There is associated teaching of human genetics in six schools—though this is not necessarily the only or even the main occasion when genetics is taught. The growth of the foetus is given detailed consideration in fifteen courses, twenty-five respondents however mentioned physical growth in children after birth (this is naturally one of the main features of all courses): in nine of these courses nutritional factors in growth are also discussed. Sixteen courses consider the emotional, psychological, and social development of children and the changes that occur in their needs and their behaviour—eight of these courses and another one specifically include intellectual development and ways of measuring it. Six of the sixteen courses and one other examine the family—its structure, its social role and how the cultural patterns and other circumstances of the family affect the upbringing of its younger members.

The normal variations in growth and development and the generally used methods of measuring and recording them are featured in eleven courses, and one school's course expects students to become familiar with the standard developmental assessment forms and to practise

filling them in. They deal with the concepts and methods of developmental assessment. Six courses are more concerned with biometrics, statistical expressions for describing physical characteristics, and the variations in physical characteristics which can be expected in a given population. They introduce students to the established 'norms' against which deviations can be compared. Thirteen courses in fact give some particular attention to deviations and delays in 'normal' development. Failure to thrive, failure to reach target measurements, and the development of certain abnormalities are discussed and the main causes given, but mainly to illustrate and support the teaching of normal patterns. Some raise the problems of handicapped children and their families.

The physical and other changes that occur at puberty and the emotional stresses and social pressures of adolescence are featured in eleven courses; the physical changes and the adaptation to different styles of living that are encountered in old age are featured in four. Two courses discuss population growth in the past, the present, and in the future, and the social and medical implications of expanding populations, both nationally and internationally.

TEACHING METHODS (NON-CLINICAL)

Both questionnaires asked identical questions about the methods used in teaching.

Lectures are used in thirty child health courses and in thirty-one growth and development courses. Most frequently the child health lectures are separately arranged by the department and form a self-contained series, but in ten cases the child health lectures are part of a multi-subject series and co-ordinated with other departments. Students at one school receive both types of lecture.

Symposia, seminars, conferences, and other forms of discussions in large-group settings were reported from twenty-eight child health courses and eleven growth and development courses. In child health, a few respondents gave more detail about these discussions: two have panels of paediatric specialists, four have panels of paediatricians plus specialists from other clinical departments. Intensive small-group teaching is conducted in thirty-three child health courses and twenty growth and development courses, but the proportion of time devoted to this method varies from school to school. Seven schools mentioned their laboratory courses in anatomy/embryology in connection with the teaching of human growth and development.

Teaching aids are employed extensively in both courses, and only two schools use them in neither. Tape–slide packages for independent study are available in seventeen schools—they were mentioned in thirteen child health questionnaires and eight growth and development

questionnaires. Cine-films and loop-films are used in ten schools, in five of each of the two courses. Television facilities and recorded video-tapes were mentioned by four correspondents, two for child health and two for growth and development.

Displays and demonstrations using museum source material and photographic and graphic reproductions, are a feature of six courses in growth and development. At one school, for example, the biology department mounts demonstrations which follow the topics covered in the laboratory classes: they illustrate comparative development and highlight the features of development which are common to other animals and, secondly, which are peculiar to man.

CLINICAL TEACHING: CHILD HEALTH

Several questions inquired into various aspects of clinical teaching; in many cases, detailed and elaborate replies were received.

Teaching in the Different Clinical Settings

Respondents were asked to describe as far as they could the relative roles of different learning experiences and different clinical settings in their courses.

Only one correspondent reported that 'structured' teaching activities are more important in weight and in benefit to students than other activities. They are sessions organized principally for the purpose of teaching and not patient care.

In fourteen courses, teaching and learning with in-patients is decidedly more important than that with out-patients: students spend more time with in-patients and more staff teaching time is spent using them than out-patients. In three courses, in contrast, out-patients are employed decidedly more than other patients for teaching and are felt to be more useful and more effective for this. One respondent indicated that the choice of method and choice of setting varies significantly from unit to unit and from hospital to hospital; it was not possible to give a representative answer. Six others believe that any form of contact with patients is valuable to students and that the productivity of different methods varies from student to student so it would be unwise for the course to concentrate on one type of activity to the detriment or exclusion of others. Exposure to sick children is an educational experience whether or not formal teaching is being conducted and whether or not staff are present, actively diagnosing and treating a child at the time: staff must provide opportunities for students to be with the children and to merge into the daily routine, and let them take advantage of whatever happens, planned or unplanned.

Seventeen respondents were unwilling to select any single activity or setting as the most frequently used or as the most valuable: all are important for different purposes. For example, out-patient clinics are primarily patient-care situations where students see the art of consultation exemplified by experienced consultants, whereas ward rounds are primarily teaching situations where signs of disease and how to elicit them can be demonstrated—and these are best learnt on in-patients. On the ward, too, students can observe the course and outcome of disease over a length of time, and see the role of other professional staff in the hospital team.

Settings outside the hospital are a feature of clinical teaching in twenty-five courses. They include visits to general practitioners' surgeries (two courses), to special schools and children's homes (eleven courses), and to homes and hospitals for mentally handicapped children (ten courses). Eighteen courses provide sessions at 'well-baby' clinics, at developmental assessment clinics, at former child welfare clinics or at child health centres, where students can observe the practice of preventive and developmental paediatrics and the role of the health visitor. Eight courses require students to accompany a doctor—a general practitioner or a community paediatrician—or a health visitor or social worker on home visits. In one of these courses 'the existence of a hospital-based paediatric home care service enables each student to accompany the doctor on his visits to sick children in their own homes, thus revealing housing and social conditions as well as giving the student practical insight into domiciliary care and the role of the mother as nurse'.

At one school, professional actors are used to simulate the reactions of parents of sick children in mock interviews with students. In this way students learn something of the fear and apprehension attending clinical situations especially where children are concerned, and how to control their own responses and to reassure (or at least not to aggravate) the other party.

Clinical teaching group size—'the number of students round a bed'—was inquired into briefly. It varies widely from one to fifteen, but in schools where a single attachment is given to the specialty, the typical figure would be six to eight. Where schools give an early and a later attachment, the clinical teaching group size during the second attachment is normally smaller: from one to four students.

Student Experience of Emergency Care

Twenty-seven courses have special standing arrangements for giving students experience of emergencies. Six courses do not have special arrangements but students are likely to see emergency conditions and appropriate management as they occur, during their attachment to a

unit, and may become involved if they wish. Definite arrangements had not been devised at the time of writing in one new school where the final clinical year had not yet taken place. At two schools in Ireland the type and extent of emergency experience depends on the students themselves—to a large extent it is voluntary.

A period of residence is required in twenty-four schools. The length of time ranges from one to nine weeks, but most often it lasts two or three weeks. The purpose of the residential stay is of course not solely or even primarily to enable students to see emergencies: it also enables them to see the whole spectrum of hospital care for children and to become more intimately involved in routine activities. It was reported from six of the twenty-four schools and one other where accommodation is not available for continuous residence, that students attached to a unit are required to accompany the house officer on 'waiting' days and nights and to observe the same rota. Where courses are two-tier and consist of early part-time and later full-time phases, the residential and emergency arrangements normally occur in the second phase.

In nine schools, paediatric emergencies are seen by students in the accident and emergency department. They may attend this department at intervals during their child health course or they may attend it for longer spells as part of another course. Two respondents explained that provision is made for their students to see neonatal emergencies during their obstetric attachment.

Students are able to follow through emergencies at two schools and to become involved in subsequent care. At one London school, students have three types of opportunity—a week's full-time residence when they are supplied with bleeps at a district hospital; a period of intensive attendance—from 8 am to 11 pm or later at the teaching hospital where actual residence is not possible; and sessions at the open-access clinic where children with urgent problems are brought in and are initially examined and interviewed by a student.

Bleeps are issued to students, calling them when an emergency appears, in at least five schools.

Four courses give formal teaching on emergency situations—one school mentioned a special post-waiting ward round which students must attend, and three others give instruction on how to cope with standard emergency conditions which can arise.

Opportunities for emergency and 'in-depth' experience are to be extended in two schools. One has no provision at all at present but will be enforcing on-call duties very soon; the other does make some provision now but in future the arrangements will be more strict and also more substantial. Three respondents are disturbed by the shortage of residential accommodation for the students (one has none at all) and would like all students to spend more (or some) time in hospital residence.

Specified Requirements and Experiences; Student Responsibility

The majority of departments (twenty) neither specify in advance nor record the detailed events and tasks which students must see or perform. However, twelve departments do draw up lists of what students should experience during the course, and three schools have systems for noting what individual students have actually seen and/or done.

As noted earlier, most courses aim for competence in examining an infant and a child, taking a history from it and its parents, and in recognizing the more common and important clinical conditions. Itemized experience, however, is unusual in most departments; only two for example reported that a prescribed number of cases must be clerked by students and that their notes are kept as part of the official case notes and are assessed by the staff afterwards. In two departments, students are handed a list or booklet of essential topics in order to check for themselves that they see examples of the appropriate conditions; a Scottish school issues a copy of the 'Core Curriculum' for both child health and neonatal teaching which details the topics of the lectures and the seminars (both scheduled and 'spontaneous' ones) which students should match with corresponding clinical experience. Attendance at certain special clinics is mandatory in two courses. One respondent commented that keeping lists, etc., was unnecessary as each group of students is small and staff are easily aware of the nature of each student's experience.

Respondents were asked to indicate on a *pro-forma* the level of students' practical experience and the extent of their normal permitted responsibility. In the first case, they were asked to indicate which procedures out of a standard list students would normally be expected to have seen or done in the specialty by the end of the undergraduate course: the list, together with the results, appears as Table A.

Similarly, the level of responsibility entrusted to students was investigated by presenting respondents with a list of responsibilities which students might be given, and asking them to indicate for each one whether it would 'routinely', 'occasionally', or 'not normally' be entrusted to students by the end of the undergraduate course. The list, together with the results, appears as Table B.

Six respondents commented that learning to carry out practical procedures is not considered important for undergraduates, and three of them added that arousing students' interest in and sensitivity to children takes priority over technical matters. Respondents added qualifications to the lists of procedures and responsibilities. Students in residence or on elective attachments or working as locums are more 'active' than other students and senior students are allowed greater responsibility and perform more technical tasks than junior students when the course is held in two stages (two schools). At two London schools participation

Table A. *Practical Experience*

Procedure	No. of Schools in which Students would: *See Procedure*	*See and do Procedure*
Subcutaneous injection	30	8
Intramuscular injection	32	8
Venepuncture	33	17
IV drug administration	32	4
IV blood and fluid administration	33	4
Bone marrow aspiration	23	0
Lumbar puncture	33	7
Abdominal paracentesis	8	0
Pleural fluid aspiration	7	0
Microscopic examination of urine	27	22
Biochemical examination of urine	26	19
Haemoglobin estimation	18	8
Staining and examining a blood film	12	7
White blood cell count	9	6
Estimation of erythrocyte sedimentation rate	14	5
Wound suturing	10	3
Anaesthesia: local	14	3
Anaesthesia: general	7	0
Endotracheal intubation	22	0
Cardiac resuscitation	11	0

is deliberately limited but observation is encouraged. A number of respondents feel it is highly undesirable for students to take an active part in the care of young children: they should practise on adults first (indeed, compare Table A with that for 'Medicine'). At one school it was reported that student numbers are too high for them to be anything other than observers.

CLINICAL TEACHING: HUMAN GROWTH AND DEVELOPMENT

In human growth and development twenty-six courses give students some contact with patients and other members of the public. It is not 'clinical' in the sense of teaching students to acquire clinical skills: the purpose is to increase their factual knowledge and to promote interested and sympathetic attitudes.

Three courses regularly demonstrate patients in the lectures or seminars and one of these and two others give some bedside teaching in the wards. Five courses enjoin attendance at post-natal clinics and 'well-baby' follow-up clinics. Visits to such places as health centres, special schools, residential homes and developmental assessment centres are arranged in seven courses.

Table B. *Responsibility entrusted to Students*

Responsibility	No. of Schools in which Responsibility is entrusted to Students		
	Routinely	*Occasionally*	*Not Normally (or Not Applicable)*
The result of students' initial examination and history taking form a part of the patient's records	11	13	10
Students' records of the patient's progress and treatment form a part of the patient's record	8	12	14
Students recommend medication	3	3	28
Students recommend clinical/laboratory investigations	6	8	20
The practical arrangements for clinical/laboratory investigations which involve other departments (eg radiology, bacteriology) may be entrusted to students	4	11	19
Students might be a 'first contact' in an emergency	1	14	19
Students assist the operator in the theatre	2	12	20
Senior students have the opportunity to play a role in the clinical team similar to that of pre-registration house officers	8	12	14
Senior students act as student assistants ('locums') in the absence of house officers	4	13	17
Students act as a contact between the hospital and patients' relatives	1	17	16

A new and experimental method of helping students to learn more of the background picture is the family attachment scheme which four schools are now operating in connection with the teaching of growth and development: two are optional. The details vary considerably but the outline and the purpose are similar: attaching individual students to a carefully selected family for a length of time to enable them to gain insights into the resources and support within the family setting as they affect the growth and development of small children. It is emphasized that students are passive observers as far as the learning exercise goes, though sometimes close personal relationships do develop with older

members of the family, and the family may consult the student for advice. The mother–child relationship in particular is an object of study. The attachments are usually supervised by the family's general practitioner, and students are expected to keep a journal or make a report at the end of the period.

Several other schools have similar schemes but did not report them in the growth and development questionnaires.

'SPECIAL FEATURES'

Both questionnaires asked respondents to select features of their courses which they regard as 'special' features which are particularly interesting or successful. A 'special' feature can thus relate to teaching methods, to the structure of a course, to an individual activity or event, or to some particular emphasis. Some respondents found several features to highlight in their reply, others reported none.

Four child health respondents claim one of the outstanding features of their course is the emphasis on the normal infant and child. This emphasis persists throughout the course, which is not disease-oriented. Teaching focuses on the healthy baby and the healthy child and on measures for maintaining and improving their health, and ensuring their development corresponds to normal patterns as far as is possible or desirable. In human growth and development, too, three respondents believe the course's most important contribution to students' education is in giving an idea of normality and a sense of the meaning of human biology. It is the inevitability of growth, change, and degeneration which has to be conveyed, the continuation of the process of development from infancy through childhood to maturity and beyond.

Several respondents commented enthusiastically on the role of a growth-and-development course in the curriculum. Three have found it to have a very beneficial effect through being held early in the students' career because it teaches normal human physical and behavioural characteristics and how they are acquired, before students learn about pathological functions and behaviour, and because it teaches about the infant and child before they learn in greater detail about the problems of adults. This sequence is a logical one and allows later clinical teaching to be seen in the right perspective. Four other respondents see the value of their course in bridging the gap between preclinical studies and clinical studies. It has an integrating role in the curriculum and especially if the course is a special, separate one, spotlighting and concentrating matter from different sources. It draws together themes and information from the basic medical sciences and fuses them into a unified presentation which treats children as living persons and this in turn orientates students towards 'whole patient' medicine and child-centred attitudes in

their clinical course. The opportunity to mix clinical staff—mainly paediatricians—with preclinical staff and to use children who are patients to illustrate the teaching, also helps to eradicate artificial frontiers between preclinical/clinical and normal/pathological interests. It demonstrates how one must be constantly and thoroughly aware of normal patterns when dealing with clinical problems in children (and, of course, in adults).

The fact that one growth and development course is voluntary has the advantage that students who choose to attend are genuinely interested in the topic and very receptive to what it has to offer. They enjoy the course all the more because they are volunteers.

The organization of the child health course gave rise to some comments. In four schools (three programmes) the decision to disperse teaching over the whole clinical course allows students' knowledge to gain in depth and detail and their outlook to become more mature as they progress from one phase to the next: each phase reinforces the previous one. This would not happen if the course was concentrated entirely in a once-for-all block.

Two courses in child health are so arranged that a preliminary and full-time orientation is given to each group of students beginning an attachment. This lasts a few days and is given by the academic department before students go to join the (frequently non-academic) units to which they have been assigned. It gives them all the same foundation on which to erect their varying clinical work and obviates the need for separate theoretical teaching completely divorced in time from the clinical attachment. At another school, all students in the group being taught child health gather together for one day each week of full-time theoretical and core instruction, and spend the other four days of each week in their respective units for clinical work. This has reportedly proved most successful.

The calibre of the teaching staff can have great impact in a field such as this one. Four respondents feel that staff–student relationships in their course are close: the teachers are enthusiastic about their subject and about teaching and they try to get to know their students personally. Their enjoyment in their work and their interest in children for their own sake has its effect on the students.

Two courses are enhanced by involving staff of many different specialty interests who contribute their own expertise and also their different and contrasting attitudes. Students are exposed to the whole range of paediatric care. In growth and development this extends to the wider social background and in child health it extends to students meeting parents and siblings of child patients and learning how to talk to them, appreciating their potential part in the management of the patient. In both, the intention is not merely that students will learn in abstract terms that the family is important, but also that they will learn

to take due account of the family's (especially the parents') needs and potential contribution, in their decisions.

Eight courses in child health are designed to reflect the shift to the community of resources in paediatric care. Much teaching is given in the community and the services available and the personnel working there are featured extensively in the course. Preventive and continuing care are presented as the model forms of care and great efforts are made to ensure that the course is not biased towards hospital treatment; this is presented as simply one of a number of therapeutic settings.

One of the key factors in community paediatrics is the arrival of multidisciplinary assessment centres. The services which they provide—preventative, screening, diagnostic, referral—are community-oriented rather than hospital-oriented, angled towards health rather than disease. In three child health courses students have sessions in an assessment centre: it is thought extremely valuable for them to pick up the philosophy of the centre as well as to see the tasks they perform and the teamwork among staff. At one English school, for example, students attend the cerebral palsy centre, where the comprehensive assessment of young and handicapped children is carried out, a centre for the deaf and blind, and the hydrocephalus and TB contact clinics. In three growth and development courses (one of which is given in a 'clinical-only' school and relies heavily on an assessment centre) the principles and practices of assessment are considered an important and necessary part of the course. Over and above aspects of normal growth and healthy development, signs of abnormal or slow development are described and some of the methods of investigating them are taught. There are two stages—first, how to recognize initial give-away signs, and second the diagnostic tests and controlled observations used to establish the presence and severity of suspected disorder. Students are expected to become competent in the first role in order to know when to refer a child to the experts.

A number of respondents referred to teaching methods when they were asked to choose especially valuable features of their course. Four mentioned their audiovisual equipment. One Scottish school is putting all topics of their core curriculum on to tape/slide, and an English school has 3,300 slides on the subject held in an open-access system. Students can study the series in these collections in their spare or waiting time, and see more than they could in the flesh during their clinical attachments. Films of the early stages of development and early signs of disturbance are also found to be very useful in one of these schools.

One department is using a problem-oriented medical record system to train students in clinical decision making and to help them to think in the desired framework. Project work involving research on a chosen topic was reported in this section by six respondents. Students reportedly enjoy it and it has many educational advantages.

Tutorials were praised by five respondents as a particularly effective way of teaching. Some of them appoint tutors to each group of students for the duration of the course, who take a personal interest in the students' progress. They may also help to co-ordinate each student's range of clinical experiences.

The sheer amount of clinical experience is the main reported 'special feature' of eleven child health courses. They are nearly all of them full-time courses, allowing students to feel completely involved. Students have plenty of contact with children and their families and the setting—wards or clinics, active teaching or independent forays—is immaterial so long as students get the 'feel' of paediatrics and become relaxed and confident in their dealing with children. In these courses they see a good range of conditions and are encouraged to participate in communal therapeutic activities. The sum of learning through this observation and participation is higher than the end result of the formal teaching programme. In four of these courses and in three others the students are attached to the clinical units in very small-sized groups, and this helps the learning process enormously. Staff can teach almost individually and the students' presence on the wards is less noticeable.

In two growth and development replies, the contact with real children and their parents (not necessarily patients) was reported to be very successful. These are the family attachment schemes which are all the more enjoyable because they are arranged from the early years of the medical course, when contact with patients and people is otherwise minimal, and therefore add a whole new dimension to preclinical students' lives and experience.

In child health, other replies made it clear that the subject can be very popular and very rewarding to undergraduates. Six respondents indicated that the residential period is highly valued by staff and students, and five indicated that the full-time period spent at district or 'peripheral' hospitals where fairly typical and unspecialized paediatrics is practised has proved equally valuable. Very few students are attached to each unit, and they are able to become involved in its work and to get to know the staff and the children, and be conscious of 'belonging' to it.

In five courses students receive instruction in out-patient clinics and spend time on admission units or in accident and emergency departments to perhaps a greater extent than elsewhere. This is felt to be very useful; they learn to appreciate the urgency of decision-making and prompt action. They see injuries and conditions at their most explicit before they have been alleviated or reduced by treatment.

Case conferences and patient-based seminars are reported to be well-established and fruitful elements of seven courses. They show how multidisciplinary and multiprofessional management is planned, and allow students to join in with questions and suggestions of their own. Indeed, they may be based on presentation of cases by students. In one

course such conferences are held weekly, using carefully selected cases, and the mother or father of the child may be present as well as a social worker or health visitor, a community or primary care specialist, a physiotherapist or dietician, and a system specialist (for example, a renal pathologist). The general purpose is 'to give a broader and more balanced coverage of clinical paediatrics (and) to demonstrate the relationship between disease and factors in home and environment'.

In Ireland two courses which combine growth and development with child health focus particular attention on perinatal and neonatal care. This is presented as a crucial period for the future development of the child when all efforts must be made to give the best care and to watch for any sign of distress. A special period—two weeks for example—is set aside for neonatology and teaching is given by both obstetricians and paediatricians.

An unusual and interesting feature of two child health courses is the nursing experience required of students. At one school a full week is spent on nursing duties and at the other shifts are worked, to a total of forty-eight hours. Students undertake all the usual routine nursing tasks under the supervision of the ward sister.

STUDENT ASSESSMENT

Assessment in child health is 'critical' in all thirty-four schools responding for the subject, and there is critical assessment in growth and development in twenty-eight schools. Twenty-six schools reported critical assessment in both areas.

Child Health

In ten schools the final critical examination in child health is separate from that in other subjects and must be passed separately. In fourteen schools including all London clinical schools the final critical assessment in the subject is combined with that in medicine and other medical specialties. In nine schools the final critical assessment in the subject is combined with several other clinical subjects in, for example, a joint MCQ paper. The combined arrangement relates to the written paper and to the adding up of marks; clinical and oral assessment are separate events if and when they are held.

In-course assessment was reported from all schools teaching child health except two. All thirty-two have 'true' in-course assessment, held within the time allocated for teaching and administered by the teaching staff to their own students. In addition, eight of them have class examinations, administered to the whole class of students and separated in time from the teaching block. In-course assessment methods vary in

formality and in scope. For instance, a dozen courses have multiple-choice question papers while six prefer to use written papers with essay or short-answer questions. Nine hold clinical examinations or assess the students' presentation of a clinical case and two of these and two others held oral tests of clinical knowledge, competence, etc.

In ten courses a project report or written-up case-study (or studies) is assessed for evidence of a student's ability, interest, and understanding, but the most widely used practice is the report compiled on each student by the teaching staff. Sometimes marks or grades are awarded, and usually the report comments on attitudes and skills as well as knowledge; it may be drawn up by the head of the clinical unit, or by all the medical and possibly the other staff of the clinical unit to which the student was attached; where tutors are responsible for teaching they would be responsible in whole or in co-operation for the report. However, the contribution made by 'marks' from any of these types of in-course assessment to the over-all result is often difficult to establish: it is probably most important in the case of borderline pass or potential 'Honours' students. Indeed, seven respondents indicated that the in-course tests are critical only in identifying students who need more teaching and who might be asked to repeat the attachment. At two schools, however, good performance in one or more of these types of assessment can exempt students from a part of the final examination, and at one English school satisfactory performance in the clinical tests during the course will exempt a student from the clinical tests at the end of the final year, unless they are invited to take them with a view to 'distinction'.

Whole-class assessments in child health occur in eight schools. In only one case does it appear to be a separate event, unconnected with other subjects. In three schools child health figures in a combined class examination with other subjects. In one school there is a joint examination with obstetrics and gynaecology and in fact this is the critical examination, taken in rotation as students complete the teaching block, to be taken again if failed, as it forms one stage of the qualifying examition. (In this case, marks derived from the project are incorporated with marks from a multiple-choice question paper and clinical tests.)

Changes have recently been introduced in the assessment procedures in three schools. They have begun to use more formalized in-course or 'progressive' assessment procedures, such as MCQ papers, as well as the impressionistic clinical ratings. One school will soon introduce new forms of assessment when its new curriculum and regulations make it possible for in-course assessment to become critical. Also, in one school, growth and development now forms a larger and more definite part of the critical assessment of child health than it used to.

A few problems have been encountered in developing useful assessment procedures. Three respondents regret the impracticability of

assessing their students personally and individually. There is not enough time and the staff–student ratio does not permit really thorough monitoring of each student. One respondent also mentioned the difficulties of arranging clinical examinations in paediatrics—sick children are not the best of subjects to have at these events! The position assigned to child health in the series of final qualifying examinations is less than satisfactory at one school: the department would like it to be featured more prominently.

Human Growth and Development

In seventeen schools aspects of growth and development are included in the final assessment in child health, reflecting the fact that some and sometimes all teaching of this topic occurs in the child health course. In twelve of these schools the topic is not assessed at any other stage: the child health examination is the only occasion where it appears. In ten schools aspects of growth and development are examined at the time of the major assessment in basic medical sciences, and may be included with one or more of these subjects. This again reflects the teaching arrangements for the topic. In five schools knowledge of and attitudes towards the topic are assessed in conjunction with several clinical subjects with which aspects of it are intimately connected.

There are not necessarily separate questions on growth and development in the joint examinations mentioned above; rather it is expected that students should show awareness of developmental factors in their answers generally.

Human growth and development is assessed 'in-course' in thirteen schools. In three of them it is largely critical and in two of them the topic is assessed separately, thus having a defined and important status in the school's assessment system, and forming the only two cases in which this topic is assessed critically and on its own. In three schools altogether the special topic course in growth and development is given a separate assessment immediately on completion of teaching.

In four schools the topic figures in the assessment of various preclinical subjects with which it is associated in teaching; in a few schools it figures in the in-course assessment of various clinical subjects. One school includes the topic in both preclinical and clinical assessments. One preclinical school does not assess students in this topic at all; the course is voluntary and therefore non-examinable, though it remains popular, and, indeed, unique.

PROBLEMS AND DEVELOPMENTS

Both questionnaires contained identical questions inviting respondents to describe recent and planned changes affecting their teaching, changes

which are desirable and the circumstances which prevent their adoption, and problems generally.

Organization and Resources

There have been significant recent developments in general curricular arrangements for the teaching of both child health and growth and development, but mainly with respect to the latter. A special new course in the topic has been created in six schools and in ten others more time has been allocated: the topic is now firmly entrenched in these curricula. In three schools the new arrangements are a direct consequence of general and over-all curricular revision.

In child health, the length of one course has been reduced (to eight weeks full-time), but three other courses have been lengthened (to the full-time equivalent of around nine weeks each), allowing more topics to be covered by the specialty. Nine respondents for child health are dissatisfied with the amount of time allocated to the subject or the way in which it is arranged. In general, part-time and half-time arrangements are not welcomed. One of these respondents would prefer to have a full-time teaching block in the final year of the medical course (at present his school has full-time clinical teaching relatively early in the clinical course, followed by later part-time clinical teaching) while another respondent, the bulk of whose clinical teaching occurs in the final year, would prefer the clinical experience to be given earlier, perhaps with the earlier part-time period going full-time. Two schools which are reorganizing their curricula will be able to give more time to child health in future and in both cases the clinical attachments will become full-time. A third school—also reorganizing its entire curriculum—will provide a single full-time clinical course in the subject instead of the present mixed arrangements; although there may not be a net gain in actual teaching time, the new system will, it is thought, be a great improvement. Also, two of these schools who are going through reorganization intend to put on new preclinical courses concerned with growth and development; one of them will be the result of a merger between the current 'growth and development' course and that on the behavioural sciences.

Five respondents indicated plans for new (bigger) courses in growth and development; two of them, however, could not be sure that they will materialize. They would be well-structured, comprehensive courses, connected (or even integrated) with contemporary teaching of reproduction and genetics, and/or behavioural science. There is no comparable teaching in these schools at present. An English school's plan is likely to be typical: the name of the course will be 'Growth and Development and Ageing' and will cover:

> 'The processes, mechanisms and problems of fertilization and implantation.

'The patterns, controls and genetics of normal development and growth processes in the embryo and foetus (illustrated by abnormalities of growth and development).

'Outline of normal parturition.

'The patterns, control and genetics of normal development in infancy and childhood including both physical and psychological developments.

'The ageing process.'

The course will involve both clinical and preclinical 'inputs' and will involve visits to GPs, growth clinics, 'well-baby' clinics, etc. However, one school has abandoned its separate course on embryology and genetics and has distributed the various elements among several 'parent' courses: anatomy, behavioural science, etc.

One respondent is of the opinion that his special course in the third year of the medical curriculum (the first clinical year) comes too late and should be held earlier, before students begin serious clinical studies. Although anatomical and psychological development are taught earlier, the special course in growth and ageing is taught after some students have already taken clinical paediatrics and geriatrics.

Six respondents propose their school should urgently formulate a policy for the topic and should make more positive efforts to organize its teaching. They are not so much complaining at a lack of teaching as the haphazard and unco-ordinated way in which it is arranged. One of these respondents is very concerned at the fragmented and inconsistent way in which it is presented, with the individual teachers in different departments not even being in contact with each other: there should be more planning, he believes. One respondent in child health also called for a review of the topic's status in the curriculum, and specifically for better, more thorough teaching of it during the preclinical course. Until now it has been included in the clinical child health course.

Staffing is often the major factor inhibiting the teaching of human growth and development. Five respondents are conscious of having insufficient time to give adequate teaching and to teach formally what is too often picked up by students informally; however, even if the course(s) could be extended in the timetable, four of them might find it difficult to fill the time as they are equally conscious of being understaffed. Altogether there were eight reports of too few staff being available or interested in teaching growth and development, and this has severely affected the provision of tutorials and small group activities. As has been seen, paediatricians in a number of schools are given the responsibility for teaching growth and development in the early years of the curriculum as well as in their own clinical course and six reports showed that the extra commitment places a considerable strain upon them.

In the child health questionnaire, fifteen respondents recorded their concern over staff–student ratios: three of them had also referred to shortage of staff time in their growth and development replies. In some schools the numbers of students per teaching group is too high but cannot be reduced until more staff are found to teach them: the problem is rather more common among London medical schools than elsewhere. Indeed, although five reports from London indicated that an academic department had recently been founded or expanded which ought to make for greater resources for teaching, only one of them did not report difficulties due to lack of staff teaching time. (This single respondent and one other in Ireland were pleased to report that new academic appointments are soon to be created in their departments.)

A problem which affects teaching in two schools is the pressure of service commitments: the staff carry a heavy load of patient care and teaching has somehow to be fitted in around it, to the dissatisfaction of all. More frequent, however, is the problem of too few patients, aggravated by the falling birth-rate in Britain—at seven schools, it is alleged, the students are not able to see a wide enough range of cases and conditions to form a satisfactory general experience; two of them are in fact to send students to other district or 'peripheral' hospitals (where, increasingly, paediatric services are being established) for some of their clinical paediatrics in future.

Geographical circumstances can cause difficulties in arranging a timetable and in covering all topics comprehensively: seven departments have this problem. The children's hospital may be some distance from the main centre of teaching, thus entailing time-wasting travel, or there may not be a single large children's hospital, so that students must be parcelled out to different places and the programme is less controllable; or the main children's hospital may be distant from the maternity hospital used for teaching so that the arrangements for neonatal teaching are less than ideal. One of these departments and two others reported that they have to contend with inadequate physical surroundings—antiquated buildings and facilities which are unsuitable for modern paediatric care and for modern teaching practices.

Teaching Activities and Content

Broadly, the same trends featured in the replies to both questionnaires under this heading. In growth and development, three respondents anticipate a greater variety of teaching methods being used. In child health the new joint programme between two London medical schools is to be based on carefully formulated objectives in a structured, balanced course and employing the most appropriate method for fulfilling each objective.

One child health department has developed a library of tape–slide packages for students to study whenever convenient; they and six other

departments intend to continue (or to begin) to invest in teaching aids of one type or another and to improve the quality and quantity of their audiovisual stock. Three respondents would like to have more audiovisual equipment and material, but it is very difficult for the staff themselves to find the time to prepare and produce the material they want. Better slides, films, and tape/slide programmes would help to overcome the problems of live demonstrations—young children do not necessarily 'co-operate' in teaching and with an unpredictable supply of the various conditions and more treatment being given outside hospital, patients are sometimes not available for teaching purposes.

Small-group teaching has increased in four child health courses; four respondents are hoping to increase the amount of small-group teaching in tutorials and seminars but two of them are more confident than the other two of achieving this. Two respondents pointed out the disadvantage of their small-group teaching arrangements: it is repetitive and time-consuming for staff to have to conduct up to ten or so sessions on the same set topic throughout the year.

Opportunities for independent research and projects are to be introduced in one child health course and extended in another.

Four courses on child health will include more topic-teaching and other ventures in co-operative teaching with other specialties. Two child health courses have recently brought in specialists other than paediatricians to teach (for example, general practitioners) and one of these respondents would like to see a wider range of expertise drawn into the teaching of growth and development—for example, psychologists and educationalists. The paramedical and remedial professions could also play a much larger and very effective part in the teaching programme if they could spare the time, according to one respondent.

Extending these aspects of the teaching base is paralleled in the exploration of territory outside the teaching hospital as a focus of teaching; both literally and thematically. Domiciliary visits and follow-up reviews of the patient at home have recently become a feature of two Scottish child health courses, while six other respondents appreciate the need for extramural experience but have found it impossible to arrange so far. In future three departments will be making greater use of non-teaching district or 'peripheral hospitals'—partly to compensate for the over-specialized or unrepresentative cases in the main hospital, as mentioned above, but also to give students the benefit of working in units more close to the community and more accessible to parents and families. Altogether eight replies (three for growth and development, five for child health), indicated steps which are being taken to make the course more community-oriented. There will be more time and emphasis given to the social aspects of a child's life, the family and school background and their role in the history and in the management of ill health; students will be required to attend special assessment and 'well-baby'

clinics, to visit schools and special institutions or to accompany members of the community services on their rounds. An interesting scheme along these lines is being introduced at an English school in the child health course: 'all students will be assigned to a child suffering from a physical, mental or social handicap. They will visit this child's home and any special school or institution he attends and meet representatives of the health, education, and social (or probation) services who are involved with the child or the family. They will be required to write a full case report, and present the case to their tutorial group . . . with the Specialist in Community Medicine (Child Health) also present.' Community involvement for all students is the wish of two respondents, following the success of the voluntary family case studies and attachment; these should be made universally available.

Introduction of formal teaching of growth and development and reorientation of clinical teaching in child health can lead to disparity with the rest of the medical course which remains 'hospital-based and disease-ridden' in comparison. Three respondents have encountered this problem; their approach is not supported by the example of other departments and their teaching appears to be isolated and is regarded as a 'soft option'.

Nevertheless the shift in emphasis continues. One child health respondent stated that the most important change in recent years has been the realignment of the course from the traditional paediatrics to the positive and broader concerns of child health. In growth and development specifically, five courses (or sub-components of child health courses) have added a consideration of psychological development and socialization to the original, physical development core of the course. In future, seven schools will be giving more weight to preventive care, screening programmes, health education, the principles and methods of developmental assessment, abnormal or arrested development including mental handicap, and to training students in some of the techniques of child assessment.

Some developments in clinical teaching are also in progress. Two schools will enforce residential or on-call arrangements for students to see emergency events as accommodation becomes available. One school plans to have more structured and better illustrated teaching of antenatal growth and development and two other courses in growth and development will benefit from more clinical demonstrations: another respondent would like to follow suit but is unlikely to be able to.

Altogether changes have recently been introduced in this specialty in twenty-seven schools. Plans for changes in the future were reported from a total of twenty-six schools who are confident of implementing them, and a further ten reports of proposals which may or may not come into effect were received. These developments relate to organizational, logistical, methodological, clinical, and theoretical matters and many schools reported developments on several fronts at once.

Communicable Diseases

Replies to questionnaires on the teaching of communicable diseases were received from thirty-four schools. Those with preclinical courses only were not asked to reply, and one school whose clinical course had not started decided that it could not reply usefully. The term 'Communicable Diseases' will be used here though it is interchangeable with 'Infectious Diseases', which some respondents prefer.

TEACHING ARRANGEMENTS

In twenty-six schools the subject is formally timetabled separately and treated as an independent subject. In eight schools it has no independent status and is taught in a variety of ways together with other disciplines and specialties. However, independent status does not preclude additional integrated teaching and in several cases communicable diseases are taught both separately and together with other subjects.

Formal theoretical instruction in the subject can be given separately by communicable disease specialists, as it is in eight schools, or jointly with other specialties—this is the sole arrangement in five schools. Ten schools include the subject in their co-ordinated multidisciplinary series of lectures or topic-teaching programme. Fifteen schools include formal teaching in the subject in their microbiology course or make special arrangements for microbiology/communicable disease sessions. The subject meets microbiology under the umbrella of 'Medical Microbiology' which is the name used for this subject area in several schools. Three of the schools where theoretical teaching is associated with microbiology also include communicable diseases in their multidisciplinary clinical lecture or topic course.

Arrangements for patient-based clinical experience are equally disparate. Some schools give students a separate full-time or part-time attachment to a unit or a special hospital for communicable diseases. In ten schools students are seconded to specialist units for brief sessions or

clinics during their general medical attachments, as communicable diseases are regarded as a necessary part of 'clinical medicine'. Alternatively, clinical experience in communicable diseases is given during the child health/paediatrics attachments in five schools.

Three of the schools where the subject is 'theoretically' taught during the microbiology course also include clinical teaching then—patients are seen and examined, and laboratory and clinical aspects are undifferentiated. One of these schools has a full-time 'Advanced Pathology' course in which microbiology and its clinical applications feature heavily; the other two have courses in 'Medical Microbiology'.

Another possibility is to timetable clinical experience in communicable diseases within a rotating series of 'special', usually unrelated, subjects.

Position in the Course; Teaching Time

As far as it was possible to locate communicable diseases—frequently a ubiquitous subject—in the curriculum, it appears rather more frequently in the middle of the clinical course than at either end. The main teaching effort occurs in the first clinical year in two schools; in the second clinical year in eight schools; and in the final clinical year in five schools. It rotates over more than one academic year or appears on a number of occasions in the remainder.

Five schools offer full-time clinical attachments to the specialty, and a further one plans to. Five of them last (or will soon last) for two weeks and the fifth is for one week: three are residential. In addition, one school gives the full-time equivalent of a fortnight's attachment (in fact, four weeks half-time): this is normally residential.

Teaching time per student in other schools, where this could be estimated is distributed as follows:

Teaching Time on Communicable Diseases (hours)	*Number of Schools (excluding those with ft or pt attachments and those who could give no estimate)*
Up to 20	11
21–30	6
31–40	2
41–50	3

The average teaching time devoted to the subject in all twenty-nine schools who could provide estimates is thirty-three hours (SD 19·25), treating each week of an attachment as the equivalent of thirty hours.

FEATURES

Aims and Objectives

Most respondents described the philosophy which governs their teaching: this may take the form of defined objectives, but is sometimes less formal or less consciously proclaimed, but nevertheless used as guidelines or principles for structuring the course.

The first of these principles is to concentrate on providing students with clinical experience, and to make the clinical experience as appropriate as possible for undergraduates. Student experience is therefore selective: cases are chosen because they represent conditions encountered frequently or because they exemplify the fundamental processes of infection. Students must learn to recognize the typical clinical features of the common conditions and some of the atypical ones. Eleven courses make this a primary aim: often it was justified by reference to the high proportion of the general practice workload which the common infections make up.

One school structures its course around a developmental theme: it begins with prenatal infections and progresses through the main conditions of infancy and childhood to those which affect adults.

Five courses are concerned to inculcate sufficient knowledge of infection—the pathology of infection—to enable all future doctors to appreciate the basic precautions. Such an approach is less concerned with specific diseases and more concerned with hygiene and protection from all types of infection. Doctors in any specialty, hospital or non-hospital based, should be prepared to initiate, maintain, and comply with whatever control measures are necessary in emergencies as in daily routine practice.

In terms of the subject's role in undergraduate medical education, eight respondents see it as a 'bridging specialty'. It combines the knowledge and skills of several laboratory, clinical, and social science disciplines, and demonstrates how this combination of expertise is essential to patient care. The subject is an antidote to the dangers of 'compartmentalized' learning. In the words of one respondent: 'In the broader sense of microbial diseases, whether or not they are communicable, the discipline is particularly valuable because of its interdisciplinary flavour. It offers a grand opportunity to bring together basic scientific concepts in microbiology, cell biology, epidemiology and immunology, and show their relationship to clinical problems, e.g. transferable drug resistance is a facet of bacterial genetics of immediate relevance to antibiotic use and problems of epidemiology. The discipline also cuts across specialties in the clinical sense in dealing with hospital as well as community infections and in tackling problems which traverse the age groups, and of greatly differing severity.'

The epidemiology of infection is a major emphasis throughout the courses of seven schools. The spread and the prevention of infections are important topics and each problem is presented as a community problem as well as a clinical one affecting individuals. Local and national perspectives on immunity, vaccination, notification, etc., are given.

Certain features of course content were singled out by respondents for special mention. For example, three courses always alert students to the growing problem of hospital infections and the measures which can be taken to keep them at bay. Two courses focus on the diseases and conditions which students rarely see in other departments and which would otherwise remain untaught. Both these courses consist of attachments which provide enough time to cover the more specialized or more complicated problems as well as the commoner or more straightforward ones.

The newer types of infection and the complications arising from developments in medical practice (and even from iatrogenic factors) are particularly stressed in five courses. In the same way, five respondents are especially anxious to teach students 'a rational approach' to prescribing antibiotics. Discrimination in the use of antibiotics is a matter which can benefit all specialties, and communicable disease specialists are exceptionally well equipped to teach it.

Seven schools believe it to be as vital now as ever to include the importable 'tropical' infectious diseases in their course. Students are taught firstly how to recognize them and secondly how to respond—where to refer them, when to notify, and which are acceptable for an 'ordinary' doctor to manage alone. (In addition to this teaching, one school each in London and Ireland include separate attachments to tropical medicine—they are not included in this analysis.)

Teaching Methods

Topic teaching has reportedly been found extremely valuable. In two schools, where infection and communicable diseases have a portion of the main topic teaching cycle, the respondents consider it very worthwhile. At one school the subject is taught entirely in this way: a series of multidisciplinary sessions covering the main topics of infection is organized by the microbiology department and runs over an eighteen-month period. Each session lasts 1½–2 hours and is open to all clinical students. Eight other schools make use of multidisciplinary panels to teach some aspects of the subject. Naturally, microbiologists perform regularly; other teachers are general physicians, dermatologists, paediatricians, and general practitioners. At one English school for example, the relevant 'interdisciplinary infections' are taught during the gynaecology and paediatrics courses in integrated teaching sessions.

Two general practice courses have agreed to include certain infections in their clinical teaching, over and above that in the hospital-based course in communicable diseases. Students will see the common diseases which do not find their way to hospital and will see how they are managed in the home.

Informal staff–student discussions are a feature of two courses. Audiovisual aids such as coloured slides, and also handouts, have been found very useful in six schools: the clinical features of many conditions are markedly 'visual' and so lend themselves well to this approach. As previously mentioned, four courses are residential—this is regarded as particularly useful: students see acute conditions and emergency treatment and are able to observe continuous care. Finally, at least three schools offer elective attachments in communicable diseases to interested students.

STUDENT ASSESSMENT

Twenty-four respondents were able to state positively that the subject 'Communicable Diseases' is 'critically' assessed: only one stated positively that it is not included in the critical assessment system. In most cases the subject is examined with clinical medicine, either in a separate 'medicine' paper or in the medical quota of questions in an integrated examination. In eight cases the subject is included with microbiology in the 'paraclinical' professional examinations in conjunction with pathology. In seven schools communicable diseases may be included with either medicine, or microbiology/pathology or both. Some respondents indicated that questions are occasionally rather than regularly included; furthermore where they are normally included at some stage of the critical assessment system, they may be optional questions, and thus it may be possible for students to avoid them.

In-course assessments take place in at least eight schools. Six of the eight produce informal, subjective reports on students' performance during the clinical course, and at one school students take an MCQ paper as each group completes the course. Three of the eight are involved in class examinations with other clinical subjects and in two cases this in-course assessment could be 'critical'—the class examination forwards marks to the professional examination, although the communicable diseases element is very minor; and of course it is possible that a consultant's report could lead to a student compulsorily repeating the course.

Two respondents expressed themselves dissatisfied with the arrangements for assessment: they would like their subject to have a 'guaranteed place' in the final qualifying examination each year.

PROBLEMS AND DEVELOPMENTS

Resources

The staff–student–patient ratio presents severe difficulties in several schools: there are too few staff and too few patients available to satisfy teaching requirements in six. 'Lack of patients' can arise from a very low admission rate, or from lack of cases suitable for undergraduate teaching. The picture is rather worse in five schools who have no separate unit at all for infectious diseases and no specialist staff appointments. One of them, a London school, has managed to book four afternoon sessions per student group at another hospital with suitable clinical facilities (the 'theoretical' teaching is done by a consortium of microbiologists, general physicians, and guest speakers from outside) but at present the others have no alternative sources and thus cannot attempt clinical teaching. One of them however has been promised a unit for infectious diseases during the next phase of hospital building, although it is not yet clear how suitable the cases referred to it will be for undergraduate teaching.

Geography also causes problems: at six schools the unit where clinical teaching is given is sited at a distance from the medical school and the main teaching hospital(s). The specialty is therefore physically isolated from other departments, and students waste potential teaching time in travelling. Two respondents proposed that a small teaching unit should be created in the main teaching hospital or that a section of the special hospital should be transferred to a central site.

Organization of Teaching

Three courses are new ones—recently established and with greater scope than previously—and two more are being planned as part of new curriculum packages which will give the specialty not only more time but also better prospects for using the time constructively. One of the full-time residential courses is new. One school (without clinical facilities) has abandoned its formal course and the subject has been merged with microbiology and to a lesser extent with medicine, child health, chemical pathology, and community medicine.

Timetabling itself presents problems. Students take the 'practical' clinical part of the course in their first clinical year at two schools, who would prefer them to acquire more general clinical experience and sounder clinical skills before they learn communicable diseases. One of these schools and three others find that student exposure is too brief—they come for scattered sessions or for a very brief intensive period—and this prevents them following the progress of a case from admission to final outcome; they cannot become personally involved or take on a

project. Two of these schools propose redistribution of students—the groups should each come for a continuous block spread over a given length of time. Another advantage of this would be opportunities to see signs and symptoms of disease while they are florid: too often, it is said, students miss seeing really good examples when they come for their odd, isolated sessions.

In five schools closer links with microbiologists have developed and there are integrated teaching sessions such as clinico-microbiological conferences between communicable disease specialists and microbiologists. One English school, for example, has brought in the staff of the local public health laboratory which is situated in the grounds of one of the hospitals: 'the teaching sessions take the form of clinico-microbiological demonstrations again based on individual case histories wherever possible'. Four schools intend to introduce this type of topic-teaching or to increase what they already do.

Separation from the course in microbiology (and virology, parasitology, and immunology) is a major handicap for six respondents. They find that they must repeat the earlier instruction and revise what students have forgotten from perhaps two years ago. Three of them and two other respondents see the solution in a new multidisciplinary course which would combine the laboratory, theoretical, practical, and clinical aspects: community medicine specialists should also take part. This would probably have to be full-time. If microbiology and infectious diseases are two sides of the same coin, then it would be logical to study them together. Moreover, it seems possible that the separate specialty of 'communicable diseases' may disappear in parallel with the disappearance of microbiology as purely a laboratory occupation.

The medically equipped hospital microbiologist is beginning to take greater responsibility and undergraduate teaching must adapt to take advantage of the possibilities: 'In his evolving capacity as hospital epidemiologist and consultant in the diagnosis and treatment of infections—and the broader infective diseases—he is rapidly becoming the central figure in the teaching of this specialty.'

Microbiology is not the only field of medical practice with connections with infectious diseases. Four respondents would like closer links with general medicine, with other medical specialties, or with surgery, so that topics of mutual interest could be tackled together. Three respondents think that a better way of showing how infection manifests itself in so many specialty areas would be a final-year course, held after students have completed their attachments to the various specialties, so that their experiences there can be referred to, built upon, and integrated together.

Four respondents would like to have some formal arrangement with those responsible for teaching the general practice course in order to ensure that the common infections which are treated at home could be

dealt with then. Either general practitioners should show appropriate cases to students, or joint teaching sessions with communicable disease specialists and general practitioners should be instituted. Under present arrangements, students miss observing the most frequent and most easily manageable diseases.

According to three respondents, the subject is not always seen as a necessary part of the curriculum—particularly by medical school planners who see even less justification for it now that the 'traditional' infectious diseases are no longer a major problem in Britain. They do not appreciate how the scope of the subject has changed and indeed widened.

Four courses were reported to be redesigned to reflect these changes: they teach very little about the traditional 'fevers' in proportion to the growing emphasis on the conditions now prevalent today, and particularly the problems of secondary infection, cross infection, etc., occurring in hospitals. They try to provide a balanced mix of common and less common conditions and of specific diseases, syndromes or problems. There is less teaching in and about the special isolation hospital, and more about the role of special isolation units, the control of infection, in general hospitals, and the management of communicable diseases in the community (and in general practice). As previously described, a number of other respondents would like to restructure their courses similarly, to modernize them and make them more relevant to present circumstances.

Concurrently with 'opening up' the course content a number of schools are experimenting with different teaching methods, and multidisciplinary panel discussions have already been mentioned. Three respondents have reduced the number of set lectures, and four courses now contain more seminars, tutorials, and other opportunities for discussion, and small-group clinical teaching. Handouts have become a regular feature in one school, another will shortly introduce them, and a third is to make tape–slide programmes available: cine-film is a potential supplement to clinical teaching at one other school. In future one more school will offer elective attachments in communicable diseases, and two respondents would like to offer residential facilities to at least some students to give them the chance of in-depth experience.

A total of nineteen courses have recently undergone changes, major or minor; six of them and another five courses will see more changes in the near future. Another six respondents indicated the possibility of some change whose implementation depends on factors beyond their control.

Dermatology

Completed returns were received from thirty-four medical schools with respect to dermatology; one other school, in the process of establishing its clinical course, sent administrative outline plans only.

TEACHING ARRANGEMENTS

In general, the teaching of dermatology—as opposed to its timetabling—is independent and separate from other subjects. In twenty-two schools all teaching of the specialty, both theoretical and patient-based, is contained within an identifiable dermatology course. However, in six schools dermatology is included in the main vehicle of theoretical clinical teaching—a systems- or topic-based co-ordinated course, in which most clinical disciplines and specialties meet. In two schools dermatologists join in the final year revision course organized with other specialties.

Position in the Course: Teaching Time

In sixteen schools the main teaching effort occurs in the second year of the clinical course—after students have completed their instruction in basic clinical method and their early attachments to general and internal medicine. Only two schools locate dermatology in the first clinical year, and four in the final clinical year; however, in seven schools the course rotates over more than one academic year. In ten schools it is timetabled as one of the 'Special Subjects': a number of the smaller specialties are grouped together for convenience as no individual one of them is felt to justify an independent block of the timetable, and students work their way through them, sometimes one by one, sometimes two or three together, half-time or one-third-time each.

Five schools provide full-time (or virtually full-time) clinical attachments in dermatology over a period of up to three weeks. Eleven schools give part-time clinical attachments, usually half-time or thereabouts, and spread over a period of several days or weeks. Other schools

give less substantial exposure; eighteen schools schedule dermatology on a sessional basis, allowing a few hours to one day per week, over a period. At two of the latter schools the attendance at clinics and ward rounds is not only intermittent but optional.

Taking a week's attachment as the equivalent of 30 hours, the average time devoted to the specialty in the timetable is 56 hours: however, the standard deviation of this mean is 29·0, and the range of teaching time is from 10 to 120 hours. Seven schools devote less than 30 hours to the subject, and six, more than 90 hours.

FEATURES

Aims and Objectives

A number of different attitudes concerning the teaching of dermatology—how to present it, what emphases to choose—can be discerned. They condition the over-all approach and general features of the course, but are not necessarily mutually incompatible. However, in almost all the schools it is hoped the students will learn to understand the underlying pathology of dermatological problems, and not merely the superficial manifestations.

A dozen schools emphasized the essentially visual nature of dermatology. The symptoms and physical evidence of disease are immediately apparent. This outstanding quality of 'visibleness' has a particular educational value in enabling students to develop their powers of visual observation and discrimination and of accurate reporting and describing of observed phenomena: it may also result in the subject being one within which it is relatively easy to engage the students' interest. Dermatology, then, is felt to be by its teachers an ideal medium for learning a basic clinical skill.

Teaching and learning clinical skills require maximum clinical experience: thus a main objective in twelve schools is to ensure that students receive as much contact with patients as possible. Out-patient clinics therefore predominate: here students see large numbers and varieties of skin conditions and learn how to identify them; they realize the extent of skin problems in the community and recognize that they can be painful and embarrassing—though 'minor' in the eyes of the medical profession. One school's student hand-out remarks 'As the public becomes increasingly intolerant of disablement, so it becomes more demanding and expects its doctors to know how to manage these problems. . . . Hopefully you will learn that even minor skin problems are disabling and the patient is right to expect treatment.'

Two schools adopting this approach and two others are concerned also with giving a general introduction to the subject—a survey of the main dermatological problems and the standard methods of diagnosis

and treatment. An adequate grounding in the subject must be given, one which is suitable for doctors who may have no further training in it but as (for example) general practitioners will be called upon to deal with its manifestations.

Another possible aim is to present dermatology as one branch of general internal medicine. Dermatologists in eleven schools particularly relate their subject-matter to—and sometimes collaborate in teaching arrangements with—general medicine, to show that the skin is not an isolated entity but one which can express and reflect systemic physiological disturbance: it is part of the 'whole body' or the 'whole patient'. This approach is prevalent in the schools which give students a relatively long attachment to the specialty.

On a slightly different theme, two schools concentrate on relating dermatology to basic biology—genetics, immunology (this particularly is stressed by one school), metabolism, nutrition, etc. They emphasize the application of basic 'preclinical' studies to clinical problems.

A distinguishing feature in two schools is the opportunity to see a very wide range of patients, so that students become familiar with atypical as well as common manifestations. One school points out that their students will have seen more new patients during the dermatology course than in the whole of the rest of their general medical training. Two respondents added that dermatology patients are more willing to be taught upon and examined by students than other patients with less accessible symptoms.

Nine schools draw attention to the effects of other body processes and non-dermatological diseases on the skin, while four schools think it equally important to alert students to the social and psychological problems associated with skin problems, and the possibility of psychological aetiological factors in skin diseases.

Teaching Methods

All schools give lectures, tutorials, and clinical experience but the ratio of one to the other varies. The proportion of clinical work is occasionally less than 50 per cent but can be as high as 95 per cent. The average appears to lie around 75 per cent.

The subject is highly amenable to the use of teaching aids; sixteen schools report that audiovisual and visual facilities are extremely useful and appropriate. Two of these schools also have standing displays for students to study in their spare time, consisting of mounted photographs, specimens, reports, and brief written summaries. Another school issues handouts to students at the start of their attendance, outlining the course and listing the common conditions which ought to be seen, the less common conditions which might be seen, and the topics to be discussed in tutorials.

Three schools regularly arrange topic-teaching sessions in which a panel of speakers discusses selected dermatological topics. Interdisciplinary teaching does not generally occur, but at three schools dermatologists accept invitations to teach preclinical students and at one school the clinic's social worker also has the responsibility of teaching medical students. One London school is able to draw upon the resources of the Institute of Dermatology for teaching the subject.

Active student participation in patient care is comparatively rare, but a few schools expect students to interview and examine patients, and two schools expect students to prepare talks or present cases, each in turn, at tutorial meetings.

Project work is available during the course at one school, and five schools offer elective programmes in dermatology which were reported to be successful.

STUDENT ASSESSMENT

Twenty schools reported some form of in-course assessment. In seven cases the staff write a report on each student at the end of the attachment or course, commenting on his performance and progress during the course. In two cases the dermatologists arrange a more formal test, such as an MCQ. A class examination, usually an MCQ paper with questions on several topics and subjects including dermatology, takes place at seven schools at the end of the relevant year or stage of the clinical course. At one school the score resulting from in-course assessment is carried forward to be considered (for all students) at 'Finals'.

No school went as far as stating that dermatology is never included in any part of the qualifying examination: however, only five schools indicated that the specialty is included definitely and regularly in a 'critical' assessment. But five more indicated that dermatological questions appear occasionally in the written, clinical, or oral examinations. Most frequently it may be included in the (general) medicine examination (seventeen schools) though at two schools the 'minor' medical and surgical specialties have their own paper.

PROBLEMS AND DEVELOPMENTS

Resources

Staffing is reported as the major worry. Six schools reported that they had either only one or no staff members with university contracts. Thirteen schools altogether urgently need initial or further academic appointments in dermatology, to give the proper amount of time and energy to teaching and preparation for teaching. Only one school reported that the appointment of new staff was imminent.

Four schools have problems connected with accommodation. Their clinics are held in antiquated premises with insufficient space or privacy for teaching or without the adequate lighting which is essentially necessary in dermatology. One solution to this which has been mentioned is to use clinical facilities in 'other' hospitals: this can spread the teaching load, relieve overcrowding, and encourage attendance from students stationed in these hospitals on other attachments.

Several schools are increasing the amount of colour slides and tape–slide presentations and the frequency with which they are used. Two schools will shortly take over new 'teaching laboratory' areas with space for permanent exhibitions and audiovisual booths. One large school would like to introduce the use of colour television, although students have indicated their preference for teaching with 'live' patients as opposed to prerecorded material. Student numbers and timetable pressures make it too difficult to arrange as much personal contact as is desired.

Organization of Teaching

A new dermatology course has recently been introduced in seven schools, and three schools now have a full-time attachment where there was none before. However, two of them are still not satisfied with the allocation of time. One school may give more time to the specialty in future, but this is an exception: fourteen respondents complained of insufficient time to teach students properly, or of such badly scheduled time that teaching is inhibited. Clinical teaching time in particular is regarded as short; in one Irish school for example, students are 'encouraged' to attend out-patient skin clinics but this is not regarded as a compulsory part of the course, and only a proportion of the class (those who are attached to a particular one of the teaching hospitals) spend any time in a dermatology department. Two Scottish schools have dermatology timetabled among a group of other 'minor' subjects, each thematically unrelated to each other; this is stated to disrupt the lives of staff and students, and to prevent concentration. Another problem, aggravated by allegedly injudicious timetabling, is that of numbers: too many students attend at once, but intermittently, and this makes an often already overloaded staff : patient : student ratio even worse (eight schools make this comment).

Regarding the location of dermatology in the course as a whole, one school would like it to be placed earlier in the clinical course. Two are willing to do some, or more teaching to preclinical students if the need were recognized by other parties. Two respondents at any rate feel the need: they are concerned at the standard of skin anatomy and physiology being taught to preclinical students and would like the responsible departments to undertake more (and more thorough) teaching of the basic elements.

Relationships with other clinical subjects could, it is felt, also be improved. It is not that dermatologists wish to strengthen their independent courses but they see opportunities for collaboration which could be beneficial. Two of them for example would like to establish links with general medicine: joint teaching sessions would help the staff to overcome the difficulty which one of them mentioned of trying to keep abreast of advances in general medicine which have implications for dermatology. Two respondents suggest that dermatology and dermatologists be formally included in the general practice course. A very large part of general practice workloads consists of skin conditions, many of which are not referred to hospital and so are unlikely to be seen by undergraduates except by accident: general practice would therefore be a very suitable teaching base for dermatology. In fact, one school has plans to use health centres and day treatment centres for this purpose. Other specialties with a 'natural affinity' to dermatology and with whom some joint teaching sessions are to be introduced are paediatrics (one school) and radiotherapy and plastic surgery (two schools).

Four schools have developed the use of tutorials and small group teaching; five other schools are convinced of their value but are unable to follow suit through lack of staff time or student time. Two schools now give greater clinical exposure to their students, with correspondingly less time spent on 'theoretical' instruction. The school that takes students to the Institute of Dermatology expects to arrange more of these visits and another London school would like to follow their example because of the wealth and variety of clinical cases available there. However, clinical teaching at another school does not suffer from lack of cases, but from quite the opposite: staff, if they had the time, would prefer to use selected patients in special separate teaching sessions rather than have to teach on all or any patients who happen to present at the clinic. A school which relies entirely upon out-patient clinics for teaching dermatology proposes in addition some in-patient clinical teaching and some formal theoretical teaching as one unit of a systems-based course. Two schools are hoping to introduce symposia and project work.

In the field of assessment three schools have been devising and collecting multiple-choice questions for either formative in-course testing or for class examinations. Two schools would like to be able to assess students formally and separately at the end of their course and three believe dermatology should be a regular part of the final qualifying examination.

Altogether significant changes have been made in twenty schools; changes are being planned for the future in nine schools and contemplated in a further ten. Not all have been described here: these other measures which are being taken (or envisaged in more propitious circumstances) amount in eight schools to a considerable internal reorganization of their courses in dermatology in order to make better, more effective use of the time and resources available for teaching.

General Practice

Questionnaires on the teaching of general practice (GP) were sent to all medical schools offering or soon to offer clinical courses: all thirty-five replied.

Thirty of the thirty-five responding schools include the topic in their present curriculum; that is, the curriculum appearing in the 'School Profile' tables. In many of the schools the curriculum is a new one and the general practice course has yet to be taken for the first time; thus, eight respondents of the thirty completed the questionnaire in respect of future arrangements coming into effect in 1976 or later, and some of their answers were consequently brief.

The remaining five respondents represent schools where the topic is not formally included in the present curriculum: they indicated plans or attempts to introduce it in the future but were not able to complete all sections of the questionnaire.

Very soon there will be no clinical school in the UK that does not teach any general practice (for comments about the position in Eire, see below). Except where otherwise stated, all comments are with reference to the full 'field' of thirty-five schools.

TEACHING ARRANGEMENTS

In twenty-six schools the most significant point at which students are taught about general practice is a separate course given solely on this topic. Sometimes this is a 'teaching' course, with formal classes conducted by medical school staff, interspersed with sessions of clinical experience in selected practices; but at most schools it consists of a full-time attachment to practices when students are free from formal teaching and are not seen in the medical school at all. The independent course is often not the only occasion of teaching. In ten of these schools the topic of general practice is also linked with a course in community medicine, and in six further schools the topic is linked with community

medicine without any other 'separate' arrangements. There are two forms which this arrangement can take: a block course during the clinical years, when students learn about community care generally and which may include part-time or full-time clinical attachments to selected practices; and secondly (and less commonly) a course during the early or preclinical years when students learn in general terms about social and environmental factors influencing human behaviour and affecting the practice of medicine. In each type of arrangement, patients on the 'lists' of the general practitioners involved are used to demonstrate topics under discussion, and the lessons of social medicine are shown being applied in good primary care.

Very similarly, general practice is linked with teaching of the behavioural sciences in five schools. Academic general practitioners may make regular contributions to a course in behavioural science, or the two topics may be partners with others in a multidisciplinary, community-based course on 'Man in Society' (or the equivalent); or, as at one of these five schools, the university department of general practice is responsible over-all for the course in behavioural sciences, which is here combined with an introduction to clinical method. In each of the five schools, however, such teaching is in addition to (and prior to) an attachment.

Altogether seven schools reported that general practice and/or general practitioners feature in their special courses of introduction to clinical method. Three of them and four others also include some aspects of the topic in their major course of theoretical teaching on clinical subjects; this is usually a co-ordinated series of lectures and symposia based on systems, but it can be a topic-teaching cycle.

A growing number of schools now enlist the resources of general practice in teaching in various hospital-based clinical specialties. In clinical medicine, surgery, child health, and psychiatry (especially psychiatry—seven respondents mentioned links with it) students are sent on follow-up studies, visiting patients at home who have been returned to the care of their own doctor after discharge from hospital.

Eire

The position in which schools in the Irish Republic find themselves with respect to GP teaching is quite different from that obtaining in the UK. Because of the essentially 'private' status of general practitioners in Eire, it is much more difficult for schools to arrange regular placements for students in the practices.

Three of the schools will try to arrange a week's attachment to a general practitioner for a student who asks for this, but cannot guarantee it: a further school simply reports that it is 'exploring the possibilities' for providing students with suitable experiences. However, the

fifth school has purchased its own general practice which is used to give every student a week's GP attachment.

In addition, this last-mentioned school and one of the three which can only provide an optional attachment to GP, each provide about twenty hours of lecture-based teaching on the subject.

Position in the Course: Teaching Time

Rather more schools concentrate the teaching of general practice into the final year of the medical course than into any other year, and more schools arrange for it to occur in the second clinical year than in the first. It is thus in the final two years of the course when attachments to general practices are normally given, and students usually though not always take these in rotation, rather than simultaneously. In three schools, substantial learning in a general practice setting occurs in all three years of the clinical course.

Thirteen schools include teaching in a general practice setting and/or by general practitioners in the preclinical years of their curriculum. Five schools include such teaching in four (of five) years of the course.

A form of learning which is often intimately connected with general practice is the long-term family case-study. This cannot be pinpointed in the timetable as it is extracurricular, spread out sometimes for a long period of time, and it is left to the discretion of the student exactly how much time and energy he devotes to it. Such arrangements occur in seven schools: in five they are 'required', in two they are optional. In structure the schemes are similar; the immediate supervision is carried out by the doctor of the family concerned, with the medical school's department of general practice and/or community medicine exercising over-all supervision.

Twenty-one courses give full-time attachments to a practice. They are spread over a period of one week in one school, two weeks in twelve, three weeks (approximately) in two, four weeks in five schools, and six weeks in one. One of the shorter attachments is in theory optional, but in practice is taken by almost all students. Most schools assign students to practices, but in some, students choose where they want to go from a list maintained by the school.

A proportion of the attachments is residential, especially when students are scattered widely and are attached to practices far from the medical school. They stay with the doctor concerned or in a nearby hospital residence. Furthermore, even when students are attached to practices in the vicinity of the medical school and live in their normal abode, they are still sometimes required to be available for evening, weekend, and emergency calls.

Including attachments (equating one week with thirty hours of teaching) and other teaching of general practice, the average time

devoted to the topic in the UK medical schools with clinical courses who were able to give estimates is 102 hours (SD 41·9). However, this is a mean of estimates, and should be treated with caution: it is however probably an under-estimate of the true situation rather than the opposite. The reported range is 60–212 hours.

TEACHING STAFF

Respondents were asked to indicate the main specialties or fields of activity of teachers involved in the teaching of general practice. Information was not directly requested about the status of a department of general practice, or about the existence of a professor, or director of general practice. Many respondents gave such information but the figures quoted below cannot be taken as comprehensive.

There is a great variety in the ways that medical schools teach general practice. There is a strong relationship between general practice and community medicine, or social medicine, and the responsibility for teaching general practice often belongs to the department of community (or social) medicine: in nine cases correspondents reported that members of the department of social or community medicine were involved in its teaching. However, eighteen correspondents reported that teaching of GP was carried out by members of a department of general practice (or of a general practice unit situated in another department) and/or a professor of the subject.

One respondent remarked that it was very important to appoint a full professor of general practice. Such an appointment contributed considerably to the credibility of the department in the eyes of the medical school and its staff, and in his case the existence of such an appointment had helped to attract research funds: increasingly, research projects can only be funded by outside monies and such a consideration is therefore of vital importance when considering the academic future of the discipline.

A great deal of thought has gone into the ways in which practical experience of the general practitioner's role can be given to students. Such experience can be provided in many different ways and teachers of the subject have different views as to which is best. A fundamental necessity is contact with general practitioners themselves and all schools offering general practice as a timetabled subject use full-time or part-time general practitioners as teachers and/or tutors in their teaching programme. Of the schools introducing the teaching of the subject, three will use full-time or part-time general practitioners in their teaching.

Teaching by general practitioners may be organized in different ways. In some cases the university has a special interest (possibly financial) in

one particular general practice or health centre as a base for teaching. Such a system may be operating together with the more usual pattern of an academic department with a number of practices informally linked to it to which students are sent for practical work and/or attachments. The number of practices used by any one medical school varies and again there are differing schools of thought on this question. Some respondents feel that a small number (up to twelve) of practices is desirable: this arrangement has the advantage that the number of general practitioners involved is small, so that it is relatively straightforward to maintain standards and bring the practitioners together, from time to time. It is felt by other respondents that it is desirable to give students experience of different (and often distant) practices and so a larger number is used: a large number of practices is also used by those schools where *laissez-faire* arrangements obtain, so that none of the practitioners on the list receive too many students in any year. Frequently a combination of these approaches is adopted and a school may have an 'inner ring' and an 'outer ring' of practices, which are used quite differently. (One of the new English schools is planning to have such a two-tiered system: there will be five 'linked practices' and one partner in each will have an appointment with the university as a lecturer in general practice—he will be involved in both research and teaching activities. There will also be a number of 'associated practices' to which students will be sent on their attachments.)

Over-all, eighteen respondents reported the use of 'local' practices; five of them reported that they also use more scattered practices, and a further three respondents said that they used only the latter. Three respondents indicated that they considered it an advantage for students to be able to choose their practice attachments from a wide range of local and scattered practices. Two respondents reported that their university has an influence on the selection of new partners in the practices in which they have an interest.

In one English school, while the University is helpful and sympathetic to the cause of general practice, no funds are available to support the essential staff member who has responsibility for organizing the teaching of the subject. In this case, the local medical committees in the region have organized a donation which now pays the salary of the doctor concerned—but only for a limited period.

General practice is perhaps an unusual subject in that a great variety of non-medical personnel are involved in patient care. In nearly all schools, respondents reported that a variety of other personnel were also involved in the teaching of it. These include social workers, community psychiatrists, community geriatricians, community paediatricians, behavioural scientists, health centre dentists, accident and emergency specialists, and members of the various hospital clinical disciplines: also, respondents mentioned the involvement of lay workers in the

practice itself—the receptionist, for example. In seven schools, respondents mentioned that district and community nurses and health visitors were involved in their teaching.

FEATURES

Aims and Objectives

Respondents were asked to describe the aims and objectives of their courses. In general, the amount of additional material received in response to this request was impressive: clearly considerable thought is being given to the specification of objectives and aims in general practice. (In fact, many schools have established working parties to examine the objectives of general practice teaching at undergraduate level. In other schools the objectives put forward by the Royal College of General Practitioners have been adopted in whole or in part.) Twenty-four respondents were able to give detailed objectives: another three indicated the themes behind the way they cover the subject matter. The remaining schools were unable to give detailed answers to this question.

A great many respondents indicated that they felt that the very nature of the general practice setting provided (or facilitated) many of the desirable outcomes of teaching. One London respondent described general practice as 'a context for teaching' and another said that general practice 'taught the student to change from a disease orientation to a problem orientation'.

The majority of respondents emphasized that general practice brings the student into immediate contact with the 'total range of problems' that face the patient. As the 'doctor of first contact', the general practitioner must be able to assess all the possible influences which are operating on a particular patient: these will include possible psychological and emotional influences on the patient's behaviour and presenting symptoms. In all, twenty respondents particularly drew attention to the need of the student to understand and be aware of the social, psychological, and emotional influences at work. The student must also be aware that these influences will continue to affect the patient and must therefore be taken into account when considering treatment. The general practitioner must also attempt to assess the influence that the patient's home life and family relationships may have on his behaviour and health. The student, as mentioned particularly by one London respondent, must himself become aware of 'the patients' fears, perceptions, and personality, of the context in which they move and their interactions with it; aware also of the importance of his own interaction and those of the medical care system with patients and their families'.

Ten respondents specifically mentioned the fact that one of their aims was to demonstrate to the student that general practice is a unique

subject and situation. The relationship that is established between the general practitioner and his patient is quite unlike that built up in any other discipline. The role of the 'Family Doctor' is vitally important to the total health care system and students must realize this.

Through contact with a whole variety of patients, the student must necessarily meet many clinical conditions that he has previously not experienced. A total of sixteen respondents felt that the student's period in general practice was very useful for (and in part designed for) extending the student's experience of clinical medicine. Thus, teaching in the general practice ambit would consolidate the teaching that students received from other clinical departments and would offer them the opportunity to extend their experience of patient symptoms and illness. In relation to this, respondents also recognize that the student should be aware of the importance of the diagnosis of the general practitioner and of the management plan devised by him. Fourteen respondents said that one of their aims was to show the students the importance of this diagnostic/prescriptive role and also to demonstrate the necessity of knowing when to refer a patient to an appropriate specialist. The student should also be aware of the need for management in continuing care, and of the implications of this for the practitioner and his patient.

Fourteen respondents mentioned that demonstrating to students the need for preventive medicine and health education in the community is a particular aim of their teaching. It is felt by many respondents that the general practitioner is in an ideal position to have some effect in preventive medicine. He has a defined population and access to detailed case-records which can show incidence of illness. He is therefore able to mount campaigns on particular topics or to counsel patients individually in preventive medicine and their own health education. Eleven respondents particularly mentioned that general practice offered a means to demonstrate the patterns of illness in the community.

It was seen under teaching staff (above) that the various practice workers are of great importance in teaching students. This aspect of general practice is confirmed when discussing the aims of the course: fifteen respondents indicated that they consider it important that the student gain an understanding of the importance of teamwork in the care of patients.

General practice has met with some difficulties in becoming established as an academic discipline, and in the past the majority of graduates have it is alleged wished to enter one of the hospital specialties. Many graduates must enter general practice, however, and seven respondents indicated that one of the aims of their course was to reassure the undergraduate about the scope and (particularly) the excitement of medical practice as a general practitioner. Nevertheless one respondent stressed particularly that his course 'is not designed to recruit students to general practice'.

Content

The questionnaire asked for an outline of the main content emphases in the teaching of GP. The majority of respondents referred to the range and types of diseases that the student encounters during his general practice attachment. Seven respondents pointed particularly to the advantages to be gained from the student seeing the 'before and after' of illness. In all, thirteen respondents noted that general practice gave students the opportunity to observe the types of illnesses which did not reach hospital but which were nevertheless of great importance and concern to the ill patient. Thirteen respondents also mentioned the significance of chronic illness in general practice.

As has been mentioned, stress is laid on the general practitioners' relationship with the family: eight respondents specifically mentioned that the course content included studies of intra-family and doctor–family interaction. In his relationships with a family (and with the community) the general practitioner will become involved in the 'normal' crises of individuals' lives: birth, death, retirement, for example. Eight respondents felt particularly that such experience was very useful to the student. Frequently, the student's prior experience of these situations would be very limited and it was essential for him to be able to understand the reactions of the 'patient' in such circumstances, and so to be able to help him.

In order to take full advantage of the range of patient situations presented to him it is necessary for the student to be familiar with, and able to practice, certain relatively basic skills. In general practice the main method of obtaining information is by interview and history-taking: while the student will have learned something of these in hospital, the approach is different in general practice and is the key to accurate diagnosis. Eleven respondents particularly drew attention to the need for students to learn such skills (many respondents described the techniques used for teaching them and these are discussed under 'teaching methods'). Eleven respondents drew attention to the need for acquiring the skill of initiating an appropriate patient management programme, and their inclusion of this aspect in the general practice course. Six of these respondents had also referred to the need for interviewing skills and history-taking techniques.

Eight respondents mention that their course includes discussion of the general practitioner/hospital relationship. Where some teaching sessions are 'joint'—for example with paediatrics, or obstetrics and gynaecology—students may see the work of the general practitioner in relation to out-patient departments, particularly. Thirteen respondents said that their course includes reference to other community health resources and the ways in which they may assist the general practitioner in his work. Two of these thirteen correspondents particularly mentioned their inclusion of occupational health care in their course.

The last main area in which teaching is concentrated in general practice is that of practice management. General practice is probably unique in that the general practitioner has a health care responsibility to his patients as well as management responsibilities for his practice. Five correspondents specifically teach their students various aspects of the management of a practice—for example, how to organize an appointments system, how to file patient records efficiently. Students are also frequently given an introduction to the ways in which patient records can be used as the basis for epidemiological studies, and how to establish age, sex, and diagnostic indices.

Teaching Methods

The very nature of general practice determines to a considerable extent the methods used in teaching it. The subject is concerned with interpersonal relationships, be they doctor–patient or doctor–colleague. Consequently, comparatively few schools use lectures to any great extent, unlike most other courses and subjects. Eighteen respondents report the use of lectures, but of these, many use the technique simply to introduce the subject: in one Scottish school, for example, which devotes over 200 hours to GP over-all, there are no more than nine one-hour lectures. In one of the 'new' medical schools, general practice lecturers take part in didactic teaching in the basic medical science teaching of community health: these lectures cover subjects such as social class, the family, the ageing population, and the organization of the NHS and other health care systems. General practitioner lecturers at this school also take some part in the central multidisciplinary teaching in the clinical years.

A great many schools (nineteen) report their use of large-group discussion sessions. They may be used for a variety of different purposes: for example as 'problem-solving' seminars, based on presentations of real cases; or they may be given a consolidating role at the end of a student's attachment to a general practice (the student presents to the group an aspect of general practice that has interested him and this is then discussed and analysed by his fellow students and teachers). Frequently, hospital consultants and other health care workers are involved in these discussions.

The most popular and widely used teaching method is small-group teaching. This may take place either in the medical school or in the practice to which a student has been assigned. Twenty-eight respondents report the use of the technique. In the medical school, small groups may often be used to teach clinical interviewing skills, often with video equipment (nine schools reported this). Students will interview a real or simulated patient, and will replay their performance and discuss this with their tutor and peers. Simulation techniques are also frequently

used with small groups, and case-studies may be given to groups to work through with a subsequent discussion of the various possible approaches to the case. One London school has developed a novel form of patient simulation: instead of using actors, nurses, or students, patients are used to re-enact past problems and consultations—reportedly with effect. In one school in Ireland, small groups are used for all work in the final year and the teaching covers simulated case presentations, real patient presentations, modified essay question teaching, and multidisciplinary case presentations to illustrate 'topics', such as the handicapped child. In all, simulation and role-playing was mentioned by six schools.

As has already been mentioned, twenty-one schools offer full-time attachments to practices. In many of these, small-group discussions will be a natural occurrence between the student and the general practitioner. Case discussions will often be organized with other health care workers, so that the student may have experience of a multidisciplinary approach to cases that he has worked with.

Twenty schools require some form of independent work. Of these, thirteen respondents report giving students a project or case-study to complete during the course. In one school students must submit a 'mini practice audit'. In another school students must undertake four different types of independent work, one of these to be completed during each week of their four-week attachment. The projects, which are similar to those run in other schools, are:

(i) A 'family study' in which the student is encouraged to take the patient's place and to find out what it means to be a patient: he takes part in home visiting, interviewing in depth, and shares with a family the experience of chronic disease, childhood handicap, or coping with a sick or elderly relative.

(ii) 'Shadowing' other professionals such as the health visitor, the district nurse, or the social worker, to learn their skills and how responsibility should be shared in medical care in the community.

(iii) Using practice registers (age and sex index, diagnostic index) to work out patterns of disease, populations at risk, and the shape of the workload in general practice.

(iv) Using practice records critically, to examine the care given, and particularly to look at how efficiently patient care is shared between the general practitioner and the specialist.

Five schools require students to undertake long-term family case-studies, and in a further two schools they are optional. Students are 'given' a family, often a three-generation one, in which there is either a 'problem' (for example, a handicapped child, a bedridden grandfather) or a 'crisis' (for example, birth of a child, imminent retirement): they visit the

family over a period of months, or sometimes years, studying the reactions and accommodations of the individuals and the family. Frequently, the student is required to write a report or give a seminar on his experiences. (*Note.* Case-studies may also come under the aegis of psychologists or sociologists—see the report on these subjects.)

'Special Features'

Respondents reported a wide variety of different features which they considered the most 'special' in their courses. Many relate to the nature of the subject of general practice itself. Nine schools specified contact with patients to be the most important feature of their teaching: one London school described it thus: 'General Practice is the only situation in undergraduate education where students have an opportunity to see illness occurring in the natural environment of patients. Access to hospital is normally through the general practitioner, or through an accident department. The first signs of illness, the factors which determine which patients who are ill will seek medical care, the impact of illness on the family and the community, can only be studied outside hospital. It also provides a unique opportunity for students to experience the implications on individuals and families of such important events as birth, marriage and death. The relationships which students can develop with patients in a well-run general practice course are unique and give them a new understanding of such concepts as the sick role and the doctor/patient relationship.'

A further seven respondents reported that they felt general practice fulfilled a need in the curriculum and in the student's development and that it should be included because it was inherently beneficial and balanced ('leavened') the more hospital-directed subjects. Six respondents here mentioned the advantages of teaching in collaboration with teachers from other disciplines: general practice could then be seen in relation to teaching in other subjects and the various relationships between the general practitioner and the hospital doctor explored.

ASSESSMENT

In eighteen of the responding schools general practice is examined by a formal end-of-course, 'critical' examination: in two of them a formal contribution is made by in-course assessment. In thirteen of the eighteen schools, general practice is examined together with other subjects—most frequently, medicine, but in five of them, with social or community medicine: however, general practice very often has a relatively separate identity within the examination: for example, in one English school the modified essay question paper in the medicine Finals is set by the

Department of General Practice, and the head of the Department and senior lecturer participate in the clinical examination for major and minor cases, and in the clinical oral examinations.

A total of eight respondents report the use of in-course assessment to some extent. Two schools, as mentioned above, use it as a contribution to the formal end-of-course examination, while in other schools the assessment may be at the end of attachment and used for 'formative' rather than 'summative' purposes. Three respondents said that the general practitioner to whom the student was attached was asked to give a report of his progress during the attachment, and in a fourth school, it was reported that the student's project work was taken into account. It is however unlikely that a student would be expected to repeat the attachment if he did not perform well in these assessments. In ten schools there is no formal assessment in GP: two of the schools have plans to introduce some.

PROBLEMS AND DEVELOPMENTS

Organization and Resources

Some of the main problems in teaching general practice appear to arise from the very nature of the subject, or at least the context in which it is practised. To enable students to gain an adequate understanding of GP and of the general practitioner's role in the community it is vitally important for the medical school to have access to active general practitioners who are able to offer students attachments. Eight respondents said that they did not feel that they had sufficient funds to adequately reward the general practitioners who help with teaching, both on attachments and in the medical school. Eleven respondents complained generally of insufficient funds to carry out their teaching programme.

An additional problem is that of being an academic general practitioner. Most (but not quite all) respondents felt strongly that it was essential for the teaching general practitioner to be actively involved in a practice, otherwise the teaching lost its relevance. However, it is not always possible for the academic general practitioner with relatively heavy teaching responsibilities to find adequate time to practise. Six respondents specifically mentioned this as a problem.

Much of the teaching of general practice in many schools is carried out by part-time personnel and nine respondents said that they lack sufficient full-time academic staff for the course. One respondent reported his teaching hindered by the lack of a department of general practice. Five respondents felt that they had too many students at any one time and that they had insufficient staff to handle these numbers. Three schools are planning to increase the numbers of their full-time staff, while two schools have in fact recently increased their staff numbers.

There is considerable discussion about the advantages and disadvantages of university-based general practices for student teaching, or whether students are better served working in 'real practices'. Three schools, one in Scotland, one in Ireland, and one in England, are planning to establish a 'university' or 'teaching' general practice. One school has outlined their plans for a joint university/NHS teaching health centre. It is proposed that ten general practitioners would be involved—spending 80 per cent of their time in patient care, 20 per cent in teaching and research—and seven academics, 20 per cent of whose time would be on patient care and 80 per cent in teaching and research. It is felt that such a centre will enable the school to introduce additional clinical teaching at junior and intermediate stages of the curriculum, using patient volunteers and a variety of visual aids. In a further two schools, it is planned to establish a clinical teaching base for the general practice department; this might involve an NHS/university employed general practitioner.

In ten schools GP is a recent introduction to the curriculum, and the point was made that one problem of being a 'new' academic subject is the lack of a sound core of scientific knowledge based on research. In seven schools, more time has been allocated to the subject in recent years. In only one school has time been taken away from the subject: in this and three other schools respondents felt that they did not have adequate time to devote to the subject.

Seven respondents have definite plans to increase, or begin, collaboration with other clinical teachers, within the hospital and medical school. They also plan to develop more interdisciplinary teaching to enable the student to view the responsibilities and role of the general practitioner in the context of the work and commitments of his clinical colleagues. Five respondents want teaching in the ambit of general practice to take place at a number of different points in the curriculum. Students would more easily be able to relate the teaching they receive in general practice to other disciplines if it took place progressively, throughout the clinical course. (See also 'Problems and Developments' under child health, medicine, obstetrics and gynaecology, and psychiatry for reciprocal comments on liaison teaching.)

Six schools are planning to give the subject rather more over-all time than at present. This additional time is most frequently to be given to patient-based teaching, to attachments and the teaching in small group situations of interviewing skills, rather than to lectures. In two schools the whole curriculum is in the process of being changed and it is therefore very likely that there will be changes in the organization of teaching but at the time of the survey it was not possible to identify what they would be.

In one school in England, it is planned that medical students be taught some aspects of the subject together with nurses. This has

occurred because of increasing pressure of student numbers in both the medical and nursing schools. The move is symptomatic of a development in other subjects and other schools, where manpower and accommodation resources are limited while student numbers are increasing. At the same time (and particularly in general practice) there is an increasing tendency to show and involve medical students in the work of a wide variety of other health professionals.

Teaching Activities and Content

In general, teachers of general practice are reasonably content with the teaching methods that they are using. Two respondents want to make greater use of small-group teaching and one of these also wishes to enable students to undertake more project work. The most frequent comment in this context, received from eight respondents, is the necessity for the entire structure of the undergraduate curriculum to be re-examined and a new philosophy for undergraduate training to be developed. These suggestions most frequently involve a movement to more community-based and multidisciplinary teaching.

In terms of future developments (rather than hopes), three respondents reported their plans to include in the course in general practice a greater emphasis on the social context within which the general practitioner works, and on the approach to the family as a unit. In one school in England which at present does not offer a full-time attachment the teaching of general practice had been criticized as 'lacking personal contact with patients in the preclinical stages, insufficient emphasis on the social, emotional and ethical aspects of medicine, and inadequate exposure to general practice at all stages'. As a result of these criticisms, undergraduates will, in future, receive early exposure to social medicine and general practice in the preclinical phase; an attachment to a general practitioner on a long-term basis is being discussed, as is the possibility of longitudinal family studies; there will be greater emphasis on the development of skills in interviewing, history-taking, and clinical examination; and a four-week period in the second clinical year will provide opportunities for greater concentration on the clinical aspects of family medicine. This is fairly typical of the sort of change presently occurring, envisaged, or hoped for.

Genetics, Human Genetics

Two sets of questionnaires were distributed: one for 'Genetics' and a somewhat longer questionnaire for 'Human Genetics'. It is recognized that the distinction in the Survey between these aspects of the subject is a somewhat artificial one; because of this, and the consequent overlap between the replies to the two questionnaires, the teaching of the subject is being reported upon as a whole, and will be referred to as 'genetics'. All schools are included in this report except those four offering only clinical courses and a school in the process of establishing a new course, which was able to provide outline information only.

TEACHING ARRANGEMENTS

Thirty schools in all stated that the topic is included to a significant extent in their present curriculum: another four schools teach the subject, but not to any great extent (less than ten hours). Twenty-one schools operate arrangements for teaching genetics separately: they have special 'topic' courses or sub-courses, which appear in the timetable independently. In four schools, in contrast, the teaching of genetics is completely integrated with that of other disciplines and specialties and there are no separate arrangements. In one school the teaching of 'pure' genetics is integrated into early multidisciplinary courses but there is a later separate course in 'Clinical Genetics'. More often, a separate course or sub-course in the early years of a curriculum or at the bridging points between 'preclinical' and clinical studies is followed by later integrated and clinically focused teaching (four schools). A unique situation obtains at one school where genetics is integrated with several preclinical and clinical subjects: this is regarded as the 'core' teaching and advanced teaching for clinical students is provided in a separate, optional, extracurricular course 'to avoid congestion of an already overcrowded curriculum'. Considerable variation exists in the arrangements. A number of schools arrange some independent and some integrated

teaching for different stages of their course, and only a few have entirely independent teaching without any formal provision for combined or co-ordinated instruction.

When genetics is said to be 'integrated' with other subjects, this refers to planned, formal teaching, not the inevitable allusions to genetic factors made by the teaching staff in any department in the medical school. Genetics has 'scheduled associations' with the following disciplines and specialties:

Anatomy, biology, embryology (thirteen schools). Five have special courses or sub-courses in human reproduction with embryology, or in embryology alone. Four have courses in biology or human biology, of which two are premedical courses in schools where almost all students take the premedical year.

Biochemistry, physiology (eleven schools). Three include a substantial amount of genetics in the biochemistry course and a fourth has done so hitherto but in future genetics will be detached and transferred to another course. Two include genetics mainly with physiology or 'physiological sciences'.

Cell studies, cell biology. Seven schools run multidisciplinary courses under this heading and genetics is a contributor to all of them.

Community studies, social sciences (seven schools). Two schools teach genetics and genetic influences on behaviour in their courses in the behavioural sciences. Three have multidisciplinary courses in the early years of the curriculum: 'Man and his Environment', 'Man, Medicine and Society', 'Environmental Studies' in which genetics appears; the others include the topic in their courses in community medicine in the clinical stage.

Pathology and its specialties (four schools).

Clinical specialties: formal teaching of genetics is provided in various clinical courses in nineteen schools. It may be during the clinical teaching of a particular specialty such as general medicine or child health, or in a co-ordinated series of lectures featuring most clinical (and also usually the paraclinical) subjects in a systems or topic-based sequence. Child health was mentioned specifically by thirteen respondents: seven said that it is the only clinical specialty associated with genetics and may indeed contain a substantial amount of genetics teaching.

Position in the Course; Teaching Time

It will already be apparent that, in most curricula, the teaching of genetics is spread over more than one year and often over more than

one stage: indeed, six schools contrive to give some genetics teaching in every year of their five-year curriculum. Two schools put in their major teaching effort on the subject in the clinical years. During the preclinical stage, the bulk of teaching is carried out in the first year in twelve schools and in the second year at thirteen schools. One school provides a more or less equal amount in both years.

It proved too difficult to identify the teaching time devoted to the subject in every school. However, the average amount of time in those twenty-one schools making 'separate' provision for genetics is of the order of twenty-five hours.

Two of the four schools who do not include genetics significantly in their present courses were able to outline the arrangements to be implemented from 1976. Furthermore, several schools answered the questionnaires in respect of new courses which were being taught for the first time as they wrote but are part of 'existing' curricula upon which the Survey's report is based in these schools. Of the seven cases where new genetics teaching arrangements have hardly begun, four are 'separate' courses entitled 'Medical Genetics' (3) or 'Clinical Genetics' (1). The topic will be timetabled with other subjects at the remaining three schools, spanning both the preclinical and clinical stages.

TEACHING STAFF

Eighteen schools have staff qualified in medical genetics and human genetics: in exactly half of these schools (some) staff hold full-time academic appointments. Eleven schools have staff who are professional geneticists, whose training and interests are not primarily in medical or human genetics. Both types of geneticist are on the staff of four schools.

Teachers combine teaching and research with NHS duties in seven schools where they are involved in the regional screening and advisory service. A special feature at a Scottish school is that all its teachers of genetics are medically qualified and hold clinical responsibilities.

Anatomists and more particularly embryologists teach the topic at six schools: one respondent explained that anatomists teach the basic elements and geneticists take over from them later to teach more clinically relevant aspects. One school with no geneticists at all on its staff (there appear to be nine such schools), relies upon physiologists and biochemists; these teachers also teach genetics in nine other schools (some are clinical biochemists). Staff from cell biology and immunology or microbiology contribute at five schools. Haematologists at four schools help to teach genetics. Two schools use pharmacologists. Another one uses social scientists and two involve specialists in community medicine and epidemiology. A forensic scientist is included at one school.

Physicians and other clinical specialists who have an interest in genetics make a contribution to the teaching programme in four schools, but the clinical specialty making the greatest contribution is paediatrics or child health: twelve respondents mentioned it. Obstetricians play a part in two courses.

FEATURES

Respondents to the human genetics questionnaires were asked to state the aims and objectives of their courses. Several respondents to 'Genetics' volunteered similar statements in which they indicated the main themes and attitudes towards the topic which determine the way in which it is presented.

Twenty-three respondents to human genetics stated their teaching aims and objectives in some detail. Eleven replies gave differing objectives for different stages of teaching: genetics is taught in a two-tier arrangement or appears on various occasions throughout the course and so the emphasis changes. At an English school for example the general aim is 'to acquaint the student with the fundamentals of human inheritance' and the objectives for each stage of teaching respectively derive from that aim and should combine to achieve it. They are: 'Awareness of the extent of the variations that genetic factors produce both within the population and between populations'; appreciation of 'the role of genetic factors in normal growth, development and the normal functioning of the body'; understanding of 'their applications in the diagnosis and interpretation of clinical states, their assistance in diagnosis and management'; and awareness of 'the importance of genetic morbidity and mortality in the present population'. It is thus possible for a school to have more than one objective.

Firstly, it is possible to identify schools who present genetics as a biological foundation subject. This can be termed 'basic' or 'pure' genetics. Before students can learn 'applied' genetics they must be sufficiently familiar with the standard mechanisms of inheritance and understand the principles of genetics. This need to present the topic initially as a basic medical science was propounded in eighteen replies. Another respondent gives a course in which the whole range of genetic studies in human, animal, and vegetable systems is presented: a scientific education cannot be based solely on studies of human behaviour—to understand the principles one must examine the examples wherever nature has created them. This course more than the others aims to introduce students to genetics as a science, it is not 'instrumental' but educational.

The teaching in genetics at five schools has a conscious service role in relation to the curriculum: it is designed to prepare students to

understand the references to genetic factors which occur explicitly or implicitly in other courses. Teaching of this type which aims to help students gain maximum benefit from the subsequent parts of the medical course is usually contained in an early 'core' course upon which later, incidental, teaching can build.

The relationships with other disciplines and specialties are considered an important theme in four schools. Here, some or all instruction is integrated as a matter of policy, so that students do not think of genetics as a self-contained subject, but learn to look for a genetic dimension to these other subjects and become accustomed to draw on their genetic knowledge when approaching problems. A total of sixteen respondents stated that it is a main purpose of their teaching to demonstrate the clinical relevance of genetic studies. They hope to show how difficult it would be to practice medicine successfully without an understanding of the subject. In general, genetics is to be compared with anatomy or physiology in its role as an essential component of vocational training.

Beyond these rather general themes, twelve respondents have adopted a firm objective of clinical knowledge. By the end of their course, students should have a good understanding of pathology in which genetic factors are known to be important. They should be familiar with the pathogenesis and the clinical features of the common genetic disorders and abnormalities, and the common genetically transmitted conditions.

Nine of these respondents and four others refer to genetic counselling in connection with their objectives. Appreciation of the purpose of genetic counselling is regarded as an essential outcome of the course: teaching would have failed if students did not acquire and retain a conviction of its importance. As well as understanding the principles and the scope of the advice which is now available they should also know what services are provided by the Health Service, should be able to give some elementary advice themselves and to refer patients appropriately for specialist help. Very few doctors it is felt will receive further instruction in this area, yet at some time almost all of them may be asked for an opinion or feel obliged to suggest to a patient that genetic investigations and/or counselling would be advisable. These respondents take very seriously their responsibility to provide future doctors with this expertise: in the words of one of them '. . . so that when the time comes for the student to assume responsibility for his own patients, he will be able to advise them on family building, in the light of any genetic disorders that may occur, not only with the wisdom of a family physician aware of the importance of a healthy family, but also from the point of view of a responsible citizen aware of the needs of posterity'.

Genetic counselling is a topic which is increasingly significant, as research results are translated into clinical applicability: it is an example of what four respondents had in mind when they reported that their

teaching aims to equip students to understand future advances in genetic research which will eventually have implications for some aspect of medical practice. Research may increase the current knowledge of the pathology of some condition, or directly affect the management of a condition. If students can be given a sound grasp of human genetics during their formative years they can be expected to keep themselves abreast of future developments.

Content of Teaching

Respondents to the 'Human Genetics' questionnaire were asked to give some indication of the subject-matter in their courses. Much of the 'core' of knowledge is taught by all schools: this report follows the respondents in selecting the more interesting or unusual items, and those items which are given greater weight in particular programmes.

Pharmacogenetics and immunogenetics are a feature of nine courses, polygenic and multifactorial inheritance are featured in eight courses. Determination of individual identity and heredity are discussed at comparative length in six schools with topics such as blood grouping. Ten courses pay particular attention to population genetics, and some include considerations of human evolution and genetic engineering. Three courses are concerned with epidemiological aspects: the incidence and prevalence of genetic disorders, the aims and methods of screening programmes. Two 'pure genetics' respondents explained that the genetics of pathogens, etc., is an integral and not insignificant part of their teaching: 'non-human' genetics have clinical relevance too.

In the clinical sector, genetic factors in various diseases are delineated in seventeen courses: the majority of these courses also deal with congenital diseases and handicaps. Twenty respondents mentioned the latter. An introduction to genetic counselling is given in sixteen schools: it is not necessarily a major goal, but all these respondents drew attention to its presence in their syllabus. Seven of them and two others specifically include prenatal diagnosis (amniocentesis, etc.).

Two respondents each mentioned the more unusual features which they emphasize to students: one discusses the current research interests of geneticists and the likely growth points with relevance to clinical genetics; the second considers the behavioural and psychological consequences of heredity patterns—the controversial topic of intelligence for example is discussed in greater depth than he feels is generally the case.

Teaching Methods

Lectures are universally used in teaching genetics: in several schools they are the only form of organized instruction. Discussions in large group settings are used in five courses; they usually involve a panel of speakers with a chairman and are termed 'seminars' or 'symposia'.

Tutorials and intensive small-group teaching are practised in nine courses.

Teaching aids of various types are employed in eleven courses. Among those mentioned were projection slides (four schools), film (two schools), and recorded videotapes (one school, where it is shown during a seminar to illustrate the response of parents to the birth of a handicapped child). Four schools have tape/slide programmes for independent study and two Irish schools make extensive use of handouts summarizing the main teaching points. A London school has developed simulation exercises: actors are used to play the role of parents in mock interviews where students act as genetic counsellors and practise interpersonal skills—'patient-handling' techniques.

Clinical teaching with patients takes place in twenty-one schools. Thirteen arrange for patients suffering from genetic problems to be 'demonstrated' in lectures or seminars. In three schools students attend out-patient clinics conducted by a clinical geneticist or genetic counsellor, and in one of these schools all students receive bedside teaching in the ward. Case conferences are a regular part of the teaching programme in genetics at one school. (These activities are a part of the organized programme and all students would experience them. In many schools, however, an unquantifiable amount of clinical teaching is given, according to which hospital a student is sent to, or the interests of the clinical unit to which he/she is attached for clinical medicine, paediatrics, etc.: this exposure is highly variable. The questionnaires were concerned with the formal arrangements for teaching the clinical aspects of the topic.)

Practical classes in the laboratory take place in eight schools. They are particularly important in some of them: at two London schools they take up approximately half the total preclinical genetics teaching time.

'Special Features'

Respondents were invited to state what they regard as 'special' in their teaching of the topic. They were free to select a feature or theme running through their teaching, or some individual aspect of the content, or a teaching method.

The reply from one preclinical school reiterated their emphasis on the fundamental principles of genetics. The topic is taught as a basic biological science and deals almost entirely with normal patterns and mechanisms; there must be thorough teaching of the 'normal' before students learn about the abnormal.

Three courses commended themselves for balancing the 'normal' and the 'abnormal'. Respondents here believe they have achieved the right mix of basic and scientific studies with clinical teaching of genetic pathology and management, which is what medical students require. They do not stress either aspect at the expense of the other.

Two schools which have also arrived at a successful balance of the various aspects claimed that 'staged' teaching is the best way to arrange it. They have early 'core' teaching of genetic principles followed by subject-specific integrated clinical teaching at intervals through the clinical course. This can be viewed as vertical integration with each succeeding module of teaching reinforcing a growing picture of clinical genetics.

One of these schools and three others mentioned the integrated teaching of genetics as being the chief distinguishing feature of their courses. Students learn about genetics from many different points of view and in many different contexts, and the close associations which geneticists have formed with other teachers (especially clinical ones) have brought their own rewards.

A dozen respondents reported the most valuable feature of their teaching to be the emphasis they place on clinical relevance. The application of genetic knowledge to medicine is the most important element to be transmitted: this emphasis may characterize all teaching or only the later stages, but it stands as the justification for the whole. Human genetics has direct, vocational, practical value, as part of a student's clinical training. A number of these courses are also consciously concerned with its future relevance.

As a part of students' more general education genetics can offer much, and three respondents referred to the concept of human variability. It raises the question, what is individuality? While learning to understand the laws of evolution and inheritance students must also learn to accept that each person—each patient—is unique, and how and why this is so.

One respondent answered this question in terms of teaching style: in his course the most interesting 'feature' is the variety of teaching methods used. Whole class and small group sessions, formal teaching and independent learning are all available, in recognition of the fact that different students find different methods more helpful than others.

Elective attachments and the opportunity to choose the topic for study-in-depth are available in nine schools. Small research projects can be carried out in connection with the main course, or during the prescribed elective periods, or for intercalated degrees.

STUDENT ASSESSMENT

'Critical' or professional assessments are held in the topic in thirty schools. Quite frequently, however, the assessment is held only at the end of the preclinical stage (or at some point in it) so that 'pure' genetics is assessed but not human/clinical genetics. In a few schools assessment is multiple: the topic is assessed on more than one occasion and in more than one of the major stages of the course.

Nowhere is genetics critically assessed in its own separate end-of-course professional examination: it is always examined with the subject or subjects with which it has been most closely linked for teaching purposes. These other disciplines and specialties are: biology and human biology (four cases, including one school where genetics is taught and assessed within the premedical biology course which all students take); anatomy, often in the embryology or reproductive anatomy section (ten cases: five of these are London schools); biochemistry (five cases); behavioural sciences (two cases); and pathology (four cases).

Eight schools include genetics in their joint assessment of several preclinical and paraclinical disciplines: much of their early teaching is given in a modular system which is reflected by the structure of the assessment system—multidisciplinary courses are assessed in multidisciplinary examinations.

Seven respondents mentioned that the topic is included to some extent in the assessment of clinical subjects (medicine, child health, etc.) in one or more parts of the qualifying examination.

Twelve respondents supplied information about in-course assessment. In five cases the topic is assessed separately as the teaching of the topic is completed: one of these courses ends with an informal examination which is then analysed and discussed with the class in the same two hour session. At one school the in-course assessment is jointly with anatomy, while at three others genetics features in a small way in the in-course assessment of various basic medical sciences.

Some or all of the in-course assessment is 'critical' in six schools: marks are forwarded to the major end of course examination, or, in at least three of these schools, no further assessment is necessary if performance in the in-course tests is satisfactory, and in two of these the assessment in genetics is separate and self-sufficient.

Two schools' replies stated they have no assessment of genetics, either preclinical or clinical, neither end-of-course nor in-course. One of them has substantial teaching of the topic with plans for expanding it and making it more interesting in future, while the other has very little but hopes for an improvement in the situation when the school's new curriculum is established. One English school in which basic genetics regularly forms part of the preclinical examinations, expects clinical genetics to become examinable under the new clinical curriculum.

PROBLEMS AND DEVELOPMENTS

Organization and Resources

Staffing is the most frequently reported problem. A shortage of staff was reported from fourteen schools: a few have no specialist staff, but all complained of the pressure on staff time and of difficulties in

recruiting suitably qualified staff who are also interested in teaching medical students. Another school is finding it more difficult to recruit demonstrators for the practical classes.

Two London respondents attach the most urgent priority to creating a full-time academic post in 'basic' genetics in their schools. Five other respondents (three in London, two elsewhere in England) give priority to making an appointment in clinical genetics; whether it be an academic, an NHS, or a joint appointment is immaterial as long as the person has recognized teaching and clinical duties. (These schools have very little organized clinical teaching in genetics at present.) One of them is especially worried over the large numbers of students.

Accommodation is described as deficient in two schools: they lack ordinary teaching space as well as suitable laboratory or clinical facilities.

Recently established courses exist in nineteen schools. In two of them there used to be no planned teaching of genetics at all, and in others the topic used to be taught, but in an *ad hoc,* incidental or unco-ordinated fashion: now a new, structured course has gathered together the scattered elements into a formal entity, which is examinable and compulsory. New courses which are being introduced at the time of writing have been described briefly already: some are replacing earlier arrangements, others are the first attempt in the medical school to teach the topic.

Reorganization in two schools has led to the topic being taught formally in the clinical years but five respondents who have well-established preclinical courses regret the absence of the topic from the later stages of the curriculum: they would like to teach clinical students and follow up their earlier instruction. One of them and another respondent envisage a single two-tier course, the first stage offered preclinically, the second in the clinical course but with the same staff responsible for both stages which would be co-ordinated to fulfil the ultimate objectives.

Such an arrangement would be a solution to the problem reported from four schools: poor co-ordination of the topic in its various manifestations in the curriculum. Certain aspects are duplicated, others are omitted altogether in a 'too many cooks' situation or because human genetics is not considered to be a topic in its own right which requires over-all monitoring. Better control is needed; only one of these schools however reported positive attempts being made to integrate the 'pure' with the 'human' genetics into a coherent teaching programme for the future.

More curricular time has recently been allocated to the topic in five schools and seven more intend to expand in time and content soon. Two of the schools where there is a greater amount of genetics than previously still have insufficient time, according to their respondents:

altogether ten reports of insufficient time in which to present the topic properly were received.

Relationships with other disciplines and specialties were discussed in several replies. New curricula in two schools have made genetics integrally part of several courses primarily devoted to other subjects. Genetics has been transposed to one school's anatomy course in conjunction with reproduction and embryology, and another anticipates closer ties with anatomy in future, as well as with cell biology and immunology. The sub-course in medical genetics at one preclinical school will be linked administratively with the course in microbiology though teaching will not be combined.

More thoroughly integrated arrangements with other subjects are proposed by six respondents: they particularly desire formal provision for the teaching of genetics within certain clinical specialties.

Teaching Methods and Content

In general it appears in many schools that expansion of genetic teaching has reached the limits of the time and staff available. Especially in the clinical arena it is proving difficult to establish a formal presence. The major developments which were reported to be imminent are nearly all of them part of general curriculum reorganization, affecting the whole medical school.

Minor modifications and improvements of course continue. One respondent hopes to introduce practical classes soon; two others feel the need for practical work if staff and time could allow it. Four would like to introduce or increase small-group teaching sessions. Clinical demonstrations are a recent addition to one course, and it is hoped that two further courses will soon be extended to cover more clinical matters. Immunogenetics will be covered more fully at a London school: an English school will teach more molecular genetics in future. Another London school believes that more attention should be paid to microbial genetics.

Three courses in future will employ audiovisual aids to a much greater extent than now. One will have television demonstrations and recorded videotapes for clinical genetics; another intends to develop tape/slide programmes, among other resources.

One respondent mentioned the absence of any suitable textbook in human genetics for medical students: textbooks currently available are not at all appropriate.

Altogether significant changes in the teaching of genetics have occurred in twenty-three schools in the last few years, and change in the near future can be expected in eleven schools, while another twelve respondents were able to indicate the possibility of developments which would have a major impact if they were put into effect.

Geriatrics

Thirty-four medical schools were invited to complete a questionnaire on the teaching of geriatrics: four schools were excused—the three 'preclinical only' schools and one English school yet to develop its clinical curriculum to the state of detail necessary to respond usefully.

TEACHING ARRANGEMENTS

A 'clerkship' in geriatrics appears in the timetables of fifteen schools as an independent entity: all students in turn are attached for a period to a geriatric unit run by physicians specializing in geriatrics. In eight cases the attachment is a full-time one, lasting for two (or two-and-a-half) weeks at five schools and one week at three. In seven schools the attachment is on an approximately half-time basis, over (in each case) two weeks. In addition to the attachment, nine of these schools provide formal teaching on geriatrics at other points in the curriculum, averaging fourteen hours approximately.

As opposed to offering a 'separate' course in the subject, geriatrics can be taught during courses in 'general medicine', or other clinical subjects: such arrangements occur in fifteen schools and should occur soon in a sixteenth one. Frequently, clinical experience is scheduled on a one-day-a-week basis over a period of time. Fourteen of these schools were able to estimate the time devoted to geriatrics: the average was 36 hours, but the size of the standard deviation of this mean (25·9) indicates the wide variations between schools (from 4 to 95 hours).

Naturally the arrangements for such curricula vary but commonly students on their medical firms are seconded on an occasional basis to geriatric units either in the same hospital or to an associated geriatric hospital to widen their experience of clinical problems and to be instructed in the clinical assessment of old people. One Irish school described such a pattern: 'In one of the two major general hospitals (used for teaching), there is a special geriatric assessment unit through

which students may be rotated as part of their programme of clinical medicine. The other hospital has no such unit but has developed a special association with a hospital largely devoted to geriatric patients and where formal clinical sessions are held by a consultant. Students rotate through this hospital with specialized attachment to the consultant as part of the programme in clinical teaching.' At two schools geriatrics is linked with psychiatry, and some formal teaching is given during the psychiatry course.

As will be appreciated, visits and rotations cannot always apply to all of the students all of the time, and depending where they are posted for their attachments some students may well receive far less experience of geriatrics than others in the same school: eight schools made this clear. (The information above about teaching time relates to the normal minimum amount.) In at least three schools, the amount of geriatric experience received by a minority (usually about 10 per cent) of students who happen to be attached to a geriatric medical firm for a period (for example during the introductory clinical course) is substantial.

Eleven schools feature geriatrics in their Introductory Clinical Course or in the equivalent orientation course at the beginning of the clinical stage. Generally the geriatric component is a few hours explanation and demonstration of the special skills needed to examine and take histories from old people, as an extension of the basic methods being taught at this time.

Eleven schools also include geriatrics in their courses relating particularly to the community: they make the medical and social problems of old age part of the courses in general practice, social medicine, community health, etc. Such teaching may occur in either the preclinical or clinical stages: the preclinical teaching focuses more on social and environmental questions, the latter teaching would be of a more clinical nature. Geriatrics at two English schools, quite apart from clinical attachments to geriatric medicine wards in hospital, is included substantially in the full-time multidisciplinary courses in community health which students take in rotating groups. Another English school offers a special 'topic' course called 'Growth and Ageing', run in the early years of the curriculum. It covers the seven ages of man, considering physiological and psychological normality from birth until death, and presenting 'positive' and 'negative' growth and development as a natural continuum.

Elective attachments to the geriatric unit are available in at least four schools.

Of the two schools not formally teaching geriatrics now but planning to do so, one of them will include teaching at a number of stages: geriatrics will appear in 'Man and his Environment' in the first term of the first year, in multidisciplinary topic-teaching and conferences during the clinical course, and in an elective full-time attachment. The other school plans to introduce a series of visits to geriatric hospitals.

TEACHING STAFF

Respondents were asked to indicate the professional backgrounds of the staff most closely and consistently involved in teaching geriatrics.

All thirty-one responding schools have full-time specialists in geriatric medicine to teach the topic, though in only a few cases are they the only staff who do so. Six schools have full-time academic appointments, and at one of these and three other schools, some staff are part-time medical school, part-time NHS personnel. Fourteen schools made it plain that all their geriatric specialists are full-time NHS staff.

Apart from the clinical geriatric specialists, many other people are often involved. Physicians whose primary commitment is general medicine but who have an interest in or some responsibility for geriatric patients contribute to teaching in eleven schools. Other clinicians involved include psychiatrists (six schools), neurologists (two schools), surgeons from specialties such as urology (two schools), and general practitioners (four schools). Teachers from community or social medicine play a part in six schools' courses, and medically qualified rehabilitation specialists in five. Clinical pharmacologists contribute in one school and representatives of the basic medical sciences contribute in two schools. Students are also taught by members of the physiotherapy and occupational therapy professions in seven schools, and by social workers in ten schools: one school brings in a dietician.

FEATURES

Aims and Objectives

Objectives for teaching geriatrics were stated in some detail by twenty-one respondents; seven further respondents gave them, but with less detail. The type of objective referred to most often concerns knowledge—information about the scope of geriatric medicine and the medical and other problems encountered in old age. Next most frequently mentioned is the acquisition of skills: the techniques of assessment and the methods of treatment with which students should become reasonably familiar. Least frequently mentioned are objectives relating to attitudes.

The teachers in most of the London medical schools meet as a group ('TOG' Club—Teachers of Geriatrics) which has produced a list of agreed aims for geriatrics in an undergraduate curriculum. These are, that a student should understand:

> The demographic and ecological aspects of an ageing population and how geriatric medicine has developed.

The interdependence of the physical, psychological, and socio-economic factors which produce disability in the elderly and the implications for health care.

How the effects of biological ageing and multiple pathology modify the presentation, course and management of disease processes and the interpretation of clinical signs and investigatory procedures.

The need for a balanced judgement in the application of investigatory and therapeutic procedures in the elderly patient.

How to assess disability and use the resources which are available for rehabilitation of the elderly and their maintenance in the community.

The role of preventive medicine in the elderly and how to reduce dependency, manage long-term disability, and care for the dying.

Other schools place greater emphasis on affective objectives: they hope to give students a more caring outlook and to make them sympathetic, responsive, receptive to their patients' needs. One English school expresses this concept: 'To convey . . . a sense of familiarity with the medical, psychiatric and social problems of the elderly, and with the quality of life that is to be expected in old age. It is hoped that students will acquire a sensitivity to the special needs of old people and an ability to communicate effectively with them, to understand their ways of thinking and their methods of expression, and to obtain a balanced view of the significance of symptoms and signs of illness in later life. They are also expected to learn of the resources available in hospital and in the community to improve the quality of life of old people, and to become familiar with the role and skills of other health professionals who share a responsibility for caring for old people.'

The objective cited most often by respondents is that of showing the interrelationships of physical, mental, social, and emotional factors in the problems of old people in general and sick old people in particular: sixteen schools make this a major objective. Students must learn to take all these factors into account when examining and treating a geriatric patient because they can all affect the onset and the outcome of disease. Several schools pointed out that while an appreciation of these interrelationships is essential in geriatrics, it is almost as important in other branches of medicine and so geriatricians have a service to perform in the over-all training of medical students.

Eleven of these schools and three others aim particularly to discuss and explain the normal ageing process. This is human biology in its widest sense, and a foundation for understanding geriatric pathology: it will include consideration of physiological and psychological changes (and the changes in a person's way of life) as the body and personal circumstances change and adapt. It is important to know what is

normal in order to realize what is abnormal, and to know what 'abnormal' conditions actually require medical intervention. Thus many geriatricians accept a responsibility to teach concepts usually regarded as 'preclinical', in a clinical context and in conjunction with patient management.

Four schools in this group and three other schools likewise extend their terms of reference beyond the clinical problems of old people, but in a 'social' rather than a 'biological' direction. They wish to make students think about old age as a social question, to be aware of the implications for social policy and for medical services of a population structure biased towards the higher age-groups, to understand sociologically what 'oldness' is, and to consider how the community behaves towards its older members and how it ought to behave towards them.

In the narrower field of geriatric medicine, eight schools have the practical aim of preparing all students for looking after their elderly patients in an acceptable and conscientious fashion. They accept that very few students will become geriatricians—the respondent in one of these schools emphasized that he positively does not try to give students the competence or the ambition for a career in geriatrics—but all doctors in whatever branch of the profession will have aged patients. They may well have no further training in how to care for them, in so far as their requirements may differ from those of the 'normal' adult, and so the knowledge, skills, and attitudes sufficient for basic care must be instilled into them as undergraduates.

One aspect of the management of aged patients is the multidisciplinary approach: ten schools emphasize this—the need for teamwork between staff, not only between hospital and non-hospital doctors but also between the medical and non-medical professions. Connected to this objective is another one of showing the role of preventive medicine (nine schools) and of rehabilitation (seven schools). Primary prevention is put forward as the ideal, and secondary prevention—avoidance of handicap and the management of disabilities—is shown to be the natural province of geriatrics and of great importance. By implication, this emphasis on 'management' is contrasted with the standard model of medical care in which an acute illness is treated by brief, prompt, and technically complex methods which restore the patient completely to the state maintained before the illness. In contrast, the student must realize that much of geriatric medicine is concerned with long-term care rather than cure, and with habitating a patient to an optimum standard in new circumstances rather than to a previous level.

However, it would be wrong to convey an impression of geriatrics as a gloomy specialty, struggling with incurable long-stay patients and irrelevant to mainstream medicine. Ten schools, over and above their other learning objectives and teaching policies, like to think they are destroying prejudices against the topic and establishing an image of a

respectable and highly rewarding branch of medicine which is as genuine a specialty as any other because its patients can be helped and cured through proper diagnosis, treatment, and management—the essence of clinical medicine. Seven of them see this as the most important feature of their course.

Content

Individual items of course content were mentioned either because they are seen by respondents to be the most important or useful ones to teach—the 'core' topics—or because they are thought to be a stronger element in the respondent's own course than is believed to be the case elsewhere. These items may be covered in 'theoretical' teaching—lectures and tutorials—or in patient-based clinical teaching, or in both.

Eighteen respondents ensure that students learn to examine and take a history from old people and learn what different and extra skills are required for this, compared with the clinical assessment of other patients. Students practise these skills and are involved in clerking patients.

Particular conditions were sometimes mentioned: fourteen schools deal with specified acute conditions more frequently occurring in older patients, and thirteen schools deal with long-term chronic conditions (including how to identify and manage each one) and the general nature of chronic disability with its associated psychosocial problems. Sixteen schools deal with the 'natural' hazards of old age, such as increased vulnerability to falls, incontinence, nutritional deficiencies, memory failure, etc., and the way in which they complicate the picture of health and illness. Fourteen schools stress the concept of multiple pathology and the additional problems it poses for diagnosis and treatment. Thirteen schools cover the mental disorders found in old people, commonly labelled 'psychogeriatrics', and one of them also makes a point of including disorders of communication: deafness, speech difficulties and so on.

Five schools discuss multiple pathology and the features of normal physiological senescence which give rise to problems in laboratory investigations and measurements, and nineteen mention the consequent difficulties in therapeutics and the choice and administration of treatment. The object here is to warn students of the existence of these problems, with a few examples, rather than to go into great biochemical or pharmacological detail. Two of the nineteen schools also warn students of time-disability data—the variations in duration and intensity of illness and in the length of time during which treatment may have to last.

In the field of patient management, many respondents mentioned that they introduce students to the range of social and welfare, voluntary and statutory services available (17) and to the various methods of

rehabilitation practised in a modern geriatric department or day-hospital (15).

Nine courses discuss the management of the dying patient (terminal care) and one of them discusses particularly the ethical and medico-legal questions which may arise in this context.

Teaching Methods

Lectures are given in twenty-five schools although nowhere is a course based entirely on them. Sixteen schools use large-group discussions, conferences, and symposia, while twenty-five have small group sessions, discussions, tutorials, etc.

The majority of schools make use of teaching aids and/or provide opportunities for independent study. Nine schools use films or slides during their formal teaching sessions. Four issue handouts; videotapes and audiotapes are used to a considerable extent in one school. Students at nine of the schools may undertake project work. Tape/slide programmes are available in four schools for students to use.

Patient-based clinical teaching is carried out in all the schools, and thirteen added that it is the most valuable and effective way of teaching the topic, as far as they are concerned. Nine respondents referred to in-patient teaching and six to teaching in out-patient clinics.

Fourteen of the respondents hold case conferences. In eleven cases, students see the work of geriatric assessment centres and day-hospitals or day-centres and may be attached to one of these for a short time. In two schools students are taken to a special hospital for the dying and incurable, or to the terminal care unit within the main hospital, so that they can appreciate the service they provide. Visits to old people in their homes are one of the teaching activities in fifteen schools, but their nature is not identical in all the schools: sometimes students accompany a consultant geriatrician or a general practitioner on a domiciliary consultation, sometimes they accompany a health visitor or a social worker on his rounds, and sometimes they visit old people by themselves simply to talk to them and to see how their life-style and social circumstances affect their health status. Indeed, nine respondents find the home visits to be one of the most valuable activities of all, and reported them as a 'special feature' of their course.

'Special Features'

Respondents were asked if they could identify particular aspects of their course—be they objectives, methods or subject matter—which they felt were especially important or successful. The following were chosen, though several people identified more than one 'special feature'.

In addition to home visits (see above), three of the nine schools arrange for students to visit residential homes and nursing homes and

similar, non-hospital institutions for the elderly. Five respondents stressed the opportunities geriatrics provides for teaching integration: they believe that their teaching exemplifies the interrelationships between hospital and non-hospital specialties, between clinical and preclinical studies, and between their specialty and other clinical specialties. Three of them, with four others, feel that they are also able to demonstrate teamwork in the management of patients, especially in the community, with regard both to the need for teamwork and putting it into practice.

Ten respondents select the theme of 'the whole patient' as their special contribution: in geriatrics most particularly, students must learn to see each patient as an individual person and to recognize their social, psychological, and emotional needs and reactions, and to take account of their total physical condition, beyond the immediate problem for which they are being treated. This is part of students' general medical education which geriatrics is well placed to undertake.

Methods of teaching and learning which are popular with staff and students are intensive small-group sessions (four schools), the use of carefully chosen and prepared material for tutorial teaching (one school), and project exercises (one school).

One school was pleased to report that its facilities for teaching geriatrics are excellent—students are able to see the best practices of modern geriatric care in up-to-date and well-equipped surroundings. Four schools however feel their outstanding feature is the depth or length of the contact students have with old people either in a full-time intensive clinical attachment or over a very long period of intermittent but regular visits, seminars, and other opportunities to meet and get to know patients.

Finally, seven respondents see their 'special feature' as teaching clinical medicine—its skills and its values—with special reference to old people, rather than 'geriatrics' as a specialty (this outlook has aready been described as an 'objective'). For example, 'The consultant geriatricians feel that the natural interest that the students have in the care of the elderly can be stimulated by teaching the fundamental principles of general medicine and using these to illustrate the special problems, in the diagnosis and management of ill elderly people. The students are taught that illness may present in unusual ways and the presentation may be influenced by the ageing process and by domestic circumstances and if they can sort out the problems of multiple pathology and the diagnostic and therapeutic challenges that this presents, and if they can be taught that drugs are an important form of treatment and also a common cause of disease and that treatment often involves much more than drugs, and that there is always treatment even when there cannot be a cure, we find that many of them respond by recognizing geriatrics for what it is, an important part of clinical medicine. In other words, we

tend to stress the social aspects of geriatrics by emphasizing that it is essentially clinical medicine and we encourage students to keep high academic standards at the same time recognizing the fundamental humanitarian aspects of the work. Particular importance is laid on the necessity for identifying problems before seeking solutions to them in the hope that the students become doctors reluctant to diagnose senility or social problems too readily.'

STUDENT ASSESSMENT

Respondents in six schools claim that there is no assessment of students' knowledge of geriatrics of any type; two of them are particularly worried about this state of affairs and consider that without the incentive of an examination, students' attitudes to learning about geriatric medicine are 'lackadaisical'.

Sixteen schools operate some form of in-course assessment. In five of them reports are compiled about each student at the end of the programme of clinical teaching—a brief report under standard headings by the head of the unit where the student spent his or her time. Six of them arrange MCQ papers, or informal clinical and oral tests, usually for each group of students in rotation as they complete the course. In two schools where students are 'required' to work on a project, it is assessed. Marks or grades derived from in-course assessment can make a small contribution to a 'critical' final or professional examination.

Geriatrics is included in the final or professional examinations in at least thirteen schools. This indicates regular or definite inclusion in the written, clinical, or oral parts of the examination, except for one school which qualified its reply by explaining that geriatrics is included occasionally rather than automatically.

Eleven schools incorporate the topic into the medicine examination; two of them also examine students in it as a component of the examination in social medicine or community medicine, and one school includes assessment of the topic with that of most other clinical specialties in integrated examinations.

PROBLEMS AND DEVELOPMENTS

Organization and Resources

The staffing situation with respect to geriatrics is improving in the UK and Eire as a whole, although it remains a severe problem in several places. Five medical schools (at least) rely entirely for their teaching upon full-time Health Service or 'hospital' staff, and in fact one Irish school has only recently seen the first full-time appointment of a

geriatrician in its hospital. Five other schools pointed out that geriatrics is a 'shortage specialty' and most geriatricians have very full clinical and administrative commitments besides undergraduate teaching. One school has recently established a department with full-time academic staff and up to five schools expect to have more (full-time or part-time) academic staff which will enable them to expand their teaching programme. Three respondents would like to see an academic department of geriatric medicine established in their schools.

One problem which reflects the late development of the topic as an academic specialty is the geographical isolation of the facilities. Five respondents complained that teaching has to be done far away from the main centres, so that valuable time is lost by students in travelling. Four respondents would like a geriatric department to be developed within the main hospital used for teaching where teaching could be concentrated, but one respondent would like more hospitals and units to be used in order to thin out the students and to give them contrasting experiences.

The topic has recently become an established part of the curriculum in thirteen schools where previously there was no regular and formal provision. A London school illustrates the process of infiltration: it began with a purely informal arrangement between one medical teaching unit and an individual geriatrician; then other medical 'firms' joined in and the geriatricians began to structure their teaching, students came no longer merely to observe but to clerk cases, write up case-studies, to attend discussions and tape/slide sessions. The medical school has now formalized the arrangements, and all students must now do geriatrics as part of clinical medicine. Seven schools have introduced a core of geriatric teaching for all students preparatory to their varied clinical experiences, so that all will be briefed with the basic concepts of the topic.

Four schools are to increase the amount of time allocated to the subject or to increase the length of time over which students are taught. A better allocation of time has been used in six schools for more clinical teaching with patients. However, seven respondents stated that they cannot teach the subject as well as they feel necessary unless more time is allowed to them.

Teaching Activities and Content

Expanding the clinical course of geriatric teaching is obviously regarded by many as desirable, but several respondents attach a similar importance to teaching in the early or 'preclinical' stage of the curriculum. Geriatricians at one school now take part in preclinical courses, showing the relevance of these disciplines to clinical practice and demonstrating some of the effects of senescence. Another school's new curriculum will include a special 'topic' course, at an early stage, on all aspects

of human development including the natural ageing processes. Four others see the need for collaboration with the basic medical sciences and for making 'guest appearances' in their courses; the disciplines most often mentioned are physiology and the behavioural sciences.

Two respondents deplore the isolated position which geriatrics has come to occupy; they regret the impression that students may gain of a separate specialty, untouched by developments outside and not conforming to rules applied in other fields. A third is uncertain where to draw the line between general and geriatric medicine when introducing the topic to undergraduates: should a line be drawn at all? The latter and one of the former, and a third school where teaching is presently done independently, recommend a degree of integration with general medicine, general surgery, and other 'mainline' specialties: this would prevent students compartmentalizing the attitudes and the skills which geriatricians have to teach and might also prevent them considering all elderly patients to be geriatric. Two schools have plans for closer co-operation with general medical teachers—in both cases coinciding with over-all curricular reform—and in one school where the respondent would like to follow this example, a stake is meanwhile being developed in general practice teaching. Interdisciplinary co-operation will operate in the reverse direction at a London school, where experts from allied research areas and specialties will take part in geriatrics and will widen its scope: partly due to new facilities for patient care and assessment becoming available, psychiatrists, neurologists, specialists in rehabilitation, nutritionists, and a community physician with responsibility for liaison with the social services, will all be involved in teaching students.

Two Irish schools intend to give more active clinical patient-based teaching (it will be remembered that six schools have recently been able to increase this type of activity) as well as more lectures: in other words, to establish a deeper course on the topic. Three courses will introduce or expand the use of audiovisual aids such as videotapes, and one will also have more tutorials and small group discussions. Small-group teaching is now regarded with disfavour in two schools—the method itself is good but the combination of too few staff and too many students makes the practice repetitious, wearying, and therefore less stimulating.

Four respondents would like home visits and follow-up schemes to be an important element of their courses but for logistic and other reasons they are difficult to organize. If they are scheduled concurrently with the main geriatrics attachment then students are unlikely to be visiting patients whom they will see or have already seen in hospital; if they are scheduled when students have moved on to other subjects then their timetables will be disrupted. An underlying problem is the fact that recovery and rehabilitation in geriatric patients is often a long-term process; the time-scale is quite different from those of some other specialties who in any case teach mainly on acute cases. Four schools alluded to this problem.

Special assessment units for 'psychogeriatric' cases are to be opened in two hospitals used for teaching geriatric medicine, and regular clinical teaching of this aspect of geriatrics will then be possible.

Elective attachments to geriatrics units are being offered in four schools, where this presumably indicates an increasing level of student interest, but this is not a universal phenomenon and three respondents felt obliged to draw attention to students' lack of interest in the topic: for example: 'The main problem is to overcome the students' prejudice against geriatrics as unrewarding and uninteresting. It is difficult to glamorize geriatrics. . . . It is certainly not enough to teach them merely general medicine in old patients. It is essential to use imagination to get across to them the fact that they are perforce going to be looking after the elderly and if they are not adequately trained in this they will do it badly and be dissatisfied. . . . The younger the student, the more open his mind will be and the later in the curriculum he has his introduction, the more likely he will be to have a closed mind.'

Altogether significant changes were reported to have been made recently in twenty-one schools, the common denominator being the 'recognition' of the topic as appropriate and desirable for undergraduate teaching, and further changes are anticipated in fourteen schools. The chance to improve the position is hoped for in six other schools with a degree of certainty, in some of them as a by-product of general curricular reorganization, but these plans are not firm. In general, though, one could summarize recent changes as having been largely quantitative, concerning the amount of geriatrics taught; future developments focus more on quality—improving the presentation of the subject, treating certain topics in more depth, and adding interest and variety.

Haematology

Full replies to the questionnaire on the teaching of haematology were submitted by thirty-two schools. Two further schools, in the process of developing new clinical courses, sent timetabling details only. One school did not feel that it was possible to answer questions on the teaching of haematology, as it was too much an integral part of general pathology. The remaining three schools—all 'preclinical-only'—treated the questionnaires as 'not applicable'.

TEACHING ARRANGEMENTS

Haematology is both a scientific discipline and a clinical specialty and so different aspects may be taught at different stages of the curriculum and in association with a number of other subjects: thus, the variety of ways in which teaching of the subject is organized is not surprising.

Fourteen schools teach haematology in a separate course or sub-course of its own: this may be a special 'topic' course, a discrete series of lectures, or an attachment to the haematology laboratories. In fourteen other schools, haematology is timetabled entirely within other subjects' courses, or in multidisciplinary courses. Elsewhere a mixture of the two approaches is adopted.

Position in the Course; Teaching Time

The pattern for teaching haematology is one of multiple appearance: formal provision is made both preclinically and clinically in seventeen schools. Indeed, two schools have formal teaching of it in all five years of their courses, and five more schools have formal teaching in four of the five possible years. The breakdown is:

Formal Teaching in:	*No. of Schools*
First preclinical year	11
Second preclinical year	14
First clinical year	28
Second clinical year	20
Third clinical year	16

The preclinical courses which contain basic haematology are generally biochemistry or physiology; in four cases both of these courses contain some formal haematology. The subject is also included in a new school's 'Cells and Tissues' introductory course.

Laboratory clerkships in which students are attached to the pathology departments for an intensive, usually full-time period, occur at fourteen schools and include haematology. At some London schools, general pathology is the 'senior partner' in these clerkships, but haematology has up to 20–25 per cent of the total time and undertakes theoretical, clinical, and practical classes. At one English school there is a full two-week block made over to haematology within the longer pathology clerkship. At one Scottish and one Irish school, where the courses in laboratory medicine each occur towards the end of the clinical course, there are shorter part-time periods concentrating on the use of haematology (and the other pathological sub-disciplines) as a diagnostic instrument.

Haematology lectures and discussions take place in the co-ordinated systems-based lecture series or in the topic-teaching cycle at eleven schools, and at fifteen schools haematological topics are part of clinical medicine and are taught in conjunction with it. Other clinical specialties in which some haematology is, in some schools, always taught are child health and obstetrics and gynaecology.

Respondents found estimates of the teaching time devoted to haematology difficult to make and they counselled caution in their interpretation.

Nevertheless, the average figure of 50·6 hours—treating a week as the equivalent of 30 hours—with a standard deviation of 32·9, indicates a considerable variation. Eight schools reported that less than 30 hours was spent on the subject, and five, over 80 hours. It is possible, though, that the lower figures are underestimates bearing in mind the essentially ubiquitous nature of haematology.

FEATURES

Aims and Objectives

A number of schools indicated in general terms their view of the teaching of haematology within the undergraduate course. The role of haematology is seen as a 'bridging' one in nine schools: it provides continuity,

a link from one stage to another in the curriculum—and, it is hoped, in the students' thinking. Thus the necessity of teaching it at different stages of the course is a positive advantage, because it can demonstrate perfectly the interrelationship of scientific knowledge and clinical practice.

In two schools the early, basic teaching is regarded as the most important because it is concerned with laying the foundations for all future studies; collaboration with preclinical disciplines of biochemistry and physiology is very highly valued. Six schools in complete contrast see the later teaching as the most important: they are anxious that students should qualify with an image of haematology being primarily a clinical subject, with direct and constant relevance to patient care.

Five other schools consider that the major aim must above all be to give students an understanding of the purpose, value, limitations, and cost of haematological investigations, so that they will employ them sensibly in later life.

A dual emphasis is practised by thirteen schools; in them, endeavours are made to balance the clinical and laboratory aspects and to teach both clinical and laboratory skills, including psychomotor as well as intellectual, problem-solving skills. Haematologists are felt to be well placed to teach both these aspects and also to show their utilization in case-management, through teamwork and co-operation between ward and laboratory.

Teaching Methods

At four schools the role of the diagnostic laboratories is explained to students in the Introductory Clinical Course—this is not an aim of haematology teaching as described in the previous section, but a special contribution by haematologists towards students' orientation to hospital life. Similarly, blood transfusions and related practical, life-saving activities are featured strongly in the teaching at five schools. Three London schools draw attention to the introductory lectures in haematology given at the end of the preclinical course—before the main, clinically oriented, teaching—for their usefulness in briefly introducing students to the principles of the subject at a time when they are known to be very receptive.

Two schools focus their teaching on the common blood disorders which are most likely to be seen in general practice, rather than on the most 'interesting' conditions, or those for which examples happen to be available. One school makes special efforts to structure teaching around genetic and molecular pathology.

Patient-based clinical teaching is conducted widely—it was mentioned by twenty-six schools—and is often regarded as the most essential and, for the students, the most enjoyable method. Unfortunately, however, it is not always extended to all students; sometimes for example they

rotate in sub-groups at different times for haematology and sometimes only some students are attached to the clinical haematology 'firm'. Four schools have patients demonstrated at tutorials or seminars; nine have haematological ward-rounds and bedside teaching, and five of these schools together with four others hold regular case conferences for teaching purposes at which both ward and laboratory staff are present.

A number of schools (eleven, including the four Scottish ones) mentioned that they use laboratory practical classes for teaching, four of them rating them as 'invaluable'. Eight schools offer revision, refresher or updating sessions in the period immediately before the final examination, though in some cases these are optional.

Tutorials and informal small-group teaching are successful and popular methods at ten schools. Aids such as handouts (two schools) and tape/slide programmes for independent study (four schools) are not very widely used, although some informal collaboration between three Scottish schools is resulting in the production of units. Guest speakers—distinguished haematologists—accept invitations to address the students of two schools.

Haematologists in eight schools reported their 'topic teaching' to be a most successful method. Panels of speakers are assembled to discuss a chosen topic from differing points of view, and often for a whole afternoon. One school, though, points out that this 'topic-of-the-day' arrangement has been successful only because it is carefully planned: factual information is set out in handouts, the clinical features are demonstrated in case presentations, and the speakers—who come from several disciplines—are briefed to emphasize the important points only, not to go beyond the scope of the handout, and to avoid giving 'specialist mini-lectures backed up by voluminous notes'.

Elective attachments and optional study programmes are offered in eight schools.

STUDENT ASSESSMENT

A total of twenty-two schools organize some form of in-course assessment in haematology. This generally either takes the form of a report on a student's performance during a laboratory attachment or of a class examination, such as an MCQ paper. The assessments are not necessarily 'separate': they may be composite with assessments in pathology and/or other laboratory disciplines. In five cases some marks derived from the in-course assessment go forward to be added to those derived from professional 'critical' assessments, but they are unlikely to have significant impact on the final outcome.

Haematology takes a definite and regular place in professional or 'critical' assessments at the majority of schools (25). In two further

schools, it can appear, and does so occasionally and irregularly. Most commonly, haematological questions are included in the pathology examination(s)—this is the case at twenty schools including all those in London. Haematology (or more precisely, 'clinical haematology') is examined with medicine at seven schools, and with a group of clinical specialties at eight schools where clinical examinations are integrated and not subject-based.

PROBLEMS AND DEVELOPMENTS

Resources

Eleven schools would like more academic posts in haematology to be created—some have none at all at present: this would allow proper attention to be given to teaching students by people with the acknowledged responsibility for it. Heavy and growing service commitments (mentioned by five schools) compound this problem of insufficient staff time for teaching: 'as new clinical units are formed, case management becomes more intensive and laboratory dependent and pathology services are centralized'. However, one respondent's experience is that even when academic posts are created they are difficult to fill, particularly in central London, and junior staff are preoccupied with career uncertainties and postgraduate examinations. Two schools suggested joint appointments between haematology and a preclinical department or between haematology and general medicine as a means of improving recruitment by offering greater career satisfaction.

Four other problems were mentioned. Physical facilities—space, accommodation, access to patients, etc.—are reported as deficient in four schools (all in Scotland or Ireland). One Scottish school, for example, is unable to demonstrate the optimal care of haematological malignancies because the facilities do not exist, nor certain haematological genetic conditions because the characteristics of the local population inhibit their development. Three schools would like audio-visual equipment which is not available to them; two of them specified colour television. Six schools are already in the process of introducing such facilities; one of them is producing not only tape/slide programmes but also videotapes, to show clinical procedures to preclinical students, laboratory methods to clinical students, and to demonstrate the clinical features of individual diseases.

Organization of Teaching

Six schools reported that their time allocation has recently increased, and two other schools now have a full-time course. However, nine respondents are unhappy about the amount of time allocated; three

would use extra time granted for practical laboratory work whereas others would use it to deal with more clinical topics.

The problem of when to teach their subject vexes haematologists in many schools. Three are concerned that the 'foundations' of the subject should be established early in the curriculum and would like closer relationships with basic science teachers to ensure that adequate teaching is given then. However, the teaching of haematology to preclinical students has recently been introduced in six more schools—sometimes as a result of wholesale curricular reorganization—and another school is on the point of establishing this. Ten other respondents felt that the clinical aspects of the subject were receiving insufficient attention. (A drawback in at least four schools is the dispersal of students around different hospitals and medical units, making the amount of contact they have with patients with haematological conditions fortuitous and variable: within a given school it is possible for some students to learn a very reasonable amount of clinical haematology and for others, virtually none.) Some regard the subject as not very suitable for junior clinical students: 'this is now a specialized clinical subject and can only be appreciated by the student having a comprehensive clinical background. Apart from a simple introduction at the start of clinical practice this is a final year subject.' Three schools would like to teach clinical haematology at a very late stage, and a fourth suggested a supplementary final year course for revision and updating when the more specialized aspects could be tackled. Another proposal is to make 'clinical haematology one of the medical teaching units through which (all) students would rotate during their clinical medicine attachments'; one school in fact has recently implemented such an arrangement.

Theoretical teaching in the subject has recently been included in the co-ordinated systems-based clinical lecture courses at three schools, and in another, plans are afoot to increase the number of topic-teaching sessions at which haematologists and other clinicians discuss topics of mutual interest. Combining the teaching of haematology with that of other subjects does not mean the subject is not retaining its own identity, however; indeed the reverse appears to be true, in that haematologists are increasingly expected to contribute more to the curriculum. Seven schools asserted that the time has come for haematology to be treated as a discrete subject and not as a minor branch of pathology: medical schools should have a policy for it as a subject in its own right, with its presentation at each stage of the course more consistently planned.

Three schools are uncertain as to what value traditional laboratory classes can have, especially when time is limited: would the time be better employed on other activities? Both laboratory work and small-group teaching are undermined by the presence of too many students at once, and three schools complained of this. Nevertheless, seven schools

are giving more tutorials than before and in two of them this form of instruction is replacing lectures to the whole class. Two other schools have also reduced the number of lectures but another has decided to restrict the amount of small-group teaching because it is too demanding on the limited staff time available.

Re-timetabling and more intensive teaching methods are required to counteract one of the greatest obstacles to presenting a true picture of haematology to students: their own prejudices against laboratory medicine. The difficulty here is the student 'who regards any technical subject as beneath his clinical dignity and the laboratory as a convenient slot machine to produce results. How can we instil in his mind that a given result may have two meanings and even be wrong and misleading?' More patient-based teaching may not in itself improve the subject's image greatly: more comprehensive teaching in which the clinical and laboratory aspects are balanced and interrelated is the ultimate aim of those who discuss this problem. Three schools feel that recent revisions have given them better integration of the two aspects and a few others were able to say that they hope to achieve better integration in the near future.

Altogether twenty-one schools reported changes which have occurred recently and six of them are proceeding with further changes. Another five schools definitely intend to change some feature of their course and six reported possibilities, without yet being able to define or gain approval for them. These developments generally are of a minor, evolutionary nature arising from seizing whatever opportunities there are to improve the quality of the haematology teaching.

Immunology

All thirty-eight medical schools were invited to complete questionnaires on the teaching of immunology. Three schools—one clinical only and two preclinical only—declined, on the grounds that not only does very little teaching take place on the subject, but what there is would be impossible to pinpoint. Three further schools were unable to give precise details about teaching time, etc., but none the less answered some of the Survey's questions. Thirty-two schools submitted full returns.

TEACHING ARRANGEMENTS

From the variety of teaching arrangements, it is clear only that no consensus has been reached as to where and how best to teach the subject. In some schools it is thought that for undergraduates it need not be detached from general pathology; at others a (sometimes deliberate) lack of policy has allowed individual teachers to follow their own interests or take advantage of whatever expertise is available to bring the subject into their own courses, unilaterally assuming responsibility. Elsewhere an over-all curriculum reorganization may have set up a special 'topic' course at a chosen point in the curriculum, or conversely have implemented a policy of interspersal, with aspects of immunology covered progressively, throughout the course.

Seven schools have separate courses or sub-courses in immunology: they treat it as a subject in its own right. Two of them also include substantial immunology elements in other courses. Indeed, ten schools altogether indicated that the subject is taught both separately and in association with other subjects. There were also twenty schools who indicated that immunology is taught entirely in conjunction with other disciplines or within larger courses; these include both schools unable to identify the exact amount of immunology teaching taking place (three)

and those where a 'measured amount' is included at different stages of the course.

Most commonly the subject is linked for teaching purposes with (general) pathology. Twenty-four schools reported some connection: six of them have full-time 'laboratory clerkships' or 'pathology firms' in which pathology in the widest sense is taught, the components being integrated to varying degrees. These six are all London medical schools. The pathology block may be taken by all students at once, by groups of students in rotation, or by the whole class divided into smaller groups who rotate between the sub-departments.

However, two English schools have excluded immunology from their concentrated schemes for teaching general pathology and some related specialties. Instead they and eight other schools reported it to be linked at some point with microbiology.

Immunology instruction also occurs in such courses as biochemistry (seven schools) and multidisciplinary cell biology or cell studies (three schools). Five schools which have integrated syllabuses in the early years include immunology in several of their courses or 'themes', and eight schools with major co-ordinated series of lectures in the clinical course feature immunology in relation to the system or problem being discussed.

Position in the Course; Teaching Time

There are three schools where immunology is taught in every year of the five-year medical course: altogether eighteen schools include it to a significant extent in both preclinical and clinical stages. Eleven schools teach it in the first preclinical year, twenty-two in the second preclinical year; twenty-four teach it in the first clinical year, sixteen in the second, and twelve in the final clinical year.

The officially recorded amount of time given to immunology may not be the best measurement of how much immunologically focused teaching a student actually receives, because of the ubiquitous nature of the subject. However, the figures are given below, but principally they consist of scheduled lectures and 'theoretical' classes.

Teaching time on Immunology (hours)	*No. of Schools*
Up to 20	16
21–30	8
31–40	2
41–50	4
More than 50	2

Note. Six schools in all could give no estimate.

FEATURES

Aims and Objectives

Immunology has not yet become a standard part of every medical school's curriculum: while it is felt necessary to introduce students to the concepts, methods and clinical relevance of the subject, it has obviously been difficult to draw up objectives for teaching it to undergraduate students and most schools did not report an agreed policy or approach. Those who did generally report an attitude to the subject (rather than an educational aim) which conditions their teaching. Seven schools, for example, believe in presenting immunology as a 'bridging' subject, essentially neither preclinical nor clinical, but connecting the two: it can enhance students' basic knowledge of human biology by showing under what circumstances normal rules do not apply, and leads from contemplation of general principles to consideration of individual patients and their problems. The preference for teaching it in the middle years of the course reflects this 'paraclinical' point of view.

Four schools, in contrast see it as essentially a basic medical science, one of the foundation subjects. Priority is given to conveying the basic principles of the subject at an early stage when cell behaviour in all its aspects is being studied. It was claimed that recent developments have strengthened the 'scientific' more than the 'applied' facets, and this circumstance has enabled immunologists to use a cell biology framework in teaching their subject.

An emphasis which pervades the courses of four schools is 'wholeness'. Students are encouraged to think in terms of the 'whole body' and the way in which immunological reactions involve all its systems: presenting opposing 'good' responses and 'harmful' processes or events (standard to all human beings) is no longer useful—the attitude to be retained is one which appreciates the constant, fugal interchanges and counter-reactions taking place and the fact that these vary with individuals. Ultimately this is a clinical approach or a preparation for clinical practice, in persuading students to look beyond the immediate pathogenic factors for explanations of an individual patient's symptoms.

Two further characteristics of the subject in its present state of development were described for the way they colour attitudes brought to bear on teaching it: three groups of teachers deliberately try to make it exciting, to refer to areas in which research is 'pushing forward the frontiers of knowledge' and to show that it will be far more important in future than it has been hitherto; while another school's policy, reached after trial and error, is to acknowledge that it is conceptually a difficult and complex subject requiring straightforward teaching in an intensive format, not complicated by being related to other subjects or by being spread over a long period when the thread would be lost. Both

approaches are seeking to make immunology palatable, interesting, and acceptable to students who have not necessarily had either clinical or research experience.

Teaching Methods

Several reports drew attention to particular features of their teaching methodology which have been found to be particularly useful or successful. For instance, seven schools drew attention to their use of patients in teaching: two give case demonstrations in lectures or seminars, and five teach clinical immunology as an integral part of patient care on the wards or at special clinics. At an English school, one firm (through which students rotate) in the department of medicine is especially interested in clinical immunology.

Again in a clinical context, four schools think it important to introduce students to the routine immunological diagnostic services and to provide instruction on how to make good use of them. At an Irish school, for example, this is a chief purpose of a concentrated course in the penultimate year, in which the laboratory sub-specialties combine to orient students in the selection, methods, and interpretation of the available investigations: the course is held in hospital.

Nine schools mentioned their use of tutorials or regular teaching in small groups. Six schools mentioned laboratory classes: like tutorials they can concentrate attention on particular areas of importance and provide 'opportunities for clarification by question and answer'. Only one school mentioned any use of audiovisual material and handouts. Three schools have final year revision or 'updating' sessions on immunology.

Guest lecturers help with the courses in four schools, supplementing the staffing resources of the medical school by contributing lectures in their own specialized areas. They may belong to other faculties in the university or to medical school research units which are not normally involved in undergraduate teaching. At one of these schools a feature of the whole course is the emphasis on future developments through research.

Elective attachments and optional study programmes in immunology are provided in at least six schools.

STUDENT ASSESSMENT

Immunology plays some part in the major 'critical' assessments of twenty-seven schools, but the precise extent of this involvement cannot be ascertained. In almost all cases immunology is normally examined with pathology. It may in addition be examined with the basic sciences at

three schools and with various clinical specialties at two others. One English school said that there is a definite likelihood of immunological questions being asked in examinations at all stages of the course.

A number of schools (14) have in-course assessment involving immunology. These tests are not always solely on immunology; more frequently immunological knowledge is tested as part of an assessment of pathology or of other subjects with which some immunology is taught. In seven cases this in-course assessment is 'critical': marks go forward to an end-of-year review or to contribute to the total marks awarded after an end-of-stage examination. One London school administers an MCQ paper at the beginning of the final year general revision course—students performing badly receive special attention.

PROBLEMS AND DEVELOPMENTS

Resources

A shortage of teaching staff in immunology is worrying several schools. Six would like more academic staff for basic teaching; two would like medically qualified appointments to teach clinical immunology in a clinical context. (Two schools have in fact recently appointed clinical immunologists who can be expected to have some effect on the nature of the teaching very soon.) The formation of a separate department of immunology is proposed in four replies: as well as simply increasing the number of staff it would ensure that immunology was taught by full-time immunologists and less by people with other backgrounds and other commitments. One school complained of difficulties in recruiting technicians, with consequent difficulties in arranging practical classes.

Lack of space was stated to inhibit practical work in one school.

Organization of Teaching

The basic problem of teaching time was referred to by six schools. They feel they have insufficient time in which to cover the essentials. By implication, they would like greater status for their subject in the curriculum, although three of them have had their time allocation raised in recent years. More time has been allocated to immunology in a total of seven schools, and in seven schools also a new course or special sub-course has been established. In three instances there is now pre-clinical teaching where there was none before.

All new opportunities for teaching immunology have been welcomed by its practitioners, but sometimes with reservations about the position given in the timetable and the restrictions which this may impose. One school would like the 'core' course in immunology to be held later when students have had some clinical experience, while three schools would

like to expand and strengthen their early courses and one school will include immunology in the first stages of its planned new integrated five-year curriculum.

Three schools suggested that the ideal pattern would be one with a strong core course run separately in the early or preclinical years, and various planned contributions to clinical courses later on. Exactly such an arrangement will be made at one English school when its new curriculum is introduced. A Systems Board in Immunology will be responsible for: a core course in the preclinical stage, taught by various departments who in the past taught different aspects of immunology but now in a completely integrated manner; and clinical immunology during the early clinical stage (the Board will ensure that important topics such as immunosuppression, immunodeficiency, immunocomplex disease, etc., are taught with the appropriate system). If this proves inadequate, the Board may also arrange a small clinical 'core' course.

It is the organization of teaching which causes disquiet in several schools: eight find it very difficult to know when and what immunology is actually taught: teaching is so diffuse that immunologists are unable to co-ordinate it. The problem is not that the subject is ignored: rather that it is referred to incidentally and by people who have other interests. The answer is for immunologists themselves to expand their activities, to be available to do more teaching, and to 'control' the way in which aspects of the subject are presented, especially in the clinical years. Six schools intend to make efforts towards this goal: at four of them immunology will be formally represented in multidisciplinary topic-teaching sessions.

In future, too, more stringent arrangements will come into force in the teaching of clinical immunology at eight schools, in parallel with its development as a recognized specialty in the NHS. Clinical aspects will be given greater attention in the early, preclinical course and/or in later years. Four of these schools would like to do even more than is envisaged at present; four others would like to but see no way to even partial success. An Irish school for example suggests greater co-operation between laboratory and clinical staff through: more extensive use of symposium-type teaching in which clinical and non-clinical staff would participate; immunology 'clinic' laboratory sessions in which results of tests on patients would be discussed; and combined assessment procedures in which case records kept by students on clinical cases with an immunological component would be jointly assessed by the clinical tutor and laboratory immunologist.

Six schools feel that practical work is important and could usefully be expanded, but are restricted by the lack of time allocated to them in the timetable or by the lack of staff time in which to prepare material for this. Another school would like to have more small-group teaching and informal practical demonstrations, which have been successfully

developed, and also hopes to have its own tape/slide programmes available for use, as well as programmes obtained from the British Society for Immunology. Three schools are to introduce 'problem solving' sessions (based on either experiments or real cases) where the onus will be on the students to provide interpretation and solutions.

Altogether twenty-three schools reported recent or imminent changes, whether organizational, methodological, or content-related. Another seven schools, five of whom have already implemented some changes, are uncertain whether further developments will take place or not. Constant minor adjustments can however happen which over the years can have significant effect on the emphasis and presentation of courses: seven schools indicated such undramatic progress.

Finally, the over-all problem facing all schools, which three of them made explicit in their replies, and which governs their attempts to devise better ways of teaching it: the complex Protean nature of the subject itself. Simple, precise statements are often impossible to make, yet one cannot give too great an exposition of detail lest, in the words of one respondent, 'students become overwhelmed by this ubiquitous subject'.

Medical Ethics and Forensic Medicine

Two sets of questionnaires were distributed: one concerned the 'topic' of medical ethics and the other concerned the specialty of forensic medicine. The medical ethics questionnaire (prompted by the GMC's 1967 Recommendations) was the longer and contained questions of detail in addition to more open-ended ones. The questionnaire on forensic medicine contained only the latter type, leaving the respondent to choose matters he thought significant enough to report.

The two sets of questionnaires were analysed separately, but a substantial overlap in answers became apparent. Many 'ethics' replies included jurisprudence, many 'forensic' questionnaires discussed ethical matters. Furthermore, the same person was asked to complete both questionnaires in several medical schools. The section of this report headed 'Problems and Developments' will show how attitudes to these subjects are changing and relationships between them being redefined.

It was therefore decided to combine the reports on these two subjects into a single document, which would reflect more closely the realities of the situation. However, it will be made clear which aspects of the broader field are being discussed at any given point.

Questionnaires on forensic medicine were returned from thirty-three medical schools—all those with established clinical courses. One university whose new clinical school will open in 1976 returned some timetabling information. The same thirty-four medical schools supplied similar information about medical ethics.

TEACHING ARRANGEMENTS

Of the thirty-four medical schools responding to the 'ethics' questionnaire, twenty-five have formal and acknowledged arrangements for including the topic in their curriculum. At eleven of them it is either included in the course of forensic medicine (a single course covers both areas) or in association with forensic medicine, in integrated teaching

sessions. In six of the twenty-five, ethical questions are mentioned in the Introductory Clinical Course; a special talk is given to students as they embark on their early clinical experiences. In four schools, ethical questions are specifically raised in courses in community medicine, general practice, or multidisciplinary and community-based 'Man in Society' courses. Two schools in Eire have special separate courses in 'Ethics' which do not deal (except incidentally) with forensic and legal matters. Nine schools reported that they have no formal arrangements for teaching medical ethics: some did not complete the questionnaire but three of them gave some information about their informal, *ad hoc* or extracurricular arrangements.

Forensic medicine as a subject has a separate course in twenty schools, although some of them include 'medical ethics' in it. In nineteen of the twenty schools the separate course is the only occasion for teaching the subject; in the twentieth there is also some joint teaching with other subjects. Fourteen schools altogether arrange some separate sessions and some combined sessions. One school appears to arrange all formal teaching of forensic medicine in the pathology block when all the pathology specialties are taught; two other London schools also link forensic medicine with pathology in their timetable, and one of them also links it, briefly, with surgery. Formal sessions with paediatricians in the child health course and with obstetricians and gynaecologists in their course are held in two schools. These two schools and three others have joint sessions with psychiatrists and, in addition, with anaesthetists in one case. In three schools forensic medicine features in the orthopaedic course, specifically in that part of the course dealing with trauma. Ethical and forensic considerations are also regularly brought into pharmacology and clinical pharmacology courses in a number of schools.

Position in the Course; Teaching Time

In twenty-one medical schools (including three with 'informal' arrangements only) medical ethics is scheduled for the clinical stage only; in seven schools the topic is introduced in the early or 'preclinical' years of the curriculum, prior to additional teaching later. At one English school some ethics teaching is given in all years of the five-year curriculum.

It was predictably difficult for schools to answer precisely how much time is provided for teaching medical ethics. Almost all British schools indicated that less than 10 hours (often less than 5) were earmarked for formal teaching of the topic. In Ireland more time is allocated specifically for the teaching of ethics (average time 15 hours).

Forensic medicine is taught only during the clinical stage. In seven schools the main teaching effort in forensic medicine takes place in the first clinical year or phase; in fourteen it takes place in the second

clinical year or 'middle phase'; and in six, it takes place in the final clinical year or phase. It is spread or rotates over more than one year in six schools; in one school it is taught in each year of the clinical course.

The teaching time devoted to forensic medicine was generally reported with greater confidence. Fourteen schools formally allocate 10 hours or less to the subject, nine schools allocate from 11 to 20 hours, and eight schools give between 21 and 30 hours. Three schools give more than 30 hours of teaching. The mean time for these thirty-four schools is 17 hours (SD 9·3): although the average for schools in London and the rest of England and Wales is less (14 hours) than that in Scotland and Ireland (27 hours); many of the former group of schools indicated that incidental, additional student 'exposure' to the subject (especially at post-mortems) was common.

Most schools were answering for the present situation or for arrangements now being implemented as part of a new curriculum. New arrangements could not always be described in great detail. However, two Irish schools answered for future plans: one will have a new final-year course entitled 'Medical Ethics' to discuss moral issues in medicine; the other will re-timetable its course in Ethics which will be adapted but not radically changed. One London school, as part of curriculum reform, is to formally include ethical questions in its general topic-teaching cycle. Another London school was able to give outline plans for a two-day teach-in on 'Medical Ethics and the Law relating to Medicine', for the final-year students, which was held for the first time in 1976. In the two new clinical schools an experimental approach will prevail: it is likely that one will have no separate teaching in forensic medicine (all instruction will be incorporated in various clinical courses); the other will promote on-going discussion groups for students to learn about ethics in medicine in an entirely non-didactic way, though a very short traditional lecture course in forensic medicine will also be provided.

Of the nine schools which reported no formal arrangements for the teaching of medical ethics, none has definite proposals for making more formal provision; however, discussion is under way in three of them to examine how they could make more positive efforts to include the topic. The others are satisfied with their present, informal situation: indeed, four of them strongly believe it would be wrong to attempt any formal system—the topic, they say, is not a 'subject' and cannot be 'taught', by definition. This case was put by one respondent: 'While Medical Ethics is very important it would seem quite ludicrous to put this into the curriculum as a separate subject. All clinical teachers teach medical ethics almost daily as part of their general clinical bedside teaching. We deal with the problems of treatment of patients, treatment of their relatives, the problems of maintaining lives of poor quality, the problems of experimental research procedures and so on, and it seems quite

wrong to me to take this subject out of its clinical context and put it in the curriculum as a separate topic. It is quite clear that a good clinical teacher will be constantly discussing ethical problems and for this reason I see no point whatever in having it as a separate subject in an already overcrowded curriculum.'

Teaching Staff

Respondents to the medical ethics questionnaire were asked about the interests of personnel teaching this topic. The questionnaire on forensic medicine did not specifically inquire about teaching staff, but a number of points emerged none the less.

A dozen schools place the main responsibility for teaching medical ethics on specialists in forensic medicine. Nine London schools share appointments in forensic medicine: the same person teaches at two or more schools. Two or three schools have allowed their post(s) in forensic medicine to lapse. Surgery is the specialty area responsible for medical ethics in one school, because of a personal interest on the part of the professorial unit through which all students pass. It conducts weekly discussions for the student group attached at the time. Pathologists (general or clinical) are active in teaching medical ethics in five schools, as are clinical pharmacologists (with, for example, a special interest in toxicology) at three schools. At seven schools general practitioners and/or specialists in community medicine are involved. A medical social worker regularly participates in discussions on ethics in one school.

Seventeen replies pointed out that all clinical staff may refer to medical ethics during the courses in their own specialties; in fact, they are encouraged to do so. This must be the case in all medical schools, whatever formal arrangements are made. In addition, members of staff with a personal interest in ethical issues, or whose specialties by the nature of their practice are prone to ethical dilemmas, make more noticeable contributions. For example, at one English school the professors of medicine, geriatric medicine, human reproduction and obstetrics, clinical epidemiology, and the senior lecturer in rehabilitation share some teaching responsibility with the professors of law and philosophy. The 'world outside' is frequently represented by ministers of religion (especially in Eire) or people qualified in philosophy. This has been arranged in five schools: one enjoys the services of a medically qualified theologian, and the course in another is run by a senior teacher with a background in world literature, theology, and philosophy, specializing in moral philosophy.

In forensic medicine, a number of schools use people who are neither in active clinical practice nor in active forensic practice; some come from outside the medical school. A total of eight schools invite lawyers and speakers from one of the medical defence/protection societies to

address students. At an English school mentioned above, forensic medicine is discussed and taught by a team consisting of a CID chief inspector, a lecturer from the law faculty, and a coroner, as well as a forensic pathologist. Coroners regularly join in the teaching programme on forensic medicine in two other schools.

FEATURES

Respondents to the medical ethics questionnaire were asked to outline their aims or objectives; respondents to forensic medicine were not actually asked to do so but many of them took the opportunity to state the themes which guide their teaching and to explain why these have been adopted. Twenty-two of the medical ethics questionnaires gave statements which might be classed as objectives: some were elaborate, but more often they were brief, general aims. The differences between them are mainly ones of emphasis.

Eight schools' teaching about ethics is intended to prepare students in a general way for clinical practice: to alert them to the hazards they might encounter during their house-officer period and to instruct them in the pitfalls of the paperwork, and the clerical duties of junior doctors. Five concentrate more firmly on the doctor and the law: students are told where they will stand in regard to the law governing defined situations, what are their duties to the authorities under most normal circumstances and some abnormal ones, and what legal and other sanctions can be brought to bear upon them. This area was also mentioned by twelve forensic respondents to be the basis of their course: they try to give a general orientation to students, keeping their teaching at a practical level and discussing the problems which an ordinary doctor in any branch of medicine might face and the course of action which he would normally be advised to take. This is the essence of medical jurisprudence, teaching on which, as one respondent puts it, is important 'to keep doctors out of your (ie the GMC's) clutches and out of the civil and criminal courts'.

Four courses in forensic medicine are particularly aimed at the future general practitioner. It was pointed out that in Ireland and in some rural areas of Britain there are no police surgeons, and general practitioners must act in this capacity without any further training. The responsibilities and duties of the general practitioner in this area are therefore a major learning objective of these courses. The statutory requirements of a primary care physician are included as well as the forensic work which may befall him or her, but the emphasis is on a typical 'everyday' workload and not rare and dramatic events.

In medical ethics a concern with issues connected with the question 'What is a good doctor?' was reported. Ten replies indicated a prevailing

theme which can be summed up as 'responsibilities towards patients'. Four of these also highlight the doctor's responsibility to a patient's family. In effect they are discussing the general nature of a professional person's relationship with his clients.

In a more general way, three schools are hoping to induce behaviour in their students, that is sympathetic to the needs of their patients. Medicine is shown to demand 'humanitarian response' in its practitioners: it calls for caring attitudes to remind students that medicine deals with people as well as diseases. This approach attempts to revive the idealism which students bring to medical school and perhaps forget in the long years of basic sciences and of studying the physical signs and symptoms of disease.

Six replies however indicated a major preoccupation with responsibilities to colleagues. Students are reminded that they will not be working in isolation—they will be members of a team, visible or invisible, and the confidence of the public in its doctors must be maintained.

The problems raised by the explosion in medical research are discussed at length by two schools who see this as an important aspect of medical ethics teaching. These schools aim to help all students to appreciate the generally accepted research safeguards and to comply with them when they themselves undertake research projects involving patients.

Two other respondents in medical ethics were anxious to explain that they do not give answers to the problems raised in their courses. To most of these problems there are no 'correct' answers; teachers can merely suggest possible solutions, show how most doctors keep their consciences clear and provide a framework within which students will, when the time comes, be able to make their own decisions.

Six replies altogether made it plain that teaching is not didactic and indeed is only justified if it arouses students' interest and makes them aware that ethical dilemmas exist and, furthermore, are unavoidable. They should not be taken by surprise when they encounter them, and should be able to face them in a mature way if they have heard them discussed, openly and sensibly. Teaching is given simply to heighten their awareness, to fill in the gaps left by their scientific training, to 'promote critical evaluation of the aims, methods and results of medical practice among patients, families and society'.

At the other end of the spectrum, two courses in forensic medicine aim to teach 'traditional' forensic pathology: here it is a major element in the course, while elsewhere it is a minimal component. Indeed, four forensic medicine respondents stated quite specifically that they are not teaching forensic pathology, which, apart from certain matters, they regard as a postgraduate discipline. Two of them and two other respondents have oriented their forensic medicine courses to wider issues. A topic such as negligence and iatrogenic illness is taken from purely legal considerations to the moral aspects it presents: these courses aim to 'paint a broad canvas'.

Course Content

Respondents to the medical ethics questionnaire were asked to indicate the content of their teaching; some gave exhaustive lists of the individual topics covered, others were more brief. Several respondents to the questionnaire on forensic medicine also volunteered information about what they teach.

In medical ethics there were six cases where both legal and ethical subject-matter was reported. Twenty-one schools cover various ethical issues—fifteen concentrating entirely on this area. Thirteen teach legal medicine—seven more or less exclusively, as regards their planned teaching. Three schools, while having a formal structure for teaching about ethics, do not have a programme drawn up in advance: topics are discussed at the students' request or when they are prompted by an event in the ward or perhaps by current discussions in the mass media.

The pattern has been established in some schools for particular issues to be dealt with when students are studying the appropriate clinical specialty, for example, euthanasia, terminal care, therapeutic abortion, the survival of handicapped children, organ transplantation, trials of new drug therapies, genetic screening and counselling. Three English schools are the most notable for this integrated topic-teaching pattern.

Items of content most often mentioned included: research methods, especially clinical research involving patients in 'blind' trials (fourteen medical ethics replies); the role of the GMC—its registering, licensing, and disciplinary powers (six medical ethics replies discussed this which is also inevitably part of all forensic medicine courses); the role of the defence societies (three medical ethics replies); where to seek advice when in trouble (seven forensic replies); and negligence, 'therapeutic mishaps', and iatrogenic illness (three ethics replies and seven forensic replies). Paediatric forensic medicine is given special attention in six forensic courses.

Certification and documentation are covered in some detail in fourteen forensic courses; giving evidence in court as a medical witness, verbally or in a written report, is a feature of seven. Again, it is the common occurrences—road accidents, claims for compensation before industrial tribunals, disputed insurance claims and so on—which are used as examples. Five of these courses include visits to a court to see the process in action.

A doctor's legal responsibilities in cases of sudden death and illness or injury discovered in suspicious circumstances are taught in ten forensic courses, of which four with two other courses also give particular attention to the interpretation of wounds and injuries from the point of view of causation. Two ethics replies dwell on toxicology and violence while five forensic replies stress these aspects and also discuss the abuse of drugs and alcohol. One Dublin school considers itself

fortunate in having access to the National Toxicology Centre and the National Neurosurgical Centre, which are attached to its two principal affiliated hospitals, making it possible to 'demonstrate the practical aspects of trauma both accidental and criminal, and the clinical, therapeutic and autopsy aspects of Toxicology'.

Seven replies on ethics mentioned current legislation which affects medical practice, bills recently enacted or those before Parliament, and also any relevant commissions and committees of inquiry: this is mainly discussed to keep students up-to-date.

Codes of practice not enforced by law yet invested with great authority are featured particularly in four schools' ethics teaching: they are the Hippocratic Oath and the Declarations of Geneva, Sydney, and Helsinki. Their principles are outlined and the texts discussed in some detail.

Without listing more topics here, fourteen schools deal specifically with a variety of ethical concerns which they described in their questionnaires. The principles are identified at the same time as the clinical situations which directly or indirectly produce the dilemmas. A number of respondents added that because their teaching is in the final year of the course, they can assume that students have a sound clinical background and some 'back-up' knowledge of the moral and legal aspects of the clinical activities they have experienced. Forensic and ethics teaching then need not dwell on the clinical situations themselves. Three forensic courses are in fact held immediately before the last part of the final examination.

Teaching Methods

Lectures are used in the teaching of medical ethics in twenty-three schools; in four of them it appears to be the only teaching method used. Indeed, in fifteen schools the lecture is the sole method used in forensic medicine courses. In two forensic medicine courses lectures are followed by open discussion on the issues raised, all in the same session.

In eighteen cases, teaching about ethics is given in symposia/large group discussions which may involve the whole class of students. More than one speaker is usually present and there is often a 'panel'; this is the case for example when integrated sessions are arranged during the teaching time of a clinical specialty in order to discuss ethical aspects of its work. Another instance of this type of exercise is the use of a local medical group. Several of the larger cities in Britain have them: they are based in the medical school but attendance at their meetings is open to members of all the health professions working in the city or beyond. Linked together in the Society for the Study of Medical Ethics, they provide a forum for discussing topic issues with ethical implications. Eight medical schools encourage their students to attend the meetings;

while these are held in the evenings and are strictly speaking extra-curricular, they are generally considered to be an extremely valuable part of the students' education.

Small-group discussion is regularly provided in thirteen schools as part of the programme for introducing students to ethical questions: sometimes these are voluntary. Like medical group meetings, they may be held outside normal teaching hours for interested students only. Alternatively, they can occur during clinical attachments when students are rotating around the specialties in small groups. At an English school, some forensic medicine is taught in this way; tutorials are conducted by the forensic specialist on a topic related to the specialty to which the particular group of students is assigned at the time.

Teaching aids are not widely used. Four courses in forensic medicine make use of coloured slides; five courses in ethics (legal medicine) show films, including those from the Medical Defence Union. Summarized printed information is handed out to students as part of the forensic teaching in one school; a pamphlet produced by the BMA is given to students during their instruction in ethics at another. Forensic demonstrations are put up in two schools: at one, the display is regarded as a primary learning method, while at the other it is done to help students revise the subject.

Patient-based clinical teaching was mentioned in thirteen replies to medical ethics. In all cases it occurs during normal clinical teaching in the ward, in out-patients, and so on. Clinical staff draw attention to the ethics of a clinical problem and encourage students to examine a clinical decision from the ethical point of view. While some schools do not describe this as 'teaching', many emphasize that it is a very important way of learning about ethical realities.

Attendance at post-mortems is a particular feature of eight forensic courses. In some it is regarded as being important, but in a few others attendance is optional—suitable cases are few and far between. Court attendance is another method of teaching which is used, but one or two respondents added that it is not particularly useful but students enjoy the visit and it makes the course more interesting. Nine forensic courses arrange visits to coroner's or magistrate's courts—or the Scottish and Irish equivalents—though the majority of them are in London schools. Again the visits may not be compulsory; students of one London school who choose to go find that the coroner pays special attention to them and gives informal tutorials before and after the hearings.

Active learning of a quite different nature is a particular feature of one Irish course in ethics: this requires three essays from every student on ethical topics. The essays are marked and returned to the students, with comments.

'Special Features'

Four replies referred particularly to the medical group meetings (described above) which have reportedly been enormously successful in those places where they have been established. The fact that they are voluntary and extramural is simultaneously an advantage and a disadvantage: some students do not bother to go, while those who do have their motivation rewarded by mixing with active, interested clinicians, and having issues discussed which are of topical interest in the health service. At one school a grant-aided research project is connected with the local medical group and it is hoped that one outcome will be guidelines for a teaching programme in ethics for undergraduates.

Four respondents see the value of teaching medical ethics lying in the very nature of the topic. It is an antidote to the 'coldly scientific and prescriptive' teaching in the rest of the medical course. They deliberately emphasize the openness of the topic and the primary importance of personal judgement and beliefs. The contrast is appreciated by students 'who feel—or say they feel—deprived of humanistic studies. Frequently medical ethics has been the only experience they have had of an academic discipline that is not scientific in the correct sense of the word. . . . Economics, history, the social sciences and philosophy have an appeal to students, who, because of the competition for places in medical schools, are more intelligent than average. This has made possible a greater emphasis on the general ideas of moral philosophy.'

However, three respondents reiterated their belief in the need to focus on legal responsibilities. Teaching about ethics should be integrated with teaching in forensic medicine, as moral considerations must be preceded by consideration of the legal position and an understanding of what are the defined and enforceable responsibilities that a doctor has to society.

Two respondents emphasized the importance of giving the topic practical relevance. They try to impress students with the prevalence of ethical problems: all doctors will face them frequently in the normal course of events. For example: 'we believe that it is most important to teach medical ethics in a practical way by showing students ethical problems as they exist in day-to-day medical practice. They are then asked to discuss possible solutions to these problems. . . . We believe there is no place for ethical theory in the medical course . . . whereas medical ethics in the practical sense referred to has produced enthusiasm and in-depth evaluation of problems.'

Structured learning at one school has been extended, at the request of the student body, to include the ethical problems faced by students themselves. Discussion is arranged at the point where students begin their clinical studies, on the relationship between student and patient, especially when the latter is seriously ill or dying, and the sharing of

responsibilities between medical students and nursing staff. In this context, it could be mentioned that one school now has a medical school ethical committee whose remit covers, amongst other things, experiments conducted by students and experiments conducted on students.

To confirm that student interest in forensic and ethical matters is not an unattainable dream, five respondents reported the elective attachments which they offer and which are eagerly taken up.

STUDENT ASSESSMENT

Twelve respondents to the forensic medicine questionnaire reported that their subject is regularly included in the 'critical' examination structure of their medical school. Usually it constitutes a part of a stage of the finals examination. Three respondents stated there is definitely no critical assessment in their subject, while ten intimated the possibility of it being included on occasion within papers devoted to one or more of the examinable disciplines and specialties, or in the clinical viva voce examinations. In all six Irish schools and in one Scottish one, forensic medicine is examined separately with its own paper which students must pass. At four London schools, the subject features in the major critical assessment in pathology, while at one English school it is included in the final examination in medicine. A compulsory and 'critical' assessment in forensic medicine was recently discontinued in two schools after the curriculum as a whole was reorganized.

Medical Ethics is not generally examined. However at one Irish school a special examination is set, a year before students are examined in forensic medicine. At four Irish and Scottish schools the subject forms part of the examination in forensic medicine or 'medical jurisprudence', possibly with a separate section of the paper allotted to it, although in two of these schools it was plain that 'ethics' was interpreted as legal medicine. Six replies indicated that while the topic is not examined in its own right it may feature in the assessment in various clinical subjects in the sense that students would be commended for showing an appreciation of the ethical implications in their answer to a question.

In-course assessment in forensic medicine takes place in eight schools in the form of a class test, such as an MCQ paper. It may be confined to forensic medicine or held jointly with other subjects. In two cases, the in-course assessment is 'critical' because marks from it are forwarded to be included in the results of the final examination in pathology.

PROBLEMS AND DEVELOPMENTS

Organization and Resources

Developments and problems in connection with resources were mentioned only by respondents to forensic medicine. In two cases, the departmental base is some distance away from the main site where most teaching is conducted which makes it inconvenient for students to attend classes, and also prevents them 'accepting forensic medicine as a genuine part of the medical school'. In six schools the absence of a department in the physical sense was regretted: the subject has no permanent teaching area for holding tutorials or setting up displays and demonstrations. However, one school described its new 'medico-legal centre' in the course of construction: this building, mainly financed by the local authority but partly by the University, will be a focus for the teaching of forensic medicine at all levels.

One of the schools without a full-time staff appointment regrets this situation: teaching is necessarily restricted in content and in method.

Two schools have new courses in forensic medicine; they have been completely restructured. In one of the schools, forensic medicine is no longer a responsibility of the department of social and preventive medicine but is now linked with toxicology and has become more clinically oriented. Another school is developing a new course combining legal and ethical topics.

There were eight reports of reductions in the time allocated to forensic and legal medicine: one of these schools however told of more time (and more formal arrangements) being made available to teach about medical ethics, whereas another reported a parallel decline in the amount of formal provision for medical ethics. Classes in forensic medicine are no longer compulsory in one London school, following amendments to the regulations, although attendance remains satisfactory. Four respondents on forensic medicine feel they have insufficient time in which to teach the subject properly, while eight respondents for medical ethics express the same views.

Plans for restructuring the teaching of medical ethics are being drawn up in four schools: in two the plans are firm but in the other two they are more tentative and depend on the policies adopted after current general curricular review is complete. One of them proposes a final-year orientation course after all other teaching is finished which would discuss ethical and legal/practical aspects of clinical practice.

Medical ethics is now introduced earlier in the curriculum than hitherto at three schools, and the respondent at another school would like access to students before their clinical studies begin, but two forensic medicine respondents would like their teaching to come at the end of the clinical course and several others argued that this is the best location.

There are difficulties in teaching, for example, about battered babies, when students have not done any paediatrics.

Curricular reorganization has linked forensic medicine with pathology in two schools, apparently for administrative reasons. In three schools the separate course in forensic medicine has been reduced but there has been no over-all loss of teaching: relevant topics have been hived off and integrated into various clinical courses. Seven respondents would like to explore or expand this new approach: they would like their formal instruction to be scattered throughout the clinical course with medico-legal aspects being presented in their clinical context.

Planning for medical ethics and legal medicine is made more difficult by the scepticism with which many staff regard these subjects. Forensic medicine is often low on the list of priorities in the curriculum—respondents in three schools complained that they are made to feel superfluous. They maintain only a foothold in the curriculum which is the minimum thought necessary by the medical school authorities. Medical ethics on the other hand is considered extremely important universally—and unteachable, by many. Three respondents intimated the view prevailing in their medical schools that special, formal efforts to present the topic are not necessary and may well be counter-productive. There is also the problem of defining medical ethics and resolving precise objectives for a sequence of teaching suitable for undergraduates. Two schools which are both attempting to develop appropriate and semi-formal arrangements without discouraging the informal, continuous teaching and learning in clinical situations, have found the problems formidable.

Teaching Activities and Content

Greater variety in teaching methods is becoming a feature of several courses. The didactic lecture is increasingly unpopular with staff and students in both subject areas. At the same time, increasing emphasis is being placed upon moral problems, as opposed to etiquette, malpractice, and law.

Four schools have recently experimented with new ways of 'teaching' medical ethics. The changes have mainly consisted of providing more opportunities for discussion, particularly in small-group settings. Two medical schools intend to found a voluntary series of open seminars to discuss ethical problems in medicine, akin to the medical group meetings in other centres. Five are planning to hold slightly more formal small-group discussions or topic-teaching sessions within the medical school, which could also be voluntary. They might follow a prearranged programme, or each group could spontaneously choose topics for itself. Small-group discussions are desired by two further respondents on medical ethics and by five forensic medicine respondents but there is

little hope of achieving them in the near future. More curriculum time and more staff time would be required than is available. Audiovisual teaching aids are to be introduced to support teaching of medical ethics in two schools.

Outside speakers have proved to be successful. Four medical ethics questionnaires reported intentions of introducing them or making greater use of them and perhaps extending the range of expertise which they represent. Two forensic medicine questionnaires mentioned, one definitely, one tentatively, that speakers from a defence society are likely to be invited to address students, and a third has recently made a feature of using guest speakers from the medical insurance field and from forensic psychiatry in his course. In medical ethics, two respondents would like to see outsiders such as general practitioners, lawyers, and coroners bringing their experience into the teaching programme, but the opportunities have not yet arisen.

Concerning forensic medicine, ten respondents are very anxious to give students practical experience in post-mortem examination, or to increase this where some is already available. Four members of this group would also like to be able to take students to attend inquests: their forensic course however short is not really complete unless they can see for themselves what happens at a routine sitting of the court. One respondent hopes eventually to introduce an elective attachment in forensic medicine for students during the summer, and small projects for all students to undertake in the core course. This respondent is newly appointed: as his forensic practice grows there will be opportunities for students to see practical procedures, assistant staff may arrive and would help to develop small-group teaching and liaison seminars.

Changes have also occurred in relation to subject-matter. Especially where the time allocation has been reduced but in other schools too, the content of forensic medicine courses has been pruned and much of what was traditionally taught to undergraduates is now reserved for post-graduate students. Five respondents mentioned this as an important development, and ten more described how they now teach less forensic pathology: they concentrate on 'the problems of the living rather than the examination of the dead'. They have shifted to the middle ground of legal medicine and jurisprudence, and their courses deliberately show greater emphasis on the ethical complications of practice.

Altogether twenty-five schools gave information about changes that have occurred recently: three in medical ethics only, thirteen in forensic medicine only, and nine in both areas. In the future, fourteen schools are definitely expecting changes: three in the teaching of medical ethics only, ten in forensic medicine only, and one in both areas. Fourteen more are contemplating changes which may be of significance.

Medical Physics

All the medical schools were invited to complete questionnaires on the teaching of medical physics/biophysics. Seventeen 'GMC Correspondents' declined, on the grounds that this topic was not included in their schools' curricula; a further five questionnaires were returned marked 'subject not taught'. This report is therefore based upon sixteen replies.

TEACHING ARRANGEMENTS

Eleven of the sixteen schools from whom replies were received make formal and distinct provision in the curriculum for this subject: there is a course in its own right in seven schools, or teaching is timetabled in a discrete and definite manner (four schools). The other five schools take steps to ensure that students have a glimpse of the subject as a diagnostic specialty: they may be conducted on tours of a hospital department of medical physics or be given a talk during the introductory clinical course.

Schools running premedical courses naturally include pure physics in their curricula, but this subject was not featured in the Survey. However, the premedical course in Physics is 'medically' slanted as far as possible at one English school; students at a Scottish school study physics in their first preclinical year, and another Scottish school has a combined (pure) physics with physiology course in the first preclinical year. None of these are to be considered further here.

The amount of time generally allocated to the subject probably indicates its status in the undergraduate curriculum: in two of the eleven schools where it is formally taught it has under 20 hours; in six more it has between 20 and 40 hours; and in three schools it has a total of over 40 hours (in fact, ranging from 61 to 90). The average teaching time in these schools is 36 hours (SD 24·7). In the five schools which provide a 'glimpse' of the subject, the time spent on it is very small, normally not more than 1 or 2 hours.

The main, formal teaching effort occurs in the preclinical years in five schools, and in the clinical years in two schools. In addition, one London school has formal teaching during both stages, and at a Scottish school it is placed in the middle 'bridging' year, and again later in the clinical course. Elsewhere the subject appears at different times throughout the curriculum.

The seven schools who give a special separate course on the subject are all in London and Scotland: for four of these schools the course is the only recorded form of teaching. Contributions to other courses are made most frequently with physiology (four schools), biochemistry (three schools), biometry and/or statistics (four schools), radiotherapy (three schools), medicine (two schools), and obstetrics and gynaecology (two schools). In several cases, medical physics is involved in more than one other 'major' course.

In addition to the above teaching, elective attachments or optional projects in medical physics are offered in four of these schools.

FEATURES

Medical physics (as opposed to physics) is unique among medically related subjects through being capable of two quite distinct interpretations: it is one of the basic sciences and an academic discipline, but it can also be primarily a practical clinical specialty, like radiology. An early or late position in the timetable can therefore give a clue to the way in which the subject is presented to students. When teaching is given at more than one stage one can assume that both aspects are given consideration.

Six schools present the subject as a science, in the same way as the other preclinical subjects. This is the approach most common in the London schools teaching it, where it is seen as one of the foundation subjects to be studied *before* students proceed to their clinical course. The policy was described by one respondent in these words '. . . in principle it is the quantitative application of physical, physico-chemical and mathematical ideas to biological structure, function and organization. . . . Every biological process, physiological or pathological, has an intrinsically physical element. . . . No student can hope to understand biological phenomena and medicine without an adequate grounding in Biophysics.'

Not unrelated to this policy is an objective given by two schools, of using the subject to demonstrate the principles of scientific method. Medical physics is a good vehicle for teaching the importance of quantification—accurate measurements, accurate recordings, and logical interpretation based on the data collected: and indeed, in one of these two schools medical physicists are associated with the course in statistics.

At two schools it is felt that the subject has more in common with 'paraclinical' disciplines, as a 'bridge' between preclinical and clinical studies, a pathway between normal and abnormal composition and behaviour. In curricular terms, it can be an 'integrating' subject.

In contrast, three schools present it as a clinical topic. They teach it during the clinical stages and in conjunction with other clinical subjects. They emphasize the application of the principles of medical physics in daily practice and show the use of these applied principles in the repertoire of clinical investigations.

Finally, respondents told of the future relevance of medical physics. The over-all feature of the teaching in three schools is the stress on the 'growth points' of the subject. Rapidly expanding research in this field will have impact on all the basic biological sciences, and the development of 'nuclear medicine' as a new hospital specialty will eventually affect all practising doctors. This approach, it is felt, makes the subject exciting for students at the time of teaching and also prepares them for adapting to changes in knowledge and practice after they qualify.

Certain features of the subject-matter were mentioned for the emphasis laid upon them. Six schools said that they discussed the techniques currently used in investigations and clinical measurement: the basic techniques, and those most commonly used. Two of these schools think it important to describe not only the techniques that students can see in operation now, but also those likely to become standard in the future, and to predict what methods and equipment they will need to be familiar with in their professional lifetime. Radiation hazards are discussed in two schools who regard it as particularly important to consider the side-effects of and contra-indications for radiological and other 'physical' investigations, to which patients may be subjected.

Teaching methods mentioned for their special value included: small group teaching and tutorials (four schools); teaching aids such as tape/slide units for independent study (two schools); and closed circuit television and mechanical simulation of body systems (one school). Patients are used in two schools in demonstrations to groups of students; another school is also teaching on patients in wards, clinics, and theatres.

STUDENT ASSESSMENT

Six schools definitely include medical physics in their critical, 'end-of-course' system of assessment: it is assessed with biochemistry and physiology in two schools, with biometry and statistics in two schools, and other/several preclinical sciences in the remaining two schools. Two schools said that, though taught, the subject definitely did not form a

part of their critical assessment system. In the remaining eight schools responding, medical physics may (or may not) form a small part of any of a number of examinations.

In-course assessment is conducted at seven schools, and at four of them the in-course assessment is to an extent 'critical', because it either contributes marks towards or exempts a student from further 'end-of-course' assessment.

PROBLEMS AND DEVELOPMENTS

There appear to be no serious difficulties over resources nor would improved facilities reportedly make a significant difference to teaching the subject. However, several respondents felt that the time given to medical physics or its timetabling neither did it justice nor allowed it to fulfil its potential role in undergraduate medical education.

Four London schools—all with 'preclinical' medical physics courses—claim that curriculum planners and colleagues do not consider the subject important enough to justify better provision (although three of these schools now have new courses or timetabled teaching). In the words of a senior London professor of the subject, 'The main problem is continuing to persuade all my colleagues in this School of the desirability of teaching Medical Physics to medical students.' Four other schools have to struggle with unfavourable attitudes from students, who may have acquired misconceptions from other staff members or who may be predisposed against any mathematical or 'non-vocational' subject. In four other schools where medical physics lacks identity and is not catered for separately, the respondent was very keen to inaugurate a 'core' course in the subject. One of these schools at least, anticipates better opportunities in the new curriculum which is being planned there.

Two schools which have established teaching do not have examinable courses: if an assessment (or a regular place in a combined critical assessment) were introduced then attendance would be stimulated and students would take the course more seriously.

Six schools have what they regard as insufficient time in which to teach the essentials of what should be taught (at two of them the course is a new, separate one). However, three other medical physics courses have recently had more time accorded to them. A total of six new courses have been established recently. Conversely, a course at one London school has been discontinued altogether.

Premedical courses have been abandoned by four schools but in each case part of the 'physics' component has been transformed into a short medical physics course, or into 'planned intervention' in other courses. One school, where medical physics is presented clinically, would also like to teach it in the preclinical course, and two schools (at one it is now

a preclinical subject and at the other there is no formal teaching) would like it to be taught in the clinical course when it would be more suitable to instruct students in the uses and abuses of various clinical investigations. At a second school medical physics, now a preclinical course, is in future to be extended into the clinical course with time allocated to it. Medical physicists at another school are to liaise with several clinical specialties and develop joint teaching sessions with them in their time; they would like similar integration with biometry in the earlier years but so far this has not been possible. A number of replies made the point that the subject is best taught to undergraduates by practising medical or 'hospital' physicists. Less specifically, two more schools are keen to experiment with combined teaching with any of the various disciplines and specialties whose concerns or methods coincide at certain points with theirs.

Realizing that curricular time and student interest both leave much to be desired, two schools propose elective attachments and optional studies for the few students who have the enthusiasm and interest to learn more than is generally possible.

Other developments relate to the character of the courses and the methods of teaching: greater opportunities for discussion and informal staff–student situations in tutorials (three schools); more equipment such as videotapes and electronic apparatus for recording experiments (one school); a change of emphasis, giving the whole course a more clinical and practical outlook (one school); general consolidation of successful features of the present course and constant though minor improvements (two schools).

Altogether twelve schools reported that changes have taken place which they consider important; six of them are about to implement more changes. In future there may be changes in six other medical schools: they indicated the possibility but their hopes, or fears, have not yet been confirmed. Curricular review is in progress at all of them.

Medicine

All schools with clinical courses (or about to start these) were asked to complete a questionnaire on the teaching of general medicine. Only one school did not comply; this gives a 'field' of thirty-four medical schools.

The majority of replies refer to present curricula; five are new ones and not fully operational, and so the replies to some questions were necessarily brief or referred to anticipated rather than established events.

TEACHING ARRANGEMENTS

As far as the two aspects can be separated, most schools have distinct arrangements for the 'theoretical' and the 'practical' aspects of clinical instruction in medicine. The theoretical teaching in lectures and symposia is very often included in a co-ordinated systems-based series or in a topic-teaching cycle which extends over several terms and involves staff from many clinical fields: teaching focuses on systems and on pathology, and not on specialty interests. Alternatively, a few schools run series of lectures in medicine *ipse*, conducted by physicians. Under either arrangement this teaching is unlikely to be directly related to concurrent practical clinical work and may not be held at the same time. Clinical experience in medicine is acquired through attachment of groups of students to clinical units.

In all schools, students are rotated through a number of units, never spending all their time in medicine in one unit only. The pattern most frequently found is for one, two, or three attachments to be arranged in the first clinical year, to be succeeded by one or two more attachments in the final clinical year. Several schools do however arrange clinical attachments to medical units in the middle year (or phase) of the clinical course, and these form part of a sequence of attachments in medicine over all three clinical years.

At eleven schools all the attachments to medical units are full-time or virtually full-time (for example, four-fifths time). In almost all these

schools the early ones, taken together, are longer than the later and final year ones. Nine of them are London medical schools.

Twenty-two schools arrange the clinical attachments in an 'early part-time, later full-time' pattern. The early ones are more often only a few hours a week though sometimes they are on a half-time basis. The part-time attachments extend over a longer period than the later, intensive ones. This pattern is universal in Ireland and Scotland, and is the rule rather than the exception in England (other than London).

One school gives full-time attachments in the earlier clinical stages and part-time experience in the final year.

Teaching Time

The total amount of time spent by each student on clinical attachment to a medical unit is particularly difficult for schools to estimate. In some schools 'medicine' includes the medical sub-specialties, rheumatology, renal medicine, cardiology, and respiratory medicine: these are not always readily identifiable and student experience of them is variable. In other schools the sub-specialties are timetabled separately in separate attachments. Also in some schools early clinical teaching is often 'general' in nature—eclectic and problem-oriented: instead of being assigned to a particular unit, students circulate around several units representing different clinical interests in order to see pathological processes at work and to practise basic clinical skills on as wide a variety of patients as possible. It is difficult to say how much of this is medicine. Finally a few schools allow some choice in their final year attachments: therefore some students do more 'medicine' than others. However students would never normally receive less than the (full-time) equivalent of about eighteen weeks on attachment to medicine, equating thirty hours of occasional clinics with one week. The majority of schools would give students a minimum of twenty weeks.

Course Co-ordination and Evaluation

Respondents were asked to describe how their teaching course was co-ordinated both 'internally' (ie the different aspects of medicine with each other) and 'externally'—with the teaching of other disciplines and specialties.

Within the course in medicine itself there is often felt to be a need to ensure that each student obtains similar opportunities for clinical experience: in many schools, different firms or indeed hospitals teach the subject with varying emphases. There are a number of different ways of trying to minimize the different experiences of students: the most frequently used technique is to organize the teaching so that students rotate amongst a variety of different firms or units. In this way each

student should obtain a mixture of experience and access to various outlooks and attitudes. In one school, although students are not rotated round the early medical firms, each medical firm gives a 'core' course on its particular sub-specialty to the whole class of students.

In all schools and hospitals there will be informal discussion between teaching staff about their teaching activities. However, six respondents drew particular attention to the fact that they hold regular meetings of *all* physicians concerned with teaching: in some cases, students and juniors will be involved. The object is 'internal' co-ordination of teaching. Alternatively, the defined objectives for the course may be issued to all firms who are expected to follow these: six respondents reported that this was the case. In one London school which is starting a new course, these objectives are highly detailed, describing the particular skills that the student must acquire, and the range of conditions that he must see.

Another frequently used way to co-ordinate students' experiences is for tutorials, seminars, case presentations, or topic teaching to be held jointly between different firms: in some cases, such joint sessions might be run by the professorial unit. Fifteen respondents reported that this type of activity took place in their schools. Eight respondents reported that they organized special 'pre-finals' revision lecture courses. These would enable students to catch up on any aspects they had missed earlier and would have a co-ordinating function. The courses may be supplemented by clinical sessions to help the student synthesize his accumulated knowledge.

The relationship between 'practical' and 'theoretical' clinical teaching is a complicated one and varies from one school to another. Here again a 'supervisor' or 'tutor' can play an important role. He may select particular cases for the student to 'clerk' and may organize tutorials to bring together practical and theoretical topics. Eleven respondents refer to such an appointment. Careful timetabling can also help ensure that students' practical clinical experience relates to their theoretical sessions: six schools mentioned this. In contrast, four respondents said that there were no attempts to relate the 'theoretical' teaching to the 'practical': this is generally because it is not thought practicable to do so.

Another type of co-ordination is the 'external'—that between the teaching of medicine and the teaching of the other clinical subjects. Increasingly clinicians from a variety of specialties work together to teach students, and co-ordinated systematic lecture courses are widely used (twenty-one schools). Topic teaching is used in twelve courses. However one school has recently abandoned interdisciplinary teaching: having tried the system for several years, it was felt that the additional work and staff effort were not justified by the benefits of the system. The introductory courses in clinical skills were referred to under this external co-ordination head by eighteen respondents: physicians play a predominant role in such courses. Here, students are introduced to clinical

methods and receive a general hospital orientation. In addition, ten respondents said that physicians play an active part in preclinical teaching. This could take the form of guest lectures, patient demonstrations, or seminars.

Over-all, twenty-nine respondents indicated that they used some type of formal co-ordination procedures. Four of these said that their schools have established committees to organize the teaching of the subject and that the process of co-ordination was controlled by these committees. The remaining five respondents indicated that co-ordination of teaching is less formally arranged.

Arrangements for evaluating the courses in medicine are frequently the same as those for planning and co-ordinating them. Replies indicated that formal procedures for reviewing these courses operate in twenty-three schools and informal ones take place in five schools; at five others there is no system for reviewing teaching. Sixteen respondents (including one with no departmental arrangements) referred to the curriculum development procedures of their medical school.

Reviews carried out in departments of medicine involve all clinical teachers—academic and non-academic—in six cases: in six others, only staff of the academic unit are involved. Four consult junior members of staff in the department and/or junior staff in the hospital units used for teaching. In one case pathologists who join in the teaching sessions take part in the formal evaluation. Two departments make special efforts to involve all the people involved in both the 'theoretical' programme and the clinical programme.

The views of students are sought in twelve schools. Sometimes there is a staff–student meeting to discuss the teaching, usually at the end of each period of attachment: all students may attend, or only elected representatives. Questionnaires were reported from one school. At another, all students are interviewed personally by the professor of medicine at the end of the first six months of the clinical course and their impressions of the firms and the theoretical courses are noted.

The frequency of review also varies, depending partly on its nature. Informal observations and subsequent minor modifications can proceed almost continuously, but a major evaluation in the same school would be held only once a year or at longer intervals. Eight respondents maintained that they never really stop evaluating the teaching of their subject—it is a constant preoccupation in their department and they were unwilling to translate it into events or precise formulae. Five replies stated that the most useful review is held at the end of each period of attachment when the students who are finishing a clinical programme are consulted.

Certain problems of evaluation emerged in the replies to this question. One respondent pointed out that genuine evaluation is impossible unless objectives have first of all been agreed. Another respondent feels that

evaluation is too superficial and 'leads to change for the sake of change': the programme is altered at the suggestion of one firm of students, whose decision is reversed by the next when there is insufficient evidence to justify either change.

In future, two departments will base their evaluation on detailed and well-publicized objectives for the course and intend to widen the planning and review procedures by inviting part-time and NHS teachers to join in the process. Two others are to institute regular procedures for reviewing their courses: one is a new school which has not yet evolved a system, while the other has decided to supervise the running of its new curriculum more closely than it did the old one.

One respondent would like to draw on the experience of recent graduates from his school. Their comments would probably be more useful than those of students, as they would show exactly how the undergraduate programmes have helped (and when they have not) in preparing them for clinical practice and responsibility.

AIMS AND OBJECTIVES

Of the field of thirty-four schools replying to the questionnaire, twenty-eight outlined the aims and objectives of their general medicine courses: these varied in their detail. One report answered for a future curriculum.

In eleven of the schools, a clear definition is made between the objectives of the students' early attachments, and those of the later ones. In all these schools students are encouraged during the first attachment to learn the basic medical skills—the principles of history-taking, systematic physical examination, and the preparation of case records. In the later phase, students are encouraged to develop further the skills previously learned and to gain confidence in their use. They will explore further the management of the patient, including investigation and treatment.

In their replies concerning the acquisition of the basic principles and skills of medicine, all the twenty-eight responding schools reported that students should acquire the skills of history-taking and twenty-seven that their students should be able to undertake a physical examination of a patient. Sixteen respondents indicated that it was important that their students learned the basic skills of communicating with patients and realized the importance of interpersonal relationships. Thirteen schools mentioned that they wished their students to be familiar with the roles and limitations of the variety of investigations available to the doctor. Eight respondents specifically teach students the skills of maintaining good patient records.

Many of the respondents (20) said that their students should be familiar with the major or common disorders and clinical problems. However, an interesting commentary was received from an English

school, where the respondent said 'We have no generally accepted definition of what is a "common" disease. In the renal course we have used a rough rule of thumb that any disease which a general practitioner is likely to see in the course of several years, or a general physician to encounter once a year, should be regarded as "common" and receive at least a mention. However there is not time nor is it desirable for each of these to be described in detail. The selection of which diseases should be looked at in some detail is therefore arbitrary and reflects to some extent the special interest of the teachers.' Of these twenty respondents stipulating familiarity with 'common' diseases, four and one other expect students to become familiar with acute and emergency conditions. One London school stresses that students should relate the 'common diseases' to the pattern in the community as a whole.

There is an increasing emphasis on student awareness of social, environmental, and emotional aspects of illness. Thirteen respondents draw attention to the need to introduce students to the ways in which illness can be affected by the patient's family circumstances, over-all environment, and life-style. Nine of these respondents draw particular attention to the need to be aware of emotional and psychological factors. Five respondents particularly wished their students to recognize the role and contribution of other workers in the health care team.

Fourteen respondents indicated that students should be aware of the management and treatment of disorders—five specified the major and/or common disorders.

Two respondents mentioned their aim to inculcate in students a questioning attitude toward the current medical literature and practice—so to be able to come to their own decisions in future practice. Another five respondents wanted their students to acquire good study habits.

A number of respondents (13) mentioned particularly the need to instil in their students a sense of responsibility towards patients and colleagues and an awareness of ethical behaviour.

TEACHING METHODS: NON-CLINICAL

Teaching methods in medicine include many of the commonly used techniques. Lectures are used to some extent by twenty-nine schools, their intensity of use varies considerably however. The majority of schools which use them for the teaching of medicine generally now do so within co-ordinated system—or topic—based courses. Just two schools mentioned the (departmental) use of lectures as a form of revision in the final year. Discussions in large groups, both clinically oriented and theoretically oriented, are popular and twenty-seven respondents reported their use: all the Scottish schools and all but one of the London schools reported using the technique.

As in most disciplines, medicine is increasingly using small-group teaching methods. Twenty-eight respondents reported that the technique was used in their teaching and six of these particularly said that small-group methods were a special and important feature of their teaching to which they attached great value.

Independent learning of some sort is used in twenty-two schools: three of these mentioned that students are encouraged to undertake projects. Eleven respondents said that audiovisual methods were used. One of these wishes to expand the use of the techniques while another two respondents reported that it was planned to introduce them including television.

CLINICAL TEACHING

A number of questions inquired into aspects of clinical teaching. Some replies were extremely detailed.

Teaching in the Different Clinical Settings

Respondents were asked to consider the structure of the 'practical' clinical teaching of their subject and to assess the relative importance of the use in it of patient-care activities and specific 'teaching' activities.

In general, respondents found that it was not possible to say which approach was more useful. In the majority of courses (18) the different methods of teaching and acquiring clinical knowledge were used and it was not possible to say which one was more important—each was important and useful at different stages of the course and of the student's development. In some schools students are taught in specific clinical teaching sessions in their early experience of clinical work: as their knowledge and expertise grows, they will participate more fully in patient care and start to learn as a result of such involvement. One respondent commented that it was very difficult to teach clinical medicine effectively, particularly with junior students, on a ward round at which patient care is the primary concern: groups became too large and even senior students do not obtain full benefit from the teaching. Another respondent (in Eire) noted that if the student was not given sufficient direction and background knowledge from 'teaching' sessions, he might well not adequately interpret the significance of patient care situations or benefit from general experience on the wards.

Eight respondents particularly mentioned the usefulness to students of being personally involved in taking a patient's history and examining him—direct contact between student and patient is a vital part of the former's development. Three other respondents felt that it was only the best students who benefited from direct and frequent clinical experience.

Two respondents said particularly that the students' general access to participation in routine ward work and patient care is most important, but in six cases, it was felt that activities with a particular teaching aim are most important.

Clinical teaching is of course not confined to the ward, and students are generally invited to clinico-pathological case conferences, post mortems, and X-ray conferences. Twelve respondents mentioned these as being of particular value to the student in the acquisition of clinical knowledge and experience.

Four respondents noted here a link between the departments of medicine and general practice: often students are able to visit hospital patients at home when they have been discharged.

Respondents were also asked to consider the relative usefulness to students of in-patient and out-patient learning situations. For the teaching and learning of medicine, it was thought by sixteen respondents that in-patient situations are the more helpful to students. It was generally felt that out-patient clinics have a limited value for junior students, but that they are of great use to the more senior students.

Student Experience of Emergency Care

In twenty-nine schools special arrangements are made for students to experience emergency situations: in a further four schools there are no 'special' arrangements, but students will, it is said, undoubtedly come into contact with emergency situations during the normal course of their training.

In fifteen schools students obtain experience of emergency situations during their period in residence. In five of these, specific teaching is given in dealing with emergency situations, as it is in a further five schools. In seven of the ten instances where specific teaching is given, techniques of dealing with cardiac arrest are taught: in four of them students are included in the post-waiting ward rounds. Students may be particularly encouraged to attend accident and emergency departments in their 'spare' time and five respondents noted this. Because a number of schools who do not specify a continuous period of residence expect students to be resident, or to be available, on waiting nights and week-ends, a total of twenty-four schools give students 'residential' experience of emergency. In two cases, students are reported as being provided with bleeps.

Increasingly, students are spending a period of their final clinical year attached to a firm and working effectively as a shadow house officer: eight respondents particularly mention this activity and emphasize the experience of emergencies which it provides.

Specified Requirements and Experiences; Student Responsibility

In many schools, practical clinical objectives are specified: these are those clinical situations, techniques, or tasks which the student might be expected to witness or undertake during his undergraduate training. In all, sixteen respondents specify some requirements of the procedures and techniques that students should experience. In two of these schools, and in another two, comprehensive records are kept of what each student has seen or done: in three of these four cases students are given a checklist of the procedures in advance. Indeed in one Scottish school the Faculty of Medicine has a booklet listing the practical procedures in general medicine which the student must either witness or undertake. Three respondents indicate that a checklist is kept by staff members—this may either be in addition to, or instead of, a list kept by the student. Another two schools give students a checklist of procedures to be seen or done but the records are not necessarily retained. Another ten schools maintain lists or records less formally and ten more keep none.

As with over-all aims and objectives, two respondents say that different tasks are specified at different stages of the course.

Respondents were asked to indicate on a *pro-forma* the level of students' practical experience and the extent of their normal permitted responsibility. In the first case, they were asked to indicate which procedures out of a standard list students would normally be expected to have seen or done in the specialty by the end of the undergraduate course: the list, together with the results for thirty-three schools' replies, appears as Table A.

Similarly the level of responsibility entrusted to students was investigated by presenting respondents with a list of responsibilities which students might be given, and asking them to indicate for each one whether it would 'routinely', 'occasionally', or 'not normally' be entrusted to students by the end of the undergraduate course. The list together with the results appears as Table B (thirty-three schools).

When discussing the question of specific objectives in clinical teaching a number of comments were made by respondents. A number said in particular that it is not always possible to dictate which medical conditions the student will observe and take part in the management of during his clinical attachments, especially the later ones: as he rotates through the different firms and specialist wards, he will see a wide variety of cases—these could not be guaranteed as being identical for each student. However others pointed out that a checklist or record of a student's experience can be very valuable when designing remedial teaching, when this is necessary.

Table A. *Practical Experience*

Procedure	No. of Schools in which Students would: *See Procedure*	*See and do Procedure*
Subcutaneous injection	31	24
Intramuscular injection	32	26
Venepuncture	33	33
IV drug administration	32	20
IV blood and fluid administration	33	28
Bone marrow aspiration	30	1
Lumbar puncture	33	9
Abdominal paracentesis	31	3
Pleural fluid aspiration	33	7
Microscopic examination of urine	31	30
Biochemical examination of urine	30	30
Haemoglobin estimation	25	21
Staining and examining a blood film	22	18
White blood cell count	23	16
Estimation of erythrocyte sedimentation rate	24	21
Wound suturing	16	14
Anaesthesia—local	18	14
Anaesthesia—general	na	na
Endotracheal intubation	21	9
Cardiac resuscitation	32	11
Vaginal examination with speculum	12	10
Assisting at confinement	na	na
Procedures frequently added by respondents (max ≠33)		
Electrocardiography	11	9
Biopsies (various)	11	1
Tests of respiratory function	10	10
Endoscopy	10	2
Blood sampling/arterial puncture	9	4

'SPECIAL FEATURES' OF COURSES

The questionnaires asked what features respondents would regard as particularly interesting, valuable, or 'special' about their teaching.

Two respondents said that the subject and its teaching are particularly valuable in developing the students' ability to ask questions about their work and responsibilities and to take decisions. One respondent expressed it thus 'The essence of clinical teaching is to make each student express himself and make personal opinions and deductions to the limit of his intelligence, capabilities, and knowledge of medical principles. Clinical teaching should be a direct early preparation for the innumerable clinical decisions the practising doctor must make after qualification.'

Two other respondents identified the process of 'progressive learning' as being the most important. By this was meant the way in which

Table B. *Responsibility entrusted to Students*

Responsibility	No. of Schools in which the Responsibility is Entrusted to Students: *Routinely*	*Occasionally*	*Not normally (or na)*
The results of students' initial examination and history taking form a part of the patient's records	20	7	6
Students' records of the patient's progress and treatment form a part of the patient's record	13	9	11
Students recommend medication	2	9	22
Students recommend clinical/ laboratory investigations	8	12	13
The practical arrangements for clinical/laboratory investigations which involve other departments (eg radiology, bacteriology) may be entrusted to students	6	12	15
Students might be a 'first contact' in an emergency	6	18	9
Students assist the operator in the theatre	na	na	na
Senior students have the opportunity to play a role in the clinical team similar to that of pre-registration house officers	17	15	1
Senior students act as student assistants (locums) in the absence of house officers	17	13	3
Students act as a contact between the hospital and patients' relatives	6	11	16

students are introduced to the subject with emphasis placed on 'methods', then learn to apply these methods accurately to small numbers of patients allocated for study: finally students move to a phase of involvement in the day-to-day activities of patient care and to the assumption of some supervised responsibility. When identifying important aspects of clinical teaching, eight respondents emphasized the importance to the student of a sense of responsibility towards patients, and through close involvement with them the development of patient care skills.

Ten respondents remarked here that students have the opportunity to see a wide variety of patients and emergencies and consequently to see a wide range of acute and chronic disorders in the course of their clinical teaching period.

In eight schools respondents reported that their students were very appreciative of the final attachment phase as it gave them the opportunity to work as part of the clinical team and gave them a feeling of responsibility that could not be obtained in any other way. A variety of circumstances are encouraging medical schools to make increasing use of regional and district hospitals for student clerkships. In five cases, respondents feel that such arrangements *per se* were a positive advantage to the students. In a sixth school this approach has been adopted because of increased student numbers: the respondent said 'most members of the staff consider the use of regional hospitals to have been a useful innovation and the students hold the same opinion. Students endowed with initiative "get" a lot out of the system but, for the protection of the weaker brethren, nine weeks is probably long enough. The staff in these hospitals also generally welcome the scheme, the students contribute to the intellectual life of the institutions, and the contacts established during the course have beneficially affected the distribution of new graduates into pre-registration posts.'

Six respondents particularly mentioned that 'grand rounds', seminars, and the like which supplement patient-based teaching are an important part of their teaching and of great value to the students.

Students are now introduced to the use of the problem-orientated medical record in a number of schools. Two respondents particularly drew attention to this, emphasizing that use of the POMR technique affects not just the students' record-taking procedures and abilities but also their over-all approach to the patient and his management.

Two Scottish respondents stressed the fact that the theoretical teaching of medicine and certain other clinical specialties is planned together. These same two respondents and one in England also emphasize that they feel that such integrated teaching is of great value not only to students but also the teaching staff.

STUDENT ASSESSMENT

In-course (within-attachment) assessment is used to some extent in medicine in twenty-nine schools. In ten schools the in-course assessment contributes a proportion of the marks to the final examination: in one school the results of in-course assessment can exempt a student from the final examination—it normally does so, and thus in effect, the in-course assessment is the final examination. Four respondents reported that they wished to introduce more in-course assessment.

A number of different assessment techniques are used. Generally, whether or not it contributes to the final examination, a report of each student's performance in his clinical attachments is made: tutors' or supervisors' reports may also be taken into account. A clinical examination

is used for purposes of in-course assessment in six schools and multiple-choice question papers in five. In four schools either an essay, a case-study, or students' problem-oriented notes are taken into account.

End of term or other whole class examinations are used by twenty-two schools. This type of paper may be only in medicine as in five cases, or may be a joint paper with other clinical disciplines. The degree to which the examination may be 'critical' to the students' progress varies—in three schools a student might have to repeat all or part of an attachment if he does not perform adequately in the class examination; in six schools, the marks obtained in this examination contribute to the final examination, and in two schools the student may be exempted from the final examination if his performance is sufficiently good in the class examination. Techniques used include MCQ papers (fourteen schools), orals, and clinical examinations.

All of the thirty-four responding schools have an end-of-course 'final' assessment in medicine. Of these, nineteen schools give a separate examination in medicine and fourteen schools examine medicine at the same time as other of the clinical disciplines. (Details of examination procedures were not available for the other school at the time of the survey.)

Three respondents emphasized the inherent difficulties of finding an assessment procedure which could adequately measure the student grasp of clinical skills and attitudes. One described the problem thus: 'in a clinical examination a student must be able to show that he understands his patient and his problem, he must be able to extract from the patient by interrogation and examination information as reliably and accurately as possible, he must be able to assess its significance in the light of his knowledge and experience, reach a tentative decision regarding likely diagnosis, select if he thinks it necessary the appropriate investigations that will confirm or refute the most probable diagnosis and exclude a substitute alternative. On this basis he must decide on immediate and long term management, communicate with the patient and his relatives and perhaps also with colleagues. Many skills and much expertise are required to accomplish these tasks. They can be dissected down to individual items, and performance in each more accurately assessed, but at the end of the day it is the over-all performance that is important and it is this that is difficult to assess. Not a great deal is known about how a clinician actually handles his material and synthesizes his information. This is a field well worthy of more careful study.'

Three respondents indicated that a problem arose when there were a great many individual teachers involved in a course as it becomes increasingly difficult to standardize marking criteria. One London respondent, who felt that the assessment procedure at his school could be improved, was of the opinion that it was fundamentally important to

fully define the objectives of the course before making any changes to the assessment methodology. A Scottish respondent remarked that multiple choice questions were not an adequate way of assessing whether a student had the ability to think, argue, communicate, and synthesize material. He thought that there could be a danger of relying too much upon MCQ to judge students' knowledge while ignoring other 'higher' attributes.

PROBLEMS AND DEVELOPMENTS

Organization and Resources

In general, respondents to the questionnaires on medicine did not express themselves discontent with their available resources. The comment from the greatest number of respondents (18) was that they would like to have increased staff available to them. This was mainly so that the staff–student ratio could be improved and so that the amount of small-group teaching could be increased. It is felt strongly that students gain most from individual or small-group based teaching and consequently schools are keen to increase the amount available: in fact four of the eighteen respondents who said that their over-all staffing ratio was inadequate pointed specifically to the fact that they wanted to be able to give more individual attention to their students. An additional reason put forward for increasing staffing numbers was to improve the amount of time available for student assessment.

With respect to physical facilities, five respondents mentioned that the geographical split between hospital and medical school is inconvenient. This mostly becomes a problem when students are expected to be at the medical school for lecture courses and during the same day at the hospital for clinical sessions. Residential facilities cause problems for four respondents—three of these do not have a specified period of residence at present: they want to see increased provision of residential facilities so that all students could obtain living-in experience in hospital. Poor study facilities within hospitals were complained of by three respondents. Two respondents said that they had plans to increase the use of 'non-teaching' hospitals for attachments.

In connection with the organization of teaching, one Scottish respondent feels that students now rotate too rapidly through the different subjects at his school: consequently there is no longer the time for teachers to get to know students and become familiar with their needs. However, different circumstances and systems create different problems: in contrast to the Scottish respondent's complaint, three respondents from London schools say that a difficult situation is being created because the medical firms around which their clinical teaching is based are becoming increasingly specialized, and it is consequently now more

difficult to ensure that students are exposed to a wide and representative variety of medical problems and cases. Existing out-patient facilities are inadequate for three respondents, who said that they wish to increase the teaching they give there.

Two respondents said that they feel that it is important to develop within the curriculum increased opportunity for students to undertake study-in-depth if they so wish: they also want to see an increased number of options and more opportunity for independent learning within the course. Increasing use is in fact being made of independent study opportunities of these various types, and there is a movement towards co-ordination between disciplines of the theoretical teaching in clinical subjects: five respondents said that they have definite plans to increase the amount of this.

Teaching Activities and Content

Respondents reported considerable change in clinical teaching. In many subjects clinical teachers are increasingly aware that it is desirable to introduce medical students to clinical medicine at an early stage of the curriculum. One Irish respondent wants to introduce a general 'Introductory Clinical Methods' course, and two Irish and two British respondents say that they have recently introduced, or improved, short introductory courses at the start of medical firms. Four respondents said that they would like to be able to introduce more clinical teaching into the preclinical years and to encourage participation in preclinical teaching by clinicians, and vice-versa. Three London respondents reported that they have definite plans to bring students into contact with patients at an earlier stage of the curriculum and two respondents said that they have recently introduced more clinical exposure to preclinical students.

With respect to clinical teaching given during the course in medicine itself, five respondents said that they are putting increased effort into the definition of clinical objectives for the course: different objectives would be defined for different stages. It was noted that objectives would also facilitate assessment. It has already been mentioned that some schools are increasing the amount of co-ordinated theoretical and clinical teaching. As part of this development there is often a desire to increase the amount of teaching done with departments such as Community Health—this is to enable students to see the patient as a 'total' case, rather than just a single medical problem. Two respondents, however, said that they are experiencing problems in establishing a liaison with such a department.

The nature of medicine itself gives rise to some anxiety. A number of respondents alluded to the fact (as they perceive it) that medicine is becoming increasingly specialized. Geriatrics is, for example, now a

completely separate subject. One of the associated problems was seen to be that there are fewer patients available to students of general medicine—two respondents drew particular attention to this.

As has already been mentioned, audiovisual aids are not reported as being extensively used in the teaching of medicine. However, in a number of schools they are considered important, normally for a specialized part of the course. Two respondents reported that they have recently increased the use of tape/slide programmes in their course and two other schools have definite plans to increase the use of such audiovisual materials. A third respondent has plans to increase the use of closed-circuit television in his course.

In addition to these particular aspects of development, many schools are going through (or are about to go through) a period of general curriculum change which will affect teaching throughout the curriculum—inevitably, the teaching of medicine will be involved. In all, fourteen respondents report that some major change has recently taken place and eight say that one is about to.

Medicine: Cardiology, Neurology, Oncology, Rheumatology, and Rehabilitation

In a number of medical schools, the GMC Correspondents felt that the undergraduate medical curriculum would not be adequately described by the completion of questionnaires only on the Survey's 'standard' list of subjects. Thus, separate questionnaires were completed by a few schools each on cardiology, neurology, oncology, respiratory medicine, and rheumatology and rehabilitation. It should be emphasized that non-completion of a questionnaire on any one of these subjects does *not* imply that it is not taught by a school; rather completion of a questionnaire indicates that the subject is taught separately within a school's curriculum, rather than within much broader specialties (or only occasionally and opportunistically), which may otherwise be the case. *This report should not then be regarded as at all exhaustive on any of these subjects,* as on none of them did the Survey originally set out to seek information.

Cardiology, Respiratory Medicine

Five schools submitted questionnaires on the teaching of cardiology and/or respiratory/chest medicine, two subjects which it seemed appropriate to report upon together. Ten further schools make some mention of those specialties elsewhere in their returns: this information is included within 'Teaching Arrangements' (below) only, and not the succeeding paragraphs.

TEACHING ARRANGEMENTS

Cardiology and respiratory medicine may be taught as an integral part of general medicine or they may be timetabled separately. Six schools offer part- or full-time attachments to cardiology, ranging from the

equivalent of two days teaching to four weeks, and one other school proposes an attachment, but does not yet know how long this will be. (In another school, some students will rotate through a cardiology firm, whilst others will not, but in addition, individual cardiologists are 'planted' on several other medical teaching units and contribute to their teaching.)

Respiratory medicine is taught formally by four schools, ranging from a formal six-hour course in one to an eight-week half-time attachment in another. Cardiac and/or thoracic surgery appears in the timetables of five schools, the time allocated ranging from one week, full-time, to eight weeks, half-time; generally, the attachments are part-time, together with, for example plastic surgery or intensive care. Indeed, one school offers an eight-week full-time 'General Intensive Care' firm.

One of the schools listed above includes both cardiology and cardiac surgery in its curriculum together.

STUDENT ASSESSMENT

Even at schools sending in separate questionnaires, any assessment of the subjects is included in that of medicine, in finals or the equivalent. In addition, at one school teachers send in reports on each student at the end of the cardiology attachment; at a Scottish school students take an MCQ paper at the beginning and at the end of the respiratory attachment, to measure their progress—results are discussed with them individually.

FEATURES, PROBLEMS, AND DEVELOPMENTS

It was pointed out that both subjects (cardiology especially) are excellent media for teaching students general principles and skills—indeed, it is likely that this is the main reason behind the longer attachments to them; the correlation of symptoms with physical signs, the importance of full and careful history-taking, the use of laboratory investigations and monitoring instruments, and matching together the information from all sources to form a picture and a plan, can all be well taught within the ambit of these specialties. Furthermore, cardiology can be presented as applied physiology, and respiratory medicine affords opportunity to teach about the 'whole patient'—the social and emotional impact of long-term illness on individuals and their families, and the effect of environmental conditions on health.

In cardiology, teaching devices given special mention by respondents included a heart sound simulator, which can be used in seminars of up to thirty people; and CCTV demonstrations to small groups. The

availability of acute emergency cases for students to see was also stressed. Noteworthy teaching methods in respiratory medicine included weekly problem sessions, involving departmental staff, pathologists, microbiologists, radiographers and radiotherapists; clinico-microbiological conferences; case presentations by students; and experience of a pulmonary function laboratory.

Pressure of service work was mentioned as a major problem by two respondents, and the disadvantages of having groups of students rotating fairly rapidly through one's unit were cited by two others: ('it is like living in a concertina') and repeated teaching of the same topics may become repetitive and boring to staff and students alike. More staff, ideally tutors, are desired in three schools to help with teaching. Two others would like to have teaching aids such as pleurocardiographs and audiovisual equipment. Indeed, cardiologists at a London school are developing cassette tapes from their heart sound simulator for students' independent study of and familiarization with heart sounds and murmurs.

A proposal from the same London school is that cardiology and respiratory medicine should combine for teaching purposes to form a single 'chest' firm. This would utilize the talents of more staff and a much larger pool of patients and would spread students out more evenly. At another school, a chair of cardiovascular medicine has recently been established; the new professor will continue to rationalize and expand teaching in this area although the preferred arrangement of a full-time attachment to a specialized team is very unlikely to replace the existing one of representative cardiologists teaching within general medicine.

Neurology

Seven schools (five in London) volunteered reports on the teaching of neurology. Twelve further schools make distinct and separate provision for the specialty—information on these schools is included below only in the 'Teaching Arrangements' section.

TEACHING ARRANGEMENTS; STUDENT ASSESSMENT

The teaching of neurology generally occurs in the later rather than the earlier years of clinical courses. Most frequently, a part-time attachment to the specialty is given, over three-and-a-half to eight weeks; however, four schools' attachments are full-time ones ranging from one to six weeks.

In most schools the subject is scheduled with neurosurgery; in one school only 'surgical neurology' is taught; and in one school a combined attachment to the neurology/neurosurgery team called 'Clinical Neurological Sciences' is offered, neuropathology, neurophysiology, and neuroradiology being included. (Students come in groups of twelve to the 'firm' and rotate around the special units, for example two of them in turn spend one week out of the six on the neurosurgical wards.) In three schools teaching is paired with psychology.

Other teaching is given in the main lecture or topic-teaching series in four of the schools; and at two London schools neurologists help to teach preclinical students.

Most schools have some form of in-course assessment of the subject, usually no more than a report on each student's performance and progress during the attachment. 'Critical' or end-of-course assessment, where this occurs, is generally as part of Medicine in the finals, though at one school it is examined with psychiatry and at another occasionally with surgery.

FEATURES, PROBLEMS, AND DEVELOPMENTS

To some extent, teaching objectives must vary with the time available and the clinical bias of the department concerned. Three schools, however, with very differently structured courses, each emphasize neurology 'as a whole', giving a balanced view of the specialists' contributions, showing how they must co-operate among themselves and how their work is related to other branches of medicine in terms of the knowledge required to approach a problem and in the multidisciplinary management of individual patients.

Thus a neurology course can be an exercise in integration, but it can also be presented as a 'bridge', bringing together 'preclinical' and 'clinical' studies. Two schools mentioned the importance of thorough knowledge of neurological anatomy and physiology in approaching the problems of clinical neurology. It is hoped that the neurology course will reinforce students' basic medical science knowledge *and* reinforce their appreciation that this knowledge must be applied consciously and systematically in diagnosis and investigations.

On another level, the main feature of teaching at two schools lies in the lessons in history-taking and in the clinical examination; great stress is laid on the need for a full history and a full description of all findings, which is perhaps even more essential in this field of medicine than in others. A fourth theme, running through two courses, is that of 'the whole patient'. Neurological illness can be long-term with distressing mental and emotional effects on the patient: students must learn to appreciate this and the social implications too. Continuing care and

rehabilitation is therefore stressed at these schools and one makes a point of discussing the role—actual and potential—of the social services and other therapeutic professions.

Multidisciplinary sessions focused on particular topics have become a feature of the course at one London school and are to be introduced at another. The latter's most notable present method however, is the series of set tutorials, running throughout the twelve-week psychiatry block into which the neurology attachment is slotted. One other school emphasizes the value of tutorials and demonstrations during the attachment. Three other schools value their staff meetings, case conferences, clinico-pathological and clinico-radiological conferences, which students attend: one of them states that it tries 'to combine formal and participating teaching with the traditional firm apprenticeship as far as possible'.

Most of the developments described in the questionnaires are new. The integrated 'Clinical Neurological Sciences' course at the London school has been offered for only two years: it has been a success and students are very enthusiastic. Programmes at other schools are still developing.

One of the difficulties encountered in its teaching is that neurology is not always taught by neurologists. One school would like the management of acute neurology cases to be recognized as a neurological responsibility, so that these can be taught by medical neurologists. At another school the difficulty is that it can only be taught by 'medical' neurologists in isolation—other neurological and other general specialties and facilities are situated elsewhere—and similarly a third school lacks expertise in neurosurgery and neuropathology to fill out the students' experience.

Two schools raised the question of how much preparation students should be given in advance of the neurology course proper. One school would like the 'basic' neurosciences to be taught more thoroughly at preclinical level, another the neurological bedside skills and clinical method to be taught earlier in, say, an introductory clinical course. Others see these matters as a function of the neurology course itself.

The most common plea was for more integration. Two schools already practising this would like to expand their preclinical teaching and to develop vertical liaison in both directions. At least two schools would like all neurological teaching to be integrated on a 'systems' basis, with all aspects—normal, pathological, and therapeutic—of the nervous system being covered in a planned and co-ordinated manner in a single course. One school sees scope for some joint teaching, such as seminars, with psychiatrists, another with paediatricians.

Oncology

Ten schools volunteered questionnaires on oncology or on radiotherapy, and what follows is based upon an analysis of these. However, the topic features discretely in the courses of a total of nineteen schools, and the comments under 'Teaching Arrangements' (only) are based upon this number.

TEACHING ARRANGEMENTS

All schools who teach the subject include oncology or radiotherapy in their clinical courses. In addition, two English schools give some lectures to their preclinical students. Two schools were unable to indicate in detail the teaching arrangements which will obtain. Elsewhere, the commonest arrangement for teaching oncology and/or radiotherapy is by means of occasional lectures and clinics, or less frequently, by a short course of lectures alone. Such arrangements obtain in ten schools, where the time spent by students being taught the subject ranges from 4½ to 60 hours with a mean of 17 hours. At five of these schools at least, some of the teaching is as contributions to major systems-based lecture series, but occasionally oncologists will take part in introductory clinical courses, or pathology courses. Such clinical experience as students receive generally consists of intermittent clinics, ward rounds, case discussions, and tutorials.

Five schools give part-time attachments to the specialty, one of them in addition to significant contributions to a general systems-based lecture series. These arrangements vary from three to eight weeks (part-time) in length. They are generally held within 'senior' surgical attachments or paired together with other surgical sub-specialties.

One school offers an almost full-time attachment of two weeks to the specialty; two further schools will emulate this in the near future. In addition, one school with considerable oncology involvement in the 'systems' course also gives a four day full-time attachment to the subject.

At four schools at least, the subject is definitely examined, overtly or covertly, in one or more of the Finals examinations. Elsewhere, informal in-course assessments are common, though in most schools there will be no specific 'official' assessment of the topic.

FEATURES

Even where the course is entitled 'Radiotherapy' it is concerned with imparting the nature and mechanisms of cancer, its diagnosis, and its

treatment by alternative methods. Indeed, six schools hope that, primarily, students will go away with a basic understanding of the pathology of cancer as an essential foundation for any of the branches of medical practice they may enter. An associated aim is for students to realize the size of the problem, epidemiologically speaking, in Britain today, and to stimulate them to take an interest in current research, and also to dispel myths.

Another major purpose of a radiotherapy or oncology course may be to clarify the countless references to and examples of cancer in other parts of the curriculum. A specialist can pick up and tie together these threads and enable the student to work out a perspective. Three schools consider it important that the special teaching on the subject should provide a core of knowledge, skills, and attitudes which the student can then relate to other clinical work. At one of these, the oncology teaching occurs in lectures given at intervals throughout the course which allows for vertical integration and horizontal integration with preclinical, paraclinical, and clinical disciplines. A multidisciplinary working party co-ordinates the teaching of oncology with itself and with other subjects, the members being a surgeon, a haematologist, a pathologist, a radiotherapist, an epidemiologist, and a cell biologist.

In contrast is another frequently mentioned objective: to define and demonstrate the role of radiotherapy. This has two aspects: firstly, radiotherapy as a branch of therapeutics and its relationship to the other forms of treatment and management; and secondly the circumstances—the particular forms of cancer and the various stages—when radiotherapy is called for, how it is administered, and the possible consequences. Seven schools make this a feature of their whole course. Two departments, for example, insist to students that cancer is a preventable and curable disease, that radiotherapy is not a 'morbid' specialty or a 'last-ditch' resort. Other schools also emphasized the 'full management' of patients: radiotherapists may be responsible for patients not receiving radiotherapy, and collaborate with surgeons, physicians, and gynaecologists, so that radiotherapy is given in conjunction with or as a follow-up to other treatment: students must therefore be encouraged to start with the clinical problem and not with a predetermined solution.

Finally, three schools pointed out how well radiotherapy units are able to teach by example the concept of 'total patient care'. They demonstrate long-term management and surveillance, the social adjustments which have to be made, the emotional and psychological distress which the doctor must help his patients and their families to live through and cope with. To appreciate such things is part of general medical education.

Certain individual features of the course were selected for attention. The most strongly felt (four schools) was the opportunity for students to see a wealth of cancer cases, early and later ones, affecting all systems of the body, in far greater variety than can be seen on 'general' medical and

surgical wards. The different manifestations of the same type of pathology and the prognosis for each type can be witnessed. Other points relating to the content of the courses included: that principles of chemotherapy, hormone therapy, and cytotoxic therapy are included (five schools); that the importance of early recognition, prompt diagnosis, and referral to specialists for the most advanced treatment currently available, is stressed (three schools); that new research findings and fruitful research areas, for example in immunology, are discussed with students; and several schools explained that they deliberately avoid teaching the methods and techniques of radiotherapy.

Four schools find multidisciplinary or topic-teaching of especial value because it reflects and reinforces for the student the concept of combined expertise and multispecialist patient care. Another school has devised a course based on tutorials and detailed handouts for all students: these have largely replaced lectures. Two schools at least now offer elective attachments to their oncology or radiotherapy departments.

PROBLEMS AND DEVELOPMENTS

The problems are mainly those to be expected in situations where a topic has managed to gain a foothold in the curriculum without yet, in its view, achieving full recognition for the contribution it could make. Three schools described the difficulties of being a 'minor' subject in the medical school though a major one as regards clinical workload. Two suggested that an academic department of radiotherapy would raise the status and improve the teaching of the subject; however, two other schools proposed a 'core course' of instruction in oncology in the wider 'scientific' sense, to which the clinical teaching by radiotherapists could be formally linked.

Two schools would like more time generally to be allocated; five schools would like more time or better chosen time for clinical exposure to allow students to have wider and deeper experience on the wards and in clinics. Three schools are interested in developing integrated teaching; one would like better co-ordination of the various outcrops of the subject, for example by prior agreement between specialists as to who teaches what; another would like to extend the topic-teaching, which has been most successful, if more staff were available, and so would the third who mentioned several areas ripe for collaboration: pharmacology, epidemiology, statistics, and premedical/preclinical cell studies, and medical physics. One school complained that students at the time of their radiotherapy or oncology experience do not have sufficient understanding of basic pathology.

With respect to teaching methods, two schools would like students to come in small groups for tutorial sessions: another would like more

space for teaching such as a seminar room, and audiovisual aids in order to back up the clinical work with structured, illustrated tutorials.

Af five of the ten schools under discussion, the arrangements described are innovations. At another, the time allocated to radiotherapy has increased slightly recently, and at a further school the number of students opting for the topic in final year has increased and a special programme developed for them. Three of these schools intend to continue to implement their new courses and to strengthen them wherever possible, and a further two (one London, one English provincial) are introducing two-week attachments, as indicated previously. Videotapes of treatments and conditions usually missed by students are to be used in the future of yet another school.

For the new curriculum at another English school, not hitherto referred to as its plans are not fixed, a Topic Sub-Committee on Oncology has proposed a 'core' course to deal with general principles which will include neoplasia in relation to normal functions and responses, general management, principles of treatment and radiation hazards. There will be possibilities of liaison teaching with pathology at an earlier stage, and greater clinical exposure at a later one.

Rheumatology and Rehabilitation

Five schools volunteered questionnaires on the teaching of rheumatology and rehabilitation.

TEACHING ARRANGEMENTS

In four of the five schools, the locomotor system is included in the main series of lectures and/or topic-teaching which gives 'theoretical' instruction to all students. Clinical experience is provided in the following ways: at two schools rheumatology and rehabilitation has a defined portion of the orthopaedics block, in one case two weeks full-time, in the other two weeks part-time. At a third school it is linked in the timetable with neurology but taught separately, for the equivalent of two weeks. At a fourth, and under new arrangements, there will be a six-week part-time attachment. At a Scottish school, the topic of rehabilitation is grafted on to clinical teaching of orthopaedics and psychiatry.

At one school the clinical attachment always occurs in the second clinical year; at the others it rotates through more than one year or is taught in different formats in different years. At one English school for example there are final year tutorials in rheumatology and rehabilitation within an 'optional tutorial' series.

There is no general pattern: the subject may appear in one self-contained episode in the curriculum, or at several points, and in relation to other specialties and other studies. Four other schools who did not return questionnaires on rheumatology make mention of the subject in their timetables. Teaching in all cases involves a part-time attachment, generally together with orthopaedics.

Three of the responding schools have informal in-course assessment. Any critical assessment takes place in the 'finals' examination in medicine, psychiatry, or in an integrated examination. Specific questions on the subject may however not appear or they may be simply some of a number, out of which a student's selection might not include any.

FEATURES

Rehabilitation is of course a far wider topic than rheumatology, and is involved in every clinical specialty, but it is claimed that rheumatology is a very appropriate specialty on which to base it for teaching purposes. This is even more true when rheumatology is associated with orthopaedics. Four of the schools believe this, and emphasize to students the need for careful rehabilitation, in view of the long-term nature of these diseases and disabilities, and the age-group in which they most commonly occur, and the variations in their natural course between patients and in the same patient over time. These schools demonstrate long-term management, and introduce students to the work of the remedial professions (physiotherapy and occupational therapy) and to the support given by the social services.

Rheumatology itself is a developing specialty. Two schools find this makes it exciting for the students. The over-all theme of two schools' courses is that rheumatic diseases can affect many systems of the body and therefore impinge on the practice of almost every branch of medicine. One school made particular mention of inflammation and immunological problems, another of teaching students to do proper examination of the locomotor system and to understand its radiology and to carry out simple techniques.

Two schools made the general point that rehabilitation is an attitude of mind, not a subject. It cannot be 'taught' in the usual way nor can it be encouraged by rheumatologists and orthopaedic surgeons in isolation: it must be a constant feature of the whole course from the introductory clinical course onwards.

Teaching methods which have proved valuable include small-group bedside teaching (one school); combining medical and surgical specialists, either in seminars or in case conferences and patient-based teaching where orthopaedic surgeons and rheumatologists are together investigating or managing a case (four schools); and small tutorials with case demonstrations (one school).

PROBLEMS AND DEVELOPMENTS

To improve their own courses, two schools would like more clinical staff—in one case to increase the multidisciplinary sessions which are expensive of staff time, and in the other to make greater use of the clinical material available. Another school suggests the use of projects, independent learning, and domiciliary visits to disabled people. A further school now gives students the opportunity to visit special units for the 'young chronic sick', and to learn about the problems of their care and management.

Disadvantages as well as advantages arise from being one part of a combined attachment: one school pointed out that students miss good experience in one area while away being taught in another, or they may be being used as a 'pair of hands'.

Two of the courses reported upon, both in London, are well established, but from 1976, one of them will become more comprehensive when the specialized therapy and assessment units and the in-patient facilities transfer to united accommodation: students will have more bedside and more rehabilitation experience.

Two further courses are innovations, brought in as part of whole new curricula: one of them is part of a self-contained systematic 'theoretical' course, in which orthopaedic surgeons, anatomists, other preclinical scientists, bio-engineers, and rheumatologists collaborate. At the other, the clinical attachment has replaced some final year revision tutorials, and if staffing arrangements permit, the new group rehabilitation unit will become a location for undergraduate teaching.

The two chairs in rehabilitation recently established are too new for definite indications of teaching roles to emerge. However, it is likely that the topic will be covered in small amounts in various other clinical specialties' time rather than in a special separate course.

Microbiology and Parasitology

Thirty-five medical schools completed the questionnaire on microbiology. Two further schools sent brief details of timetabling—a new school where plans for teaching microbiology had not been finalized and one other school which chose not to complete the main questionnaire. One 'preclinical only' school did not attempt any return: only a small amount is taught and the relevant teaching practices were reported in the questionnaires submitted by the clinical schools who share responsibility for it.

The subject will be referred to as 'Microbiology' which is the name used by the majority of respondents. In Scotland the term 'Bacteriology' is sometimes used, and in Scotland and Ireland particularly courses or sub-courses are sometimes entitled 'Medical Microbiology'.

TEACHING ARRANGEMENTS

Two of the responding schools answered for 'future' curricula which would not be implemented until 1976. The majority were answering for courses and curricula which were fully operational, or which were replacing previous arrangements at the time.

Position in the Course; Teaching Time

At almost every school microbiology is taught in more than one year of the curriculum, and in most it is taught in both the early years and the later years, corresponding to the 'preclinical' and the 'clinical' stages. In five schools it appears that the bulk of teaching is given during the early years, usually in the second preclinical year, but more often in schools offering both preclinical and clinical stages, a greater amount is given during the clinical period.

Several respondents were unable to estimate the hours of teaching devoted to microbiology: these were still a matter for negotiation as new

arrangements were coming into force. Among the schools who did give an estimate, the scheduled teaching time for the subject ranged from 54 hours to 165 hours, with schools clustering at the lower end of this range. Excluding schools offering only one of the two stages (pre-clinical and clinical) the estimates were as follows:

Teaching Time (hours)	*No. of Schools*
Up to 70	7
Between 70 and 100	11
Between 101 and 130	4
131 or more	4

The mean estimate of teaching time on the subject was 94 hours (SD 31·6).

A large portion of the teaching of microbiology in ten schools is concentrated in a full-time block devoted to pathology which is held in the clinical stage: the block usually comprises general pathology, haematology, immunology, and chemical pathology as well as microbiology, and it is sometimes entitled 'Special Pathology', 'Advanced Pathology', etc.

Course Development and Evaluation

Microbiology can be a ubiquitous subject in the undergraduate curriculum and so respondents were asked what arrangements exist for planning and co-ordinating the teaching of their subject, particularly when there are associations with other disciplines or specialties in the timetable. Sixteen schools were shown to have formal arrangements for co-ordinating the teaching of microbiology generally, in a comprehensive system; sixteen schools operate formal arrangements for only some of the teaching of the subject with for example careful planning of teaching which takes place within the microbiology department but no policy or executive body for the teaching of microbiology which occurs in other spheres. Three schools appear to have an essentially informal pattern of organization for microbiology and three more schools appear to have no arrangements for co-ordination at all.

All the teaching of microbiology is conducted separately from that of other subjects in some schools, where there is consequently no need to correlate and plan with other departments. Most have some 'separate' teaching and some jointly scheduled teaching. To effect 'internal co-ordination'—that of the 'separate' teaching—committees or similar gatherings of the full-time teachers of microbiology meet regularly in four schools to discuss and plan their activities. At these meetings proposals to alter or up-date aspects of the course are put forward; another four departments designate an individual with a special interest in teaching matters to co-ordinate the programme, supervise it, and be

responsible for its day-to-day running. Yet four others have 'tutors' in microbiology who apart from their own teaching duties are responsible for filling in any gaps in the lecture programme, using their personal contacts with students to discover what they do and do not understand, and keeping in touch with each other to ensure that all students have covered the same ground and to the same level. The content of lectures and practical classes is dovetailed in ten courses: practical work on a topic follows on immediately from related lectures, and treatment of a topic in the two settings is carefully correlated to support a coherent sequence of learning.

'External' co-ordination refers to the co-ordination of those parts of the microbiology programme which are given in association with other departments and the formal arrangements which have been devised to plan and monitor this teaching. Microbiology is frequently associated in the timetable with pathology, not that as a rule they have joint teaching sessions, but rather that they share an 'umbrella': the paraclinical disciplines occupy the same stretch of the curriculum and have mutual interests which can with advantage be planned co-operatively. In fifteen schools there is some joint planning of microbiology with pathology. Microbiologists make some contribution to the major basic medical science courses in three schools, and join representatives of the pre-clinical disciplines to design the parts of the courses with which they will be involved.

A school's theoretical clinical teaching very often takes place in a topic-teaching cycle or in a series of co-ordinated lectures, focusing on systems and clinical problems: most clinical subjects are covered in these, and in sixteen schools microbiological teaching is also included. This applies to lectures and seminars: practical work may be correlated with them if microbiology involvement in the theoretical teaching is heavy and if little teaching of microbiology is given at other times in the clinical course. Arrangements most often mentioned in this connection were microbiologists contributing to the consideration of a system (for example, a talk on meningitis during the component course on the nervous system), and combined teaching sessions where microbiologists, clinicians, and sometimes also specialists in community medicine discuss categories of disease (for example, immunosuppression and the immune deficiency diseases) which have an allotted place in the cycle's sequence. There are three schools where microbiology is not a full member of the main vehicle of clinical 'theoretical' teaching: in them, the microbiology teaching is conducted in parallel with the other theoretical teaching and is correlated as far as possible with it (microbiology and pathology follow the same order of systems and topics), but beyond this there is no joint planning of teaching.

In four schools where an introductory orientation course in clinical method and hospital practice is given to students at the very beginning

of their clinical course, staff from the microbiology department regularly appear. They explain the common investigations carried out in hospital microbiology laboratories, their purposes and interpretation, and they encourage students to try to make good and efficient use of the facilities.

Liaison with clinical staff occurs in a variety of situations and to varying degrees of formality: as a regular and constant feature of the scheduled course—as opposed to *ad hoc*, patient-based teaching—it is arranged by fourteen schools. General physicians, paediatricians, and specialists in communicable diseases are the clinicians most frequently mentioned: they come to teach in the microbiology course, or microbiologists join them for special sessions in their courses.

In five courses the laboratory, clinical, and epidemiological strands are fully integrated and planned as a unit, once the basic, preclinical teaching is completed. Three of these schools have no separate clinical course in infectious diseases and the combined course pre-empts the need for such arrangements. One London school for example runs a series of seminars at approximately six-weekly intervals over an eighteen-month period, in which bacteriologists or virologists in conjunction with clinicians discuss problems of infection: they cover medical, surgical, paediatric, and obstetric topics. Another of these three schools explains the rationale for the teaching arrangements as follows: 'One cannot meaningfully discuss laboratory diagnosis and the laboratory control of antibiotic treatment in isolation from the clinical features and epidemiology of the disease.' Such courses demand considerable efforts to co-ordinate staff and correlate material: they demand both 'internal' and 'external' co-ordination.

Twenty-three departments have formal arrangements to review, revise, and evaluate their courses. A further nine operate only informal arrangements—discussions take place, teaching matters are raised at general purpose staff meetings but there are no special arrangements concerned specifically with teaching matters. Six respondents made it plain they do not have any such process.

There is a significant but not complete concordance between co-ordination arrangements and review arrangements. Twelve schools formally plan, co-ordinate, and review their courses regularly and thoroughly. Five further schools co-ordinate and review their teaching partially or informally. One respondent added that while evaluation is a constant process with minor adaptations being made very often, a formal major review is mounted only every few years.

Normally the review is held annually, at the end of an academic session, perhaps after examination results have been announced and when a draft programme for the next session can conveniently be considered. At six schools the formal review takes place immediately before or immediately after each course, block, or teaching cycle. In

three of these the main course is an intensive full-time one; in the others it spreads over a longer period than an academic year. However, the non-stop nature of evaluation was emphasized by seven respondents as a special feature of their arrangements. Apart from the main, end-of-course review exercise, staff are constantly analysing their activities and attempting to improve them: indeed monitoring is or should be an inseparable part of teaching.

Respondents were asked who normally takes an active part in the review. Twenty-one replied that all teaching members of their department were involved. NHS microbiologists who take part in the teaching programme at two schools also take part in evaluating the programme. One 'preclinical only' school which runs its own microbiology course with its own staff nevertheless invites comments from microbiologists at the clinical school to which all students transfer. Staff of the whole division of pathology review teaching together in six schools (the division of pathology in one school, for example, has its own joint teaching committee): there is no independent review of microbiology alone. Meetings are held with students in fourteen cases to listen to their views and sound them out about proposed changes. These meetings are normally held at the end of a course, but in a few cases there are standing departmental staff–student committees. Three of these departments and six others organize questionnaires about the teaching and administration of their courses which students are requested to fill in. One English school involves newly qualified doctors in its review procedure: their comments are sought, particularly in relation to the usefulness of what they were taught in the light of needs which hitherto they had not realized, and staff also watch their usage of the laboratory services in order to identify possible deficiencies in their earlier teaching.

FEATURES

Aims and Objectives

Respondents were asked to describe the major aims and objectives of their teaching: thirty-two did so. Some gave a brief outline of their main emphases and themes and others listed detailed learning objectives.

The aims and objectives which were reported have been grouped into several distinct but not mutually exclusive categories: courses can follow more than one of them, and a school can have two or more stages of microbiology instruction with separate aims and thirteen respondents in fact divided their answer into two sections, giving the objectives pertaining to the different sections. Here, early and preclinical teaching is characterized by emphasis on basic, elementary principles which lay the foundations for the later course which is itself characterized by clinical application and a focus on disease entities and body systems.

Several respondents gave general and over-all aims for their courses which distinguish the needs of medical undergraduates from those of other groups of people whom they also teach. They design their teaching to meet the needs of future doctors in hospital and non-hospital practice, who will have no further training from microbiologists and who must therefore be given a multipurpose and sufficient introduction to the subject now: a general understanding of infection in man. (For two schools, this was their only objective.) Two respondents expressed this determination not to attempt to produce specialists in laboratory medicine: their courses are not technical, and certainly not 'botanical'—they 'avoid dwelling on the flora and fauna'. However two other departments hope that some students will be stimulated to choose microbiology as a career, the over-all goal for the majority of students remaining less ambitious: 'The broad aim is understanding the parasitic relationships and the long and short-term adjustments man makes, some deliberately, others unconsciously, in order to live in a "dirty" world without being overcome by parasites. . . . At the end we hope the students will be competent to recognize and treat those infective diseases they understand and will be inquisitive about those they don't.'

Two courses are designed with the principal role of 'bridges' between the students' preclinical and clinical studies. They lead on from knowledge of the normal structure and responses of the human body, through a demonstration of the harmful processes and events which can afflict the body, to clinical teaching in the diagnosis and treatment of these afflictions. Teaching is concentrated at the 'preclinical'/'clinical' interface.

Eleven respondents are concerned to present microbiology as a science, literally as the study of microscopic forms of life. This is regarded as important intrinsically as well as being an essential preliminary to learning about clinical microbiology: 'know your enemy'. Knowledge of the physical and behavioural characteristics of the various micro-organisms, the environments in which they flourish and their reproductive cycles, is taught as a 'basic' science, as an academic discipline with its own methodology, body of knowledge, and research programme.

Sixteen courses emphasize pathogenicity (in six cases this is a twin emphasis with the 'scientific' approach above). Time and effort are devoted to teaching the principles of infection and the relationships between man and the micro-organisms. Students must grasp the complexity of the processes involved which are now known to be interactive rather than simple cause-and-effect procedures, including the responses made by the host to the parasite. These respondents perceive this approach to be the major role of microbiologists in a medical school: medical students may need to know less about micro-organisms than their other students and clinicians may teach the clinical manifestations

of infection, but medical students must learn about the pathogenic processes which lead to infection, and it must be microbiologists who teach them.

Six of these courses (none of whom also expressed a 'scientific' approach) combine with others to form a group of fifteen with a clinical outlook. They go as far as giving a vocational training in the diagnosis and treatment of infectious diseases—they deal with specified diseases as well as types of pathogenic processes. Indeed, one or two respondents view their teaching as 'really a course in infectious diseases', focusing on the end result of the process, and on the achievements of medical microbiology in combating them. Above all, they believe that students must be convinced of the prevalence of infection in modern medical practice: they must be shown how high the incidence of infectious illness is in general practice settings and also in hospital practice, and that it is an alarmingly increasing problem.

The epidemiology of infection is a major feature of eleven courses. It is thought very important to convey an idea of the spread and transmission (and the prevention of spread) of infection in a population. The population may be ethnic, geographical, or institutional but the principles of looking at the problem with a community dimension remain basically the same: if students can be persuaded to remember these principles then eventually it is less likely they will treat infected patients purely as individuals without thinking of implications of their illness and of the choice of treatment for a wider community. Topics taught would include immunity, cross infection, disinfection and sterilization, vaccination, and immunization, the use and abuse of antibiotic and anti-viral drug therapy, and the rationale of other forms of control of infectious disease in the community. In these courses the social aspects of infection and the problems of 'management' as distinct from 'treatment' are underlined.

A not unrelated objective in one school, where it is considered an objective equal in value to the other major goals, is that students should learn to practise personal hygiene. In their laboratory work and in their clinical activities they must themselves comply with the safety precautions which they would expect other people to observe. As medical students and later as doctors they will be uniquely placed to pass on infection and potential infection to vulnerable people, both directly and indirectly, and at the very least students should not later contribute to the pool of infection by their own thoughtlessness.

Finally, as a result of a course in microbiology, thirteen respondents would expect students to appreciate the role of a modern hospital microbiology laboratory. They should be able to use it intelligently in requesting investigations and confirmation of clinical evidence. Over and above the role of the laboratories in diagnosis, students should also be prepared to take advantage of the advisory service which

microbiologists can provide in patient care and in the management of infections in hospital and community practice. The undergraduate course must demonstrate what part microbiology as a specialty plays in clinical routine today and in the future.

Teaching Methods

All the courses reported upon rely heavily on lectures as a major teaching method, some of them very heavily. Seventeen courses contain large group discussions, known variously as symposia, seminars, colloquia, etc.: eight of them regularly feature multidisciplinary sessions when a panel of speakers from microbiology and clinical specialties review a topic from their various points of view. One clinical school's department which is also responsible for the course at the associated preclinical school, maintains a list of visiting speakers who are invited to join the panel for 'class colloquia': at these a film may be shown and students then enter into discussion with the guest speaker who may be a general practitioner or a veterinary practitioner, for example.

Small group teaching is used in twenty-seven courses. These are generally tutorials held at intervals throughout the main course/s. In addition, four departments arrange revision tutorials before the examinations and after the main body of teaching is over, and six departments conduct some or all of the practical work in small groups with a member of staff assigned to each.

Teaching aids and opportunities for independent study are available in a total of nineteen schools. Four departments have developed or acquired tape–slide programmes for independent learning. Other audio-visual facilities are cine-film (seven schools), closed-circuit television and recorded videotape (three schools, all in London) and 35 mm and overhead projector transparencies (five schools). All students are required to undertake projects at one Scottish school, while at one in England some students may do so if they are interested. One school has a museum with source material for students to examine and consult; seven put up standing displays and demonstrations using various materials: slides, photographs, models, charts, specimens, etc. At an English school a special room is set aside for a series of mounted demonstrations which are changed to keep in step with the theme of current lectures and practical work. The room is open until the evening and a member of staff is in attendance nearby to discuss and amplify the themes presented. Two courses make particular use of handouts.

Thirty respondents mentioned their use of practical classes. In six cases students work in small groups in the laboratory, doing 'research' or conducting experiments as a team.

Clinical Teaching

Eighteen respondents attempted some of the (optional) questions in the section of the questionnaire devoted to 'clinical teaching': their comments will be brought together here.

Fifteen of the group of eighteen reported specific objectives for their clinical teaching: in so doing they made it clear that 'clinical teaching' was interpreted to mean practical procedures using clinical specimens or resembling the procedures used in routine diagnostic tests. A dozen of them also record what each student has seen or achieved during the clinical/practical work—eight insist on students themselves performing a given number of the common tests and analyses. However, three departments which list the required experiences to be performed or witnessed do not appear to check whether individual students have met the requirements; three others keep an attendance register for laboratory classes. The tests and procedures which were most frequently mentioned are venepuncture, microscopic examination of various body specimens, and simple cultural techniques.

In the practical classes it is very likely that students will be working with 'real' clinical material taken from patients. This is especially the case when the university department of microbiology is located in and provides facilities for the teaching hospital, and students may even be entrusted with some responsibility in investigative duties. At three London schools for example students initiate tests in other departments (in two of them occasionally, in one routinely) and at one of them they may occasionally have a hand in writing up a report or a record of an investigation, to be incorporated in the patients' records. In three schools where students do not do any work in service laboratories they are taken to visit one of the hospital departments: they are shown the processing of a request from beginning to conclusion taking note of the clerical, the storage, and the priority arrangements as well as the technical tests.

Patients are involved in teaching microbiology in twenty-two courses. Nine of these courses bring patients to be demonstrated as examples of a particular condition in lectures or tutorials. Clinico-microbiological case conferences are held in twelve courses as a regular teaching activity; in five of them and one other, students regularly receive teaching at the bedside, on ward rounds or in out-patients, and visits to the intensive care unit, for example, to see extreme conditions. At four schools students have informal contact with patients during investigations—they may go to take a sample from a patient or become involved in following through a case. One of these respondents expressed the hope that students will be given more clinical/practical responsibilities and duties in future.

Clinical specialists (ie other hospital specialties, usually physicians) participate in teaching microbiology in eight schools. One respondent

has found general practitioners willing to participate and he and another respondent in Ireland also use veterinary practitioners for certain topics. A specialist in community medicine contributes to the course at two schools, while two use nurses to demonstrate aseptic techniques, etc. (one of them hopes to use staff from the pharmacy in future). Full-time NHS microbiologists participate in four courses. Four courses use (senior) laboratory technicians in some of the formal teaching and two of these and two others bring in personnel from the public health laboratories/Environmental Health Department, or the Control of Infection office. Altogether seventeen respondents indicated that non-microbiologists play a significant role in their course.

'Special Features'

Respondents were invited to indicate what they think to be unusual, exciting, or significant about their teaching. The points they mentioned covered methods, course content, and over-all themes; sometimes these repeated what had been given in answer to another question, sometimes they embodied new features.

Four respondents believe their broadly based, fundamental course in the preclinical years serves as an indispensable introduction to the subject. One of them follows it with a full-time attachment in the clinical years—and together with another respondent mentioned this as a special feature: a concentrated period spent in a microbiology laboratory as one of a very small number of students (four to five in one case, seven to eight in the other) with no other concurrent courses to distract, provides a student with the same kind and intensity of experience gained in full-time attachment to a clinical unit.

Having a course spread over the whole of the clinical stage brings advantages of 'grading' the learning from relatively simple to more advanced concepts, and of relating the teaching to many contrasting clinical subjects and body systems which are studied in turn as the microbiology course continues. This was mentioned by one school.

Close integration with pathology is the notable feature of microbiology teaching in two schools: there is no separate course in microbiology and the two subjects are taught in conjunction with each other, though of course pathologists and microbiologists each appear in different clinical contexts in later teaching.

Two Scottish respondents reported their satisfaction with the organization of their courses—they are internally coherent, well balanced, and now that they have arrived at this state are not likely to change as radically as they used to have to. There is no single element which is more valuable than another—it is the way in which they are brought together which is the key to success. One added that the great freedom and responsibility allowed to individual teachers may have helped in developing the course so successfully.

Under this question, a number of schools mentioned aspects of the content of their teaching. Clinical orientation is regarded as a strong point of their courses by thirteen respondents. They drew attention to the clinical activities which take place, the clinical references which they make in their lectures and tutorials, and the selective nature of the presentation of subject matter, so that as far as possible all teaching is seen to be relevant to the clinical world. Often they arrange their topics according to the systems of the body, one by one, and they tend to cover therapeutics as well as the pathology of infections in man.

Three respondents believe that it is urgently necessary for microbiologists to ensure that students go away with a rational approach to antibiotic therapy, recognizing the abuses that occur, and the potential hazards.

The social and preventive aspects of infection are considered important topics in three courses, the respondents claiming that practical epidemiology and community medicine are brought to the fore in their courses. The so-called tropical infections feature particularly in four courses. One respondent likes to maintain a world outlook: a course would suffer for being too parochial and 'relevant'—but another reason for this is the growing mobility of these conditions which do not confine themselves to their country of origin.

A number of schools mentioned their teaching methods. In five schools the topic-teaching is highly valued and occupies a fairly large slice of the timetable. Community specialists/epidemiologists take part with clinicians. Topic-teaching with staff representing more than one specialty allows the different points of view to be presented succinctly and at the same time avoids giving the impression that they are opposing and unrelated: they are seen to be different perspectives on the same problem, and the end result is illumination not confusion, synthesis not antithesis.

Tutorials are the favourite teaching method in microbiology in one very large school, where they provide opportunities for staff and students to establish some personal rapport: a different topic is discussed each week. Small-group intensive teaching is conducted in the practical course-work at three (London) schools, who have found this makes for more informal sessions which are better geared to the pace and the 'interests of individual students and can be made problem-oriented rather than technically/task-oriented'. Another feature of practical classwork which four respondents reported as having special interest is the use of material-specimens, samples and cultures derived from real patients whom the students may have actually met, and with whose cases they are familiar. This adds a new dimension to their laboratory studies.

Time spent in the laboratory is valued by seven respondents for another reason—it developes manual skills, it shows the disadvantages

as well as the positive uses of the procedures, it teaches how to protect oneself and others from harm when in contact with unpleasant or dangerous material, and it makes students personally acquainted with the daily routine and the codes of practice of laboratory medicine upon which they will rely very heavily after graduation. They learn through personal experience. One respondent said: 'Several clinicians have informed me that seeing and handling organisms was the valuable part of their course in microbiology, not the recognition of different species. I remain convinced that laboratory conditions should allow students to handle all but the dangerous pathogens and to see even these (following a 'no-touch' technique in clinical work remains a mime with little meaning). This cannot be done in crowded laboratories which may be adequate for looking quietly at dead material, but do not allow moving about amongst infected objects.' (One of the seven respondents.)

Duplicated notes, extremely comprehensive ones, handed to all students to guide them through the course, were reported here by one respondent. Two others mentioned their videotapes and films, stated to be particularly useful with large numbers of students.

STUDENT ASSESSMENT

Thirty-seven schools hold formal, critical, professional assessments in microbiology: that is all schools except, it is believed, the non-responding one. Four schools examine microbiology as a separate subject in a separate paper (three Irish, one Scottish); thirty-one examine it in tandem with pathology and other branches of pathology; nine of these plus two others combine it with subjects other than pathology—in five cases it is combined with one or more preclinical disciplines (this refers to early, 'basic' teaching) and in six cases it is combined with various clinical specialties, either because these schools hold 'integrated' examinations in the clinical years, or because infectious diseases are assessed within 'Medicine'.

Twelve schools reported 'within-course' assessment of microbiology. In four cases the assessment combines microbiology with pathology at all stages, whereas in other cases it depends on the occasion: sometimes it is a joint assessment, sometimes microbiology work is assessed alone. At one school for example there are separate arrangements for the assessment of virology but assessment of all other aspects of microbiology are combined with pathology and the other branches of pathology with which it is taught. Four schools reported that this in-course assessment can be 'critical': in three courses marks are forwarded to be summed with results from professional examinations, and in a fourth an adequate performance during the course, as measured by in-course

assessment, can exempt a student from more formal examinations—the in-course assessment itself thus forms the critical assessment.

Thirty schools reported holding class examinations at the end of a term or year: ten of them also have in-course assessment as described above. In at least eight of them the assessment is a joint one with pathology and other branches of pathology, while at three schools the examination is in microbiology only. These class assessments can be to some extent 'critical' in nine cases; in eight, marks from the class assessment are forwarded to be summed with professional examination results, and in one of them a good performance in the class assessment will exempt a student from further examination in that part of the microbiology course.

Five respondents highlighted certain points about their assessment methods. Three of them assess the students' notebooks recording their laboratory work; and two schools—one preclinical and one clinical—who have 'harmonized' their assessment procedures, set papers requiring 'short note' answers. The most general change to be reported was the introduction of MCQ papers in six schools. A further five schools are contemplating changes in their assessment practices in microbiology (for example, more 'critical' in-course assessment; more integration).

Two general difficulties were mentioned. Firstly, four respondents are not entirely satisfied with MCQ papers: however carefully compiled, the questions by their very nature cannot test a student's understanding, and ability to synthesize, to present an argument, to explain an opinion. They believe MCQs should never be the only method used in an assessment. Secondly, two of the same respondents plus another two are anxious not to elevate assessment to excessive importance. As in-course and class assessments become more frequent and carry greater weight, there is a danger that staff and students will become obsessed with them. Assessment takes up too much precious teaching and learning time, and inhibits students from thinking critically.

Comments about the place of microbiology and infectious diseases in the 'critical' and qualifying examinations were volunteered. One respondent for example would like a greater and identifiable place for the whole topic of infection, in accordance with its wide and growing relevance in clinical practice.

PROBLEMS AND DEVELOPMENTS

Respondents were asked to describe changes—recent, planned, and potential changes—and the problems which hinder the teaching of the course. (Many of the current developments in microbiology were mirrored in the questionnaires on 'Infectious Diseases/Communicable Diseases'.)

Organization and Resources

The staffing level in microbiology departments is the most frequently reported problem. The over-all staff–student ratio has reached an alarming state in seventeen schools; two of these respondents and two others reported that increasing student numbers have heightened the pressure, as raised intakes have not been paralleled by new staff appointments, and staff–intensive teaching such as tutorials and supervised practical work has inevitably decreased. This problem appears to affect the English 'provincial' schools and those in Eire more than the others. Specifically, nine departments urgently need more medically qualified staff in order to 'retain their credibility': this is the aspect which led more than one respondent to refer to a 'crisis'. It has become almost impossible to attract medical graduates into a full-time career in academic microbiology. According to one respondent, the 'ultimate failure in our teaching is the failure to recruit medical teachers'. Five respondents concerned with this aspect also have a general staffing problem; the other four apparently do not. None would want an entirely medically staffed department, but all believe that a reasonable proportion should have medical training—certainly the majority of those who teach medical students. Three departments who have come to rely on NHS microbiologists to help with teaching are pleased that they have medical qualifications and active clinical involvement, but reported the disadvantages of using them—timetabling is made more difficult and they are not so 'committed' to teaching as to their clinical work.

A shortage of technical staff to maintain equipment and set up practical experiments was reported by three schools. Five departments find themselves severely lacking in space for teaching. One of them is also short of laboratory equipment for students to use. However, support for new audiovisual facilities will soon be available in three schools—one is to expand its television programmes.

One preclinical school does not have a department of microbiology, although the microbiologists feel the time has come for one to be established.

Access to clinical resources is difficult in four schools. The unit for infectious disease may be geographically separate from the microbiology teaching department—students of three London schools have to travel some distance in order to see patients—or there may be no special unit available to the medical school. Two would like an infectious disease ward to be added to the main hospital. If hospital laboratory facilities could be improved they could play a larger part in training students and giving the microbiology they receive a more clinical flavour.

A great deal of course remodelling is in progress, very often in connection with general curricular reform in the medical school. Four

current microbiology courses are completely new: not all have yet been fully implemented and some modifications will have to be made to the original plans. A further nine departments are engaged in radically redesigning their courses: a few were able to give some information. A preclinical school for example is to detach microbiology from its partnership with biochemistry and establish it as a separate course (for medical students only) and with a separate examination. The new course will be allocated about 50 per cent more time than the present course. At two other schools, microbiology will be taught in two contrasting tiers: a basic 'core' course run by microbiologists only, followed by various integrated modules dealing with the different systems and clinical topics, at intervals. At one, immunology (already taught 'separately' by some schools) will be 'hived off' from microbiology into its own course.

The full-time blocks of laboratory medicine in four schools are innovations: three are genuine 'attachments' while the fourth has concentrated the majority of teaching in pathology, microbiology, etc., into one term, though later, clinically related microbiology continues. One school recently had to abandon its full-time laboratory medicine 'clerkship' when its course was contracted. Five respondents would like their students to have the opportunity of working inside service laboratories not necessarily for a full-time clerkship but for even a short or part-time period in order to savour this type of experience.

Only two respondents consider the time allocated to their subject is insufficient for them to teach it thoroughly. A high number of grievances centred on timetabling—the position of microbiology in the curriculum and its relationship to other subjects. Recently for example six schools have introduced 'basic microbiology' into their preclinical courses but one of their respondents plus another one regret this early course: they would like all teaching to be done in the clinical years—if microbiology is not a clinical subject it is nothing. Yet another respondent would like the basic teaching of microbiology to be relocated at the very beginning of the medical course: if this could be achieved the school should also institute a short course for very senior students on the topic of infection. Three respondents in all proposed such a course: it would discuss and illuminate the question of infection in medical practice, and encourage students to be always conscious of the problem. The respondent at one English school would like to teach the main microbiology course after students have had clinical experience—towards the end of the clinical course instead of at the beginning, as now.

The importance of infectious diseases in the timetable is also a matter of concern to microbiologists. Two whose schools make very little provision for the subject because the clinical facilities are simply not available feel very strongly that something must be done about it. Two respondents envisage ideally a single integrated course synthesizing the

laboratory and the clinical aspects. Infectious diseases will soon be moved to the first clinical year at one English school when the bulk of microbiology is taught, creating the possibility for co-operation.

Combined teaching with clinical subjects other than infectious diseases has developed in three schools recently and is expected to do so in another eight in future. Sometimes this indicates multidisciplinary courses in the shape of topic- or systems-based modules, sometimes it indicates liaison teaching in *ad hoc* sessions. However, two departments have had to abandon integrated teaching for logistic reasons, but three others are anxious to pursue it. Two respondents desire stronger links with pathology and the other pathological specialties: there would be many, mutual benefits from joint planning and joint teaching.

Integration of the component parts of microbiology itself remains a perennial problem. Two respondents would like bacteriology and virology to become separate departments, each running their own course as their interests are diverging more and more.

Teaching Activities and Content

Several respondents referred to the measures they take to keep their teaching up-to-date, incorporating the findings of current research and adapting to what is thought suitable for undergraduate medical students. Apart from various minor modifications, two have allowed more time for virology and/or parasitology, and four have made their courses more clinically oriented, building their teaching around disease entities and starting off from symptoms and clinical syndromes and not from microbes. Two others now concentrate on the broad view, on the principles of the subject and on pathogenic processes and have pruned away the technical and botanical detail.

As has already been shown, several microbiologists wish for more clinical teaching in their courses and for more microbiology 'intervention' in other courses: they see many potential openings for liaison teaching and correlated course planning (for example, one respondent would like to arrange combined teaching sessions with general practitioners on the common infections). The underlying factor which hinders these proposals appears to be the attitude of other staff: the medical school establishment does not always appreciate the scope of microbiology and its role in modern medical practice and how pervasive its teaching ought to be. The problem was expressed by two respondents who believe that scientific medicine can be successfully practised only by clinicians who have been well trained in laboratory studies and who insist on a high standard of supporting services for their clinical activities. The low status of the subject is found by seven respondents to be perpetuated in the attitudes of students whose motivation is poor because they think the subject is not 'relevant'.

Improving the image of the subject would be easier if clinical integration were promoted and if enough staff were available to experiment with more interesting and more personal teaching methods. Unfortunately, some departments are forced to phase out their more successful methods such as tutorials, or to postpone introducing/increasing them because of the staffing crisis. However, in four schools more small group teaching has developed—in one or two cases partly replacing lectures—and this method is planned to assume a larger role in another course. Five respondents remain depressed over the small role it plays in their courses.

Changes were also reported in relation to practical work. There is now less of it in four courses, though one of these schools plus another now include more demonstrations of procedures by staff to students than previously. The large numbers of students to be accommodated have led to laboratory classes being duplicated in at least four schools, which imposes an additional burden on staff time.

Four departments are investing more heavily in audiovisual teaching aids, notably tape/slide and television programme production.

Altogether twenty-two questionnaires gave information about changes affecting teaching which have occurred recently. Exactly half of these respondents reported definite plans for significant changes in the future; they belong to a total of seventeen respondents reporting proposals which will soon be implemented. Less positive indications were received from eight respondents who outlined developments which had either not yet been approved or had not yet been finalized in detail.

Obstetrics and Gynaecology; Human Reproduction and Family Planning

Two different questionnaires were distributed: one inquired into the teaching of the major specialty 'Obstetrics and Gynaecology', and the other into the teaching of 'Human Reproduction and Family Planning', a topic suggested for inclusion in the undergraduate curriculum in the GMC's 1967 Recommendations. The questionnaire on obstetrics and gynaecology was longer and more detailed than that on human reproduction and family planning. It contained a number of questions on clinical teaching particularly, which the shorter one did not.

The questionnaire on obstetrics and gynaecology was sent to all medical schools offering clinical courses with the exception of one school whose new clinical course had not begun. There was a 100 per cent response, which gives a 'field' of thirty-four medical schools. The majority answered for existing arrangements, although some of these are new and had not been in operation very long or had not been fully implemented. Five replies referred to future arrangements, about to come into operation.

The 'human reproduction and family planning' questionnaire was offered to all medical schools. All completed it, except one offering only a preclinical course and a school whose course had not then begun, giving a 'field' of thirty-six medical schools. Again the majority answered in respect of existing arrangements, but three replies referred to future curricula. Thirty-four medical schools completed both questionnaires.

It was decided to combine the report on the two sets of questionnaire into a single document because it was found that the subject matter and the courses in which it is presented overlap, and indeed very largely coincide. 'Human reproduction and family planning' is taught within the course on obstetrics and gynaecology in all schools with clinical courses, whether or not it is taught on other occasions too. The same respondent completed both questionnaires in a high proportion of schools.

ORGANIZATION OF TEACHING: HUMAN REPRODUCTION AND FAMILY PLANNING

All medical schools with clinical courses give formal teaching in human reproduction and family planning during their course/s in obstetrics and gynaecology. Some were able to put a figure on the amount of time devoted to the topic in lectures, seminars, and at special clinics, but these indicate the minimum rather than the maximum time. Five respondents stated firmly that a substantial portion of the obstetrics and gynaecology course is devoted to the topic: over a quarter. At one of these schools no other formal teaching in the topic is given (or was reported): 'the teaching of Human Reproduction (including Family Planning) is inextricably bound up with the teaching of Obstetrics and Gynaecology. Indeed in recent years there has been an increasing trend away from the technicalities of O. and G. and commendable efforts made to emphasize the wider aspects of Human Reproduction. In a department with a very active research programme in many aspects of reproduction this attitude is readily fostered . . . the whole course is connected with Reproduction.'

Special courses or sub-courses in the topic are timetabled separately in six schools; most occur in the early years of the curriculum. They are entitled 'Reproductive Medicine', 'Human Reproduction' (three schools), 'Problems of Fertility', 'Reproductive Biology', 'The Female Reproductive System', and 'Medical Aspects of Population'. Two of these schools treat the topic more than once, from the reproductive science angle and then from the social and family planning point of view. Two however, appear to concentrate on human reproduction, and family planning was not mentioned in connection with the course.

Seven schools arrange special courses or sub-courses in human reproduction and sometimes family planning along with other related topics, such as human growth and development and/or genetics: these too are held in the early years of the curriculum. Titles indicate their scope: 'Human Reproduction and Development', 'Embryology and Development', 'Reproductive and Developmental Sciences', and 'Growth and Development'. Four of them definitely include consideration of family planning.

Five other reports showed that a significant amount of formal teaching of reproduction features in physiology courses; seven others said that responsibility for the topic is shared by several of the basic medical sciences; and this arrangement may exist both instead of and in addition to separate arrangements. At one school special consideration of family planning and the reproductive cycle is given in the course in ethics and that in pharmacology.

Twenty-five schools indicated that they offer courses which include both aspects of the topic together, while eleven questionnaires indicated

that the course which is regarded as the main teaching vehicle of reproduction does not include family planning.

Students in eleven schools are given some instruction in family planning matters during their 'preclinical' years, before they begin clinical courses. These are specific arrangements; they may be extra-curricular and in some cases are not paired with formal teaching of human reproduction. One school, where all formal teaching of both topics is part of the clinical course in obstetrics and gynaecology has a voluntary programme in 'Sex Education' which is organized by students as an appendix to the course in behavioural sciences.

There appears to be no pattern in the choice of location for 'basic' teaching in the topic. Seven schools locate the teaching mainly in the first preclinical year and another seven locate it in the second; four distribute it more or less evenly between the two years. Other schools arrange all teaching in the clinical years of their course. The latter include four of the medical schools in Eire where obstetrics and gynaecology departments are primarily responsible, and where differences in circumstances prevail.

The difficulty of 'dis-integrating' the topic from composite courses and the general reluctance of respondents to estimate teaching hours for it, make it impossible to average and compare teaching time allowances.

ORGANIZATION OF TEACHING: OBSTETRICS AND GYNAECOLOGY

Obstetrics and gynaecology are normally included in one single course, although in three schools each is timetabled separately though consecutively for clinical attachments. They may also be associated in the timetable with neonatology (when this is separately timetabled as a subject) and/or genito-urinary medicine and venereology.

The questionnaires asked about the 'theoretical' and the 'practical' aspects of clinical teaching. Schools reported three major ways of arranging the 'theoretical' instruction:

(*a*) A course of lectures which is separate in time (and often place) from the clinical teaching and separate from the theoretical instruction in other clinical subjects. This is frequently the case in Eire, where it is most noticeable.

(*b*) Lectures and/or symposia which form part of a co-ordinated sequence, generally focused on body systems or clinical topics, in which most clinical departments take part. Six obstetrics/gynaecology departments contribute to this type of course; they each also give 'theoretical' instruction separately.

(*c*) All or most 'theoretical' instruction can take place during clinical attachments: the students attached to various clinical units are brought together for lectures and seminars. This is a common arrangement in London medical schools. Unlike (*a*) and (*b*) which are given to the whole class of students, these have to be repeated for each attached group of students.

In addition, nine departments offer final-year revision courses, whose main purpose is to correlate previous 'theoretical' and 'practical' clinical learning.

In two schools staff from obstetrics and gynaecology contribute to the early Introduction to Clinical Methods course. These are multi-specialty courses in which students learn about clinical practice and clinical problems in general, rather than in an exclusive and in-depth subject-oriented way. Specialists in obstetrics and gynaecology will follow suit in a clinical course which has yet to start.

A certain amount of teaching is given in combined sessions with specialists in certain other clinical subjects. This occurs regularly in five schools, for example in collaboration with psychiatrists. However most frequently there are links with teaching in child health and in one or other courses, specialists from both fields join in teaching neonatal care: fifteen respondents reported arrangements of this sort. Indeed, in three schools the two specialties share a timetabled 'slot' to emphasize their associations, though most teaching in the respective fields is conducted separately. In one of these schools the 'close proximity of these subjects on a time base and their similarity in terms of interest means that certain subjects are taught on a 16-week rotation (the length of the two courses together) rather than on an 8-week rotation. A joint course on perinatal medicine is run between the two departments, with seminars every Monday afternoon with teachers from both departments.'

The time spent on clinical attachments to obstetric and gynaecological units accounts for the bulk of the curricular allocation to the subjects. Very frequently the main clinical attachment occurs in the second year or the middle phase of a clinical course: the exceptions are those where a two-tier system operates. One of the schools whose main attachment occurs in the second clinical year also has a full week's orientation in the first clinical year; another has a fortnight's part-time refresher course in the final clinical year. Most often there is a single full-time attachment. In a few cases there is one full-time attachment in obstetrics and one full-time attachment in gynaecology; the more usual arrangement is for students to be subdivided and sub-rotated through each element during their single attachment.

Twenty-eight schools have full-time attachments for clinical experience. Five schools 'stagger' clinical experience: there is an early part-time course succeeded by a later full-time course, which in three of them forms one of the final year 'junior house-officer' posts. Finally, one

school will give an entirely part-time (or possibly mostly part-time) attachment; clinical attachments will be integrated with attachments to child health over a sixteen-week period.

The average period of time spent on clinical attachment is 11·3 weeks (SD 2·93) full-time or full-time equivalent. London schools generally are in excess of this and Scottish schools and those in Eire are below it.

Course Co-ordination and Evaluation

Respondents to the questionnaire on obstetrics and gynaecology were asked to describe how their teaching is co-ordinated and evaluated.

Twenty-nine departments have regular formal arrangements for co-ordinating the different elements of the undergraduate programme. Five have informal arrangements. Two medical schools in London now have a joint department under one professor and the undergraduate courses have been co-ordinated: the main difference between them is that at one school students have an additional four weeks for the subject.

In ten schools an individual is designated to co-ordinate and supervise the teaching programme, ensuring that planned arrangements are working and that all staff understand what is expected of them. The individual may be the professor or a senior member of staff with a special interest in teaching; departments sending students to more than one hospital often nominate an individual in each hospital to be responsible for co-ordination. At nine schools efforts are made to correlate 'theoretical' with 'practical' clinical teaching.

In four schools a list of objectives is (or is planned to be) compiled for circulation to all staff involved in the programme. Six departments take advantage of the specialized interests of different units: students rotate between the different units which gives them a wider, more balanced experience by the end of the course.

Personal tutors to groups of students are appointed in eleven schools. Apart from their teaching duties they have a co-ordinating role: they check that students understand different aspects of the course, and that they do not miss important aspects of teaching and experience. Seven of these courses and ten others run tutorials and seminars for all students on attachment at a particular time. They are on set topics which embody the 'core' of the course. Tape/slide programmes which are accessible to all students similarly provide 'core' teaching in five schools.

Nine clinical obstetrics and gynaecology courses begin with an 'orientation' or introduction lasting up to a week, when all students are given a basic grounding before they scatter to the various clinical units. The orientation is 'theoretical' and 'practical', it revises the anatomy and physiology, it makes students familiar with terminology, it gives them supervised practice in the practical, manual skills required in the specialty, it demonstrates the role of the other professional staff and it

makes students aware of the objectives of the course. One of these departments brings all students together again for the final week of the attachment.

The special courses in human reproduction earlier in the curriculum can serve the same purpose. They are foundation courses and often (though not always) directed to the later clinical course in obstetrics and gynaecology. One school gives a full-time week to a course in reproductive medicine immediately before the phase of the clinical course in which obstetrics/gynaecology rotates. Six respondents feel the early course has this aim.

Revision courses in the final year have a co-ordinating function; they are conducted by nine departments. Lectures, tutorials, and patient-based teaching are all used. They counteract the differences of individual teachers and units in the main course and emphasize what is important for the student to know

'External' co-ordination was mentioned by some respondents—co-ordination with other specialties and other departments. Reference has already been made to participation in introductory courses in clinical method, in multisubject lecture courses, and in neonatal sessions with paediatricians, all entailing some collaboration in both teaching and planning. Eight respondents made it clear that concerted efforts are made to co-ordinate the teaching in topics in which obstetrics and gynaecology overlap with other specialties—for example haematology, virology, genetics, radiotherapy.

Teaching staff in the specialty meet regularly in eighteen schools to discuss the teaching programme and its co-ordination. Some departments have teaching committees or sub-committees to plan undergraduate teaching: one department also has a standing Working Party to co-ordinate instruction in obstetrics/gynaecology with that in related disciplines and specialties.

Twenty respondents who reported formal arrangements for course co-ordination also reported similar arrangements for course evaluation. Altogether twenty-three schools' courses are subject to regular, formal evaluation procedures: often these are identical with those for designing and monitoring courses. Four further respondents indicated that evaluation takes place informally, while others indicated a lack of such a process at present. In one reply, it was said that the course is reviewed at medical school level, together with other courses, but there is no internal or departmental review. At one school all students completing their clinical attachment are examined by a different firm and the results are formally compared and discussed.

Some information was given regarding the participants in the review process. The members of the academic department are involved in twenty schools, in six of whom the part-time and non-academic clinical teachers also take part. Eight departments altogether consult the

non-academic clinical teachers. In two cases it is primarily the head of the department who carries out the review. The paediatricians and other specialists (for example pathologists) who contribute significantly to five programmes, join in their review. Students' views are invited in twenty-one departments—normally there are staff–student meetings at the end of a period of attachment and three departments also issue questionnaires to their students.

Certain problems were mentioned in connection with review. The dispersal of students to different units for clinical teaching makes it difficult for the departmental staff to know exactly what experience is being given and whether it is broadly similar; should they impose some control or persuade all clinical teachers to follow common objectives? Two schools point out that evaluation is an impossible procedure unless there are agreed objectives for teaching: until there is agreement over what targets to aim at there can be no serious evaluation.

TEACHING STAFF

Respondents for human reproduction and family planning were asked in a separate question what staff were responsible for teaching the topic; respondents for obstetrics and gynaecology were asked in a sub-question whether staff other than obstetricians and gynaecologists were involved in the teaching on a regular basis.

All replies on human reproduction and family planning indicate that obstetricians and gynaecologists have a role in teaching the topic: often the leading or only role. Generally, more than one subject is represented and some of the early courses, the special topic courses, are truly multidisciplinary. One for example, involves the departments and disciplines of human morphology, physiology, biochemistry, obstetrics and gynaecology, clinical epidemiology, paediatrics, primary medical care, and sociology. A co-ordinator is responsible for co-ordinating these departments for the teaching programme.

The basic medical sciences are well represented in the formal teaching programme of human reproduction and family planning: anatomy and embryology (ten replies), physiology and reproductive physiology or reproductive biology (nineteen replies), biochemistry with clinical chemistry/chemical pathology (eight replies). Five obstetrics and gynaecology respondents reported participation of 'preclinical' staff in their courses—physiologists, biologists, and other scientists with research interests in reproduction. Other disciplines mentioned were genetics or human genetics, pharmacology and clinical pharmacology, and the social sciences. Paraclinical staff were mentioned by a total of twelve respondents: generally these are pathologists and radiologists.

Other clinical specialties involved in the teaching of the subjects are: general medicine and medical specialties (five schools); child health and paediatrics (thirteen schools); psychiatry (fourteen schools); venereology (five schools); general practice (thirteen schools); radiotherapy (four schools), and anaesthetics (two schools). Doctors working for the Family Planning Association or specializing in full-time family planning services are brought into the teaching of human reproduction and family planning in nineteen schools and obstetrics and gynaecology courses in three schools. Three of these schools also involve people who are professional counsellors for sexual problems. Nurses and midwives, social workers, physiotherapists, and cytologists may also take part.

AIMS AND OBJECTIVES

Respondents to both questionnaires were asked to outline the aims and objectives of their teaching.

Twenty-four respondents to the human reproduction and family planning questionnaire gave fairly detailed objectives, as did thirty-three respondents for obstetrics and gynaecology. In human reproduction and family planning a further ten respondents gave a brief outline. For obstetrics and gynaecology two respondents indicated outline aims only: one of them was answering for a course which had not begun.

With regard to human reproduction and family planning, a major objective is sound factual knowledge of the anatomy and physiology of human reproduction. Eighteen courses aim to teach students the facts of the physical structure and the physical processes involved. In obstetrics and gynaecology, this is a major aim in fourteen courses, with emphasis on the anatomy, physiology, and biochemistry of reproduction in women and the changes that occur over the normal life-cycle. By the end of the course students should have a sound understanding of these principles.

Almost as important in the subject as a whole (and equally so in the eyes of many respondents) is the need to teach students about non-physical factors in human reproduction. They must understand the social and psychological aura surrounding the whole topic and how problems encountered are often partly or wholly attributable to personal and cultural factors. Nine respondents for human reproduction and family planning stress these aspects—they mention both the psychology of human sexual relationships and the psychological and emotional reactions to pregnancy and childbirth. Fifteen replies for obstetrics and gynaecology were on the same theme: students must learn to see the 'whole woman'—to understand that pregnancy, childbirth and gynaecological disorders have profound psychological meaning, and must always be considered in terms of the woman's family and social

situation. They are family events—so the obstetrician/gynaecologist must understand the role of the woman in the family.

Nine respondents pursued this thought further, in showing how they attempt to teach female reproduction in the perspective of the community. This emphasizes how the health of women is a vital concern, how their health and social status is changing and how unwanted children can be as damaging to a community as to the individual. Seven of these respondents teach what they referred to as 'fringe gynaecology' in their clinical courses.

Altogether twenty-three schools now make this a main objective—in some it is a priority. Many topics are covered—family planning, termination of pregnancy, screening for malignant disease, sex counselling, marital therapy, well-woman clinics, etc.

In human reproduction and family planning too, sixteen respondents present family planning as a form of 'social and preventive' medicine. They hope that students will come to appreciate the importance of the subject and the role of the medical profession. In one course 'special stress is laid on the value of family planning for the family, with resultant decrease in perinatal mortality, child mortality and morbidity and handicap within the community . . . the object being to make the student aware that family planning is a part of medical care in all women of reproductive age'.

Practical knowledge about family planning services and techniques are the objective of sixteen courses. They focus on the 'acquisition of adequate knowledge on which to base sound contraceptive advice and guidance concerning sterilization, including instruction in practical procedures and knowledge of complications of contraceptive measures'. However students are not usually expected to reach a level of competence which would enable them to give more than elementary advice—they should be able to recognize the circumstances in which expert help is required to deal with contraception, infertility, and with psychosexual problems, and should be able to direct patients to the appropriate sources (three replies) and it is recognized that postgraduate training is necessary for any doctor whose practice includes more than a modicum of this sort of work (seven replies). In obstetrics and gynaecology too, three respondents made it clear they have defined their objectives to fit what they see to be undergraduate needs: the techniques and specialist practices are omitted as far as possible, and teaching concentrates on principles and attitudes.

One of the main stated purposes of four courses in reproduction and family planning, all of them held in the early years of the curriculum, is the health education of the students themselves: it is not part of their vocational training so much as for their own benefit. Learning about sex, sexual mores, and about methods of contraception, is necessary to them personally.

Other objectives reported in the obstetrics and gynaecology questionnaire were more clinical: most respondents however gave both affective and cognitive/skill objectives. Indeed six respondents explained that they aim at a balance of the scientific and compassionate approaches and of clinical knowledge with caring skills.

Seventeen obstetrics and gynaecology courses are concerned to ensure that all students become competent at interviewing and taking a history, and conducting a physical examination with obstetric and gynaecological patients. Three of these respondents and one other regard the instruction and practice of these skills as part of the students' general clinical training—their course is simply adding to the repertoire of clinical and problem-solving skills which, in turn, are further developed through application in this branch of medicine. The course helps to give the all-round clinical skills which they must attain by the time of graduation.

Interviewing and taking histories are essentially a matter of communication. To be able to talk naturally and without embarrassment about normal functions, to be able to discuss problems with patients from all walks of life in language they can understand, to be able to avoid sentimentality and pomposity—in other words to respond to women as human beings—can be one of the most valuable results of this course. This was stated by five respondents.

The majority (27) of replies stated that they aim to teach 'basic' obstetrics. Students will learn about normal pregnancy, normal childbirth, and some of the more common abnormalities, and about antenatal and post-natal care. Four courses give importance to teaching 'obstetric first aid'—how to recognize and how to handle emergencies—but generally the emphasis is on 'normality'. Three courses give particular attention to pregnancy as it affects other systems of the body and other medical conditions: how a pregnant woman is more vulnerable or is affected other than typically by illnesses or other hazards, and conversely how pregnancy may complicate the symptoms and the management of other conditions, physically and psychologically.

Similarly, a 'basic' experience of modern gynaecology is the objective in twenty-seven courses. Students will be introduced to the more common conditions and the more 'important' of the less common ones, and will see how they are treated. It is hoped that by qualification they will reach a 'family practice level' of competence in recognizing and managing gynaecological problems: they should be able to give their future patients up-to-date advice and to know when to refer them to specialists even if they have no further training. The approach is generally 'medical' rather than 'surgical'.

Neonatal care features in six schools' courses in that it is considered a responsibility of the obstetrics and gynaecology course. The well-being of the unborn and newborn child is demonstrated to be as much a concern of the obstetrician as of the paediatrician.

Respondents to the questionnaire on human reproduction and family planning were also asked to outline the subject-matter of their courses. The biology of reproduction and the reproductive process is examined in nineteen courses. Normal sexual behaviour is examined in eleven courses in some detail from the psychological point of view among others, and sexual problems, deviation and deficiencies are discussed in thirteen courses: eight replies mentioned both. The subjective nature of the terms 'normal' and 'abnormal' is discussed.

Three replies mentioned puberty and adolescence and the special problems associated with them.

Social and demographic aspects feature in a total of nine courses. Particular reference was made to the special needs and attitudes relating to family planning of different social groups such as 'problem families' (three replies), the global population explosion and the problems of the third world (four replies), and the changes in the role, size, and structure of the family in western society, and the implications of new social attitudes towards women and children (seven replies).

The problems of unwanted pregnancy and termination are discussed in twelve courses—social, ethical, and technical aspects are explored. Methods of decreasing fertility are taught in some detail in twenty-nine courses (though the scope is somewhat different in medical schools in Eire compared with those in the UK). Eight also stated that they discuss problems of infertility.

TEACHING METHODS: NON-CLINICAL

Respondents to both questionnaires were asked questions about the methods used in teaching.

Lectures are used for human reproduction and family planning in thirty schools and for obstetrics and gynaecology in twenty-five schools. Three schools use them for neither purpose; five respondents mentioned that they keep the number of lectures to a minimum and would dispense with them altogether if they were not such an economical method of conveying factual information. In a few cases they are part of a co-ordinated multispecialty series. At one school a series of 'advanced' lectures in the specialty is given which students may attend if they wish.

Discussions in large-group settings—symposia, seminars, conferences—are used for the teaching of human reproduction and family planning in twenty-three courses and that of obstetrics and gynaecology in twenty courses. One school runs a special all-day conference on sex and family planning, and special afternoon 'teach-ins' are a feature in one or two other schools. Small-group sessions are the most popular teaching method, however: all schools have them. They are used in thirty-three human reproduction and family planning courses and all thirty-four obstetrics and gynaecology courses.

Independent work by students is a feature of a number of courses. In human reproduction and family planning they are required to carry out research projects in seven schools, and projects or essays are required in sixteen obstetrics and gynaecology courses.

Audiovisual and other teaching aids are used to a considerable degree. Tape/slide programmes are available in twenty-one schools for students to study whenever convenient. One of these schools also has student-operated videotape players. Cine-films and film-strips, particularly on sex and family planning, are shown in sixteen courses. Television facilities, live or recorded, are used to teach obstetrics and/or gynaecology in six schools. Models of the female pelvis and simulated patients are used in twelve schools: for reproduction and family planning in six cases and for obstetrics and gynaecology in nine cases.

Altogether respondents from thirty-five schools reported using teaching aids of one sort or another: that is all responding schools except those whose courses have not begun.

CLINICAL TEACHING: HUMAN REPRODUCTION AND FAMILY PLANNING

Teaching with patients was reported in thirty-three of the replies to these questionnaires: this is mainly because some or all teaching of the topic is subsumed in the clinical course in obstetrics and gynaecology. In-patients were mentioned in four cases, while out-patients, for example antenatal and post-natal clinics, are used in ten. Attendance at family planning clinics is organized in twenty courses. Home visits are arranged in two courses.

Further details of clinical teaching in human reproduction and family planning appear in the sections which follow.

CLINICAL TEACHING: OBSTETRICS AND GYNAECOLOGY

Several questions inquired into various aspects of clinical teaching. Replies were often elaborate and detailed.

Teaching in the Different Clinical Situations

Respondents were asked to describe the relative roles of different learning experiences and clinical settings in their courses. These may be rather different for obstetrics and gynaecology, and would be different for junior students compared with senior ones (when the course is given in two stages).

Five respondents consider that specific teaching activities are the most valuable part of the course; that is situations which are principally planned for teaching as opposed to patient care. One respondent on the other hand said that patient-care activities are the most valuable; in these situations staff are primarily concerned with the needs of patients and not those of students, and the situations themselves (ward rounds, clinical, etc.) would be organized in exactly the same way whether students were present or not. Five respondents place the greatest emphasis on students' own contact with patients, without the mediation of staff. (This is not to say that 'active' teaching does not take place, nor to any less extent than in other schools where it is considered more important, but the individual student talking to individual patients, becoming involved in their progress, is regarded as the ideal way of learning.)

The longer-lasting relationships are formed with in-patients and several respondents see ward experience as the foundation of the course: another reason is that it provides opportunities for longer sessions with patients for history-taking. Out-patient clinics were mentioned by eight respondents as being essential for demonstrating a variety of the more common and less acute gynaecological conditions which are not seen with in-patients. Thirteen respondents mentioned sessions in the operating theatre, but do not regard them as a priority: they can be useful in showing a student what actually happens so that he or she can explain it with confidence to future patients, but mainly in allowing students to practise internal examination on a relaxed patient. Five courses include sessions at radiotherapy clinics.

Students on five courses do not receive any teaching outside hospital—the respondents regret this: students in nine schools however, receive a significant amount of non-hospital teaching in obstetrics and gynaecology. This is in GP surgeries, health centres, welfare clinics, and local family planning and antenatal clinics.

Fifteen respondents were not able to select any single clinical setting or mode of learning as the most 'important'. They are all used and are complementary to each other, and together they make the course balanced and comprehensive. In-patient experience is used 'to gain experience in history taking and examination and to learn methods of patient investigation and follow-up and to see a variety of clinical conditions'. Out-patient experience is used 'to see a selection of clinical conditions and to observe how patients are handled in terms of interview and examination . . . and to gain further experience in practical skills'; visits are used 'to see the methods of dealing with obstetrics and gynaecological conditions in their community setting and to see how other than hospital services are organized'.

Case conferences as a form of patient-related teaching are used regularly and successfully in eleven courses. Pathologists and specialists

in therapeutics would be among the speakers and might conduct the whole conference, which normally relates to in-patients.

A high proportion of the students of seventeen schools spend some of their clinical attachment time at a maternity or district hospital away from the medical school: sometimes they scatter over several counties. This is for obstetrics, rarely for gynaecology, and excludes the 'main' or 'teaching' maternity hospital if this is a central one though separate from the general teaching hospital.

Clinical teaching group size—'the number of students round a bed'—was inquired into briefly. Many respondents see this as a crucial factor in clinical teaching. If the number of students taking the attachment at the same time is large, they are often subdivided and the smaller teaching groups sent to different units and different hospitals.

Thirteen schools arrange for no more than 5 or 6 students to be in any teaching group. In five, the group size is between 6 and 10–12 although none of them gave 12 students as the average. Some were unable to give an exact figure, for example because the new course has not yet found its permanent state. In schools where the course is given in two stages it was noticeable that the full-time residential period sees very low numbers of students per unit: only 1 or 2 (one school) or 2 (four schools). However several English schools achieve a low number during their single period of attachment: 2–3 students at a time (two schools), 2–4 (three schools), 2–5 (one school), and 3–4 (one school).

Naturally the numbers vary according to the activity. In-patient teaching generally involves the whole group of students, but out-patient clinics and family planning advisory sessions normally involve fewer students. A dozen schools in fact arrange for only one or (maximum) two students to be present at such a consultation. In theatre and in the labour ward a similar low number would be present, in some schools at any rate.

Student Experience of Emergency Care

Twenty-seven respondents consider that special arrangements exist in their schools to provide students with 'emergency' experience. Six do not operate special arrangements but if an emergency occurred while students were present they would be expected to attend and perhaps assist. Two respondents in Eire do not make any special arrangements and think it neither necessary nor desirable. One department gives instruction in first-aid procedures in obstetrics to all students.

Residence is required of students in thirty-one schools. At two of the schools not requiring residence the shortage of accommodation is the reason for it—and one of them requires students to attend on 'waiting nights'. Thirteen schools specify residence in both obstetrics and gynaecology separately. A 'call' system to summon students is operated

in sixteen cases. The time spent in residence varies from school to school not only in amount (from two to twelve weeks average) but also in its proportion of the total clinical attachment time. In six schools virtually 100 per cent of the main clinical attachment is residential. In others, half the total time is spent in residence while in others again, it is a minority of the time. (The figures do not include intermittent nights on duty and 'waiting days' over and above the residential block.)

At one school, in the main teaching hospital 'students are provided with a reading and audiovisual room in the delivery unit to encourage them to be readily available for any obstetric or neonatal problems as they arise'.

Students are attached to the maternity 'flying squad' or its equivalent, for perhaps one night or on a rota basis, in eleven schools.

Specified Requirements and Experiences: Student Responsibility

Twenty-seven departments specify in advance what cases, conditions, procedures, and events their students should experience. Nearly half of them (twelve) have a system for recording what each individual student has seen and performed, and so does another which does not operate a list of requirements. Six departments neither specify nor record these student activities.

A frequent arrangement is to assign a student to a patient in order to write up a case-study and such reports contribute to the assessment of students in twelve schools. At an English school, for example, students submit a total of eight case records and commentaries at the end of the attachment, each from a different field: this ensures a spread of clinical interest and background reading. At least one major gynaecological operation must be included. The fields are: a medical and surgical disorder influencing pregnancy; an antenatal problem; a condition leading to operative delivery; a puerpural condition; a malignant or pre-malignant disorder (or suspected disorder); a menstrual disorder; an endocrine or infertility problem; and an infection or venereal disease.

At three of these eleven schools and at two others, the students' notes on their assigned patients are part of the patients' permanent record, and one respondent added that student notes are the only ones in the official record of their patients although they may be corrected.

In fourteen schools the students must carry out a specified number of deliveries themselves. At eight of these and thirteen altogether, their attendance at clinics is laid down in advance, as to the minimum number of attendances at each type of clinic. At six schools, a handout is given to all students indicating the topics and the conditions to be covered during the course, which they must endeavour to see at first hand.

Respondents were asked to indicate on a pro-forma the level of students' practical experience and the extent of their normal permitted

Table A. *Practical Experience*

Procedure	No. of Schools in which Students would: *See Procedure*	*See and do Procedure*
Subcutaneous injection	23	7
Intramuscular injection	28	13
Venepuncture	32	29
IV drug administration	32	19
IV blood and fluid administration	32	22
Bone marrow aspiration	6	0
Lumbar puncture	6	0
Abdominal paracentesis	19	0
Pleural fluid aspiration	4	0
Microscopic examination of urine	22	19
Biochemical examination of urine	19	16
Haemoglobin estimation	15	6
Staining and examining a blood film	8	3
White blood cell count	6	2
Estimation of erythrocyte sedimentation rate	10	6
Wound suturing	31	27
Anaesthesia: local	31	26
Anaesthesia: general	27	1
Endotracheal intubation	28	3
Cardiac resuscitation	na	na
Vaginal examination with speculum	33	31
Assisting at confinement	33	33
Procedures frequently added by respondents (max ≠ 33)		
Taking cervical smear	17	14
Forceps delivery	11	4
Foetal heart recording	11	2
Amniocentesis	11	0
Perform/repair episiotomy	8	8
Caesarian section	8	1
Induction of labour	7	1
Epidural anaesthesia	7	0
FP fittings	6	4
Curettage of uterus	6	1

responsibility. In the first case, they were asked to indicate which procedures out of a standard list students would normally be expected to have seen or done in the specialty by the end of the undergraduate course: the list, together with the results for the thirty-three schools which answered this question, appears as Table A.

Similarly, the level of responsibility entrusted to students was investigated by presenting respondents with a list of responsibilities which students might be given, and also asking them to indicate for each one whether it would 'routinely', 'occasionally', or 'not normally' be entrusted to students by the end of the undergraduate course. The list, together with the results, appears as Table B ($N = 33$).

Table B. *Responsibility entrusted to Students*

Responsibility	No. of Schools in which the Responsibility is entrusted to Students		
	Routinely	*Occasionally*	*Not Normally (or na)*
The results of students' initial examination and history taking form a part of the patient's records	18	13	2
Students' records of the patient's progress and treatment form a part of the patient's record	12	12	9
Students recommend medication	1	2	30
Students recommend clinical/laboratory investigations	2	9	22
The practical arrangements for clinical/laboratory investigations which involve other departments (eg radiology, bacteriology) may be entrusted to students	1	7	25
Students might be a 'first contact' in an emergency	1	12	20
Students assist the operator in the theatre	16	17	0
Senior students have the opportunity to play a role in the clinical team similar to that of pre-registration house officers	9	14	10
Senior students act as student assistants ('locums') in the absence of house officers	7	19	7
Students act as a contact between the hospital and patients' relatives	2	4	27

Attitudes to practical tasks and responsibilities vary considerably. A number of respondents believe technical skills are not important and the actual tasks expected and performed may vary with the hospitals and the consultants. In some situations students are strongly encouraged to propose investigations and medications or to take up locum appointments as house officers, while some respondents feel this to be most inappropriate.

'SPECIAL FEATURES'

Both questionnaires asked respondents to select the features of their teaching which they believe are the most valuable or interesting. They could relate to the whole course or to individual elements, and could be

objectives, teaching methods, or subject matter. Most respondents selected more than one aspect of their teaching as a 'special feature'.

The structure of the course was referred to under this question by several respondents: three have found that concentrated teaching on family planning or reproduction, either as a special separate course, or as a special section of a major course, is most effective. It emphasizes to students the importance of the topic. However, two respondents for human reproduction and family planning claim that their policy of 'dispersed' teaching is the better one: there is progressive teaching at all stages of the medical course so that by the end of it, students have a comprehensive picture and have not had it thrust on them all at once when they are perhaps not all receptive or mature enough to understand everything. This broad approach allows the different aspects to be taught at the appropriate time.

In obstetrics and gynaecology one respondent mentioned the 'pre-clinical' teaching which his department carries out: it stimulates interest among the students and has, he feels, been very worthwhile. Three respondents mentioned the intensive teaching given at the beginning of their course before the clinical work begins. It serves the purpose of orientation and constitutes the 'core' of the subject, to be exemplified and elaborated upon over the subsequent weeks. A short period of active teaching and supervision is needed before students are exposed to busy clinical units and the full unselected range of clinical problems.

Another course in obstetrics and gynaecology is so organized that the 'theoretical' and the 'practical' clinical teaching are well integrated; they run in parallel throughout the whole full-time period.

Four schools have additional 'courses' in sex education and family planning which were instigated and planned by students. They are extracurricular and voluntary and rely on brief, informal sessions in the earlier years of the medical course. Student initiative is also a feature of seven obstetrics and gynaecology courses where they take it in turns to conduct seminars and chair case conferences. They may choose the topics and/or present papers which are the basis of the meeting.

The advantages of a full-time attachment instead of a part-time one are underlined by the very small number of students attached to a unit for clinical experience, particularly when a large number of 'firms' and hospitals are used: eight respondents are of this opinion—they feel that a full-time programme is much to be preferred. The respondent in this group who has an early part-time attachment followed by a later full-time one has found that students respond very well indeed to the latter. Two of these respondents gave the small size of groups as a 'special feature' in its own right; altogether ten respondents commented on how few students they have at one time. Small groups and a full-time attachment combine to foster very good staff–student relationships: as one respondent put it: 'Teachers and students have a very good relationship

with firm control and yet friendly and caring relationships. This is the main requirement for the good learning situation—respect and informality . . . (and so) . . . students learn to talk freely about sex and reproduction. It helps many of them personally.'

Turning to the features which arise from the approach to the subject and the teaching objectives, it was the scientific character of their teaching of human reproduction which two respondents mentioned here. The biology of reproduction is given most attention and they also give weight to the research in this field, especially that which seems likely to have an impact on clinical practice in the future. In obstetrics and gynaecology at two other schools, students are also encouraged to follow the research programme—an MRC unit is closely associated with one department—and to attend postgraduate meetings to stretch their abilities and give them a greater appreciation of the subject.

However, more courses stress the 'personal' aspects of the subject. The social and the emotional implications of maternity and gynaecological events are brought to the fore in five schools' clinical courses: they insist the patient must always be treated as an individual, with a private life and with feelings which should be discussed openly yet with discretion and understanding. Indeed, the intimate nature of the doctor–patient relationship is explicitly a theme of two courses on reproduction and family planning. Teaching attempts to explain what this concept means and at the same time (as a primary aim) to emphasize how essential a good, trusting doctor–patient relationship is in sexual and contraceptive medicine.

In obstetrics two courses are characterized by a preventive approach. 'Obstetrics is the perfect example of preventive medicine with which it is the students' first encounter. We hope that attendance at perinatal mortality meetings will encourage the student in the idea of constant monitoring of clinical practice and we even hope that this idea may extend into other specialties. They are made aware of the procedures by which maternal deaths are investigated and assessed. We think that for many students they get a new slant on hospital medicine when they realize that the object of obstetrics is basically to help healthy women through an entirely physiological function.' At the other school sharing this approach, about a quarter of clinical teaching is devoted to neonatal medicine—'the link between traditional obstetrics and traditional paediatrics—a critical link in the chain of life'. The whole course emphasizes the 'potential quality of life of the unborn and very young child'.

A number of respondents described teaching methods and practices as 'special features'. Two mentioned the use of videotape to demonstrate the conditions or procedures which it would be difficult (impossible or undesirable) to show live. Under this head, little interest was shown in audiovisual aids which seem to be regarded as only fairly useful.

Independent study or 'self learning' was rated highly in only two obstetrics and gynaecology replies. They refer to tape/slide programmes which are available to students to use in their 'free time'; one of these courses has invested heavily in this medium by putting a large part of 'core' and theoretical instruction on to tape and slide. Another form of 'independent study' is the preparation of essays and case commentaries and writing up case-records, which are a particular feature of four courses, in that a significant part of students' time is spent on them and they have proved to be a valuable learning exercise.

Informal teaching methods are a particular feature of two courses—information and attitudes are imparted through dialogue between staff and students. One of the latter schools in its reproduction and family planning questionnaire chose to highlight the interdisciplinary arrangements for teaching the topic: it would be wrong to present it as a single-subject matter—there are many facets to it and they should be presented by staff with the relevant experience. Four replies in all fell into this category: two referred to special integrated topic courses, another to the policy of treating different aspects of the topic separately in different courses, and the third came from a 'clinical only' school where a very broad view of reproduction prevails. All refer especially to the co-operation which has been achieved among staff of different backgrounds. In obstetrics and gynaecology too, integration of specialties is remarkable in three courses. Topic teaching is very popular and successful, with panels of speakers from different fields together presenting their view and discussing the topic before a student audience.

It was features of practical clinical teaching, however, that aroused the strongest enthusiasm in obstetrics and gynaecology. One school has found that using a very large number of district hospitals for the full duration of the main course is not only unique but gives far more beneficial experience to students than could be obtained in a teaching hospital, even if this were logistically possible. In eight schools the wealth of clinical material is the outstanding feature: there is a wide and representative range of conditions, and the turnover of patients is high and fast enough to ensure that all students are exposed to plenty of patients of all types.

Eleven respondents reported a very high degree of student involvement with patient care as their 'special feature': actual teaching takes second place to direct contact with patients and students are encouraged to spend their spare moments on the wards, talking to patients and assisting the medical and nursing staff in routine tasks. This is why the residential period is often the heart of the course and the part that students enjoy most. For example: 'Clinical residence with a carefully detailed programme keeps a student very much "on the run". Our key is practical work—see the phenomenon take place, then look it up. This is my instruction when I receive a new class. I see obstetrics and

gynaecology as a practical discipline enjoyed by students because they *act* and do not only listen and learn. They have a status given them . . . and they enjoy feeling that they matter.' In three of these courses it is considered especially valuable that students are often the first to see new patients and take the history from them. Out-patient teaching has become very important in another course—the weight of teaching has shifted away from the ward to the clinics where problem-solving skills can be acquired in 'problem-oriented' teaching.

Two respondents emphasize that their ward rounds are genuinely 'teaching' ward rounds and staff take great pains to keep the discussion relevant to students' needs. One of these departments has special facilities for observation by students built into the operating theatres: 'teaching operations' are conducted and this is considered a very special feature.

STUDENT ASSESSMENT

Both questionnaires contained questions on student assessment.

Human Reproduction and Family Planning

'Critical' assessment in human reproduction and/or family planning was reported from thirty-five medical schools; the topic is included at one or more stages of each school's professional examination structure.

Except for the two preclinical schools the topic figures in the 'end-of-course' professional examination in obstetrics/gynaecology (see below). The exact form will vary from school to school and from year to year; some respondents were more specific than others about the role it takes. At one school the social, behavioural, and administrative aspects of the topic are included in the professional examination in community medicine (with social sciences). At nine schools a critical assessment in the topic is held during or at the end of the preclinical phase of the medical course: the topic contributes to the second MB or the equivalent. The two 'preclinical only' schools belong to this group, some of whom have separate courses which are assessed either separately or as a discrete component of multi-subject assessments, and some of whom schedule the topic among various 'major' preclinical subjects for both teaching and assessment.

In-course assessment of the topic was reported in thirteen questionnaires; again this is normally practised as an integral part of obstetrics/gynaecology (see below). However two special courses in the early years of the course have their own in-course assessment systems: one of these is 'critical'.

Obstetrics and Gynaecology

All responding schools reported in-course assessment of some sort in obstetrics and gynaecology. A report (often graded) is compiled by the staff of the clinical unit to which a student has been attached, in twenty-five schools: these comment on knowledge and performance during the attachment. Two departments set written essay-question papers for their students: nineteen schools set MCQ papers. Clinical examinations on cases are held in or towards the end of seven courses; orals are held in ten. Research projects and/or written-up case studies, often a considerable number of them, are required for assessment purposes in fourteen courses.

In-course assessment using one or more of these methods contributes marks to the final and professional examination result in eight schools: it is therefore 'critical' in these cases. In five schools in-course assessment can exempt a student from a further major examinaton in the subject: in two of them it is a part of the 'final' clinical examination from which students may be exempted if they do well enough in their full-time clinical attachments. At two of them the assessments held at the end of the clinical attachments, which are based on written, clinical, and oral examinations, themselves constitute the final and professional examinations, though each group of students takes them independently: a supplementary examination is held for all failing students together. 'Before and after' MCQ tests are conducted in one department and are planned in another: they are used 'formatively' and have proved equally useful for student assessment and to course evaluation. In most cases the performance on in-course assessment is only 'critical' in identifying the very weak students who might be asked to repeat the course.

Class assessments were reported from five schools: these are given to the whole class, at the end of a year, for example, but do not constitute the qualifying examination itself: two are exclusive to obstetrics and gynaecology but the other three are combined with several other clinical subjects. One school sets written essay question papers; three set MCQ papers; two conduct clinical examinations and one of them uses oral examinations. Partial exemption from the 'final' qualifying examination is possible, according to how well a student does in the class examination, in two cases. Forwarding of marks to the final qualifying examination occurs in two cases also.

Obstetrics and gynaecology figure prominently in the final, qualifying examination system in all medical schools with clinical courses, although in two schools (see above) the examination is taken in rotation. The examination is separate in obstetrics and gynaecology alone in twenty-six schools, including all London, Irish, and Scottish ones. In three schools the examination is associated with child health: together they

form a separate component of the final examination. Obstetrics and gynaecology is combined with several other major subjects in integrated examinations at seven schools, including one where there is also a more important separate examination.

In several schools the final, critical examination in this subject is held before the end of the clinical course and at a different time from the final examinations in other clinical subjects; often this is at the end of the penultimate year.

PROBLEMS AND DEVELOPMENTS

The two questionnaires asked identical questions about recent change, future change, and the problems and constraints which hinder developments.

Organization and Resources

Four of the early 'special' courses on the topic of reproduction are new. Another school is planning a new course in a similar style; it will be removed from the present course in growth and development to concentrate more fully on 'Human Sexual Relationships and Conception Control'. Over-all curricular reorganization in another school is likely to affect arrangements for teaching human reproduction and family planning. Meanwhile a school offering only a clinical course is engaged in 'trials of multi-disciplinary courses (on sex education generally), where in addition to medical students there are representatives from other groups in training e.g. nurses, midwives, social workers, health visitors, teachers etc.'

In obstetrics and gynaecology less time is now allocated to the subject than formerly in eight schools: often the time is being made available to 'new' subjects introduced into the curriculum. However three schools are allocating more time to the subject; in one, the period of full-time clinical experience will be doubled and the earlier part-time experience and 'theoretical' teaching will be abandoned.

Five clinical courses have been re-timetabled significantly and two of them now consist of full-time, final year, in-depth residential appointments (although one of them has some earlier clinical sessions). Altogether seven clinical courses are or will be affected by major curricular reorganization. Three respondents believe their clinical attachment is now too short and held too frequently. In human reproduction and family planning, six respondents would like greater time, especially for opportunities for clinical contact with patients and the family planning services.

Increased timetabled teaching in the early years of the medical course was mentioned by several respondents in one or other questionnaire. The topic of reproduction and/or family planning has recently been

emphasized in six 'preclinical' courses. Two respondents for obstetrics and gynaecology reported that they and their staff have begun to teach in the preclinical years with basic medical science teachers. Two others would like to see more 'vertical' co-operation with preclinical staff, perhaps planning courses together and making contributions to each others' courses, to bridge the gap between preclinical and clinical studies. Four respondents in human reproduction and family planning would like better arrangements to be made for the topic in the early years: not merely more time but more deliberate provision, establishing it as a separate topic and relating it to clinical practice and human beings, rather than as yet another part of the routine syllabus. Participation by clinicians would improve the teaching.

Five schools will see stronger efforts at co-ordination of teaching, both 'internally' within the subject and 'externally' with respect to other courses and departments. In human reproduction and family planning four respondents feel that the staff immediately responsible for teaching the topic and building up its role in the curriculum can go no further without more active support from the medical school. There is not yet a positive policy for the topic and a decision is required as to the level of priority to be given. One respondent has found 'slow acceptance even among obstetricians and gynaecologists of the value and necessity of teaching family planning, etc., to medical students'. The academic department in another school has found the NHS staff who teach most of the students for at least some of the time do not share its views about 'social gynaecology'. They disagree over its role in clinical practice, the desirability of teaching it and how much and what type of problem to teach or to exclude: ethical disagreements exist too.

Clinical facilities and access to them cause considerable problems in several schools. Six respondents have to contend with the geographical problems presented by the hospitals and clinics being some distance away from the medical school and the main teaching hospitals. In obstetrics and gynaecology this leads to feelings of isolation in two schools, but in five cases where reproduction and family planning have to be taught there are practical difficulties in getting students and patients together, especially where only brief sessions are possible or the special clinics are at hospitals but scattered. Using a large number of hospitals for the full-time clinical attachments gives rise to problems due simply to geography. Central contact with students is diminished and the academic unit cannot easily control the programme in the distant hospitals. Twelve respondents mentioned the problem, although new buildings will soon bring greater centralization of teaching for two of them.

Of course, there are also advantages in using other hospitals for clinical attachments—one respondent would like access to more hospitals urgently. His department and another have been hit by the falling

birth-rate: there is decreasing clinical material for teaching obstetrics. Generally however the opposite situation still prevails; the patient load and other service commitments make heavy demands on staff time, leaving less for their students. Also student numbers are increasing without additional staff posts being created—two respondents are particularly anxious at the prospect. Altogether seventeen schools, in one or both of their questionnaires, reported alarm at the staff–student ratio and the staff–student–patient ratio. The position is felt to be extremely serious in many of them.

Substituting actors for 'live' patients would provide a valuable new resource for two respondents. They are not suffering from a numerical shortage of patients: the problem is one of patients with conditions and requests which must feature in the teaching programme who are reluctant to take part in it or whom the staff are very reluctant to ask. Using actors would allow students to practise interviewing and counselling. In gynaecology and in family planning the nature of the patient's complaint and the need for privacy and for free communication between doctor and patient make teaching in a 'real' situation fraught with difficulties (four replies). If a one student–one patient–one doctor system is practised then each student will see very few patients with this sort of problem and the experience while valuable and realistic will be limited (two replies). In Eire there are particular difficulties in introducing students to all aspects of modern gynaecological care and in discussing family planning in a clinical context (three replies).

Space for seminar and tutorial rooms—but in particular consultation rooms which preserve the intimacy and privacy of one student–one patient interviews—is severely lacking in seven schools. It was mentioned in five replies to human reproduction and family planning and in five replies to obstetrics and gynaecology. Often the accommodation is inadequate in design and appearance as well as amount. Residential accommodation for students is reported as insufficient at four schools.

Audiovisual resources have increased and are increasing. Two obstetrics and gynaecology departments have expanded their facilities recently and together with nine other departments, plan to expand further. These departments intend to develop their television facilities and to use them in training students in interviewing skills. Five of the same departments reported that audiovisual aids will be put to greater use in future teaching of reproduction and/or family planning. Three others expressed a wish for aids, especially videotape recorders. A particular advantage is that they are often more appropriate and less embarrassing than using live patients before a student audience.

Teaching Activities and Content

Changes in the emphasis of teaching and in the methods of conveying it are often closely allied. Six courses in obstetrics and gynaecology

for example have recently been rearranged so that teaching is more 'planned': there is less of the 'apprenticeship' style of learning, and staff give priority to students' understanding the basic physiology and the principles and processes of the pathology of the reproductive system, rather than the more detailed and esoteric know-how of the specialty. While there is probably more contact between students and senior staff there is also more instruction by tape/slide programmes. Reorganization of the timetable frequently stimulates a redefinition of objectives and concomitant reappraisal of methods.

A total of eight courses are now less 'technical' in their teaching; there is less surgery in the theoretical instruction and in the clinical attachments; students are not expected to acquire the manual skills and the appreciation of operative surgery that used to be the case. In obstetrics four schools consciously give less attention to the minutiae of childbirth and its complications, and more to the principles and methods of antenatal and post-natal care. They stress the preventive aspects of obstetric care and their value for both mother and baby.

An important change is one which is affecting courses in obstetrics and gynaecology and human reproduction and family planning equally: this is the increased attention being given to sexual relationships and sexual problems. One department has now a senior lecturer in family planning and 'this formalization and expansion of teaching in this topic coincides with the expansion in the availability of services for clinical attachment and there is now a very wide spectrum of experience available to the student, which includes contraceptive advice and prescription, vasectomy counselling and youth advisory sessions'. Four schools will emphasize family planning even more in the future and one of them intends specifically to bring vasectomy and the male side of family planning into the teaching programme.

In parallel there is a greater emphasis on the social and psychological aspects. One respondent has found that students are sometimes too shy or too ignorant of sexual practices to ask really searching questions or to realize what the patient is trying to say. Here is one reason why clinical contact is for the student's benefit and why another school would like to extend it: 'we try to make human sexuality an ordinary uncomplicated part of our daily teaching, and get the students to talk easily about it to patients. We stress the frequency of sexual problems.' Indeed four respondents indicated a greater degree of student participation in patient care. This was reported in two human reproduction and family planning questionnaires and two obstetrics and gynaecology questionnaires.

Three respondents would like to 'de-hospitalize' the teaching of family planning and to use the community services instead. They and a fourth respondent intend to experiment in this direction and to establish links with the staff who teach community medicine and general practice.

One is to introduce a project on a family planning topic to be undertaken in the community. Another respondent would also like students to conduct a research project on the social and psychological aspects of reproduction, motherhood, and family life, as part of the obstetrics and gynaecology course. Topics such as demography, population problems, and community health will feature in another course, and staff from the London School of Hygiene and community specialists within the school will contribute their expertise. Three respondents would like to involve general practitioners in their course.

Altogether changes which have significantly affected teaching were reported from thirty-four medical schools. There are definite plans for future developments in twenty-six schools.

Ophthalmology

Questionnaires were completed in respect of the teaching of ophthalmology by all thirty-five medical schools offering or about to offer clinical courses, except one whose clinical course has not yet begun: the latter was able to send certain details of timetabling.

TEACHING ARRANGEMENTS

Ophthalmology may be taught to undergraduate students in one of two general arrangements: students may receive both 'theoretical' and 'practical' (patient-based) instruction either in a full-time or half-time attachment to the specialty (nineteen schools) or in a more fragmented fashion, on a day(s)-a-week or even more 'occasional' basis (sixteen schools, including seven Scottish and Irish ones).

'Theoretical' aspects of ophthalmology are included in the major systems-based co-ordinated series of lectures and discussions in five schools where it has a regular block: the 'clinical' course or attachment is then devoted mainly to patient-based instruction.

At four schools ophthalmologists take part in the introductory course in clinical method, a multidisciplinary course held before the start of the clinical course proper when students are principally taught how to examine the various systems of the body. At two of these schools the ophthalmologists' contribution is brief: ophthalmology itself is taught entirely separately in its own course. Ophthalmologists can also teach the anatomy and physiology of the eye in the early years of the course, and in four schools formal arrangements are in operation for them to appear in the appropriate preclinical courses.

Although teaching is independent, ophthalmology may be linked in the timetable with other subjects for administrative reasons. In eight schools, it is linked with several other 'special' subjects, and students taking this whole group are subdivided and rotate through them in turn. Similarly, in three curricula ophthalmology is paired with otorhinolaryngology.

Position in the Course; Teaching Time

Ophthalmology is most frequently scheduled in the middle year of the (nearly always three-year) clinical course. It occurs after students have had some clinical experience and acquired basic clinical skills but before they move to senior attachments. In three schools the main teaching effort takes place in the first clinical year, in seventeen schools in the second clinical year, and in seven schools in the final clinical year; in eight schools the main teaching effort is spread or rotates over more than one academic year, but usually towards the end of the clinical course.

Eight schools give their students continuous full-time (or almost full-time) attachments to the subject over a number of weeks. In one school this is for one week, in four for two weeks, in one for two and a half weeks, and in one for three weeks: in the eighth (Irish) school the attachment is over six weeks, almost full-time. Half-time (or one-third time) attachments are given in eleven schools: they are spread over a period of time varying from one-and-a-half to eight weeks. They are generally 'mornings only' or 'afternoons only'. The remaining sixteen schools arrange for students to have more occasional clinical experience of ophthalmology, attachments which are significantly less than half-time and which may well not be continuous.

Taking a one-week attachment as the equivalent of 30 hours of teaching, the average time devoted to the subject in the thirty-five schools is 52 hours (SD 29·5). The range is considerable—from 16 hours in one school and 18 in another to over 150 in a third.

FEATURES

Aims and Objectives

Some general aims or themes were reported which guide respondents in planning their courses. One is the need for students to see as many eye conditions and variations of these conditions as possible: it is believed that no substitute for personal clinical experience can be found which would give students the same degree of confidence and familiarity with eye problems. They should be exposed to the whole range of problems which pass through a normal, busy eye department, and although some cases will be used more intensively for teaching than others, students should not be deprived of learning opportunities by too much selection. The importance of eye conditions is demonstrated in terms of their prevalence in the population and the high proportion of the workload in general practice which they constitute, and also in terms of the distress which they cause to patients. Ophthalmology may be a small subject in the undergraduate medical curriculum, but it is far from trivial in medical practice. Five respondents take this view.

Similarly, ten respondents, aware that most doctors encounter a certain number of eye conditions, feel that it is most important that students should have sufficient training to enable them to recognize any given problem (or know when they do not), and to know whether they can treat it themselves or whether it should be referred to a specialist. (Even students choosing a career in general practice are unlikely to have further training in ophthalmology, it is alleged.) These respondents' courses are designed to give students a certain level of competence in diagnosis and management and concurrently an acceptance of their limitations. Two respondents stressed the difference between undergraduate and postgraduate requirements: they do not teach 'pure' ophthalmology to undergraduates but rather try to teach what every non-specialist ought to know.

Twelve courses stress the interactions between the eye and other systems of the body. Throughout their courses these teachers draw attention to the effect on the eye of physiological disturbances in other parts of the body and how symptoms of various systemic diseases may be detected there. This reinforces and supplements what students learn in general medicine and portrays ophthalmology as a medical specialty, a branch of clinical medicine, and not an isolated entity.

The role of the ophthalmology course as a medium for teaching general principles was propounded by eight respondents. Ophthalmology has of course some special techniques, but what is most important is to give students practice in examining patients, taking histories, and keeping accurate and useful records. In ophthalmology as in all other clinical courses students must be helped to train themselves in clinical method—in becoming sensitive to physical signs and eliciting relevant information from patients, in acquiring the habits of thought implicit in the diagnostic process.

Teaching Methods

Individual aspects of teaching methodology were mentioned where they were considered to be interesting or particularly successful: in some cases these activities reflect the themes described above.

The use of the ophthalmoscope is a major objective of eight courses: by the end of the course, individual students should be reasonably proficient in ophthalmoscopy. One of these schools has pioneered a dual viewing attachment for the ophthalmoscope to enable the teacher to guide an individual student in accurate observation while they are both looking at the identical feature. Another school has developed a set of self-instructional materials to help students learn to use the ophthalmoscope.

Two schools particularly mentioned what is true of most courses, that most teaching is conducted at out-patient sessions. This ensures a

wide range of conditions for students to see, as they attend the different clinics in turn. Two schools issue a checklist of the conditions and procedures which must be seen by all students: these are the 'important' ones which present regularly so that students can fairly be expected to see them. One of these schools and three others are particularly anxious that students should see acute conditions and understand the methods of 'first aid' treatment for eye injuries, and be able to give emergency care themselves when necessary. Alternatively, they should know when a patient requires immediate emergency admission to an eye hospital. Students may be seconded to the casualty department of the eye hospital during their ophthalmology course, or may be called to the casualty department of the general hospital at which they are based, if an acute eye case arrives.

Audiovisual aids are widely used and extremely popular. Eleven respondents have collections of coloured slide transparencies, sometimes in vast quantities, as they are exceptionally appropriate for this subject. Three of them also show cine-films, and six of them, and two others, have produced videotapes and tape/slide programmes.

Small-group teaching is a particular feature of eleven courses; teaching is far more effective when only a few students are present at a time and at these schools the arrangements for rotating students around the various attachments have been successful in keeping the numbers in each group very small.

'Special' seminars occur in two schools. At one, students are always briefed before a clinic with the vocabulary and 'theoretical' information required to benefit from the particular clinic: consultants perform all the teaching duties on this course—no junior staff are involved. In the other a 'teach-in' of seminars and demonstrations lasting two days is held for final-year students.

Topic teaching was mentioned as a valuable feature of three courses where a panel of ophthalmologists and sometimes one or more other specialists discuss a clinical problem from all angles before an audience of students.

Blindness and the social and psychological consequences of deficient eyesight were explicitly referred to in two returns. A blind person gives a talk to the students at one school, and at the other all students are taken to visit a home for the blind.

One respondent mentioned that he uses his material to teach aspects of genetics and statistics—it is an interesting context in which to teach them and underlines their relevance in clinical situations.

Elective programmes in ophthalmology are offered in at least four schools.

STUDENT ASSESSMENT

In Ireland, ophthalmology is always included as a significant element of the professional examinations. Elsewhere it features less strongly: five respondents indicated that it appears only occasionally in professional examinations and other 'critical' assessments and one stated that it does not appear at all. Only two English schools definitely include the subject each year in the written, clinical, and oral examinations.

Seven schools include ophthalmology to some extent in the major critical assessment in surgery. Fourteen schools combine it with several other subjects in integrated examinations, or combine it with different subjects on different occasions. Three Irish schools run separate examinations for their 'special' subjects which examine ophthalmology, otorhinolaryngology, etc.

Sixteen courses include some form of in-course assessment operated by the teaching staff for 'formative' purposes. In four cases a report is written at the end of the attachment, rating each student's progress. Nine schools (including all the Scottish ones) add ophthalmological questions to class examinations which they hold. In at least one school a class examination covering all the 'special' subjects is the only instance of their being examined: it is not a 'professional' examination, but must however be repeated if failed. Marks from in-course assessments contribute to the result of professional examinations in two schools and in that sense the in-course assessment is 'critical'.

Five respondents are dissatisfied with the system of assessment. Three London ones would like a compulsory question to be included regularly in the written 'final' examinations; the two others would like different methods to be used.

PROBLEMS AND DEVELOPMENTS

Resources

Staffing was reported as a major problem. Many medical schools rely heavily, some entirely, upon NHS staff to carry out undergraduate teaching in this subject. Thirteen respondents claimed they have insufficient staff (or insufficient staff time available) to carry out teaching to the standard which they would like to maintain. They are worried also about the staff–student ratio in general: four of the thirteen respondents and eight others have to cope with larger than acceptable groups of students. One school has recently made an academic appointment in the subject, and this was particularly mentioned because it has significantly affected teaching. Four respondents expressed an urgent wish for an academic appointment in ophthalmology, even if it were on a part-time

basis. Two respondents believe their schools should establish academic departments of ophthalmology.

Access to patients is a problem in some areas. Three medical schools with small eye departments do not have enough patients to give students all-round experience unless they go to a special hospital. Two others see that the resources of a specialized hospital are needed but time-tabling and travelling conditions prevent them being exploited.

Four schools complained of insufficient space for teaching students: clinical areas were not designed for teaching activities and some older departments are quite unsuitable. One respondent is concerned at the lack of equipment with which students should practise examining patients: they cannot learn to do so completely without the proper instruments. However, another respondent pointed out that most non-specialist doctors are unlikely to possess the instruments with which to carry out the procedures which ophthalmologists like to teach to students.

Support for audiovisual aids has recently been forthcoming in six schools. Tape/slide programmes for independent study have become available, and handouts have been produced. One department lends a set of slides to each student on attachment to illustrate the topics explained in a detailed manual of instruction which is issued at the same time. Six departments intend to expand their stock of audiovisual material. Three would like to but financial restrictions hold them back; two are hoping for colour television facilities.

Organization of Teaching

The ophthalmology course has been reorganized in eight schools and has achieved a net expansion in two: another school may have a new and more satisfactory course as a result of present curriculum redevelopment. One course has virtually ceased altogether for administrative reasons: it is hoped the lapse is only temporary and the medical school is believed by the respondent to be taking steps to improve the situation. Meanwhile students are not being examined in ophthalmology.

No fewer than a dozen courses were reported to be too short. There is simply not enough time allocated in which to teach the subject properly. Some of these courses are the result of recent reorganization.

Teaching in twelve schools is handicapped by the presence of too many students at once: ophthalmology is a 'bottleneck subject' in them. The problem which is essentially logistic can sometimes be met by re-timetabling: for example by rotating smaller groups over a longer period—which is expected to happen at one school soon.

The position in the course can have an indirect effect on teaching. One respondent would like his course to be held earlier than in the final year when students' thoughts are more occupied with their major final

examinations than with ophthalmology. Another would prefer his course to be held somewhat later than at present when students have had greater experience of general clinical situations.

One respondent would like the methods of examining the eye to be taught in the introductory course of clinical instruction, when basic clinical methods are taught in an intensive fashion, followed later by a full-time specialty attachment. Three others envisage final year 'review' courses based on clinics, to build on the earlier basic course and refresh the students' knowledge and encourage them to put it into practice.

Integration with other subjects is a matter now being explored. Two schools have ophthalmologists who have begun to teach ocular physiology in the early years, in collaboration with preclinical staff. Another has developed links with related clinical specialties and in future the ophthalmologists at yet another school are to conduct topic-teaching with general physicians. Six respondents expressed a desire to establish closer links with other clinical subjects (for example, general medicine) so that joint teaching sessions could be arranged concerning topics of mutual interest.

An inherent difficulty in designing an undergraduate course in ophthalmology is that excessive pruning to the level of 'what the non-specialist needs to know' could do a disservice to the subject: students will not appreciate the scope of the subject and assume they have learnt more of the whole than they have (one answer). One respondent pointed out that a suitable undergraduate course is a false ideal until adequate postgraduate training for general practice (and possibly other areas) includes some advanced ophthalmology.

The changes in content which were reported focused on giving the course a greater clinical flavour. Three courses have recently been reformed to give students more contact with patients: for example at one London school students are given some responsibility for in-patients —a patient is allotted to each student for him to follow through from admission to discharge, including assistance at the operation. Two courses will give more time to clinical exposure in future and three other respondents are trying to find ways and means of bringing students and patients together more, so that an increased number of acute conditions are seen and students can practise the skills they have acquired.

Stronger emphasis on the recognition of physical signs and on diagnosis is now the policy in two schools: there is less 'theoretical' and 'surgical' ophthalmology than before. However, at one of these schools there is also less 'raw' clinical experience: learning has become more selective and structured—cases are demonstrated and staff plan the sessions more carefully.

Stereography has been introduced into one course. In two schools, teaching has been improved by centralizing the 'core' instruction: lectures and demonstrations are presented to the whole class of students

together. In future the course at one school is to be constructed around tutorials in place of lectures.

Altogether, nineteen replies indicated that important changes have recently been introduced; seven will continue to introduce changes and four other schools have definite plans for teaching reform, major or minor. Embryonic plans for reform, with varying possibilities of success, were reported from eleven schools.

Orthopaedics and Trauma

Questionnaires on the teaching of orthopaedics and trauma were completed by all thirty-five medical schools offering (or about to offer) clinical courses; one of them whose clinical course had not been planned in detail, sent only outline details of timetabling, etc.

In analysing the questionnaires it soon became apparent that orthopaedic and traumatic surgery are not synonymous and that various respondents interpreted 'Trauma' in different ways. The title was intended to cover the surgical aspects of accident and emergency departments; respondents found it easier to answer for these aspects in schools where 'accident and emergency' is a part of the orthopaedic course and when the orthopaedic staff have recognized responsibility. However, in some curricula, an attachment to the accident and emergency department is timetabled separately from the orthopaedic course and may be linked with other courses in intensive care, anaesthetics, or unrelated minor subjects: students frequently spend nights or weekends in accident and emergency departments during their periods of residence in general medicine and general surgery. (Such teaching will not be considered further here: for further information, refer to the respective reports.)

TEACHING ARRANGEMENTS

Orthopaedics is a completely separate entity in the curricula of eleven schools. It is timetabled on its own and both theoretical and clinical teaching are given during the orthopaedic course. At sixteen schools the theoretical information is given as part of the main course of clinical theory which is either a series of systems-based lectures or a topic teaching cycle: the locomotor system is one of the sequence of systems discussed. The 'practical' clinical patient-based instruction is therefore separated in time from much of the formal instruction.

Orthopaedic surgeons contribute to the multidisciplinary introductory course in clinical method at six schools; they teach the basic

methods used in examining patients in their specialty at a time when students are being introduced to the techniques of physical examination and history-taking in general.

In eight schools, orthopaedics is a partner in an integrated attachment with rheumatology and sometimes rehabilitation: the combined clinical programme emphasizes their common features. (One school returned a special questionnaire describing its six-week course in orthopaedics and rheumatology: each takes a half share in the attachment and 'traumatology' is included in the orthopaedic section. The whole programme is co-ordinated informally by a staff member from each department working together. A few teaching sessions are integrated, but there is a great deal of co-operation in patient management which underlines the mutual objective of teaching the medical and surgical aspects of the diseases of bones and joints. Their 'common background of anatomy, physiology, pathology, etc.' makes the co-ordinated programme 'more logical and economical'.)

In three Irish schools the orthopaedic courses are arranged under the general umbrella of 'surgery' and are not timetabled as for fully independent ones.

Position in the Course; Teaching Time

The main teaching effort occurs in the first clinical year in eight schools, in the second clinical year in twelve schools, and in the final clinical year or stage in four schools. In the remaining schools, it rotates over more than one academic year or teaching is divided into two or more modules.

Ten schools give students full-time clinical attachments to orthopaedics, varying from two to eight weeks in length. Twenty-one schools provide occasional or part-time attachments, up to eight weeks in length, three-quarters time; three Irish schools do so also, but less intensively.

The average time devoted to the subject, treating one full-time week as the equivalent of 30 hours, is 127 hours (SD 52·6). Further details are given in the table below: however, in two schools the amount of time varies and they are therefore excluded.

Teaching Time (hours)	*No. of Schools*
Up to 50	3
51–100	6
101–50	14
151–200	8
201+	2

FEATURES

Aims and Objectives

Most respondents indicated the character of their general approach to teaching their subject to undergraduates. They described the themes or principles which guide them in planning their course and which justify their role in the undergraduate curriculum. One such theme is the integrating role of orthopaedics. Eight respondents pointed to the way it makes anatomy and physiology 'come alive', and to the mutual interests with rheumatology. It transgresses boundaries between pre-clinical and clinical, and between medicine and surgery. Indeed the primary purpose of combined orthopaedics/rheumatology attachments is to demonstrate the basic principles of caring for the human musculo-skeletal system. These eight courses focus on the system rather than on the specialty: students are being trained to understand the musculo-skeletal system and the hazards it faces, not to become orthopaedic surgeons.

Another advantage of orthopaedics from the teacher's point of view is its 'very clinical' nature: it is an excellent ground for developing students' competence in clinical methodology. It has a special contribution to make to their general education, allowing them to gain confidence in handling patients and correlating signs and symptoms in a not over-specialized specialty. Nine respondents share this attitude: 'The elicitation of clinical signs is relatively simple, a matter of observation and palpation, and the connection between the clinical signs and the underlying pathological and anatomical changes is usually direct and simple. In this sense it is a very rational subject. Similarly, treatment is in general rationally related to the underlying pathological process and the student can fairly easily understand the connection between the diagnosis and the treatment.' Basically for these reasons, nine courses try to give the maximum possible clinical teaching and the minimum of 'theoretical' teaching without patients. The object is to give students the direct clinical experience which is the best way of learning what orthopaedics has to teach. Two of these respondents and a third one are determined to show students the whole range of clinical problems referred to orthopaedics departments: this will give students a wide exposure instead of a selective one and enable them to recognize the majority of both acute and chronic conditions.

The trauma aspect of the subject is felt to be particularly valuable in demonstrating clinical decision-making and selection of priorities in urgent situations (two schools). This is part of accident surgery in the broadest sense—including acute orthopaedic cases as well as 'casualties'—and teaching in it should include the social and epidemiological aspects of emergencies and the community resources of ambulance,

police, and rehabilitation services which deal with accidents and their victims. Teaching in the accident and emergency department is unique in the medical curriculum in exposing students firstly to the very early stages of acute illness in patients who have not officially become 'patients', and secondly to features of the doctor–patient relationship which they would otherwise not encounter until perhaps the preregistration year. Three respondents believe the second theme is an important one: 'Many of the young people in medicine have led a very protected life and they must be toughened up into everyday experiences, especially for increasing civilian violence. The practice of medicine or surgery cannot always be limited to tidied-up, clean, ward patients. In the Accident Department priorities for survival, investigation and treatment can be learned as well as developing a sense of urgency of handling people.'

Six courses make special reference to rehabilitation. (*Note.* 'Rheumatology and Rehabilitation' is the subject of a separate sub-report.) They demonstrate the importance of instituting rehabilitative care as soon as possible and introduce students to some of the methods. At one school students are taken to visit an industrial rehabilitation unit: another uses physiotherapists and occupational therapists in teaching students. The more common locomotor problems including the chronic conditions, and particularly those which are frequently seen in general practice, are given greater attention in five courses (four belong to the group of six where rehabilitation is a special feature), while two of them are also concerned with shock and resuscitation as topics of general and increasing importance.

Twenty orthopaedics courses include some time spent in accident and emergency: students are seconded there generally on a part-time basis for a specified number of sessions. Some regard it as more important than others. Teaching may be restricted to fractures and other orthopaedic emergencies but students will inevitably see a wide range of cases of all types and degrees, and much social and emotional trauma, too, as several respondents pointed out. One course includes visits to police, fire, and ambulance centres to demonstrate how their activities are co-ordinated.

Students are required to spend a period of the course in residence at six schools. Two periods of residence are specifically for orthopaedics and last one week and two weeks respectively; the others are spent on duty in accident and emergency, three lasting two weeks and the remainder lasting one week. One school requires residence in both orthopaedics and 'A. and E.' on different occasions and totalling three weeks.

Teaching Methods

Topic-teaching with colleagues from other clinical specialties is a regular feature of six courses. The combination of different points of

view forms a balanced approach to the clinical problem or 'topic' under discussion. In three schools orthopaedic surgeons take classes in the anatomy course while at another a special lecture course in orthopaedic anatomy is conducted jointly by staff of the anatomy and orthopaedic departments, almost one year after the main 'preclinical' anatomy course ends and concurrently with the early clinical attachments in orthopaedics. Plastic surgeons and neurosurgeons are an integral part of the clinical orthopaedics team in four medical schools and therefore make up a multidisciplinary teaching team during the students' clinical attachments.

'Practical' student participation is encouraged in five courses where they gain expertise in the simple techniques: for example, applying plaster of Paris, stitching minor wounds.

Two schools who send students to the orthopaedic departments of district hospitals reported this as a particularly useful arrangement.

Case conferences and students' case presentations, usually held weekly, are a successful method of teaching and seven respondents singled them out for special mention. Four courses have tutorials on specially selected topics. Two Scottish schools use videotapes of clinical conditions which students might otherwise not fully appreciate. One school insists on project work from all students; they choose their own subject for investigation.

Elective programmes and optional attachments were particularly mentioned by five schools.

STUDENT ASSESSMENT

All medical schools assess students' knowledge of orthopaedics 'critically'. The majority of schools examine it with other subjects in the final qualifying examinations: in most it is examined with general surgery and other surgical specialties in the surgery examinations. At seven schools where there are no separate subject-based examinations for clinical subjects, orthopaedics is one of many in multi-subject examinations.

Twenty-six respondents mentioned in-course assessment of students in orthopaedics. Fifteen mentioned the end of firm report written by the head of the unit to which the student has been attached, recording in standardized format whether progress has been satisfactory. Orthopaedic questions appear in class examinations, usually MCQ papers incorporating a number of clinical subjects, in a dozen schools: sometimes these papers must be repeated if a sufficient standard is not reached. In three cases the in-course assessment can itself be 'critical': marks contribute directly to the Final results.

PROBLEMS AND DEVELOPMENTS

Resources

The staff–student–patient ratio gives cause for alarm in thirteen departments, eight in London medical schools. Service commitments are heavy—it is a very demanding specialty—and some respondents feel that staffing levels have not kept pace with the increasing flow of patients nor with the growing numbers of students. A high proportion of teachers are full-time NHS surgeons. It was reported from three schools that they urgently require academic staff; however, one of them is shortly to acquire its first full-time academic appointment in the specialty. Two respondents are concerned that no-one sufficiently experienced is available to teach students in the accident and emergency sessions. These departments are manned by junior staff who are fully occupied with their duties and students attached to them are too often on their own.

Three respondents suggested making greater use of district hospitals: this would have the advantage of offering a greater and more representative selection of cases than do central teaching hospitals. One respondent added, 'Peripheral hospital consultants would probably put more effort into teaching, at least initially.'

The variety of patients seen by students in four schools is reported as biased: they do not get a balanced picture. In two of them the amount of trauma is excessive: this is valuable experience in itself but unfortunately filling a gap caused by a shortage of orthopaedic cases.

Two schools have the problem of split departments: the centres used for teaching are located at a distance from each other, making it difficult to integrate the emergency, the elective, the rehabilitative, and the specialized aspects into a coherent teaching programme.

Audiovisual aids have aroused some interest. Three departments have established libraries of slides, tape/slide programmes, and videotapes: two of them will continue to build up their collections and four others also have plans to develop such teaching material. Three respondents complained however that staff time is too hard pressed to spare for preparation of teaching material; technical and secretarial assistance is also required to maintain these facilities and to operate a lending system.

Organization of teaching

Teaching of the subject has expanded in five schools where more time is now given to orthopaedics than before. A sixth school has a completely new course, and in another the course has become full-time as a consequence of over-all curricular review. Orthopaedics teaching at another

school will be restructured radically when that school's new curriculum is implemented.

Eleven respondents find that their allocation of time is insufficient for comprehensive coverage of all the topics which should be taught: they would like more. Part-time attachments are frequently not considered to be fair to students or to the specialty: teaching is inevitably fragmented and superficial—'students seem continually to be rushing off to other departments'—and the whole learning atmosphere is not conducive to fruitful study (seven schools). Four respondents specified a full-time attachment as the only genuine solution.

Poor timetabling is partially blamed for the unmanageable size of student groups: the numbers attached to clinical units at seven schools are too large or about to become so, and 'small-group teaching' is suffering. Four courses have recently been moved to earlier locations in the clinical course, but one of them is shortly to be moved back. Two other respondents dislike teaching junior clinical students in comparison with more senior ones, but another respondent whose course is held at a later stage remarked upon the disadvantage that students have 'forgotten much of their anatomy lessons' by then.

Formal teaching in accident and emergency is a recent development in one school: a full programme has been built around tutorials and case demonstrations and it is hoped to intensify the programme by rotating students through different departments with contrasting workloads. Students have requested a longer period on this and at a later stage of their course, when they are better able to participate. Altogether six respondents wish for more teaching of 'trauma' in their course and would like to ensure that all students receive some planned 'core' instruction in it; three would like this experience to be detached from the orthopaedics course and timetabled separately in its own right.

Four respondents wish for reappraisal of the whole clinical course—they feel that their approach to their own subject is an incongruous part of an over-theoretical environment: there should be more patient-contact from the very beginning and students should be allowed to learn through direct experience. At present, the orthopaedic course has to attempt to make up some of this general clinical deficit.

One school expects to institute combined teaching sessions with anatomy and physiology departments in future; joint staff appointments between orthopaedics and anatomy are envisaged ultimately, but present circumstances do not permit these. Another department sees scope for regular combined teaching with radiologists. Collaboration with various clinical specialties has been made possible with the introduction of a new course at one school; integration with rheumatology is the most significant.

One course now gives students substantially greater opportunity of patient-contact and involvement in patient care. Three respondents

would like to do likewise; they regret the relative lack of responsibility and would like students to follow through patients to whom they could be assigned for the duration of their stay. Another would like all students to spend a period of residence in orthopaedics, again to give them in-depth experience and a sense of personal involvement.

In future two courses will concentrate more on basic clinical methodology: students will be given a thorough training in the examination and diagnosis of musculo-skeletal complaints, but there will be less 'surgery'. Elective orthopaedic cases will figure more prominently at one school; three Scottish and one Irish respondents would like to reform their courses in this direction. The emphasis would be on what the non-specialist should know: 'It is important that students have some concept of reconstructive surgery, not in the technical sense but in the appreciation that disabled people can be helped. It is a common problem that patients who could have been helped are frequently not referred by their doctor for the simple lack of knowing that such patients can easily be helped. Moreover, much disability and deformity is preventable . . . if tackled in time, and again it is very important for the student and the doctor to appreciate by knowing how to examine and having a basic concept of reconstructive surgery that these problems can be very considerably helped.'

The 'trauma' section of one course will provide more active involvement for students in future; they will be called to travel with the ambulance to the scene of an accident, for example. Independent learning activities are to be encouraged in three courses—students will have access to libraries, tape/slide material, and in two cases to patients, for clerking individually. One of these departments in fact has been engaged in formulating 'behavioural' teaching objectives, and summaries of what is expected of them are handed out to students to help them fulfil the criteria: part of the outcome of this process has been an increase in tutorial teaching as a better way of helping students achieve the objectives. Five schools in total have invested more heavily in structured small-group teaching; some have at the same time come to rely less on lectures. Elective attachments to orthopaedics will become available in one school soon.

Altogether changes were reported to have taken place in nineteen schools. Thirteen intend to introduce changes in the near future and another thirteen were able to indicate the possibility of change without being able to confirm the details.

Otorhinolaryngology

All thirty-five medical schools with established or planned clinical courses provided information on teaching time, etc. All except three (two of these are only in the stage of planning their clinical course) also submitted a more detailed commentary.

Throughout this report the anglicized abbreviation 'ENT' will be adopted, for reasons of brevity.

TEACHING ARRANGEMENTS

ENT is normally considered by the medical schools as a subject in its own right, with established and normally independent curricular status. However, the actual arrangements for teaching it vary greatly. In several schools it is paired in the timetable with other 'special' subjects such as ophthalmology: they are combined in a group of attachments through which students rotate; each may be full-time or half-time. No combined teaching occurs except at one school where some theatre sessions in ENT also carry formal teaching by anaesthetists: the two specialties are expected to give instruction in 'the common airway' together. For similar reasons of administrative convenience but also because ENT is regarded as a 'surgical specialty', three curricula link the subject with (general) surgery: it is timetabled within a period mainly devoted to non-ENT-surgery and students are seconded to ENT for a specified time.

However, most frequently all teaching of ENT is an independent exercise, carried out by ENT specialists in a special separate course. In twenty-two schools all teaching—theoretical and clinical aspects—is independent in this sense, but both aspects are not always contained in one single course. In six schools the formal 'theoretical' teaching course is given apart from the clinical attachment to an ENT department in a series of systems-based lectures and symposia which comprise most clinical subjects. At a few other schools (mainly in Ireland) separate

short lecture courses in the subject are given before the clinical experience begins.

ENT specialists at four schools reported that they take part in the introductory teaching on clinical methods at the beginning of the clinical course, together with representatives of many other clinical fields.

Position in the Course; Teaching Time

At four schools, the main teaching effort devoted to ENT is in the first clinical year; at seventeen schools it is in the second clinical year; and at five schools it is in the final clinical year: at the remaining schools, it rotates over more than one academic year but more often towards the end of the clinical course than the beginning. The typical situation therefore is one where a 'once-and-for-all' course in ENT is given to rotating groups of students who have already completed their early clinical experience.

A full-time attachment in ENT is given in eight schools: three attachments last four weeks, one lasts three weeks, one lasts two and a half weeks and two last a fortnight: in the remaining school with a full-time attachment the length varies, but it is normally no more than a week. Part-time attachments exist in seventeen schools. Students attend for, generally, mornings-only or afternoons-only over a period of some weeks. The full-time equivalent varies from one to four weeks. Three part-time and four full-time attachments are supplemented by separate brief lecture courses, or contributions to system-based courses.

The remaining ten schools—mainly in Scotland and Ireland—arrange for students to gain clinical experience in ENT on an occasional, sessional basis, generally spread over several weeks when students are studying other subjects as well.

Taking a week as the equivalent of 30 hours teaching, the average time spent by students on ENT is 57 hours (SD 31·0). It is higher for schools in England and Wales, including London, and lower in Irish and Scottish schools.

FEATURES

Aims and Objectives

A number of respondents described their approach to their subject in terms of its role in undergraduate training. These are perhaps not so much aims or objectives as themes or principles which determine the over-all character of a course: some courses are characterized by more than one of them.

A theme running through six courses is a consciously clinical one of deliberately minimizing the amount of formal 'theoretical' instruction

and allowing students to have as wide a clinical exposure as possible. Students should have maximum contact with patients; all teaching should have direct clinical relevance so that they become familiar with the presentation of the common conditions and with the methods of diagnosis. ENT is thus presented as a practical specialty; out-patient clinics predominate.

Three respondents however are anxious to avoid attempting to produce 'competent ENT practitioners' at the end of their courses: they tailor them to suit the undergraduate need for an introduction to the subject, its workload and methods, while leaving the finer points to postgraduate training. A feature of two courses is the weight placed on 'medical' relevance. Here again the aim is not to teach the specialty to future specialists but to exploit the resources of patients and staff expertise to show the effect of pathological processes in other body systems on the otorhinolaryngological area, and of infections which can attack this area, among others. In other words the ear, nose, and throat are part of a whole body, and the medicine of them is no different basically from that of other systems. ENT is thus a convenient arena for detecting and teaching the symptoms of several 'general' medical conditions.

Twelve courses concentrate on teaching students the skills of clinical examination and the use of the standard diagnostic instruments. They should all be able to examine and take a helpful history from a patient with an ENT problem and should be able to do so with confidence and without hurting the patient. Reaching the necessary standard is time-consuming, but it is time well spent: one respondent believes that more than in almost any other field of medicine, practice in examination is necessary and the student should take every opportunity to examine as many patients as possible during his or her period of training.

Eight courses attempt in their design to consider particularly the needs of the hypothetical future GP—a practitioner who is likely to have to deal with a large number of ENT conditions but is very unlikely to receive any further training in the subject. Teachers therefore ensure that the more commonly occurring conditions are seen by students who must be able to recognize them, and the treatments at the disposal of the non-specialist are explained. Students must also be taught to recognize what conditions should be referred for specialist investigation and possible surgical therapy (more ENT problems are treated by non-specialists than by specialists and this situation will not change). The ENT department at one London medical school recently circularized all general practitioners in the surrounding district to discover the amount of their work that was directly related to ENT: the survey showed that 'this averaged approximately 30 per cent and we therefore took careful note of this when revising our ENT student teaching programme'.

Finally, two respondents try to convey to students their own enthusiasm for their subject. Important advances have been made recently and equally important ones can be anticipated. It is a rapidly developing specialty and all doctors should appreciate its increasingly sophisticated nature and have an up-to-date picture of what it can offer to patients.

Teaching Methods

On a less philosophical level, respondents described specific aspects of their course content and teaching methods which they regard as particularly interesting, unusual, or successful.

Paediatric ENT is included in seven courses, and particularly deafness and speech disorders in children. Three respondents think it important to teach about the common ENT emergencies, such as those which appear in accident and emergency, and the first-aid treatment which can be applied. At two schools, the normal functioning of the (ENT) area is emphasized: students are expected to revise and learn in greater detail than before, the anatomy and physiology of the upper respiratory tract. They should gain a clear understanding of what a healthy system looks and feels like.

Eight courses are focused on out-patient clinics: a high proportion of student time is spent there and they provide the most valuable clinical experience. Two of these courses and a third make use of the specialized clinics for teaching: students attend sessions there, seeing in turn the different branches of ENT practice. However, another course has established teaching clinics where selected patients attend for special sessions with students instead of relying on the more 'free-for-all' situation which obtains in routine clinics.

Students will see operations in most courses; in six cases it is considered important for them to witness the relatively major surgical procedures because it enables them to see the pathology at close quarters and to examine a relaxed patient, as well as making them better informed about events which they may have to explain to their own patients one day. Four courses on the other hand make a feature of teaching the simpler techniques of examination and the minor procedures of treatment which can be done single-handed.

The importance of early diagnosis and prompt referral of, for example, suspected tumours, is stressed by two respondents; it is essential in their view for students to learn and retain this approach. The social aspects of ENT conditions are given greater weight in three courses than in some others: they include the growing problem of noise pollution and the ways in which deafness affects a person's life-style, family relationships, and perceptions of himself and others. Two courses include a visit to a special school for the deaf, to show what provision the community makes for children handicapped in this way.

Clerking patients independently is a feature of three courses where students have more responsibility particularly with regard to new outpatients than is perhaps the rule elsewhere. The division of cohorts of students into small groups makes teaching easier and allows students to feel more involved in the department's activities. A dozen respondents remarked upon the small and manageable numbers of students whom they have at any one time and on the many advantages arising therefrom.

Seven courses make use of audiovisual aids to illustrate, support, and elaborate upon the other teaching methods. Respondents mentioned cine-films, coloured slides, tape/slide programmes, and video-cassettes. One English school also puts up standing displays on certain topics which are changed at regular intervals.

Symposia are held in at least three schools: topics are discussed relatively informally by several staff together, with students also taking part. At another school the ENT panels are a component of the main topic-teaching cycle. One school in particular feels that the case conferences which its students attend, and where a number of doctors are present, are especially rewarding. Radiologists and speech therapists regularly join in the formal teaching programme in two schools. Teaching at three schools in fact emphasizes the links with other medical and surgical specialties and the role of the remedial and rehabilitative professions; efforts are made to demonstrate multi-specialty and multi-professional case management.

STUDENT ASSESSMENT

There was no report of ENT being excluded from a medical school's system of 'critical' or professionally qualifying assessment. Fourteen reports showed that ENT questions are part of the final assessment in surgery; four reports indicated that ENT is one of many subjects incorporated into one or more multi-subject examinations; in the remaining schools either the situation varied or was unclear. ENT makes an occasional rather than an automatic appearance in the critical assessment events in some schools, whereas in others written questions on it must be answered and in at least four, clinical and/or oral assessment in the subject is always given. In particular, certain Irish medical schools hold separate qualifying examinations (parts of the Final Examination) in ENT with ophthalmology and sometimes other 'special' subjects.

In-course assessment is conducted in twenty schools. The purpose is to give information to staff and to students about standards reached and the progress made by the end of the course. None appears to be 'critical' in the sense of forwarding marks to or exempting students

from either a final examination, or a stage of it. In nine cases knowledge of ENT is assessed with that of other subjects in a class examination, and if failed, a class examination may have to be repeated. At least seven courses end with a report being drawn up by the head of the unit to which a student has been attached, recording his or her achievements and conduct during the attachment. Two respondents would like to arrange in-course assessment for each group of students passing through the department. One of them also regrets the irregular appearance of ENT questions in the final examination in surgery and would like identifiable questions in this subject-area to be included every year. The new curriculum at another school, however, will permit assessment in ENT as a routine measure.

PROBLEMS AND DEVELOPMENTS

Resources

In some parts of the UK at least, ENT is apparently a depressed specialty. There is a constant, heavy patient-care workload, but recruitment is not keeping pace with demand and so some departments are under-staffed and morale is low. Much undergraduate teaching is carried out by full-time NHS personnel who are thus confronted simultaneously by large numbers of patients and (possibly) large numbers of students. Seven respondents referred to this situation with varying degrees of impatience.

Three respondents claim that one or more academic appointments are urgently required: their teaching programme could then be organized by someone whose primary responsibility is for student, rather than patient, care. At an English school the post of ENT tutor is unfilled through lack of funds: during the two years when it was possible to make the appointment the tutor 'revolutionized' the course, 'it became one of the most popular and well attended in (our School)'. Without him it is a disheartening struggle to maintain the programme. Here and at another school about to begin a new clinical course, there is really no staff time for planning teaching sessions and preparing material in advance.

Four respondents (all in English schools) would like to see academic departments of ENT established in their medical schools. Six also have to contend with poor physical facilities: both clinical work and teaching activities are hampered by inadequate space and by unsuitable, old-fashioned, and unpleasant surroundings, which are apparently beyond the point of upgrading. Seminar rooms and libraries are urgently required. Two of these departments expect to transfer to new premises soon, where more experience with out-patients will be possible as teaching activities will no longer be dictated by the available accommodation. One school expects to take students to another hospital for

some of the ENT course; they will see a more typical range of patients and the teaching load of the centre will be relieved.

Audiovisual facilities have become available or have increased in availability in four schools: one of these and five others are planning or hoping for greater provision of teaching aids of one sort or another, for example video-cassettes. A Scottish school is developing a library of videotapes to teach topics such as the examination of the neck, nose, throat, and hearing, and taped lectures synchronized with sets of slides: they are all made in the ENT department and their use will relieve some of the pressure on staff. Like other departments, this one would also like to have colour television facilities to demonstrate clearly various signs and procedures to the whole class of students by live or recorded transmission.

Six respondents altogether wish for more or better teaching aids and equipment. However, three departments have recently acquired operation microscopes with side-arms so that students can get the same interior view as the surgeon. Another has acquired better audiometric equipment for students to use.

Organization of Teaching

A large number of courses have recently been reorganized or revised, though in most cases the changes have been internal: comparatively few have changed their status in the curriculum *vis-à-vis* other subjects. More time has been allocated to two ENT courses: one now consists of a full-time attachment, the other of a half-time attachment. Two others have been allocated a more concentrated period of time; in their new curricula both will have half-time attachments, so the teaching will be more substantial though the net amount of time has not changed significantly.

Again as part of general curricular reform, three London ENT courses will be retimetabled. One will be held earlier than previously, one later, and it is proposed to split the third one into an early 'starter' course of instruction in the examination of the ears, nose, throat, etc., and a final year 'advanced' course of specialty teaching within the ENT department. Another respondent would prefer his course to be held earlier: like one of those which will be moved, it is too close to the final examinations, and students' attention is liable to be directed towards the latter and not to ENT.

The most common complaint of ENT respondents is lack of time to teach the subject. Eleven respondents have insufficient teaching time in which not only to teach the subject properly, but also to give students adequate opportunities to practise and learn thoroughly. Four of them and three other respondents are subjected to excessive numbers of students: there are too many in each group for teaching time to be used

to its potential effectiveness. Timetabling arrangements which alternate ENT sessions with the teaching of other unrelated specialties is a practice condemned by four respondents who find their teaching disrupted by students coming and going at intervals. It confuses students and wastes time. Two of them propose a full-time attachment in ENT alone which would give students a fair impression of the specialty and allow a continuous and balanced teaching programme to be implemented. In contrast, four respondents would like a longer spread of teaching even if it meant opting for part-time rather than full-time arrangements, in order to expose students to a full range of conditions and to follow-up some patients.

Due partly to timetabling, partly to the use of more than one unit for teaching and partly to the inevitable fluctuations in patients' disorders, students at two schools can receive very variable experience. This is regarded by the respondents as unfortunate but it is perhaps not exclusive to these two courses where it is perceived as a major problem.

Three respondents find themselves teaching fairly elementary methods of examination and history-taking in their main courses which would be better done at the beginning of the clinical course. ENT specialists should be invited to join the staff who introduce students to clinical methodology; they would then know how thoroughly these methods had been taught. Whilst one respondent would be happy to experiment with contributing to some teaching in the basic medical science courses, there appears to be little general interest in 'vertical integration' across the clinical/preclinical frontier—it was hardly mentioned in the questionnaires. However, another respondent suggests combining some of the ENT course with teaching in general practice in a formally integrated manner: students would gain a realistic picture of ENT problems and their incidence in the community and the vast resources of general practitioners with their unique and wide experience could be tapped.

Finally, the problem which at least two respondents see underlying the difficulties they face in mounting a satisfactory course for undergraduates is the low status accorded to ENT: medical schools still regard it as a 'minor' subject and starve it of teaching time and resources. The scope of the subject is not fully enough appreciated; this derogatory attitude filters through to students and the tasks of teaching and learning are made unnecessarily more difficult.

A dozen courses have been revised in the recent past and in some cases the changes amount to a whole new course. The general impression is that teaching has become streamlined, more consciously planned and structured. There is less unplanned clinical exposure, and also probably fewer lectures and other large-group formal teaching events. There is more staff–student contact.

One department has devised detailed learning objectives as the basis for the new course it intends to introduce. They incorporate skill

objectives, attitudinal objectives and factual knowledge objectives for each of the main branches of ENT. A Scottish school intends to attempt to standardize the teaching received by different groups of students and to strengthen the 'core' section which they all receive. Two courses will in future enjoy better co-ordination between the theoretical and the practical aspects so that the course as a whole will be more coherent.

Two departments have abandoned lectures completely; one of them now has regular teaching ward rounds. Another department has reduced the number of ward rounds which students were required to follow but may restore them if more staff time can be found. As reported above, several schools are expanding their use of audiovisual aids, and in some cases independent study of audiovisual programmes is replacing the traditional lecture. One Scottish school is to reintroduce a short preliminary lecture course before the main clinical diet at the students' request. One school where teaching is very part-time at present hopes to introduce a teach-in lasting a whole day each week: selected, interesting cases could be 'booked' and a more comprehensive programme could be arranged and monitored so that staff would know fairly accurately what students had seen and done by the end of the course. Another school would like all students to have more outpatient experience but this could only be achieved by raising the number of students present at an interview to an unacceptable level: only one or at most two students are present at each consultation at the moment.

Twenty-two questionnaires reported some changes, major or minor, that have occurred over the last five years. Six of them also reported plans for further changes; altogether ten departments are intending in the near future to make improvements in their teaching programmes. Nine respondents indicated the possibility of other changes and improvements: final decisions had not been taken at the time of writing.

Pathology

Questionnaires on the teaching of pathology were sent to all medical schools in the Survey: two schools (one of them offering only a preclinical course) did not submit replies. The 'field' therefore consists of thirty-six medical schools: two of these are however schools which only run preclinical courses whose introductory courses in pathology are taught and organized by the departments of pathology in the various clinical schools to which the students will proceed. These courses can each be regarded as a continuum with the clinical schools' courses, and so the total number of complete courses is thirty-four.

All schools except two gave information about existing curricula (that which is currently being taught or being introduced): it had not always been fully implemented at the time of writing and so some reports were written partly in anticipation. The two remaining replies referred to arrangements which are ahead of the 'existing' curriculum in the respective schools and will be part of over-all new curricula still being planned.

TEACHING ARRANGEMENTS

Formal teaching in pathology is generally spread over most years of the curriculum. It is equally true that the bulk of formal teaching generally is given in the second and third years of the typical five-year medical course. Notable exceptions to this second rule are two schools where a significant amount—48 hours and 100 hours respectively—is taught in the very first year of the (preclinical) medical course.

The structure of a pathology course can fall into one or more of the following groups:

> Those where most of the formal teaching is arranged in a two-tier structure. The earlier stage deals with general pathology and general principles while the later stage deals with the pathology of systems and is more clinically oriented. The first stage usually

occurs in the preclinical years of a curriculum and the second during the clinical years. Twenty-one courses present this pattern and altogether twenty-four schools have some teaching of 'general pathology' in their preclinical course.

Those where the general or introductory instruction is given on its own in a separate course which is followed later by integrated teaching in collaboration with individual clinical specialties in their own courses and attachments (two schools).

Schools in which the major course in pathology is concurrent with and to some extent integrated with those in microbiology and pharmacology. These paraclinical subjects or 'basic clinical sciences' are timetabled to run together in the same sequence, interrelating their lectures and laboratory work. Other clinical studies may or may not be taken over the same period. This arrangement was described by three schools.

Those where the major part of systematic or clinical pathology is included in or closely associated with a co-ordinated series of lectures and symposia, focused on systems of the body. Most clinical disciplines and specialties contribute to these courses when they are held and they constitute the main vehicle of 'theoretical' clinical teaching in these schools. However, not all such courses formally include pathology: in sixteen schools they do incorporate it—pathologists give lectures and participate in symposia—and two of them are heavily biased towards pathology which is their foundation.

Those where pathology is a 'partner' in a multidisciplinary preclinical course in cell studies, cell pathology, or cell biology. Five questionnaires mentioned this.

Those where pathologists conduct a revision course of lectures or tutorials in the final year of the curriculum (or in the period immediately before the final examination in pathology) though the main body of teaching is given some while previously. Nine reports described such arrangements which are particularly a feature of London medical schools.

Those where an attachment of full-time 'block' in pathology is given. Eleven schools operate such a scheme at present. In the longer courses in this group other pathological disciplines are also included—microbiology/virology/parasitology, haematology, immunology, and chemical pathology. The different elements may be to some extent integrated or they may each have their own self-contained portion of the block. The two shortest courses (one of two weeks full-time and the other of two weeks part-time) consist of 'general' pathology only: the longer ones (up to sixteen weeks, in

one case) usually timetable general pathology part-time, taking 20–40 per cent of the total time. Some rotate and student groups take the course in turn; this enables students to be attached to working hospital laboratories on the lines of a 'clerkship' (the short part-time course being given to groups of, say, six or seven students at a time).

Teaching Time

Partly because the teaching of pathology often includes time spent on subjects other than 'general' pathology (for example, haematology) which are separately reported upon, and also due to the difficulty of establishing what is part of the course (how many post-mortem attendances are expected/required, for example), many respondents found it difficult or impossible to make a realistic estimate of teaching time. Bearing this caveat in mind, however, the average time reported by twenty-five (five-year) courses is 183 hours (SD 58·7): the range is from a little over 100 hours to three times this amount. (One full-time week is treated as the equivalent of 30 hours in these calculations.)

Course Development and Evaluation

Respondents were asked to describe the arrangements for planning their courses and for co-ordinating the teaching. They were also asked to describe the arrangements for reviewing and evaluating their courses. The new medical school whose course had not begun could not answer either question; one of the preclinical schools whose new pathology course had hardly begun could not answer the question on evaluation. Nineteen departments operate formal arrangements for co-ordinating their teaching: twenty-one departments operate regular and formal arrangements for both aspects of course development.

Nine respondents said that arrangements exist for thorough co-ordination of the different aspects of the pathologists' own teaching and of the different strands of the 'core' pathology course, but not for any 'external' teaching with or by other departments or in multidisciplinary courses. Conversely, two respondents described relatively formal arrangements for planning and controlling 'external' teaching in co-operation with other departments, but none for the 'internal', departmentally based teaching.

Four schools where pathology is integrated with other clinical subjects throughout the clinical course arrange matters informally on an *ad hoc* basis. Nine respondents indicated that course review is practised, but only informally and irregularly. (One of them finds positive value in the informal nature of his department's evaluation; it makes change easier to accomplish and more acceptable if it is proposed and implemented as

and when the need is felt and without bureaucracy.) Five schools however report no review or evaluation; three are London schools.

Obviously, planning, supervision, and review are bound up together and cannot entirely be considered separately. Plans for one year's teaching inevitably take account of reactions to the previous year's. Also, the same individual staff members tend to be involved, though review is likely to invite comments from a wider field than can be involved in decision making.

In eleven courses the themes of lectures and practicals are dovetailed; different methods are thus used to teach different aspects of the same theme. Co-ordination of a different sort was discussed by three respondents, who mentioned tutors who, apart from their teaching role, have a policing role in ensuring that all their students have sufficient experience of the various practical, theoretical, and clinical aspects. They are able to fill in gaps themselves or direct their students in further study. Similarly, in four departments members of staff are designed to supervise the teaching programme: like the tutors they are concerned with what actually happens as well as with planning what ought to happen. One department for example nominates one senior staff member to be responsible for day-to-day administration of the 'junior' course and another for similar duties in the 'senior' course.

Such co-ordination is less necessary at schools where groups of students rotate through the pathology attachment—the same staff give the same programme to each group and there is little danger that any particular group would be disadvantaged. It is however, normal practice for a pathology department (or division) to have a committee or working party on undergraduate teaching. In four schools there are joint standing committees for all the pathological disciplines—the teaching of pathology, microbiology, etc., is planned and administered as one. Altogether, seventeen respondents indicated a system for relating the objectives and synchronizing the order of teaching in these subjects; it may fall short of a committee structure but there is a regular and recognized procedure for joint consultation.

A number of arrangements for co-ordinating pathology with instruction in clinical specialties were reported. Several of these arrangements coexist in the same school. Where formal instruction in pathology is separate from the theoretical instruction in clinical subjects it can nevertheless follow the same sequence, or, where there is no independent course of theoretical instruction in clinical subjects, it can be staged to coincide with the appropriate teaching as it occurs in clinical attachments. This latter is the case in four schools where pathologists interpolate their teaching in parallel with the modular teaching of the different systems by physicians and surgeons. In fifteen schools the pathology department is active in planning the co-ordinated teaching sequence and the presentation, either over-all or in relation to particular

component sections and topics. In a more informal way, four pathology departments liaise with clinical staff to ensure the minimum of duplication and accidental omission in their respective courses. They try also to standardize terminology.

Over and above the major course/s in pathology, a considerable amount of teaching by pathologists is given to groups of students during their attachments to the clinical units. This is case-related, patient-based teaching—case conferences, for example—which entail a certain amount of formal liaison: a dozen respondents mentioned it as a regular feature.

Five respondents from schools with special preclinical interdisciplinary Cell Studies courses referred to the arrangements for them. They are managed by an *ad hoc* body composed of pathologists and histologists, microbiologists, biochemists, immunologists, etc.: cell pathology is an important element of these courses. Three schools have a 'bridging' course at the very end of their preclinical period or at the very beginning of their clinical stage in which the prime mover is pathology. In the final year of the medical course at three schools, pathologists join with the department of medicine to produce a revision course of lectures and tutorials on essential topics.

To support and illustrate teaching in other clinical courses, nine pathology departments put on demonstrations of selected specimens, diagrams, photographs, and charts for students to study in their spare time. The material is changed at intervals to coincide with the appropriate system or topic.

Eleven respondents made it clear that all strands of their teaching—both the intradepartmental and the external—are reviewed and revised regularly. However, they may not all be reviewed together: it is common for multi-subject courses to be revised at medical school level (and several schools have 'year committees' or paraclinical standing sub-committees, or the equivalent which design, supervise, and/or review all courses falling within their terms of reference).

Review exercises are held annually in fourteen cases, but four departments hold formal reviews each term and two (of whom one also holds a more comprehensive review at the end of a year) hold them at the end of each period of student attachment, specifically to consider reactions to the attachment programme. Two respondents were less precise—their reviews are held at irregular intervals through the year, whenever it seems opportune. All members of the department take part in the procedure in thirteen schools, while in nine schools it is restricted to teaching members. A small departmental committee is constructed for the purpose in four cases. Health service pathologists who contribute to the teaching also contribute to course evaluation in two departments.

Students are formally invited to comment in sixteen schools. Eight make use of a questionnaire, four have student representatives on

departmental committees or at departmental meetings: four respondents added that involving students has been extremely useful.

The major problem reported in connection with course evaluation and review was the difficulty of reaching a consensus of opinion on what should be taught and how: the more democratic the consultation procedures, the more difficult it is to agree on what is best. In future, two departments will operate more regular and more formal review procedures. In one, this will coincide with a new curriculum and revised arrangements for teaching pathology.

FEATURES

Aims and Objectives

Respondents were asked to outline their aims and objectives in teaching pathology to undergraduate medical students. As a result, most schools provided statements indicating the philosophy which determines how the subject is presented.

Most respondents listed more than one theme or aim. In eighteen replies the objectives were phased, to correspond to the needs of students at different stages: the course is planned as a whole and each stage leads on from the previous one. For example, one school stated: 'In the second year the aim is to give the student factual knowledge and understanding of the principles of pathology . . . in the third year the aim is to unashamedly impart what we consider to be the essential facts about specific diseases . . . in the fourth and fifth years the aim is correlation with clinical experience, and, for a minority (elective students only) to encourage individual initiative and research.'

Altogether twenty-seven replies referred to conveying to students the principles of pathology: the aim is to convey the idea of pathogenicity and an understanding of pathological processes in universal terms. For some this is an aim of the early teaching of equal status with aims for later teaching; for others this is a primary aim of the whole course.

Fifteen replies referred to clinical pathology and specific pathology. This may be systems pathology—a working knowledge of the pathology of each of the body systems—or specialty-oriented pathology, treating the main groupings of disease and disorder one by one (for example 'the pathological features of all major diseases likely to be encountered in European practice'). Such an objective may be paired with earlier aims for teaching general pathology or it may be a primary aim in itself with the respondent describing all teaching as having a clinical bias and including very little 'scientific' pathology.

Once the foundations of general pathology have been set in the early years, some respondents do not regard subsequent teaching as 'pathology' in any specific sense. They prefer to think that they are helping to

teach medicine, broadly defined, and contributing to the education of medical students through teamwork. Pathology is not presented as an isolated specialty but as part of the spectrum of clinical practice, as a dimension to all clinical problems. Nine courses reflect this approach, and all are notable for the multidisciplinary courses which include pathologists and other clinical specialists. At one, for example, '. . . the old "Special Pathology" has been replaced by a course which attempts to integrate histopathology into the clinical situation. . . . It embodies a deliberate attempt to change the students' attitude towards tissue pathology, with a view to their ceasing to regard it as a separate discipline which can be "learned" for examination purposes and then largely discarded. We aim to blur as far as possible any distinctions between "pathology" and the major clinical disciplines.'

Three respondents remarked that their courses are not designed to produce ready-made pathologists. They are relatively unintegrated but nevertheless not esoteric. They aim to make students reasonably fluent in pathology as a preparation for clinical problem-solving, bearing in mind that postgraduate vocational training is the right occasion for detailed and in-depth considerations.

A different approach is that of four respondents who see the function of pathology as a 'bridge'. Its role in the curriculum is to carry students from the basic medical sciences to their clinical studies, from 'normal' to 'abnormal' behaviour, from abstract and general to the particular, and from passive to active and non-academic learning. This justifies a position chronologically in the middle of a medical curriculum. However much of a science it is, it is always directly related to clinical events. It has been called 'the bridge which extends from the cell to the patient'. It 'gives an all-embracing and explicit unity to facts and concepts learned in the preclinical sciences and shows how these can subsequently be applied to understanding the nature of a particular disease in a particular patient'.

A course in pathology provides an ideal medium for rigorous intellectual training, quite apart from the need to convey essential factual knowledge. Thirteen respondents hope that their teaching will raise students' curiosity and force them to analyse and make connections: it should improve their reasoning, deductive skills. They are presented with raw data of differing source and value and expected to draw conclusions, having selected what further evidence is required. In one respondent's words, the course should 'make them *think*'. Acquiring factual knowledge is useless unless the mental ability to relate signs, symptoms, and laboratory reports to underlying diseases is also acquired. The course must teach them to discern the invisible by means of the visible and the tangible.

An aim subsidiary to the main ones of imparting pathological knowledge and attitudes, was reported from ten respondents. It concerns the

laboratory services: students should learn how to use them with discrimination. They should learn the purpose of the routine investigations and their techniques, how to help the technicians by making clear requests and collecting and dispatching specimens properly, how to cope with the forms and paperwork, and how to interpret results and be aware of their limitations. They will then be prepared, as doctors, to make the best use of the laboratory services in their hospital and to appreciate the role of these in patient care.

Finally an objective of two courses is to teach the pathological basis of preventive medicine. It is necessary for students to know when to intervene to best advantage, at what stage in the course of a disease to take preventive action or to organize screening programmes, and through understanding the causation of some diseases and disorders to realize that they need never arise at all.

Teaching Methods

Lectures are used in all courses. Twenty-one departments give two or more series of lectures at different points in the curriculum, corresponding to an early and introductory series and a later 'applied' and more clinical series. Three departments give some lectures to students in all years of the clinical course. Discussions in large group settings are held in twenty-two courses: they are known as seminars, conferences, or symposia. Sometimes the only staff represented are pathologists, but in eleven schools pathologists join teachers from various clinical specialties on a panel to discuss a topic. At three schools, guest speakers from outside the department or even from outside the medical school regularly contribute in lectures and seminars to the undergraduate course.

Discussions in small-group settings are held in thirty-one courses: they generally take the form of tutorials. In seven courses they are especially important and are more highly valued than lectures. Seven departments arrange revision tutorials for final year students.

Teaching aids are used in many formal classes. Nine respondents mentioned coloured slide transparencies and four mentioned cine-films. The course at one school features 'visually oriented lectures'—students are handed a sheet summarizing a case history and asking questions about it, they see slides showing further information about the case and then they divide into groups to discuss the problem and put forward solutions. At the end of an afternoon session the confirmed diagnoses are projected on to the screen with which they compare their own conclusions. Altogether five courses use prepared handouts. Four of them and nine others produce displays and standing demonstrations for students to look at. These include preserved specimens, graphic material and charts, X-rays, photographs, and models.

Television facilities are used for undergraduate teaching in five departments who show both live and recorded programmes. An Irish school has perhaps progressed furthest in this method; they have graduated from black and white television to colour and now transmit programmes to other departments and even other hospitals where students are stationed. It is used for the transmission of open lunchtime meetings and post-mortems, formal practicals, demonstrations of research and diagnostic techniques and specialist case conferences (for example, neuropathology).

Independent study by students is a feature of many courses. Sixteen offer tape/slide programmes to students and several require them to use these in timetabled rather than 'free' time: they are an essential part of the course. Museums which are open to students were mentioned by nine respondents: the standing displays also provide opportunities for structured but independent learning.

Ten courses provide opportunities for project work. In six cases all students are required to undertake a project and to write a report or long essay on some pathological topic of their choice. At the remaining four schools the project is optional and only interested students would take one up. Practical class work was mentioned in 27 questionnaires: a number of departments relate their content to that of lectures and tutorials. The schools which give attachments to pathology departments (see under 'Teaching Arrangements') may include in these periods in service laboratories in hospital.

Three respondents described 'practical problem-solving classes' (two of them did not mention 'conventional' laboratory work at all). At one of these schools there are two types of problem-solving activity. Firstly, the large classes use microscopic and mounted specimen demonstrations (of which many are case-identified) with some of the clinical history and pertinent questions for discussion attached to them: X-rays are sometimes attached too. Secondly, there are small group exercises known as 'class cases' during the teaching of the major systems. A clinical history is provided, with biochemical findings, specimens, and histology slides, and students are expected to interpret the results with the help of demonstrators. This takes two two-hour periods; in a third period, the students write up their analysis of the case, a clinico-pathological correlation, differential diagnosis, and death certificate. Tutors mark the reports and subsequently discuss them with students.

Clinical Teaching

All completed questionnaires except one from a preclinical school reported some teaching with patients. However only some attempted to answer the (optional) questions concerned with details of clinical teaching.

Case conferences and clinico-pathological conferences are a regular feature of twenty-nine courses. They may be conducted in front of the whole class of students, or to smaller groups. As clinical specialists are usually present on these occasions they are sometimes held in the clinical departments or in ward side-rooms, rather than in the pathology department. Nine reports mentioned clinical specialists coming regularly to the pathology department to join in teaching: three of them also mentioned their collaboration with radiologists. Thirteen reports gave information about the participation of 'other' teachers—non-pathologists and one respondent described his use of the services of zoologists, biochemists, a mechanical engineer, a dental surgeon, and an electron microscope officer, who are associated with his department's research.

Patients currently undergoing treatment are demonstrated in the formal teaching sessions in six courses. In six courses again, students 'clerk' living patients while they are working in hospital laboratories: they follow through the cases, carry out investigations and write up reports: in two of them this is a positive requirement and the number of cases to be clerked is specified.

Post-mortem case discussions feature in thirty courses. They are given during the later, clinical-stage courses. Very few insist on students actively taking part in the examination; generally the format is student observation of the experts. The clinical staff responsible for the patient may also be present and contribute to the discussion. Sometimes the whole class of students attend the post-mortem session, and sometimes students from other years, together with postgraduates and interested clinical staff, also attend so that at one Scottish school for example there can be an audience of up to 200 people. Equally, post-mortem teaching can be given to groups of students numbering ten or twenty.

Students are not expected to attend every teaching post-mortem session; they may be given a target number or told how often they ought to try to attend (for example, once a week). Eight departments operate rules for post-mortem experience and inform students what is expected of them. Eleven require or encourage students to witness a given number of examinations; and four expect their students to carry out post-mortem examinations themselves—a fifth is pleased to let them do so if they volunteer.

Altogether fourteen courses lay down in advance what clinical or practical experience of clinical pathology the students should receive. Apart from the reports and the tests which make up the in-course assessment (see below) only two departments keep records of what individual students do—these are the records of the cases clerked by students during their laboratory attachments. The specified requirements relate both to procedures (for example, 'how to submit surgical specimens to the laboratory in a manner proper for efficient diagnosis') and to techniques (for example, 'use of the microscope'): they are

designed to prepare students for any clinical practice they are likely to take up, not to train them for laboratory medicine. This is considered one of the more useful aims of the laboratory attachment schemes, and one of the schools with this feature takes younger students on a tour of service laboratories in order to show them what actually happens and how productivity is affected by the way in which clinical staff make requests and provide specimens. One department selects the required activities for students on the basis of what the average house officer or general practitioner routinely initiates—collecting, dispatching, analysing, reporting, for the more common or simple investigations, so that they will be aware of the total process of investigations in which they will play a part at the beginning and the end. Tasks and procedures frequently itemized for performance by students were microscopic examination of urine; biochemical examination of urine; haemoglobin estimation; staining and examination of blood film; and white blood cell count.

'Special Features'

Respondents were asked to select features of their teaching which are unusual or particularly valuable: these could relate to organization, to objectives or to methods of teaching, and several respondents mentioned more than one.

Four respondents regard their early 'basic' course as the most essential element. The whole class is taught together and given a thorough grounding in the principles of the subject, before they proceed to study pathology in a clinical context, often in small groups. One of these schools and two others have comparatively recently begun to teach pathology in the early or preclinical stage of the course and they are convinced this is the right location for introductory pathology. It prepares students for clinical pathology without distracting them with clinical illustration and makes the entire preclinical course appear more 'relevant'.

Another valuable feature of course design and organization is the policy, reported by three respondents, of relating the subject matter of pathology classes to the concurrent clinical activities of students, as a harmonic accompaniment. Some teaching of pathology is given at all stages of the clinical course, growing in sophistication as students come to their senior clinical attachments. In two schools where the pathology department integrates teaching of all the specialties and sub-specialties of pathology (they do not have their own departments), this was felt to be a positive advantage.

Comments were made here on the general character of courses. Two courses emphasize the basic principles of pathology, pathology as a science: they are intended to give students an over-all view of all

organic disease. In contrast, six courses emphasize the clinical side of the subject and regard this as a 'special feature': much of the teaching is applied or given in a clinical context and related to problems of management and therapeutics. These courses (or rather their clinical stages) present the subject as a diagnostic, explaining specialty—as part of the clinical team. Two of these courses and five others give a strongly clinical flavour to their practical classes; some are based on case histories and clinical problem-solving while others allow students to handle and analyse real specimens from patients.

Topic-teaching is a reportedly very successful activity in two schools. Pathologists join clinical specialists for a panel discussion on a topic or problem of mutual interest, and these often end with question-and-answer sessions. Small group and tutorial teaching is considered the most valuable method in eight courses. It is more intensive and more effective than whole-class activities and allows staff to get to know their students personally. Five respondents referred here to practical classes: straightforward laboratory work remains very useful in allowing students to handle materials, to develop manual dexterity, to appreciate experimental method and to become familiar with laboratory protocol for safety and hygiene.

Four respondents whose students spend part of the course on attachment to the pathology department mentioned this as their 'special feature'. It provides a truly in-depth experience of all the essential aspects of laboratory medicine and also allows students to pursue their own developing interests and become involved with and take on some responsibility for actual patients. Post-mortem experience is considered a uniquely valuable medium in five cases. At one school '... all students should have attended showing of material and clinico-pathological correlation of over 200 cases in their time with us. They begin to speak from knowledge and experience. Care is needed in selection of the daily case to ensure that the rare or esoteric is not always chosen—the case must be one from which the student can build up his diagnosis logically.' At five schools, the reportedly interesting feature about post-mortem teaching is the fact that they are open-house sessions and held at lunchtime.

Four respondents explained that while particular methods and characteristics were more successful than others, the distinguishing feature of their courses is the variety of activities that are offered, with different teachers excelling at different approaches. The courses are designed to avoid relying too heavily on any single method. Exceptionally detailed and appropriate handouts are provided in two courses. One department has produced its own book which is issued to students in practical classes: it provides detailed introductory notes covering the subject of the class, experimental instructions, and also a number of questions related to each class.

Six of the departments where students may undertake elective work reported this to be a special part of their contribution to undergraduate education. Students may spend an elective period attached to the department or choose a topic for study-in-depth research. At one of these schools the research will continue for some months, outwith the timetabled course, though not all students choose to do it: at another all students must write a clinico-pathological essay, mainly in their own time, and on a topic which interests them in any clinical field (the marks given to the essay are included in the final 'critical' assessment).

STUDENT ASSESSMENT

Final professional qualifying examinations (taken by all students) were reported from thirty-two schools. Five schools hold examinations in pathology alone, though two of these include the subject with others on another occasion of the final examinations. Twenty-three schools examine pathology with the other pathological disciplines (microbiology, etc.). Three schools include pathology in the diet of examinations relating to preclinical courses, as a substantial amount of introductory pathology is taught during the early years. Nine schools include a definite element of pathology in their 'critical' examinations of the major clinical specialties: these schools generally do not have subject-specific examinations at the end of their clinical course, and some of them also hold critical examinations in the pathological disciplines earlier in their course. It is normal, therefore, for pathology to be examined critically and identifiably at more than one stage of a medical curriculum.

In-course assessment was reported from nineteen schools. The most common practice is for teachers to compile a report on each student, commenting on his progress and ability. Normally, this is written by a tutor, but sometimes by the pathologists in whose laboratories the student worked. Eleven respondents mentioned it, including several where students have full-time experience in pathology. In three schools the clinico-pathological project undertaken by students is used for assessment purposes, and in three others the reports based on post-mortem analyses or case studies are assessed. These reports, essays, etc., though compiled 'in-course', may not be submitted for assessment until the class or qualifying examinations are held. One department sets a written paper with essay questions 'within-course' while five set MCQ papers. Classroom practical work is assessed in five courses—students' practical notebooks are scanned and marked.

In at least five cases marks awarded to in-course performance are carried over to contribute to the result of final and critical examinations: in three of these it is the independent project or case-study/post-mortem

work that counts. At another school, satisfactory practical work during the course will except students from further practical tests in pathology.

Class assessments (ie formal examinations not part of qualifying examinations) were reported from twenty-six schools. In five schools at least these are combined with class assessment in the other pathological disciplines. Written papers with essay questions are used in six schools. MCQ papers are used in twenty schools; two of them combined with oral examinations in pathology and four of them being combined with practical tests. Another school also gives practical tests.

Class examinations contribute marks to the results of the final and qualifying examination in eight schools, and in seven schools good performance in one or more of the class assessments can partially exempt a student from further, more formal examination: except for weaker and potential Honours students there is no 'traditional' final examination in pathology. (One of the preclinical schools does not have a critical and professional examination in pathology. However its class examinations, which combine pathology with introductory microbiology, haematology, and immunology, must be passed before students are allowed to commence the course in pathology at their clinical school.) Eleven schools hold in-course assessments, class assessments, and final qualifying assessments in pathology.

Several respondents volunteered comments on their methods of assessment. There is more in-course assessment in two courses than there used to be, and in one of them it now functions critically. Four other schools have introduced or increased the amount of critical in-course assessment. Patterns of assessment are frequently altered when medical schools reorganize their curricula over-all. For example, one school will hold its final (separate) examination in pathology well before the other final examinations now, and another is to integrate the examination of pathology with that in other clinical subjects which will be held at the end of each successive year, abandoning the subject-specific end-of-course system. This it is said should induce students to regard medicine as a whole and not to consider pathology in isolation.

Four respondents regret the shortage of staff time for in-course assessment. They would ideally like to organize more self-assessment and more discussion and 'feedback' to students about their performance in informal tests. Self-assessment during practical and clinical problem-solving exercises is considered the most valuable form of assessment in one school. Two other respondents find the tutor's comments are the most useful to the department and to their students, in assessing the progress they have made. One school mentioned that it has computerized its MCQ questions which makes selection and marking of questions much more convenient. However, it is the variety of methods that six respondents believe to be the most interesting and beneficial feature of their assessment system: they retain practical as well as

written tests in order to test the skills which they wish students to develop, or balance MCQ and short-answer tests to assess students' range of factual knowledge with essay and oral examinations 'that test understanding at a deeper level'.

PROBLEMS AND DEVELOPMENTS

Respondents were asked to describe recent changes, plans for future changes, and problems.

Organization and Resources

Frequently, over-all curricular revision has had considerable impact on the timing, structure, and objectives of pathology courses. The most widespread change has been the introduction of general pathology into the 'preclinical' stage of the medical course. This has affected a total of fifteen schools. (Four of the fifteen are London schools collaborating in a single venture. A course is being established at one of the preclinical colleges which is to run in triplicate. The pathology departments of the three clinical schools who each take a proportion of the students of this college, each contribute staff and materials. Lectures are held at the preclinical college, practicals are held in each of the clinical schools for each group of students. Another introductory course has been established at the other preclinical college in London, for which only one clinical school is responsible.) One school which receives extra students from another preclinical school in which the elementary pathology has not been co-ordinated with that taught in the clinical school, is concerned at the disparity between its two groups of students.

Less time is now allocated to pathology in two schools. In three schools the subject has been radically re-timetabled in the middle and later years of the curriculum; in one for example it is now less concentrated and has been subdivided into sections, linked to the different clinical courses. Similar steps are being contemplated at one school where a revised clinical curriculum is being suggested: changes will definitely affect pathology but to what extent is uncertain. It may lead to more evenly spread, phased teaching throughout the clinical course, replacing the present intensive period at the beginning of it.

The full-time laboratory clerkship is a new development in four of the schools which have it. Another respondent would like to arrange a full-time attachment scheme for all students, even a short one, but is most unlikely to achieve this.

Three schools are revising their entire curricula and will expect major adjustments on the part of pathologists. Details had not been finalized at the time of writing though respondents expressed their hopes and

fears in their replies to the questionnaire. One would like closer integration with teaching of the basic medical sciences but believes the bulk of the pathology course should be given during the clinical course, after students have had their initial clinical exposure. Another respondent shares this view: pathology should be seen to be a clinical science and carries far more meaning to students who have acquired a clinical background. Similarly, another respondent would like to be allowed to give a course in advanced pathology to final-year clinical students who would appreciate it as a postscript to the main course in general and systematic pathology which is held earlier.

The staff–student ratio is causing disquiet in twelve schools. The numbers of students are too high—and are in some cases increasing—for existing staff to cope. Small-group teaching and other experiments are abandoned for lack of staff to conduct them. In one department the pressure of service commitments curtails the staff time available for teaching. They and another department would like more junior staff posts to be created, leaving senior and academic staff free to teach. In two departments there are problems over recruiting supporting staff—technicians and secretaries—and this has repercussions on the teaching programme both directly and indirectly. Senior medical students are going to be brought in to supervise junior students' practical work in one school where staffing is a problem.

Teaching space is reported as inadequate or unsuitable in five schools to the extent of restricting teaching activities. In some schools more than one pathology department have teaching responsibilities, in others the main teaching department is situated some distance from the other hospitals where students are taking clinical attachments: all this leads to lack of co-ordination and problems in gathering all students together for formal teaching, and it applies in one form or another to seven schools (though one of these will soon have new buildings which will solve the problem by concentrating all facilities on one site).

Only two respondents felt strongly enough about the time allocated to their subject to make a claim for more. They would like a greater share in the curriculum in order to cover the essential points more coherently and more thoroughly. This extra time should be devoted to pathology *ipse* and not to more liaison teaching or integrated pathology.

Teaching Activities and Content

Two respondents are unhappy with the amount of clinical experience in their course: teaching is 'too theoretical'. They would like students to be more involved with patients so as to avoid the impression of learning in a vacuum. Another respondent hopes that his school's new curriculum will permit more emphasis on the effects of therapy on pathological processes, as one of the benefits of more collaboration with clinicians.

It has been mentioned that a number of courses have in fact become more integrated with clinical teaching. Three respondents are keen to develop integrated sessions with clinical staff in order to present the 'whole picture' to students as topic teaching is not only popular with students but is also stimulating for the staff.

The practical classes in one course have been overhauled completely and now are firmly clinical and vocational in outlook. Previously the emphasis was on experimental pathology, with much use of animal material. In this and two other courses there are plans to decrease the traditional laboratory work still further and correspondingly to increase the problem-solving exercises based on real case-histories and diagnostic information. Two schools have also replaced live and time-consuming practical demonstrations with set displays which are left standing for students to peruse in their free time, and in the evenings. The new courses in two schools have achieved a high degree of correlation between the theoretical and the practical instruction.

Television is becoming available for demonstrating practical procedures and post-mortem findings to large gatherings of students. Recently three departments have acquired television facilities and a fourth will soon install them. Otner audiovisual media are less expensive and more widely used: four departments have introduced tape/slide packages for students to study independently and seven intend to offer them to students in future, or to increase and improve the range of programmes already offered. At one school self-study programmes have largely replaced lectures in the introductory section of the course. However, a shortage of funds prevents three departments acquiring the audiovisual equipment and materials which they would like.

Independent learning will be encouraged in three courses in the future and time will be set aside for it. It could take the form of project work as well as 'programmed instruction'. The respondent in another school would like to be able to give every student the opportunity for research because it would make the pathology course greatly more interesting for both staff and students. In three cases, projects and research options were reported to be innovations.

The significant change in one course has been the increase in post-mortem experience provided for students. A new medical school will soon be able to conduct post-mortem teaching and will also enjoy the advantage of a pathology museum, as new buildings are commisioned. Circumstances have led to less post-mortem teaching in one course, a matter of regret to the respondent; whereas another course may give more of this clinico-pathological teaching, again if clinical staff are willing to contribute. The sessions are far less effective if the clinical staff cannot attend and explain the clinical background and one respondent reports that clinicians may fail to appear for prearranged sessions.

In one school the amount of small-group teaching has been reduced as less time is available for it. However, four other courses now include more small-group teaching than before and two of them are hoping to increase this still further. A total of eight respondents expressed a wish for more small-group teaching in their courses.

Altogether twenty-nine reports were received of changes which have taken place recently. Further changes will be effected to fourteen of these courses; a total of nineteen respondents described plans for improvements and revision in the teaching of pathology in their school in future. Three other respondents described proposals which may or may not come to fruition.

Pharmacology, Clinical Pharmacology, Therapeutics

Two sets of questionnaires were distributed on the teaching of these subject areas: one inquired into the teaching of 'pharmacology and clinical pharmacology', the other (in more detail) into the broader sphere of 'therapeutics'. However, after considering the returned questionnaires, it was decided to report on all three areas in one document because of the great deal of overlap found in the replies: in several schools, for instance, pharmacology and clinical pharmacology are not entirely separate courses, and also in a number of schools clinical pharmacology and therapeutics are indistinguishable in the timetable. Indeed, the organization of teaching these subjects and the relationships between them are unusual to each school.

The report will therefore discuss the teaching of 'pharmacology' and 'clinical pharmacology/therapeutics', in parallel, expanding upon 'therapeutics' where extra information has been obtained.

All schools returned questionnaires on pharmacology and/or therapeutics, as appropriate, with one exception—one clinical school did not complete a 'therapeutics' questionnaire. Only outline information was available in two cases, where the courses had not yet started.

The thirty-four pharmacology replies all described existing arrangements. Three of the thirty-three returns on therapeutics, however, referred to future arrangements which had not been implemented at the time of writing. A fourth therapeutics reply stated that the topic is not taught at that school and will not appear in formal teaching until 1977—further questions were not attempted. This reduced the 'field' for therapeutics to thirty-two schools.

TEACHING ARRANGEMENTS

Pharmacology and clinical pharmacology are viewed as a continuum in fourteen schools: they are taught as a single course or as two tiers of a united course. In fifteen schools, it is clear that two separate courses

exist: they are not planned together—their respective roles in the curriculum are different, each self-sufficient.

The actual teaching of pharmacology is conducted separately from that of other subjects in most schools, but some of the teaching in seven schools is conducted jointly with one or more of the other basic medical sciences such as physiology. Clinical pharmacology is much less likely to be taught separately. A proportion of the teaching is 'separate' in a number of schools but in fourteen schools the body of teaching is linked with the main course of theoretical clinical teaching, which usually consists of a co-ordinated sequence of lectures, systems-based, comprising most clinical subjects: sometimes there are separate sessions in clinical pharmacology proceeding in parallel with the main cycle, and sometimes the clinical pharmacology contributions are incorporated within the main cycle. Two schools at present have no formal provision for teaching clinical pharmacology as a subject.

Therapeutics as a subject is included in the co-ordinated systems-based theoretical clinical course in thirteen schools (ten of these schools belong to the group of fourteen who schedule 'clinical pharmacology' in the co-ordinated theoretical course). Thirty schools reported that some teaching of therapeutics (including elements of clinical pharmacology) is separately timetabled, be it theoretical or clinical. Twenty-four of them also reported some combined teaching with other disciplines and specialties, and in one further school all teaching of the topic is combined with other disciplines and specialties. At one London school for example teaching in clinical pharmacology and therapeutics '. . . is planned in a closely integrated fashion to dovetail with teaching in allied subjects such as histopathology, microbiology, immunology, genetics, environmental and community medicine, as well as the more general aspects of internal medicine and surgery . . . there is also small-group teaching of students (attached in groups to various clinical units) which . . . utilizes problems and is accompanied by resumés of relevant and current literature'. Four London schools have a special topic-teaching cycle in therapeutics primarily for senior clinical students run by those responsible for teaching clinical pharmacology; three Scottish schools and one London one have 'revision' courses of lectures and/or tutorials in therapeutics for senior clinical students.

Position in the Course; Teaching Time

No school teaches pharmacology in the first year of its preclinical course to any significant extent. In twenty-five schools pharmacology is taught mainly in the final preclinical year: in eight schools most basic pharmacology is taught in the third year of the medical course which may be regarded as either a 'bridge' year or the first clinical year. Two of these schools do not recognize any distinction between 'pharmacology'

and 'clinical pharmacology' and most of their clinical pharmacology is taught in the same year, in the same course. Seven schools altogether schedule most teaching in clinical pharmacology for the first year of the clinical course.

In two schools most clinical pharmacology is taught in the second clinical year and in two schools most is taught to final year students. The teaching of clinical pharmacology is spread more or less equally over two or three years of the course in the remaining schools. With regard to therapeutics, the normal pattern is for teaching to be scattered rather than concentrated in one stage of the course. In ten schools the topic appears in the programme for every clinical year; in fourteen it appears in both the first two clinical years and in eleven it appears in the final and penultimate years.

The average total amount of teaching reported to be received by a student on pharmacology, clinical pharmacology and therapeutics is 170 hours (SD 40·3) over a preclinical and clinical course: of this, a little over two-thirds is 'basic' pharmacology.

Organization of Clinical Teaching

Respondents to the therapeutics questionnaire discussed the various ways in which their clinical teaching is organized. In six schools the Department of Therapeutics or the Department of Clinical Pharmacology has its own ward and/or its own beds whose patients are used for teaching in the normal way. In another six schools bedside teaching was reported whereby staff in clinical pharmacology or therapeutics teach on patients in medical, surgical, or paediatric units. At one of these schools and at three others, teachers 'borrow' patients from clinical units for demonstration at lectures and seminars; the staff have no specific clinical responsibilities of their own. In a few schools the staff in clinical pharmacology or therapeutics do not control beds and in-patient services; they may have an advisory role or hold special clinics for out-patients and take students with them to see these patient-care activities, which are thus used as teaching activities.

Another practice is the use of topic-teaching sessions for the whole class: these take the form of case conferences, using data about real patients, and are reportedly very popular. Alternatively, clinical pharmacologists may teach small groups of students in turn in regular tutorials while they are on attachment to medical units.

Two schools reported no patient-based clinical teaching.

Teaching Staff (Therapeutics)

Respondents to the therapeutics questionnaire were asked to indicate the professional interests of the staff responsible for teaching the topic.

Clinical pharmacologists are heavily involved in the teaching of therapeutics in twenty-five schools. In eighteen of them at least some of the clinical pharmacologists held full-time academic appointments. (Incidental information showed that sixteen schools at least have a department of therapeutics, a department of clinical pharmacology or an equivalent.) A clinical pharmacologist specializing in toxicology takes part in one school's course. Physicians and clinicians from various medical specialties regularly take part in the formal teaching programme at twenty-eight schools.

Non-medical health service personnel contribute to the programme in two schools: they are dieticians and pharmacists. Guest speakers from outside the medical school may also be invited to speak: distinguished research scientists (two schools), representatives of regulating bodies (one school), and representatives of drug companies (two schools).

Seven respondents said that 'pure' pharmacologists contribute to the therapeutics teaching. Conversely, fourteen respondents said that clinical pharmacologists who may belong to a department of clinical pharmacology and/or therapeutics regularly teach preclinical students in the course run by the department of pharmacology: two regard this as particularly valuable. Two have only recently established this arrangement; two more reported plans for making it a feature soon. Six respondents would like to introduce or to increase this sort of 'vertical integration'. They would like staff of either persuasion to team up with their counterparts in the 'preclinical' or the 'clinical' course and make them appear less like two separate courses.

Developments

Four schools described their future courses on clinical pharmacology/therapeutics. All are in the process of replacing existing arrangements, and all will combine clinical pharmacology and therapeutics into a single teaching structure for the clinical years. In two, the topic will be intimately connected with the teaching of every clinical subject and there will be no separate and no 'theoretical' teaching at all. Topic teaching and a separate revision course will be held at the third school, where clinical teaching will centre on medicine and general practice. In the fourth school, a lecture course on 'Principles of Treatment' in the summer term of final year is being introduced, supported by clinical teaching during medical and surgical clerking.

FEATURES

Aims and Objectives

Respondents to the therapeutics questionnaire were asked to outline the aims and objectives for the topic in their curriculum. Respondents for

pharmacology and clinical pharmacology were not asked specifically but many chose to do so, indicating the main themes of their teaching or the approach to the subject which influences the way in which it is presented. Some statements were brief and general, others were more elaborate. Twenty-six respondents for therapeutics gave one or more aims or general objectives; they have been grouped into distinct but not mutually exclusive categories, a number of schools maintaining several of them at once. Six therapeutics respondents gave either no aims or objectives or only very general ones.

Three pharmacology respondents stated that they pursue a quantitative approach; they emphasize quantification and the need for accurate observation and measurement in this basic medical science (as in others). In this way pharmacologists are making an important contribution to students' general education, forcing them to develop precision and a concern for detail, and of course at the same time giving a necessary preparation for prescribing and monitoring treatment.

Three other schools see the subject as a 'bridge'. Its role in the curriculum is to link the preclinical and the clinical studies as in itself it is neither one nor the other. This attitude tends to imply that pharmacology and clinical pharmacology are but one entity, or should be as far as medical students are concerned, and should be positioned at the interface of the two main stages of teaching. The bridge can conduct students from 'pure' scientific knowledge to its application in particular situations and develop their manual skills from laboratory experiments to sideroom tests and the preparation and administration of drug substances. Learning the subject/s requires previous basic knowledge of anatomy, physiology, and biochemistry and leads into and raises curiosity about pathological changes in the body's make-up and how these may be manipulated. The policy of fourteen schools to plan pharmacology and clinical pharmacology as a continuum with teaching in the second stage taking over from the first in a natural sequence, has already been mentioned.

Fourteen courses in pharmacology relate to clinical pharmacology from the very beginning. They are designed to be 'relevant' to medical students' needs and the course content is selective and flavoured with clinical references and examples. The amount of pure or 'classical' pharmacology has been reduced to the necessary minimum. However, the early course has not been 'taken over' by clinical pharmacology; rather, it concentrates on what will help students to benefit from later teaching of clinical pharmacology and therapeutics and does not aim to survey the whole subject impartially.

In therapeutics the most frequently mentioned aim is 'to teach the basic principles of clinical pharmacology and therapeutics': teaching focuses on principles rather than practice. Apparently it focuses on the principles of clinical pharmacology more closely than other forms of

therapy; it was comparatively unusual for respondents to mention discussion of comparative treatments and alternatives to drug therapy. One respondent's aim is to emphasize the scientific basis of the topic; to teach it as a science with rules and principles which must be observed—it is no longer an empirical art, to be acquired through personal experience. Eight respondents indicated their renunciation of comprehensive teaching; it is neither possible now nor necessary. They do not attempt to teach 'all you need to know' about drug therapy and do not expect students to learn lists of names, drugs, dosages, normal effects, side-effects, etc.

Rationality is the key to making therapeutic decisions and is emphasized by ten respondents. They wish to establish logical thought-processes to which students will habitually resort in the face of any clinical problem:'. . . we try to get students thinking pharmacologically so that they can handle a drug if given the necessary data on it because they know what it is necessary to know and so will not use a drug if they do not have the necessary facts'.

In five cases one deliberate aim is to prepare the students no further ahead than the preregistration year: this is the time when they will start to learn the detailed information about drug therapy. As students they must be given sufficient knowledge and sufficient appreciation of clinical decision-making to function sensibly and confidently in their first supervised appointments.

Four of these courses and eight others have the longer-term aim of enabling graduates to evaluate new developments in therapeutics. The rate and the scope of advances resulting from the enormous research programme in Europe and North America make it essential for doctors to be able to evaluate drug implications. They should have yardsticks against which to measure claims for new drug compounds and improved methods, and should know what questions to ask, so that they will bring into their personal repertoire only those treatments which they have satisfied themselves are both safe and beneficial to their patients. (A number of respondents feel very strongly about this.)

Four of these respondents and three others pay special attention throughout their course to the potential hazards of drug therapy. They emphasize the dangers of indiscriminate prescribing both to the individual patient and to the community—for example in building up a pool of resistance. In discussing the categories of drugs they believe it very important to discuss the known adverse effects and to dwell on the disadvantages as well as the advantages.

The need to consider 'the whole patient' is emphasized in three courses. This is an attitude of mind which these three respondents hope their courses will help to instil. Therapeutics is a science but it is a clinical science and decisions must therefore always take heed of the circumstances of the individual patient: for example, age, sex, and treatment

history must be taken into account—no drug is universally applicable. The desired attitude was described by one respondent as one of 'rational eclecticism'—methods of treatment can and should be 'rational and caring'.

Content

The therapeutics questionnaire asked respondents to indicate something of the subject-matter of their course, not exhaustively but sufficiently to indicate the main features. Respondents for pharmacology and clinical pharmacology were encouraged to select aspects of their course content if these were particularly interesting or 'special'.

Fourteen courses in therapeutics and clinical pharmacology are built upon a systems approach. The course proceeds in parallel with a systems-based theoretical course in clinical studies, or, alternatively, is integrated with clinical teaching of each body system in turn. Some other course organizers prefer a topic or problem-oriented approach.

Eight courses are designed to cover the therapeutics of most of the more common conditions encountered in hospital and general practice, and to make the course comprehensive other forms of treatment besides drug therapy are given consideration. Half of these courses and some others (making a total of twelve) review each of the more widely used drug categories in turn—antibiotics, anticoagulants, diuretics, hypnotics, etc.: in five cases this sequence ties in with a systems sequence.

Two courses give particular attention to the different methods of administering drugs—oral, intravenous, parenteral, etc.—and their relative advantages and disadvantages. Seven courses include a consideration of modern pharmaceutical practice—the distribution and storage of drugs, the preparation of compounds, the services provided by a hospital pharmacy and a High Street chemist's shop, the administrative and clerical aspects of prescribing, and the security aspects.

Four of these courses and three others also include consideration of the medico-legal position regarding responsibility and negligence, therapeutic accidents, and so on. The importance of maintaining good case records, noting details of all treatments and prescriptions, and recording a full treatment history (including response to treatment) is stressed in three courses.

The conduct of clinical trials is a feature of twelve courses in therapeutics and clinical pharmacology—including seven courses at London medical schools. This helps to make students more interested in future advances in drug therapy and also more critical of them, and better able to mount trials of their own when they are in clinical practice. In this connection statistical methods and biostatistical concepts are integrated with the teaching of pharmacology in four schools: mainly they are incorporated in the practical laboratory work.

Manufacturers' advertising and other commercial pressures on doctors are featured in four courses of clinical pharmacology and/or therapeutics. In one, students are handed promotional literature to read and evaluate in the light of the pharmacological and statistical knowledge they have acquired at medical school. They are encouraged to form independent judgements.

One of the few instances in which students are taught how to treat specified conditions in schools' clinical pharmacology/therapeutics courses is the treatment of emergencies: five respondents mentioned this. The type of emergency care taught would be in connection with self-poisoning and accidental overdoses, snake bites, dangerously adverse reactions, the accompanying states of shock, and 'what to carry in an emergency bag'.

Finally, one respondent tries to give a historical perspective to the course: he reviews the history of medical treatment in order that students will avoid making the mistakes of past generations and will see therapeutics as a constantly changing and developing subject.

Teaching Methods

Respondents to the therapeutics questionnaire were asked specifically about the use of various teaching methods; respondents to the pharmacology questionnaire were encouraged to report interesting or unusual teaching practices.

Lectures are given in twenty-nine courses in clinical pharmacology and therapeutics. In eleven courses they are very important; for example, a separate 'core' lecture course in clinical pharmacology early in the clinical stage of the medical course. Four others made it plain that the lectures are not so significant—they are used to transmit some information but they are not as important as other teaching methods. Ten schools include lectures in clinical pharmacology/therapeutics in their co-ordinated systems-based lecture course. In four schools the lectures are followed by discussion on the same topic at the end of the session. All the (basic) pharmacology courses rely heavily on lectures.

Twenty-three schools put on symposia or seminars—discussion in large groups with a panel of speakers, usually with the whole class of students present. In three cases these symposia are part of a cycle of topic-teaching ranging over many topics. In six cases there is a special cycle of therapeutic conferences for final year students. The teaching may be based on real case-histories (or patients): at one school for example there are 'topic-oriented sessions which occupy a nominal three hours on one afternoon per week. . . . The first hour of each session is spent on a brief lecture which seeks to cover the patho-physiology of the condition to be discussed later, together with the pharmacology of the group of compounds used to treat this condition. The remainder

of the afternoon is taken up with demonstrations and discussions on a series of patients currently under treatment for that condition.'

Small-group teaching was mentioned by respondents from a total of twenty-six schools. It is more common and more popular in the clinical stage though in six schools it plays an important and highly valued part in the preclinical pharmacology course. It was mentioned in seventeen therapeutics questionnaires. Such teaching takes a variety of forms: at one English school, for example, students attend small-group sessions based on problem-solving. Between ten and twenty students attend, 'and each student is presented with a case description and is asked to diagnose and prescribe. His peers criticize and discuss'.

Independent study is particularly encouraged in a number of schools. In five therapeutics/clinical pharmacology courses students are given references in medical journals to follow up and read for themselves. Elaborate handouts are a feature of three pharmacology courses and four clinical pharmacology/therapeutics courses (and one department gives a printed booklet to all students describing the whole course and the objectives and methods for each stage, with reading lists for pharmacology and therapeutics): reading lists are also a common feature. One respondent finds that 'self-learning from books still plays a major part' and self-instruction generally is more popular than the formal teaching which students can generally choose whether to attend or not.

In pharmacology four courses require students to undertake project work or produce a long essay, and at a Scottish school, students must prepare 'mini-lectures' lasting about five to seven minutes on topics covered in the lecture programme, to read to tutorial groups. The 'enthusiasm and capabilities' of the good students benefit the others. Displays and demonstrations are mounted in seven pharmacology courses: mostly they use graphic material, photographs and printed summaries, and are studied in students' spare time. Tape/slide packages are available in ten schools, on various topics in pharmacology or clinical pharmacology, and two schools also have ciné films which are shown in the clinical pharmacology/therapeutics course. At a London school 'live' demonstrations of physiological responses are projected on to a screen in a laboratory using an episcope and pen recorders linked to the subject. Computer simulation of pharmacological effects is a feature of the course in clinical pharmacology at two schools.

Twenty-eight schools include some patient-based clinical teaching at one or more stages. Six courses include ward rounds and one of them plus two others involve teaching at out-patient clinics. (This happens more frequently when staff responsible for clinical pharmacology and therapeutics have a clinical charge.) Five respondents mentioned demonstrations of patients in lectures and seminars, and eight referred to regular case conferences in therapeutics which are regarded as a most valuable component of the teaching programme.

'Special Features'

Both sets of respondents were asked to indicate what is 'special' about their teaching.

Vertical integration is the most significant reported feature of the course at ten schools: the artificial barriers separating 'pharmacology', 'clinical pharmacology' and 'therapeutics' are not allowed to affect the structure of the course nor the learning objectives and there is a steady progression from the early years to final year as the scope of knowledge and understanding increases without being interrupted halfway through. The integration of 'therapeutics' with teaching in clinical medicine and other clinical specialties is regarded as a valuable achievement in eight schools: the topic is presented in the context of patient care and students learn the therapeutic problems and requirements of a condition at the same time as the pathology and the diagnostic methods. Indeed, some of these respondents are not sure whether it is even possible to teach therapeutics in any other way.

Topic-teaching and multidisciplinary seminars have proved extremely successful in a few schools. Specialists in clinical pharmacology and therapeutics are joined by specialists from various clinical fields and the 'whole picture' can be portrayed. All aspects of management can be discussed, and the presence of people with active clinical commitments makes the proceedings more stimulating for the students.

Five respondents referred to their final year 'finishing school' courses in therapeutics as being particularly valuable. They are not merely revision exercises; they bring students up-to-date with the latest thinking in the main fields of clinical interest and balance the opposing points of view so that students are familiar with both the consensus opinion and some of the independent opinions.

Four respondents who regularly teach on patients in their own care find the bedside teaching to be among the most successful and popular of their activities. Two others have found that well-produced teaching tapes (tape/slide self-instructional units) are very useful and students appear to enjoy using them. One respondent has the support of what he feels is a particularly good textbook.

Five respondents repeated their belief that the most important thing they can do for their students is to educate them to think critically (four of these respondents are from Ireland). They try to 'immunize' students against the claims of drug companies. One of them tries to emphasize 'evaluating the long-term effects, side-effects and interactions of drugs being used in clinical practice as opposed to the special conditions of the clinical trial' and to get away from 'the concept that every symptom and every disease process must have a specific drug therapy'. It is desirable to reduce 'the difference between the ivory tower concepts of the academic department and what the practitioners actually do'—especially in the way of monitoring one's own prescribing habits.

STUDENT ASSESSMENT

Pharmacology

'Critical' professional 'end-of-course' assessment of pharmacology is held in almost all the schools with preclinical courses. Twenty examine pharmacology in a separate paper (there may also be a practical examination). One includes the subject in a joint examination with introductory pathology and two examine it with physiology (all three are Scottish schools). Four schools examine it with a mixture of other basic medical sciences. Ten respondents explained that pharmacology is examined partly or entirely in conjunction with clinical pharmacology: in three cases it appears that there is no critical assessment in pharmacology apart from the combined one.

Twenty schools reported some in-course assessment of pharmacology. Eleven of them have a separate class examination in the subject. At two of them the report which students write of their research project is assessed. In two other cases the in-course assessment (in one case this is a class examination) is a combined exercise with clinical pharmacology. The in-course assessment in pharmacology can be 'critical' at ten schools: either it contributes marks to the results of the main end-of-course examination, or it may exempt students from some part of the end-of-course examinations, or the in-course assessment, held in a series of modular tests and examinations, itself constitutes the 'critical assessment' and students would only sit an examination at the end of the year if their over-all performance in in-course assessment was below standard.

Clinical Pharmacology and Therapeutics

All responding clinical schools gave information about some 'end-of-course' assessment in this part of the subject: none of them excludes it from their system.

Twelve schools including all the London schools with clinical courses who are operating under the new regulations for London University, hold separate critical examinations in clinical pharmacology (and therapeutics). Five schools include the topic in the examination in medicine. The others include the topic in the assessment of various clinical subjects as well as or instead of in a 'separate' examination. Some of these schools have entirely multidisciplinary examinations, while others examine groups of subjects separately and include the therapeutics aspects as appropriate.

Students at two English schools each take a copy of the British National Formulary into their examination; this reportedly encourages them to use it for reference habitually.

In-course assessment was reported from twenty-two schools. In some cases it is peculiar to clinical pharmacology and/or therapeutics but

more frequently the assessment is part of an interim assessment in various clinical subjects. Clinical pharmacology and/or therapeutics figures in MCQ papers in thirteen schools during the clinical course: the topic is examined within written essay-question papers in four schools.

The in-course assessment can be 'critical' in eight schools, where marks are forwarded to be added to the results of end-of-course qualifying examinations—in one school the proportion of marks so provided is 30 per cent.

Clinical pharmacology/therapeutics has only achieved examinable status recently in one medical school. Two respondents remain dissatisfied with the position awarded to their topic in the examination system: they would like it to figure more prominently and identifiably and, if possible, to be a 'critical' component of the qualifying examination.

PROBLEMS AND DEVELOPMENTS

All respondents were invited to report recent or planned changes, and problems.

Organization and Resources

A large number of schools reported problems with staffing. This applies to both 'preclinical' and clinical teachers. A total of twenty-two schools reported unsatisfactory staff–student ratios; staff time is short and the existing staff are hard pressed to manage existing commitments without taking on the additional or improved teaching which they would ideally like to do. Three added that large and growing numbers of students make the organization of practical classes and tutorials in the early pharmacology course a heavy burden: one new school needs more appointments in 'basic' pharmacology.

Ten respondents have encountered severe difficulties in recruiting medically qualified staff, and particularly people seeking a career in clinical pharmacology. This problem is affecting both 'preclinical' and 'clinical' departments.

Three medical schools have recently established new departments of clinical pharmacology or the equivalent and one of them has also established a separate department of pharmacology. Four respondents expressed a wish for departmental status for clinical pharmacology/therapeutics in their own school, in recognition of the topic's teaching and research importance. Geographical separation of the departments of pharmacology and clinical pharmacology perpetuates separation of interests in two schools: the distance between them makes contact difficult and holds back liaison over the teaching programmes. Three

respondents report that in the clinical years the distribution of students among several hospitals makes it difficult to gather the students together for seminars and tutorials in the academic unit, and almost impossible to standardize the 'therapeutic' teaching which they receive in the clinical context.

Several specialists in clinical pharmacology would like to gain access to beds and patients and to have clinical responsibilities which would enable them to conduct bedside teaching.

Support for teaching aids is apparently rather more easily available. Audiovisual facilities have recently increased in four pharmacology departments, and one of these and one other expect further increases in future. Audiovisual units for self-instruction are likely soon to be more widely used in five clinical pharmacology/therapeutics courses. One pharmacologist would like to have television facilities; two others would like to increase their stock of aids and equipment. However, the main problem in one pharmacology department is the lack of space for private study.

The pharmacology course has been revised recently in sixteen schools: in several, the result has been a completely new course. This will happen in three more schools in the near future: in two of them (as in several of the former group) the new course is engendered by over-all curriculum revision. At one school, for example, pharmacology is no longer taught in the preclinical stage but is mostly concentrated in a full-time 'laboratory term', which it shares with pathology and microbiology and which is held after students have had a year of clinical studies. At another school less time is allocated to pharmacology than previously and so there are fewer formal teaching sessions and many fewer 'traditional' practicals. Generally, however, curriculum revision has resulted in a greater allocation of time for both pharmacology and clinical pharmacology/therapeutics.

Eight respondents to the therapeutics questionnaire showed that the topic is now better recognized and better catered for in the clinical course than hitherto, and, for example, the specialist staff attend more formal teaching sessions or set examination questions. Three of them now have separate courses.

Five respondents confidently expect changes in the arrangements for therapeutics as part of general curriculum revision. The allocation of time continues to cause disquiet elsewhere: two respondents feel that pharmacological subjects are underestimated by curriculum planners and require more time than their comparatively weak bargaining power can achieve. The position of clinical pharmacology and therapeutics is more serious than that of basic pharmacology: six respondents altogether believe this area of teaching needs to be strengthened and built up with specialist staff themselves more heavily involved. Two respondents on the other hand would like more time to be allocated to pharmacology,

not to allow more teaching but to allow students time to think, absorb, and reflect.

Reference to 'vertical integration' between pharmacology and clinical pharmacology/therapeutics has already been made: it is increasing. At two schools clinical pharmacologists have begun conducting classes in the 'basic' pharmacology course and at four others they will do so in future. A total of six respondents wish for more interchange of teachers, in either or both directions, to weld the separate courses together. Links with colleagues in other fields are also developing: at four schools pharmacology has been partly integrated with other basic medical sciences. However, the implementation of this type of system has not been easy: 'In theory the co-ordination of various aspects of teaching within topics should provide a better comprehension but this depends on assimilation during lectures if sequential development of a theme is to be achieved.' It is suggested that 'fragmentation has resulted in part in trivialization with a decreased opportunity to identify problem areas of comprehension particularly among the weaker (or idler) students'. Six respondents are nevertheless willing to risk the drawbacks and teach pharmacology in collaboration with other preclinical disciplines such as physiology and biochemistry.

Two Scottish schools have recently incorporated the formal teaching of clinical pharmacology and therapeutics into the major systems-based course of theoretical clinical teaching (although one respondent is not satisfied with the arrangements and intends to improve the quantity and quality of the contribution to the co-ordinated course, and additionally to establish separate provision for the therapeutic topics which cannot be taught well in a systems-based lecture format). This will occur also in another school when its new curriculum is introduced.

Two other respondents would prefer clinical pharmacology and therapeutics to be integrated with the clinical, patient-based teaching of the clinical specialties. This would provide a continuity of themes, while relating the instruction to patient care and not presenting it as a separate, theoretical exercise. However, one school pointed out that specialist teaching of clinical pharmacology/therapeutics can be undermined by the behaviour of clinical colleagues: students observe senior staff following less rigorous practices of treatment and prescribing than the academic department might countenance.

Teaching Activities and Content

In the restricted time available for teaching it is inevitably difficult to decide what to include and what to omit: one school asks: Should a course attempt to give a broad foundation in the subject or to focus on what students are likely to accept as 'relevant'? Three pharmacologists would like to prune their courses of irrelevant 'accretions' and to make

their drug studies more appropriate: unfortunately, they feel that they must still meet the expectations of the rest of the medical school, rehearsing names of drugs and formulae and teaching practical laboratory skills. The clinical pharmacologist at another school finds that preclinical teaching is inappropriate and in many respects too detailed. It is a poor preparation for the clinical course.

Two respondents are hoping to redirect their courses from a 'traditional' approach towards a quantitative, analytical emphasis. One would like ultimately to see 'a single preclinical practical course in Experimental Medicine—ranging from Biochemistry through Physiology to Pharmacology and Experimental Pathology. The objective would be training in Scientific Methods rather than learning techniques and certainly not to "illustrate the lecture".'

The image of a subject is affected by the setting in which it is taught, and, realizing this, seven respondents are working towards greater clinical involvement.

Topic teaching is a relatively new activity in two schools where clinical pharmacologists and clinicians discuss problems together. At one of these schools and at another discussions of all kinds have become more common, in large groups and in small groups, during the clinical course. Small-group intensive teaching has been developed in one basic pharmacology course, although six pharmacologists expressed a wish for the resources to make more of this method. There will be fewer lectures and more small-group tutorials in two clinical pharmacology/therapeutics courses in future. Practical classes have been reduced in one school but many pharmacologists still regard them as valuable if they can be designed to fulfil an educational purpose. Three courses now emphasize human responses and reactions: students experiment upon themselves (and on fewer animals or none) for laboratory work.

Physiology

All thirty-four medical schools offering 'preclinical' courses returned questionnaires on the teaching of Physiology.

TEACHING ARRANGEMENTS

The over-all structure of a physiology course is determined in the first place by the general policy a medical school operates towards the early years of its curriculum. Schools which have opted for integration will incorporate physiology into their multidisciplinary arrangements; schools whose departments plan courses independently in their own subject areas will have timetables more traditional in appearance, with integrated teaching the exception rather than the rule. Only a very few schools have completely 'integrated courses'. However, it is becoming rare for courses in the major 'preclinical' disciplines to be completely unrelated to each other; even where they are taught and timetabled mostly apart there may be joint planning agreements between the heads of the departments to co-ordinate the sequence of their teaching, to streamline their terminology and to keep each other informed of problems and progress. The outcome in one school is termed 'harmony'.

Bearing this caveat in mind, it is possible to distinguish twenty-one schools where the majority of physiology is taught separately: conversely, there are ten schools where integration prevails, the majority though by no means necessarily all of the physiology being taught in association with one or more other subjects. The remaining schools have arranged a two-tier structure: in the early stage (usually the first year) physiology is largely separately timetabled, but later on it is integrated, with a series of interdisciplinary self-contained courses based on topics instead of academic disciplines. Ten respondents indicated that their attitude to integration is an open one: it happens on an *ad hoc* basis, formally or informally as the situation requires, and they are pleased to forgo independent status when appropriate alternatives can

be arranged and when other preclinical departments are equally willing to co-operate. In the basic sciences a partnership most frequently develops with anatomy but four physiology departments have forged links with pharmacology and one has done so with biochemistry.

Beyond the basic and traditional subject-matter which physiology covers, newer topics, and aspects of physiology in which research has 'taken off' over the last few years, may be given special treatment. Seven schools run established courses in the neuro-sciences, human reproduction, or nutrition, for which teams of preclinical and clinical staff are responsible, but physiologists naturally play a large part in them.

In seven schools the teaching of histology occurs within the framework of physiology. However, as in most schools the teaching of this topic is associated with anatomy, it is described in an appendix to the report on anatomy (q.v.).

One Scottish school recently dropped its premedical year and brought certain elements of it into the first year of the new curriculum to accommodate the qualifications of local school-leaver entrants. For this reason its physiology course begins with a major physics component, which decreases as the proportion of physiology increases through the year.

Position in the Course; Teaching Time

All medical schools schedule physiology in both of the first two years of their medical courses. Slightly more schools place the majority of their teaching in the first preclinical year than in the second, and a few apportion the teaching time more or less equally between the two years.

In view of the integrated nature of some curricula it proved more difficult than expected to ascertain accurate figures for teaching time in the subject, and the somewhat unpredictable length of tutorials and laboratory classes also made respondents draw attention to the tentative nature of their estimates. These estimates of teaching time are nevertheless classified below. They exclude time devoted to histology teaching, and figures are only given for twenty-eight schools as in the remaining six, special circumstances made realistic estimates impossible to provide.

No. of schools with physiology teaching time (hours) between:						*Range*	*Mean*	
151–200	*201–50*	*251–300*	*301–50*	*351–400*	*401–50*	*(hours)*	*(hours)*	*SD*
4	8	8	3	4	1	159–410	274	68·1

FEATURES

Aims and Objectives

The themes and guiding principles on which physiology courses are based can be grouped into distinct types, although these are not mutually incompatible and some courses feature more than one theme. Implicitly or explicitly they affect the structure and the character of the teaching. Some respondents discussed the themes and their attitudes towards teaching their subject at great length.

Ten courses emphasize their general clinical relevance. They are courses in human physiology and are designed to meet the needs of medical students, and they would not be considered suitable for science students pursuing a degree course in physiology. The subject-matter is deliberately selective and overtly clinically slanted, and clinical illustration and the participation of clinical staff are integral parts of the learning process. Indeed, two of these courses are so committed to a clinical outlook that they expect their students by the end of the second year to not only have a working familiarity with the major systems of the body but also to be able to perform an 'adequate' physical examination of a patient.

Seven courses feature a progression from 'pure' physiology in the early stages to 'applied' physiology in the later ones. It is considered that the principles of the subject should be conveyed in a clear and scientific manner before the more vocational and sophisticated aspects are tackled. In some cases this pattern corresponds to the 'first year separate, second year integrated' teaching arrangements, so that in the newer medical schools and in the revised curricula of some older ones the second stage consists of courses taught by basic medical scientists and clinical specialists together and whose titles suggest they conform to areas of clinical interest.

In contrast, nine respondents see their major task as providing a scientific education for students before they proceed to their vocational training. Even in courses with a substantial amount of integrated teaching and 'clinical' orientation, they assert that the most important goal is to infuse students with the scientific mentality and an ability to analyse rather than to accept unthinkingly. Proponents of this outlook deny that it makes teaching irrelevant to medicine: 'In terms of utility to medicine, perhaps the greatest value is that understanding of how concepts are built up from evidence, what constitutes evidence, and how it is obtained and assessed, confers the ability to advance the subject; by contrast, apprentice-type "training" perpetuates the current level. Physiology is a matter of gaining understanding of how a complex mechanism works. . . . Understanding arises from a subtle but familiar process, from handling the subject matter, conceptually and practically.'

One respondent reported that a major aim of his course is to equip students to keep abreast of the advances that can be expected to be achieved in medicine over the next forty years or so. Far from restricting the objectives to preparing students for their undergraduate clinical course, it is hoped to provide a fund of knowledge for them to draw upon to the end of their working lifetime.

Eight courses attempt to correlate structure and function to a very close degree. This can be done within a well-planned physiology course in accordance with internal rationalization, or it can be done in combination with other disciplines in an integrated 'systems' approach. The aim of both organizational patterns is similar but some respondents report extra benefits in approaching a system from all viewpoints: for instance, 'the systems course approach, in spite of its faults, makes teaching physiology easier. It gives a chance to learn about clinical problems and to participate with clinicians in teaching programmes . . . by comparison with others we have a greater feeling for the clinical relevance . . . than is common in most basic science departments. This is coupled with a greater confidence in our contact with clinicians and in the teaching of our clinical colleagues.'

Teaching Methods

Practical classes are highly valued by many of the respondents: twelve of them particularly added that material for experiments is derived as far as possible from human subjects and measurements are made *in vivo* rather than *in vitro*—for example, students take blood samples from themselves and each other. Student autonomy in the laboratory is a feature of four courses: they plan and design their own experiments and on completion must report and defend their methods and conclusions to a tutorial group or even to the whole class. In six courses the problem-solving element in practical classwork is stressed: staff must support the intellectual training which the course as a whole should be giving by concentrating on the interpretation and evaluation of data. Practical exercises are chosen with this purpose in mind, and schools extend this approach by formally including some teaching of statistics in the physiology course. Physiological measurements are used for the raw data and subjected to statistical analysis: the practical classes are regarded as very appropriate learning situations for such concepts as normal variation, significance, etc., and students are more ready and able to process information which they know is 'real'.

Tutorials and intensive small-group teaching are regarded as a most valuable activity in twenty-three courses; in some of them, students are assigned to one tutor for a fairly long period of the course, a term or more. Small-group teaching can be a 'feature' in courses where it takes up a high proportion of students' time, or, in another sense, in courses

where there is not so much of it but where it is an extremely effective and popular method, disproportionate to the amount of time spent on it. Two departments have persuaded senior students—postgraduates and medical students intercalating an Honours year—to conduct tutorials with junior medical students; these are extra sessions outside normal teaching hours.

Projects or extended essays are required in six courses. At one Irish school the project occupies a major part of the summer term in the second year; it is laboratory based, and groups of students choose a project from a list of ten to twelve and work under a staff member or senior research worker. A minimum of 30 hours work is required but many spend up to 100 hours on it; the advantages are listed as 'close staff–student contact; valuable mental exercise in reading in depth; identification of the student with his/her project which is crystallized in their setting up a demonstration at the end of the term; awakening a feeling of excitement in touching a frontier of knowledge, and an insight is obtained into biological variation, technical accuracy and investigational design'. Two other courses contain some timetabled free study time.

Tape/slide programmes are available to students in six schools for independent self-instruction; four schools have closed-circuit television facilities which can be employed to demonstrate an event or a procedure not amenable to mass live performance; and as well as using videotapes, one English school uses 16-mm cine-film for the same purpose.

Approximately half the questionnaires gave information about clinical events in the physiology course. In eight courses, patients and case-histories are demonstrated from the first year onwards: in six others they begin in the second year. At one school a quarter of the time devoted to each body system in the second year is taken up by clinical demonstrations which help to show students how their basic science training can 'help them understand or work out the basis of (*a*) a disease process, or, (*b*) the response of the body to such a process'. The clinical specialties here are medicine, surgery, child health, chemical pathology, obstetrics and gynaecology. Five physiology courses involve visits to the teaching hospital where students attend ward rounds, special clinics, or case demonstrations in small groups. In other schools, patients are brought to the physiology department for demonstrations. Nine respondents were pleased to record their co-operation with the clinical staff who regularly come to teach in their courses. One of these courses in fact is entirely taught by medically qualified people (the respondent believes this is unique): all teaching members of the physiology department are medically qualified.

Four courses culminate in a grand 'overview' programme to consider biological interrelationships, and this inevitably occurs in the final pre-clinical term. Symposia afford opportunity for discussion and question-and-answer sessions. In some, staff from more than one basic science

department take part; in others clinical staff join the basic scientists. The object is to give a perspective on the 'whole body' and the way the systems interact.

Three schools have formulated detailed learning objectives for each section of the course, and these are handed to students at the beginning of each section. One of these schools and two others make provision for feedback from students: they are invited to comment on teaching, on the structure of the course and so on. Questionnaires are generally used for this.

STUDENT ASSESSMENT

Physiology is a part of critical, professional, or degree examinations in each of the medical schools. Examinations at the end of the course are conducted separately for physiology alone in the great majority of schools; however, in seven schools the examination or the most important one is conducted jointly with other subjects—in two schools, with pharmacology. As a compromise, and following the general structure of the preclinical curriculum, five schools arrange separate, subject-specific examinations at the end of the first preclinical year or stage and integrated examinations at the end of the second year or stage.

Twenty respondents supplied information about their in-course assessment. One reported there is none. In five cases it is clearly an informal affair held within the physiology department. However, fifteen respondents showed that some or even all of the in-course assessment is critical. Mostly, marks from in-course tests are forwarded to be added to the results of end-of-course degree examinations. In a few schools, good performance in in-course assessment can exempt a student from one or all of the end-of-course examinations. Two schools have unusual in-course assessment procedures. At one, sample multiple choice questions can be answered via an electronic machine which gives immediate yes/no response to the student using it. In another school where students undertake a major group project, not only are marks awarded to students for their own project, but marks are also given for the rest of the class's projects. Three schools operate a modular assessment system in the preclinical course; two are focused on systems while the third is focused on subjects and topics. Assessments are held at intervals during the two-year period, and only if the summed result is unsatisfactory will a student be required to take a supplementary end-of-course examination. Two respondents expressed dissatisfaction with assessment arrangements in their schools: the critical assessments are held too frequently and their scope is too compartmentalized, each dealing with work immediately leading up to the test and not synthesizing earlier knowledge.

PROBLEMS AND DEVELOPMENTS

Resources

Staffing appears to be a widespread problem, with ten departments reported to be understaffed in relation to the numbers of students they teach or who cannot develop small-group teaching and personal staff–student contact any further for lack of staff time. Furthermore, six of them and a dozen others—eighteen altogether—are concerned over recruitment of medically qualified staff, made difficult because of preclinical/clinical salary differentials. Those whose general staffing ratio is satisfactory and those whose contingent of medically qualified personnel is still active are as deeply worried as others who face a crisis now, as their situation will soon worsen as senior staff retire. Four respondents suggest that joint appointments between clinical and preclinical departments should be established to attract suitable young staff. One school is exploring this possibility and expects to establish a post where the primary commitment would be to physiology teaching and research but with enough clinical involvement to allow a return to a full-time clinical career after two to three years. Another respondent suggested an association or even amalgamation of the departments of physiology and medicine in his school.

One school has found similar difficulty in recruiting junior staff as demonstrators to supervise practical classes. Most new physiology graduates have little experience of human physiology. Suitably qualified technicians for laboratory service and in particular for electronic apparatus are now also hard to come by, in the experience of three schools.

Physical difficulties centre on space and geography. Two schools have insufficient accommodation for small-group work and for laboratory work; four others lack decent laboratory accommodation and have to double or treble up with other departments in rotation; one other school urgently requires classrooms for seminars and tutorials. However, in one English school, large and well-equipped multidisciplinary laboratories are soon to be commissioned. Physiology departments in three schools are geographically separated from other preclinical departments: the staff feel isolated and a psychological barrier is imposed which prevents students interrelating physiology with other basic sciences.

Organization of Teaching

Nine courses are new ones. In most cases the physiology course was thoroughly reorganized in keeping with a general curriculum overhaul. In two of them, and in a third school where less radical restructuring has occurred, the syllabus was streamlined and some matters previously

taught were discarded. One physiology department has had more curriculum time allocated to it but two others have suffered a significant reduction in teaching time. Coupled with an obligation to co-ordinate their efforts with other departments, it has made these respondents feel that their subject is in danger of losing its identity. Three courses have recently become more closely aligned with those of other preclinical disciplines and four others anticipate that this will happen in the future. Five respondents (including those from the three new medical schools) have undertaken to review their new courses comprehensively after a few years have passed and provided enough 'feedback' for a fair evaluation.

Changeover to a five-year curriculum from a six-year one has affected the physiology course in one school where it must now include more elementary instruction.

Seven respondents—whose courses vary widely in age and in degree of integration—all criticized the intensive, heavily purposeful character of their schools' curricula: students are expected to work under constant pressure with no time to think or relax. Physiology is inevitably caught up in this. To improve their own situation three other respondents suggest a lengthening *over* time (but not *of* time) of their courses: if these were spread out further, learning would be less mechanical and students would be able to absorb and to deliberate. One of them also suggests a pact between all basic medical science departments, who would prune their syllabuses simultaneously and so without prejudicing their status *vis-à-vis* each other. It was also proposed by three other respondents that, following a ruthlessly simple basic course, all students should be encouraged to pursue a year's more elaborate study of a basic science subject for its own sake.

More courses will be co-ordinated with other basic science courses in future: two others would like this to happen, though none envisage a fully integrated systems-based structure will emerge. One department, now committed to a multidisciplinary systems structure, reported that while it has many advantages, this approach has the disadvantage of always presupposing understanding of a process or a principle exemplified by another system, whatever system is being taught currently and in whatever order they are taught. Questions are therefore always being begged.

Three departments have recently formed new and separate 'topic' courses in the neurosciences ('Neurobiology', for example) with preclinical and, to a lesser degree, clinical colleagues. All have proved very successful in conveying a picture of the whole nervous system. One of these schools is now also implementing a new topic course in 'Reproductive Biology'. Another would like to help establish a special course in neurophysiology bracketed with psychology; indeed the respondent would like a joint teaching programme with behavioural scientists (and

biochemists) to replace a large part of the existing second-year course. In another school, physiologists whose main course remains largely separate, have become involved in multidisciplinary courses in haematology, immunology, and nutrition.

Six respondents consider the growth of 'clinical' activities in their courses to be one of the most important developments of recent years. They now have clinical staff teaching in their course, patient demonstrations, or both. As its new course gets under way another department will regularly use clinical staff. Four schools are piloting arrangements for vertical integration in the opposite direction: physiologists will take part in clinical courses in the later years. One of them, which has had considerable experience of liaison teaching, implies that this arrangement may be easier administratively than using clinicians in the early years, as the latter do not always have time to prepare and rehearse their contributions and are subject to last-minute clinical emergencies. Nine pleas for more preclinical/clinical integration were recorded: five propose a double interchange between the two parties; two propose that clinical staff step up their contribution to physiology courses and other courses containing physiology; and two propose a role for physiologists in the appropriate clinical specialties at their schools.

A difficulty encountered by a few departments in reforming their courses and trying to widen horizons is student resistance: two respondents complained of the conservatism and exam-passing mentality of their students. Another has found that first-year students have uneven backgrounds in biology and mathematics; much of the early stage must be devoted to straightforward factual instruction before matters more suitable to a medical school are discussed.

Realignment of subject matter has taken place in four schools, in broadly similar directions. In their theoretical and in their practical teaching they refer to human physiology far more than to animal physiology. One of them plans to extend this further and three other courses will also become more concerned with Man. The reorientation correlated well with the growing practice of clinical illustration in these courses.

Intensive small-group teaching has increased in seven schools, but the staffing situation prevents increasing use of this method in several other schools who recognize the need for more. Three of these together with three other schools have decreased the number of large 'cookery book' practical classes over the same period: laboratory work is now more selective, and more purposeful. One school's physiology practical classes will be held in multidiscipline laboratories within the next two years, and medical students' laboratory work will then be quite different from that of non-medical physiology students but what may be gained in 'relevance' may entail a loss of personal staff–student contact which flourishes when both are united in studying a single subject in a special building.

Two schools whose new courses are still developing will introduce project work for all students who will be able to choose which of several possible physiological topics to study. Other minor modifications in methods and sequence are planned in four schools.

Two departments have recently acquired new equipment which will enable students to carry out more sophisticated experiments themselves. Five departments would like more equipment for laboratory classes but cannot, for financial reasons, have this.

Self-instruction facilities have been introduced or expanded in three schools; two others intend to introduce audiovisual aids such as tape/slide programmes in the near future. Closed-circuit television has become available recently in another school. However, three of these departments feel that even more teaching aids are required to fulfil their objectives.

A total of twenty-eight questionnaires indicated important changes which have occurred recently. Half of these also indicated positive intentions of more change: sixteen respondents altogether described proposals which they propose to implement shortly.

Psychiatry

All thirty-five medical schools with clinical courses (or about to start them) were asked to complete a questionnaire on the teaching of psychiatry. There was a 100 per cent response.

However, the two schools whose clinical courses had not come into operation at the time could not answer all questions fully. Six other questionnaires were completed in respect of arrangements which were to come into operation for the first time in 1976/7, and some of their answers were outlines of anticipated events rather than reports of established ones.

TEACHING ARRANGEMENTS

Structure

In a number of schools all psychiatry teaching takes place over a single defined period and in an independent course. This course would include all the theoretical and clinical teaching of psychiatry and no teaching would be given by psychiatrists at any other stage of the clinical course. However, this pattern is becoming less true (see 'Developments'). For example, psychiatrists contribute to the introductory course in clinical method at the beginning of the clinical course in fourteen schools. At the same time as students learn the elements of the physical examination they are introduced to the art of the clinical interview—how to gain a patient's confidence, reassure him, etc.—and given some insight into the psychological and emotional state of a sick person. The psychiatrists in this course are not necessarily teaching the psychiatric interview specifically, they are helping with the students' general training.

Almost all medical schools have courses in behavioural science in the preclinical years and in fourteen of them psychiatrists are among the teachers playing a leading role. Indeed, the psychiatry department in

these schools may carry the administrative responsibility for teaching the psychology component. This gives students a grounding in 'normal' psychology and psychological development, and the emotional, social, and cultural stresses to which human beings are subject, before they come to deal with the clinically abnormal. Eight schools told of psychiatrists taking part in behavioural science courses *and* introductory multidisciplinary clinical methods courses.

Some schools have lecture courses in psychiatry which are not synchronized with students' clinical experience of the subject and which are not co-ordinated with theoretical instruction in other clinical subjects. A few schools schedule lectures and symposia on 'Mind' or the mental system, within the sequence of systems-based instruction covering most clinical fields. In addition, psychiatrists put forward the 'psychiatric' point of view in courses devoted to other specialties: they appear in general medicine, gynaecology, child health/paediatrics sessions and in community studies, in particular. In other schools (most), the 'theoretical' teaching in psychiatry by means of lectures, etc., takes place over the period of students' attachment to a psychiatric department for clinical teaching.

Clinical psychiatry is taken in a single full-time attachment in twenty schools: another school gives two full-time attachments of one month each, known as 'junior psychiatry' and 'senior psychiatry'. Twelve of these last for eight consecutive weeks. Five other schools have two-tier arrangements: there is an early part-time and a later full-time attachment. Nine schools give part-time experience only: in two cases it amounts to as much as three-quarters time: at most it is about half-time, but at one it is significantly less: two of these schools give double courses, both sections being part-time—in one, both sections are half-time while in the other, one section is half-time and the other, longer section is more substantial because it is residential though half of each day is scheduled for another specialty. The psychiatry attachment (or the senior full-time one) is one of the final year 'junior house officer' posts in three schools.

Position in the Course; Teaching Time

Seventeen schools place their single full-time attachment in the second year or middle period of the clinical course. Three others place it in the final year. Of the schools with two attachments, either part-time/full-time or double part-time, two hold them both in the first two years of the clinical course while four hold them in the last two years, and two hold them in the first and final years. (Rotating schemes mean the psychiatry attachment is not confined to such a precise curricular location in remaining schools.)

Many respondents were not able to estimate the time they devote to teaching in the introductory courses, etc. It was therefore resolved

to ignore this teaching for the purpose of presenting average figures, and to concentrate simply on the clinical attachments described above. On this basis, and including child psychiatry where this is taught within the psychiatry course rather than paediatrics, the average time spent by students on psychiatry is 7·4 weeks (SD 2·01) or 221 hours (SD 60·2)—equating one week with 30 hours. The range is from just under 100 hours to 12 weeks: in twenty-one schools the full-time (or full-time equivalent) period is between 7 and 9 weeks.

Late Note (Autumn 1976). Since the information was collected, a school with a four-week attachment has increased it to eight weeks.

Course Development and Evaluation

Respondents were asked to describe arrangements for co-ordinating the different elements of their own teaching, for co-ordinating with other subjects, and for evaluating the teaching.

Replies show that relatively formal systems for co-ordinating the different elements of psychiatry teaching exist in twenty-four schools. Relatively informal arrangements operate in a further eight schools. Departmental teaching committees or sub-committees were reported in twenty-two cases. They are composed of academic staff, sometimes only the senior academic staff, and formulate policies and supervise the general running of the courses. Eight of these departments and two others designate individuals to be course co-ordinators: they are responsible for the day-to-day administration of the timetable and would be the first to be called in if a problem arose. The circle of psychiatrists involved in clinical teaching is usually far wider than the academic unit; to keep them informed of the aims of the course and to bring a measure of cohesion to the programme, documents listing the objectives of teaching and suggesting ways of meeting them are distributed to all their clinical teachers by eleven departments. Eleven respondents indicated that all teaching of psychiatry as a specialty—theoretical and clinical—occurs within the same period, so the course is self-contained, making co-ordination of the two aspects administratively convenient.

Three respondents indicated that theoretical teaching is separate in time and place from clinical teaching so that little co-ordination can be achieved. Students in two schools are assigned to personal tutors who take care of deficiencies in students' individual experience. In fourteen courses, seminars and tutorials on set topics draw together threads and help to correlate the theoretical and the practical, and generally make the course more comprehensive and comprehensible; they are conducted by academic staff with an eye to a 'core' syllabus.

Students do not necessarily spend the whole of an attachment with one unit; they may be transferred to another one or more in order to see a different approach or a different type of patient. Again, they may

spend part of their time on the academic unit, some in an 'ordinary' mental hospital, and the rest with community-based services. The different spells are deliberately unco-ordinated though carefully planned to provide contrasting pictures of mental illness and how it is tackled, leading eventually to a balanced impression of the whole field.

Various arrangements are made to link psychiatry with other courses and other specialties. Fifteen respondents mentioned child psychiatry. Whether this is taught during the psychiatry course or during the child health course, it necessitates co-operation with paediatricians. Three of these respondents also mentioned forensic psychiatry: all courses would include some of this, but in these three apparently greater efforts are made and specialists in forensic medicine are involved.

As mentioned earlier, psychiatrists in fourteen schools join in the multidisciplinary Introduction to Clinical Method course. Psychiatrists in fourteen schools organize or play a leading part in a preclinical behavioural science course, and this entails varying degrees of co-ordination of clinical and preclinical colleagues. Liaison sessions with other clinicians are a regular feature in sixteen schools: most frequently they are held with physicians. They are patient-based and relate to individual cases who have a psychiatric or psychological component to their physical illness. The group of students attached to a medical (or occasionally a surgical or gynaecological) unit receive bedside teaching or a tutorial from a psychiatrist and the clinician responsible for the case: these sessions can also take the form of conferences. Two of these schools have a duty psychiatrist attached to every teaching unit in general medicine who automatically takes part in the clinical teaching.

Five of these schools and six others hold formal topic-teaching sessions for larger groups of students or for the whole class together, in which psychiatrists and other clinical specialists discuss a topic of mutual interest and general relevance. They are given at all and any stages of the clinical course and not primarily in connection with the main psychiatry course. Three respondents—one of whom practises *ad hoc* liaison teaching—regret the absence of formal mechanisms for collaborative teaching with other departments.

The question on course evaluation could not be answered by two respondents; in one case the course has not begun and in the other case it is embryonic and the new professor will no doubt introduce a new approach to evaluation. Twenty-four respondents indicated that formal review procedures exist, and four others indicated that informal reviews definitely take place. Only two respondents replied that no review at all occurs. In eight of the twenty-four schools, informal and less consequential review is a frequent occurrence (for example after each term or block) while major, formal policy reviews are conducted at longer intervals—annually or less often. One department for example 'deals

with minor matters monthly, routine business once each term and major discussions at least annually'. There is significant correlation with reports of formal arrangements for co-ordinating teaching and those for evaluation: nineteen departments operate formal arrangements for both aspects of course development—in many cases the same mechanism is used, such as a departmental sub-committee.

The major review is held annually in ten departments, at the end of the academic year. Eleven review the course at the end of each attachment or clerkship period as this is the primary teaching episode, and two of these schools hold equally important annual and clerkship reviews. Three respondents insisted that review is a constant process and not an event to be held on a certain date—they review more or less continuously.

Eighteen reviews take account of all teaching activities at all stages of the course, but two departments said that only the major, separate psychiatry teaching is subject to their review; psychiatrists, teachers of community medicine and other personnel together review the teaching which they share in community-based courses of study.

All or most of the staff who teach undergraduate students join in the review in fifteen schools, part-time and non-academic psychiatrists being invited to join in. In six cases it is only members of the academic department of psychiatry who stage the formal review. Five departments mentioned here their teaching committees, etc. (qv); sometimes they have executive authority to implement their proposals, sometimes they must put forward their proposals for comment to the whole department or to the senior members.

Students' comments are invited in a total of twenty-two departments. Generally, this occurs at the end of their period of clinical attachment and the format is a staff–student meeting. Seven, either in addition to or instead of a meeting, issue questionnaires for students to record their approval and criticism anonymously. Six respondents added that the interesting feature of their review exercises is that students' suggestions are actually accepted and lead directly to changes in the programme.

Problems of course evaluation which are probably universal were raised by two respondents here: how to know what teaching goes on in the different clinical units, how to agree upon common standards, how to discover whether and with what success they are attempted: 'The main problem is "Quality Control" in the teaching firms. It is difficult to assess, except by students' reports (which are very fair-minded) just what the ethos and degree of keenness of a firm really is. The teachers do their best but often with limited resources. If teaching staff were not so limited in numbers I would allocate a lecturer to each firm for a stated period each week, firstly to help in teaching, but secondly to act as a two-way channel of communication—spotting and reporting on deficient areas of instruction and feeding back information

to the clinical teachers and by example, encouraging them to do even better.' Improved arrangements for evaluating teaching—more formal, more structured procedures and in some cases, a wider range of participants—will be introduced in six departments soon.

AIMS AND OBJECTIVES

Respondents were asked to outline the aims and objectives of their teaching. Naturally most of them have more than one aim, and some respondents were most elaborate in their reply—unfortunately this report cannot do justice to their eloquence. All thirty-five respondents gave objectives.

Many respondents feel they must show students what psychiatry is. Students bring misconception, fear, and even hostility to the subject: they must be helped to develop a 'positive attitude to psychiatry' and to appreciate that although they themselves may not become psychiatrists, an understanding of psychiatry will be essential for them in dealing with their own patients who have mental and emotional disturbance and with cases where a psychiatric approach is called for. Thirteen respondents hope that by the end of their course the students will be better able to face this type of problem in non-psychiatric clinical practice. They should not be frightened of psychiatrically ill people (seven schools) and should have lost their initial, lay reactions and acquired confidence and a professional understanding in contact with these patients. It is hoped too that students, having overcome initial doubts, will realize that psychiatry is more than a collection of attitudes and moral stances; it is a major clinical specialty with enormous potential for treating patients which has made and is making remarkable progress in research and therapy (five schools). Relevant to their own professional future and to the future of the NHS, students should know what are the growth points in psychiatry (three schools) though at the same time being aware of the peculiar hazards in psychiatric research and treatment which do not apply (or apply in less acute form) to other specialties. The role of the psychiatrist for example, is more ambiguous than that of other doctors, and the ethics of therapeutics and therapeutic research are more controversial here (three schools). For all these reasons, an overview of the practice of psychiatry today is offered to students in these schools because 'it is essential for the student to acquire a positive attitude to psychiatry and to be willing to add to his knowledge as he encounters psychiatric problems throughout professional life. There are even greater difficulties in fostering appropriate attitudes to psychiatry than to other subjects . . . thus students must be encouraged by example of all teachers to become sensitive to the psychological problems of patients and to react with

compassion. A student may remain sceptical of the more controversial theoretical concepts: he should not deny the common occurrence of emotional disturbances in his patients or the need to deal with them sympathetically, rationally and energetically. The trainee is also required to develop certain intellectual approaches to psychiatry. For example, he should learn to appreciate the uniqueness of the patient's personality in determining the content, form and even the origin of his illness. He should also acquire a multi-dimensional view of the causation of mental illness.'

Thirty-one courses have a major objective of introducing students to the features and characteristics of each of the main psychiatric disorders. They must be able to recognize the signs and symptoms of each type of illness and to recognize their implications. These disorders are taught in both 'theoretical' and clinical teaching. Seventeen of these courses give equal attention to the standard forms of therapy for the major types of disorder. They discuss the most commonly used alternatives and the circumstances when it would be advisable to use them. A comprehensive yet critical approach is practised.

Nine respondents are anxious that all students should be made aware of the principles of psychotherapy: no student should leave the course ignorant of its purpose and the methods. Individual psychotherapy, group psychotherapy, and other forms of psychological management are included here.

The special skills of the psychiatric interview are a major objective of twenty-seven courses. Students must learn what processes and tensions are at work, and how a psychiatrist makes the interview a successful one by creating a 'therapeutic doctor–patient relationship', and they must also acquire these skills themselves at an elementary level. They must learn the particular skills needed to interview mentally ill people and must absorb them into their personal repertoire so that they become more adept at taking histories from and giving advice to all patients. One respondent gave an equally important objective 'the ability to interview patients' relatives and to communicate with them, bearing in mind their role in a patient's illness and recovery'.

Ten courses aim to demonstrate the social and cultural background to mental illness and the social factors in its treatment. Some contain a significant element of community psychiatry. Two others are particularly concerned to demonstrate the role of the family and students are expected to undertake 'in depth' studies of the family of a selected patient, in order to see the wider picture. Also from the wider community point of view, fifteen courses stress the importance of the other professions and caring agencies in rehabilitation and in preventative and supportive work: the purpose is to show how genuine teamwork is essential.

Acquisition of interviewing skills and experience of community care and other health professionals will also have some impact on studies in

other subjects and future non-psychiatric clinical practice. Twenty-seven respondents aim explicitly to improve students' general outlook and clinical competence by focusing on 'whole person' medicine. They draw attention to the psychological stresses in normal human life and to their role in organic and physical illness, and emphasize that a patient is always a person with human needs and anxieties which may in illness be exaggerated.

Twenty-one respondents including fifteen of the latter group intend that students should gain some insight into the doctor–patient relationship: psychiatrists are uniquely well placed to teach what this means. Moreover, they can help students to become more sensitive to the other person's feelings and to convey sympathy while maintaining a professional stance. They can help them learn to be attuned to emotional currents while resisting their pull. Thirteen respondents including eight of the latter group, also hope students will begin to understand themselves a little better. All other teaching in the medical school aims to help them understand patients, but psychiatrists can prompt them to analyse their own attitudes and reactions, to face up to their unconscious and instinctive responses as the first step in learning to control them. By the end of the course in psychiatry they will be more mature people.

TEACHING METHODS: NON-CLINICAL

Lectures are given in a total of twenty-seven courses; nine respondents explained that only the necessary minimum is given in order to transmit basic factual information—they are not the method of choice. One of these courses gives lectures only at the very beginning, to orient students and indicate the 'core' themes. Three other departments give a brief series of revision lectures at a later stage.

Thirty respondents mentioned seminars, symposia, conferences, etc., in front of large-group audiences. Often psychiatrists form a panel of speakers with other specialists to discuss a topic of mutual interest, and very often these sessions are held outside the main psychiatry course. Eleven respondents stated that topic teaching on these lines is a regular and very successful feature of their teaching. The subject-matter need not be purely 'psychiatric', for example in one school it covers disorders of appetite (anorexia nervosa, obesity), psychological problems of pregnancy and motherhood, sex and marriage, and so on.

Small-group teaching occurs in thirty-three courses. In many of them it is the favourite method. In three schools, small-group sessions are used to teach aspects of psychology and group dynamics, variously known as 'sensitivity training', 'T' groups, or 'Balint groups'. At a fourth school they are planned for the new curriculum: students will be invited to volunteer to form groups of up to ten people, holding

fortnightly meetings throughout the clinical course, provided that enough experienced staff can be found to conduct them and the students are not away at distant hospitals.

Independent study is encouraged in several courses. Free study time is specifically timetabled in seven courses, to allow students to read, write up case-histories or projects, or study tape/slide programmes. Summaries and information sheets are handed out in four courses. Project exercises are available in six schools: they are required of all students in three courses while in the others they are optional.

Teaching aids are fairly widely used. Slides and tape/slide programmes are used in seven courses. Television is employed in some form in a total of twenty-six courses. Recordings are made of patients being interviewed and undergoing treatment to show typical features and methods, in twenty courses. Students' own interviews are recorded and played back to them and discussed with them in twenty courses. Fourteen departments use the medium for both purposes.

CLINICAL TEACHING

Several questions inquired into aspects of clinical teaching: replies were often detailed and elaborate.

Teaching in the Different Clinical Settings

Respondents were asked to describe the relative roles of different learning situations and different clinical settings.

Six respondents reported that 'active teaching' is most important in their course in determining how and what students learn. This requires the presence of staff and would mean a ward round, for example, conducted for the benefit of students rather than specifically for the benefit of patients. In contrast, two respondents claimed that activities which are directed toward patient care are the most important: the active teaching occasions are few or comparatively less effective and students are expected to benefit most from being present when the staff are carrying out their normal work: consultations, psychotherapy, arranging treatment, and so on.

Twelve respondents favour the 'learning' rather than the 'teaching' approach in allowing students to become involved with patients and to spend as much time as possible with patients, regardless of active medical and/or educational events. In fact, the patients themselves are the teachers and psychiatry is learnt directly from them rather than indirectly via the staff. Six of these courses encourage responsibility and active participation. Another gives opportunities for participation if a student is willing, but there is no pressure on unwilling students because this could strengthen misgivings.

Psychiatric problems repay long-term observation more than other disorders; because they can last longer, the outcome is perhaps less predictable yet students must see that patients do recover and that treatment is successful. Students can also see that the environment (both physical and human) is important in patient progress (ten respondents). Two respondents find that in-depth experience on the ward is indeed valuable but requires supervision: it is unfair to expose students to it without any support or guidance.

Three respondents whose courses are 'split' explained that the role of each situation varies between the two stages. 'Junior' students are given more teaching whereas 'senior' students are expected to be more independent. In the early stage there is more staff–student contact, in the later stage more student–patient contact.

Altogether twenty-two respondents were unable to say that any single learning situation was more 'important' than any other—they are all valuable for different purposes and are complementary to each other. This comment applies equally to the relative role of different clinical settings: in-patient, out-patient, and non-hospital. There will be variations in emphasis—between students and between teachers—but most courses are designed to use a balance of the different types of experience. In one course for example a student will spend one half of the time attached to a ward and the other half attached to the out-patient and liaison services.

Attendance at out-patient clinics is regarded as particularly useful for teaching and learning by six respondents. Disorders are seen before they are affected by treatment when they are perhaps at their most acute, and the art of consultation is demonstrated by experienced staff.

Community psychiatry features in twenty-two courses. Students accompany doctors or other professional workers on home visits, join general practitioners to see how psychiatric illness can be contained at general practice level, or observe the work of community psychiatric teams. In nine courses the students visit other institutions for 'social misfits' and mentally abnormal people—hospitals for the mentally handicapped were mentioned most often. For example students at one school have a session in a GP surgery, a session at a child guidance clinic and tours of a special psychotherapy unit, alcoholism unit, prison, adolescent unit, and reception centre. Four respondents would like to see some or more collaboration with general practitioners, either through the medical school's GP department/unit or directly through shared patients. Students could then follow up hospital patients after they left hospital.

For hospital teaching there are three possible arrangements: a psychiatric unit within a general hospital which would also be the academic unit of psychiatry in the main hospital used for teaching; a mental hospital which is a teaching hospital: and a mental hospital or

hospitals which are district and 'non-teaching' ones. The last two settings are those most frequently used, but in twelve schools part of the course is given in an academic unit of a teaching hospital and part in 'ordinary' mental hospitals where students are sent in groups to see 'typical' psychiatry.

Clinical teaching group size was inquired into briefly: information was supplied in most replies, but where the introduction of a new curriculum coincided with an increased intake of students it was not possible to estimate numbers.

Three schools never exceed 1–3 students for any clinical activity or setting. In sixteen schools the number attached to a ward unit does not exceed 5–6 students, and in seven other schools the number attached to a ward unit does not exceed 10 although it is more than 5–6. Where the number of students attached to a ward unit is fairly high they are subdivided for more intensive contact with patients (for example for clinics). Where two stages of clinical attachment occur, the numbers in the later and normally final-year period are lower—1 or 2 students per unit in four cases.

Numbers of students attending out-patient clinics to sit in at consultations are generally lower per consultation than the numbers attached to a ward unit and attending, say, a ward round. The usual range for sitting in at out-patient consultations is up to 5, but ten respondents stated that 2 or 3 is normal, and three others reported 1 to 2.

Student Experience of Emergencies

Ten departments make special arrangements for students to see emergencies in psychiatry. The majority (twenty further replies) do not make special administrative arrangements but because of the general structure of the course, it is more than likely that most students will see emergencies and urgent situations. Four respondents stated positively that no arrangements are made, that it is undesirable for undergraduates to have such experience, and their students are unlikely to receive any.

Eight courses mentioned that they require students to be resident in hospital for a given period. This provides opportunities for 'total' experience including emergencies and crises. The residential period varies from one to eight weeks (average three weeks). In a further five courses, residence is optional. In several other schools the students are expected to be available when their unit is admitting, and may in fact be 'resident' for night rotas and weekends, with some sort of call system being used (seven replies). In two courses it was reported that all students would spend some time in the admissions unit of the mental hospital. Six returns pointed out that during their spell in an accident and emergency department, students will see urgent psychiatric problems and in three of the same schools and in four others they will see

them during their attachments to community services, and how they are managed.

Specified Requirements and Experiences: Student Responsibility

It has already been shown that acquisition of interviewing skills and familiarity with the main clinical syndromes and the appropriate treatments are major course objectives in most cases. More specifically, twenty schools itemize what particular skills should be acquired and/or what particular cases and treatments should be witnessed by students by the end of the course. Two of them keep records of what individual students have actually seen and achieved. However, twelve indicated that neither lists nor records are kept. Two respondents pointed out that students came in very small groups so that staff can easily find out what experience each student receives: in fourteen courses where patients are selected for students to interview and present, staff would select the cases for their learning value and make sure that each student's experience was not inadvertently biased to one type of case.

Attitudes differed as to the amount of practical experience and responsibility which students ought to receive. When courses are given in two stages the senior students have more responsibilities and frequently 'do' what junior students would only 'see'. Similarly elective students and students doing a project on a clinical topic would be more active. Although one department is very enthusiastic and encourages students to be active team members, generally there is greater caution regarding students' roles. Several respondents pointed out that preregistration posts do not exist in psychiatry—to be 'junior house officers' students would have to emulate the actions of post-registration house officers.

Respondents were asked to indicate on a pro-forma the level of students' practical experience and the extent of their normal permitted responsibility. In the first case, they were asked to indicate which procedures, out of a standard list, students would normally be expected to have seen or done in the specialty, by the end of the undergraduate course. The list was not altogether appropriate to psychiatry, but respondents none the less completed the form, adding their own items. The question was therefore effectively an 'open' one as opposed to a 'closed' one and should be interpreted accordingly. This list, with the most frequently listed items appears as Table A.

With respect to psychotherapy, as well as experiencing the one-to-one individual kind, eight respondents like their students to observe group therapy, and two of them routinely expect them to participate. Some encourage students to conduct some psychotherapy briefly and under supervision, and voluntarily. In four courses this is a routine event, in ten it happens occasionally, ie by no means for all students. The opportunity of taking on a patient for long-term psychotherapy is offered in two courses.

Table A. *Practical Experience*

Procedure	No. of Schools in which Students would: *See Procedure Only*	*See and Do Procedure*
ECT	25	1
Behaviour therapy	10	5
Psychotherapy (individual)	9	3
Group therapy	8	2
Abreaction	7	0
Psychological tests	6	0
Hypnosis/relaxation therapy	6	0

Similarly the level of responsibility entrusted to students was investigated by presenting respondents with a list of responsibilities which students might be given, and asking them to indicate for each one whether it would 'routinely', 'occasionally', or 'not normally' be entrusted to students by the end of the undergraduate course. The list, together with the results, appears as Table B (only thirty-one respondents completed it).

Teaching Staff

A number of respondents drew attention to the types of staff involved in teaching psychiatry. Staff other than psychiatrists regularly contribute to the teaching programme in thirty schools. Seven respondents are especially pleased with the contributions made and the effect they have on the course.

Nurses, psychologists (clinical psychologists), social workers, psychiatric social workers, and occupational therapists were mentioned in twenty-two replies. Sometimes they conduct formal teaching, but more often students talk to them informally and observe them at work. Three respondents strongly encourage their students to talk to the other staff whenever they are available and to learn from them as much as they can. General practitioners and/or members of the community care services were mentioned in sixteen replies. They may teach students 'on location' (see above) or may come into the hospital/medical school for topic-teaching, case-conferences, or liaison meetings. Representatives of voluntary bodies such as the Samaritans feature in the programme of two courses. Geriatricians and physicians specializing in geriatric medicine regularly help in the courses to teach what is known as 'psychogeriatrics'.

In two courses, medical students and other health students share some teaching sessions and activities.

Table B. *Responsibility Entrusted to Students*

Responsibility	No. of Schools in which the Responsibility is entrusted to Students: *Routinely*	*Occasionally*	*Not Normally (or na)*
The results of students' initial examination and history-taking form a part of the patient's records	21	6	4
Students' records of the patient's progress and treatment form a part of the patient's record	14	10	7
Students recommend medication	1	4	26
Students recommend clinical/ laboratory investigations	1	11	19
The practical arrangements for clinical/laboratory investigations which involve other departments (eg radiology, bacteriology) may be entrusted to students	0	10	21
Students might be a 'first contact' in an emergency	1	19	11
Students assist the operator in the theatre	na	na	na
Senior students have the opportunity to play a role in the clinical team similar to that of pre-registration house officers	7	16	18
Senior students act as student assistants ('locums') in the absence of house officers	2	9	20
Students act as contact between the hospital and patients' relatives	1	16	14

'SPECIAL FEATURES' OF COURSES

Respondents were asked to give their views on what are the interesting, unusual, or exceptionally useful features which distinguish their courses. Their choice could relate to the whole course or to any individual aspect, and most selected more than one 'special feature'.

The value of a course in psychiatry lies in the open-ended approach, according to three respondents. It is less black and white, less 'cause and effect certain' than most other specialties, and if its multidimensional nature can be conveyed, it helps students to deal with not only psychiatric but other problems more realistically and therefore more fruitfully. The medical model is presented as only one of a number of approaches, and the whole ethos of the course is non-prescriptive and non-didactic in accordance with the nature of the specialty.

Ten respondents emphasized in their answer their aim of educating students in 'whole person' medicine. A course in psychiatry should make them permanently aware of the total background: 'The most valuable aspects of the clinical teaching concern, first the development by undergraduates of appreciation of the mental life of individuals with emotional disorders, and in themselves; next, the gaining of an understanding of the respective roles played by environmental and personal factors involved in the precipitation and outcome of mental illness; and last, the production of a wider awareness of the value of an understanding of human emotion in all aspects of illness whether mental or physical.' Some believe this is best done in clinical teaching—the patients demonstrate these principles—while others have found multispecialist topic teaching and liaison bedside teaching very successful methods of emphasizing the same principles. The latter show that psychiatry is a 'medical discipline', and that psychological and emotional problems are implicated in all branches of medicine, not only psychiatry. Psychiatry thus helps students towards 'understanding the link between biological and social processes'. These courses try to balance the 'medical' with the psychiatric approaches on one hand, and the medical/physical/organic aspects of psychiatry with the alternative, psychodynamic ones on the other.

The course in behavioural science in the early or preclinical years was mentioned here by three respondents. The introduction to basic concepts of psychology and to psychological explanations of people's behaviour in sickness and in health prepares students for subsequent clinical teaching while they are more receptive to these ideas than possibly they become later. As the courses are planned by psychiatrists (amongst others) they are deliberately made relevant to the course in psychiatry.

Five respondents commented on their teaching staff. Two are fortunate in having staff who enjoy teaching and make great efforts to get to know their students and to make their teaching interesting. The other three referred to the range of interests and expertise among the teachers. The differences in outlook and in practice, and even the disagreements, are consciously fostered in order to present as complete as possible a picture of contemporary psychiatry.

Another feature of organization which also promotes good staff–student relationships is the small number of students who are attached to a unit at any one time; this was mentioned by three respondents, two of them referring to their second, final-year full-time attachments.

Small-group teaching in the shape of set discussions and tutorials is regarded as especially valuable by four respondents. In three other courses students themselves lead discussions by presenting papers on chosen topics or presenting patients to the rest of their group; this requires considerable initiative and independent work and is highly

valued by the respondents. In two departments there is opportunity for students who show promise to become involved in departmental research projects or to attend talks and other meetings in the postgraduate calendar.

Aspects of clinical teaching were frequently referred to here. The fact of a full-time period of psychiatry is itself the best way of ensuring profitable learning, according to four respondents; it provides the fullest possible exposure to patients. The exposure will be wide—to a variety of cases through all stages—and include personal involvement. The small size of student group also enables the ideal student–patient contact to be achieved. Four other respondents spoke enthusiastically of the number and variety of patients whom students see.

There is no substitute for personal experience in learning how to recognize and respond to the different disorders. The range of cases is wider but also less biased and more representative of actual incidence and typical features at the ordinary mental hospitals which students visit in some of these courses. Here they get a true acquaintance with the national extent of serious psychiatric illness and with the established patterns of treatment; two of these respondents also spoke of the range of interests of their clinical teachers. An introduction to community psychiatry is a special feature of four courses—two are in Eire. This provides a more accurate picture of the extent of psychiatric problems than a hospital-based course even at a non-teaching hospital. Other advantages are—demonstrating the multi-professional co-operation in a community team, demonstrating the work in this field of general practitioners, demonstrating how preventive and supportive care reinforces and can preempt medical/therapeutic care, and generally giving a totally new perspective. The emphasis is much more on mental health than on mental illness. Two respondents mentioned the visits to other institutions for 'deviant' people. These make students more fully aware and more critical of the provision which society makes for its less fortunate members.

Television has reportedly had a marked effect on teaching in four courses. Clinical teaching material is selected and refined and is made convenient for all involved: staff, students, and patients. These courses have experimented with videotape in many contexts and have come to depend heavily on them for their 'core' teaching.

Clinical experience was discussed by twenty-two respondents in terms of active practical experience, in addition to observing and seeing cases and procedures. It is felt that the most rewarding learning is through responsibility—interacting with patients, joining in the therapeutic activities which they do, carrying out tasks for the nursing, medical, and paramedical staff, interviewing and taking case-histories and correlating them with information from books, journals, and lectures. As a result students grow in self-awareness and in knowledge.

There are a few departments where considerable responsibility is permitted to students who volunteer for it. Selected patients are assigned to them for long-term psychotherapy. (In a few other departments it is possible for suitable students to conduct psychotherapy but on a short-term basis and under closer control: see above.) At one school the process can last for about a year, with weekly sessions with the patient of an hour each and weekly meetings of the 'supervision group' to which five or six students belong, with a psychiatrist or psychologist as tutor. Approximately a quarter of all the students at this London school accept the opportunity. They acquire the skills of psychological treatment and 'those who have gone through this experience find it easier to deal with their patients' psychiatric and emotional problems after qualifying, especially in general practice; others have as a result chosen psychiatry as their specialty and many are by now qualified as psychiatrists'.

STUDENT ASSESSMENT

All respondents except one were able to describe how students are assessed in psychiatry. The types of assessment will be discussed in terms of their timing, their methods and whether and how they affect a student's progress towards graduation.

In-course Assessment: Class Examinations

Thirty-two departments assess students during or immediately at the end of the teaching period, when only the group of students on attachment are given an assessment: this system is also likely to be adopted by a school which has not yet run its clinical course. In twenty-three cases a report on each student is compiled by the tutor or by senior members of the unit noting knowledge, performance, and general demeanour during the course. If the report is a poor one, or if the grade it gives is low, or if the staff feel unable to 'sign up' the student, then the student might possibly be required to repeat the course/attachment. In one department the project which all students must carry out is assessed. In twelve courses the case-histories which students write up or the case presentations which they deliver are used to assess their progress. Clinical examinations with patients are used in eight courses, and three of them with four other courses give oral examinations to each student. Thirteen respondents mentioned their use of MCQ tests.

In five schools these 'in-course' tests contribute marks to the total marks awarded in the final qualifying examination. In four other schools, good performance in these tests can (and often does) exempt students from part or all of further examination in psychiatry; for

example, it can exempt them from further clinical but not further written assessment.

In four schools, class examinations are held at the end of a term or year, for the whole class of students together. In one of them psychiatry figures in an examination with other clinical subjects but in the other three the examination is on psychiatry alone. All are based on MCQ written papers.

Assessment in the Qualifying Examination

Thirty-two schools feature psychiatry in their final 'end-of-course' qualifying examinations. Two of the other schools operate a 'critical' in-course assessment system and the third will probably do so also (it has not yet run its clinical course). A separate written paper in psychiatry is taken at six schools and the subject is included in the examination of medicine in sixteen schools including almost all London schools where it accounts for 20 per cent of the marks available. Eight schools (of whom several are noted for their integrated examinations) include psychiatry in the examination of several major disciplines. One of these also examines psychiatry with medicine on another occasion. Two schools in Eire schedule the assessment of psychiatry with that in other (minor) specialties.

Changes in the assessment procedure are planned in no fewer than fourteen schools. In six cases the subject is being given a more prominent role in the final qualifying examinations and in two of these cases, and in five others, there will be more, better structured, more useful in-course assessment. Two departments will require students to give case presentations for assessment.

Respondents from two schools report what they regarded as particularly interesting features of their assessment. In one of them MCQ tests are given halfway through the attachment to allow opportunity for remedial action if a student is discovered to be in difficulties. In another school, students are specifically assessed with respect to the psychological dimensions of the other major clinical specialties in the final qualifying examinations. In other words, they must prove they have understood the liaison psychiatry which is a feature of this school's teaching.

Some problems emerged in the reports of assessment. Two respondents have found it very difficult to define what knowledge, skills, and attitudes would be expected of students and then to devise appropriate tests which will measure their presence (or absence) precisely enough to be useful. In five departments an alleged shortage of staff or staff time precludes the development of really useful in-course assessment.

In one Scottish school the formal assessment in psychiatry is at the end of the second clinical year, after a part-time attachment, but before the full-time one; the respondent indicated how unsatisfactory this is.

He would like psychiatry to become a recognized element in the Final examination, in the final year, with a quota of questions in the paper in medicine. This proposal was made by two respondents in Eire, both dissatisfied with the status accorded to their subject in their schools' examination system.

PROBLEMS AND DEVELOPMENTS

Respondents were asked what changes have recently occurred in their teaching, what changes are planned for the future, and what problems hinder the development of the teaching programme.

Organization and Resources

A number of respondents reported radical changes in their programme amounting to completely new courses. In the majority this coincides with general curricular change, generating change in most subject areas. Developments on this scale have occurred in eleven courses and are planned in seven more in the immediate future.

In nine schools more curricular time has been granted to psychiatry and two of these schools will see an extra allocation being made again very shortly.

A total of five schools are to increase the amount of time given to psychiatry in future: in one of them and two others the main clinical course will become a single full-time one replacing existing part-time or mixed part-time/full-time arrangements. There is likely to be teaching by psychiatrists elsewhere in the curriculum in these schools, but the main clinical psychiatry course will be a more coherent entity. Two of the courses receiving increased time allocation will remain split into two sections, and the respondents feel that the opportunity to rectify this has been missed. One of these respondents also remains dissatisfied with the amount of time allocated; a total of seven respondents indicated that psychiatry in their school is granted insufficient time and that students cannot be taught fully or learn about the field of modern psychiatry in the time available (the mean time allocation to psychiatry in these schools was in fact very close to the average for all schools).

Topic-teaching and liaison psychiatry with other clinical departments has been increasing, as already shown; such activities will continue to expand. At one school there will be in addition to the main psychiatry courses:

> Ten to twelve seminars with preclinical colleagues on psychiatric subjects, requiring a knowledge of applied physiology, anatomy, biochemistry, pharmacology, or psychology. They will be held during the first or second clinical year.

A small contribution to the introductory clinical courses, concentrating on methods of interviewing patients.

About four seminars during the final-year integrated course as well as joint topic teaching with other medical colleagues.

Teaching by psychiatrists in the early or preclinical years of the curriculum is a growing phenomenon. In three cases, a new course in the behavioural sciences has been introduced which involves psychiatrists and their contribution to this at one school is to be enlarged. The new curricula at two other schools will see a preclinical introduction to psychology as well as more teaching of abnormal psychology in the psychosocial field. Two respondents complained that not enough basic psychology is given to preclinical students: in one case only a small amount is given, in connection with the nervous system, and in the other the course in psychology is in the first clinical year. Both would like a sure foundation in psychology to be given to students at the same time as the basic medical sciences are taught. Five respondents would like to see some (or more) 'vertical integration' between behavioural sciences courses, especially psychology, and the clinical psychiatry courses: there should be greater continuity, and associations should be made more obvious to students.

The physical basis of the course in psychiatry is changing in three medical schools. At two of them a psychiatric unit is being established in the new general teaching hospital (already a fact in one school, and anticipated in 1978 in the other) which will allow teaching to be conducted on cases more suitable for undergraduates and also permit more liaison teaching with patients whose management will be shared by psychiatrists and other clinicians. Students at another school will spend less time in the academic unit and more time in 'ordinary' mental hospitals which hitherto have not been used in the undergraduate programme, where they will be exposed to the 'typical' range of disorders and treatments.

Five respondents reported the disadvantage of the hospital or hospitals used for clinical teaching being located at an inconvenient distance from the main centre(s) of teaching. This brings problems of travelling time, isolation of psychiatry from other specialties and lack of co-ordination with the rest of the teaching programme. The situation will be remedied in one school (see above) where it is hoped that teaching will be centralized.

The most severe and widespread difficulty reported in meeting teaching commitments is a shortage of staff, or of staff teaching time. This was reported from seventeen schools, representing all geographical areas. Sometimes the shortage is one of academic staff, sometimes the clinical side is understaffed, and sometimes the pressure of patient care encroaches upon teaching time. In particular, it means that intensive

small-group teaching cannot be maintained to the extent desired. One of these respondents also mentioned a shortage of non-medical staff which affects teaching directly in that these professions ought to be part of the teaching team, and indirectly in that it increases the workload of the medical staff. Three of these courses and another one are further hampered by the presence of too large a group of students on each attachment. The staff–student ratio has become extremely unfavourable for good clinical teaching activities. One respondent believes the solution to inadequate staffing would be the creation of a department of psychiatry in the medical school (at present they do not have one): it would increase the teaching manpower and stimulate interest in teaching and might lead to better provision of other resources.

Teaching Activities; Content

The special features of psychiatry as a specialty—its ethos, its methods, its comparative youth—make it appear 'different' from other subjects in the timetable, and in the view of some respondent psychiatrists, make some of the other subjects appear inflexible and old-fashioned. Five respondents explained that teaching in psychiatry cannot be any more effective until the whole curriculum is revised (and in none of these cases does this seem likely). New objectives should be established for undergraduate education (these might concern attitudes as much as factual knowledge and skills) and course planning should be more fluid and interdepartmental, both 'horizontally' and 'vertically'. Four of them see the present curriculum as over-compartmentalized and over-hospitalized—far more teaching should relate to illness which is not treated institutionally and it should take place in the same social and cultural milieu as the illness. One of these respondents and four others find that the students come to psychiatry with prejudices and have to be 'decontaminated' before they can learn what psychiatry has to offer. These psychiatrists must still devote some energy to establishing their specialty as a 'respectable' one in the medical school and to encouraging students to show the same compassion and human interest to psychiatric patients as they do to the physically ill.

Most respondents did not report such difficulties. Five courses for example now include regular sessions of 'community psychiatry': in one school students are now attached for one whole week to the community psychiatric service and the experience covers emergency situations, domiciliary visits, and the social services; they see an unselected array of problems. Six courses in future will allow students some community experience; they will be taught by staff working in primary and community care, and will make domiciliary visits, seeing patients before and/or after their hospital stay. In their formal teaching two courses have in recent years laid greater emphasis on the social

aspects of psychiatric disorder and on the importance of investigating the background to a case. Even with these developments, six respondents would like greater community bias to decrease the emphasis on specialized hospital psychiatry in their courses. They would like general practitioners to help in the teaching programme regularly, and some of them also suggested geriatricians: the mental and psychosocial problems of old people are a neglected topic, best taught in a multidisciplinary and multiprofessional format (cf. section on 'Geriatrics').

Closer links with other clinical specialties are strongly desired by fourteen respondents. They see plentiful opportunities for establishing joint teaching, both in theoretical and topic-teaching sessions, and in bedside and case-conference settings. Departments which already enjoy such relationships regard them as a healthy development and would like to create similar contacts with other branches of medicine; for example, with surgeons. Greater involvement of non-medical staff in the teaching programme will be arranged in one course in the future and another respondent also feels the need for students to have more contact with these people though circumstances may not permit it.

In clinical teaching, three courses have been revised to allow students to spend more time with patients and to become more involved in day-to-day routine, learning from the relationships they establish through their own efforts. Two schools however report a recent growth in systematic teaching with more staff-student contact and more conscious teaching being introduced, which has superseded learning by observation and unstructured 'raw' experience. In three schools students will receive more instruction at out-patient clinics in future. This will show them representative cases of an acute nature and also how psychiatric interviews are conducted—both featured in greater variety than before.

The clinical involvement of students is handicapped in one school by a lack of residential accommodation. It would be desirable for students to have the opportunity of residence—though not compulsorily—in order to have a fuller experience of in-patient services and of the crises of all sorts which occur on a psychiatric ward.

Audiovisual facilities are growing in popularity. Recently five courses have invested in them substantially and eight courses are to introduce and experiment with them over the next few years. Television (CCTV) and videotape recordings were mentioned most frequently: they attract a great deal of interest particularly for the purpose of training in interview techniques.

As regards course content, the greater allocation of time and the collaboration with other specialists will lead to more thorough coverage of 'core' matters and incorporation of others which have been neglected until now. The areas which the largest number of respondents perceive as those most urgently requiring more attention are child psychiatry and mental handicap. Six respondents would like to arrange more

teaching in one or both aspects if they could gain access to the facilities for doing so, or if specialist staff were available for teaching.

Altogether important changes have occurred in twenty-seven courses recently. Eighteen will continue to develop and improve, as part of a group of twenty-two schools in which changes are definitely anticipated. Three respondents not reporting changes represent new schools where the psychiatry course had either not begun or not run its full length.

Psychology and Sociology

Replies to questionnaires on the teaching of 'Psychology and Sociology' were sought from all thirty-four medical schools offering preclinical courses.

Two schools do not teach either subject at the moment: one intends to introduce both into its curriculum and gave some information about its proposals, while the other as a matter of policy does not intend to make formal provision in the timetable for either subject. This left a 'field' of thirty-two schools.

The questionnaires inquired into the teaching of both psychology and sociology, and some schools preferred to complete two questionnaires, one for each subject.

A further complication was the uncertainties arising in introducing these 'new' subjects into a curriculum: many schools answered in respect of developing or embryonic activities, and this report must thus be seen as rather more 'provisional' than most others in describing the way in which the topic is taught in the medical schools.

TEACHING ARRANGEMENTS

Thirty of the thirty-two responding schools answered principally with respect to the arrangements provided in their present curriculum: in some cases this curriculum is a new one, not fully implemented. The other two schools answered for future arrangements, about to come into operation.

Twenty-seven of the thirty-two schools teach both psychology and sociology. Four at present teach psychology but not sociology (one of them has definite plans to introduce sociology and another will probably make provision for it under a new curriculum though the proposals are still under discussion). One school at present includes sociology but not psychology, but is introducing a course in clinical psychology.

Psychology and sociology are taught in a single course in twelve schools, usually as a special 'Behavioural Science' course. The other

schools teaching both schedule them separately: they are not formally linked together, but they may however be linked with other subjects (for example statistics). It is also possible for psychology, sociology, or both, to be taught independently at one stage and to be integrated with other subjects at another stage.

Separate teaching in psychology is entitled 'Psychology', 'Medical Psychology', or 'Psychology as applied to Medicine'. A little psychology will be catered for in one multidisciplinary neurosciences preclinical course, and several respondents added that psychology is a formal element in the clinical psychiatry course. One school schedules the subject together with statistics. At the school introducing the subject for the first time, the new arrangements will consist of lectures, topic teaching, and practical demonstrations in psychology 'as applied to clinical problems in psychological medicine' during the fourth-year course in psychiatry.

Where sociology is timetabled separately it is entitled 'Sociology', 'Sociology as applied to Medicine', 'Social Aspects of Medicine', 'Social Sciences', 'Sociology and Social Administration', 'Medicine and Man', or 'Social Factors in Health and Sickness'. An existing course in one school is being modified into a new one entitled 'Organization and Efficiency of the Health and Social Services', while sociologists will continue to take part in other courses in geriatrics, human reproduction, and psychiatry. In several schools the subject is partly taught within the course in community medicine, and indeed at two schools it is taught entirely within community medicine. Major 'umbrella courses' are run in four schools covering a variety of topics under such headings as 'Man in Society', and 'Man and his Environment', in which the behavioural sciences figure in a highly integrated and thematic approach. (This is likely to be the arrangement adopted by the school introducing both subjects into its curriculum for the first time.)

Position in the Course; Teaching Time

Psychology and sociology are taught in the early or 'preclinical' years of all thirty-two schools. In some they are taught in both of the (normally) two years: if taught in one year only, this is rather more likely to be the second than the first year. Three schools also teach the behavioural sciences in their premedical year, and the new curriculum at another school will make it the fourth. (In one Scottish school, which does not timetable the behavioural sciences as one of its scheduled premedical courses, the majority of students take it as an option if they are exempted from one of the standard courses.)

Nine schools give timetabled teaching in one or both of the subjects during their clinical course: normally this is connected with mental health/psychiatry.

Some respondents gave estimates rather than precise figures for the time spent on the topics, due to the newness of their courses and the integrated pattern of some courses where subject-specific figures cannot easily be extracted.

The lowest amount of time reported was 26 hours, the highest 157 hours. The information, which relates to present provision, is classified in the table. The average amount of time is 72 hours (SD 33·4).

Teaching Time on Psychology + Sociology (hours)	*No. of Schools*
Less than 50	9
Between 50 and 75	10
Between 76 and 100	7
Between 101 and 125	4
Over 125	2

TEACHING STAFF

A proportion of staff, and in some schools all of them, teaching the topics may be drawn from outside the medical school, from other faculties and departments in the university, or from adjacent research institutes.

Psychologists teach psychology in eighteen schools: they are 'pure' psychologists, social psychologists, or experimental psychologists. Three of these schools and a fourth one also involve child psychologists and specialists in child psychiatry, and one of them mentioned an educational psychologist. Clinical psychologists are involved in twenty-three schools, and in thirteen of these schools no other psychologists are involved.

Sociologists teach their subject in seventeen schools: six of these schools also have medical sociologists. Altogether fourteen schools involve medical sociologists: at one there are two such, full-time lecturers, and a new post has been created jointly between the university department of sociology and the department of community medicine to develop teaching and research in evaluating the delivery of health and welfare. Specialists in community medicine (who may be NHS personnel), social and environmental medicine, epidemiology, and/or demography contribute to the programme in a dozen schools, and in some are responsible for administering the teaching of sociology.

Other occupations and specialties represented in teaching psychology and sociology include psychiatry (fifteen schools), general practice (nine schools), geriatrics (three schools), rehabilitation (two schools), physiology (two schools), and pharmacology (one school). Guest speakers from outside the university participate in many courses regularly.

Some or all of the staff teaching psychology and sociology are medically qualified in fifteen schools. However, the scene is changing: some courses are still experimental and may not continue under the staff who inaugurated them.

FEATURES

Aims and Objectives

Respondents were asked for a brief statement of their aims and objectives. Some gave an exhaustive list of learning objectives; others gave a general indication of their main themes and emphases and of the intended benefit of their course to the students.

Twenty-nine respondents stated their teaching aims; only three did not. The statements reflected all points of view in the debate on the manner (or desirability) of the introduction of the behavioural sciences into the undergraduate medical curriculum. These statements can be roughly divided into 'academic' ones (those concerned to present psychology and sociology as subjects in their own right with which university graduates should be familiar) and 'instrumental' or 'vocational' ones, concerned to present the subjects as 'relevant', and a necessary part of medical students' training which will directly help them in the later practice of their profession.

Courses with 'academic' objectives are designed to give a foundation in the subject/s, to convey the main principles, and to show that they are well-established disciplines with a great body of knowledge and a well-proven methodology to test and extend this knowledge. They are designed to show that the social and behavioural sciences are genuinely scientific and further man's understanding of himself and his environment. On these lines, twenty-one courses aim to introduce students to the concepts and methods of psychology and ten courses aim to introduce students to the concepts and methods which constitute sociology. The common topics—for example, perception, roles, interactive behaviour—and the theories of the most widely accepted schools of thought, are explained in outline.

Six respondents emphasized the contrast between their approach and the 'reductionist' approach prevailing in the rest of the medical school. They believe in seizing their opportunity—the only point in a medical course when it is possible—to discuss other ways of considering evidence, other ways of viewing humanity than those of the more physical sciences. They emphasize the absence of 'correct answers', and the need to appreciate that other explanations for an action often coexist with the ostensible explanation. They discuss the relativity of normality and the different concepts of it. All this is not to undermine the students' faith in their basic medical sciences but to give them a new perspective.

Some courses deliberately balance the 'academic' and the 'vocational' aspects. This type of approach, leading quickly from the 'basic' to the 'applied' was summed up in the aim of one respondent: 'To present the student with an elementary framework of knowledge of sociology, psychology and social administration which will enable him to understand the basic needs for normal human development, inform his understanding of the processes by which an individual becomes a patient or a doctor and to comprehend the structure and organization of the social and medical services.'

A dozen respondents claimed that the overriding theme in their teaching is to demonstrate the 'relevance' of their subject(s) to the study and practice of medicine; often, they try to relate their treatment of subject matter to hypothetical clinical situations, for example. One argued that '. . . a medical institution or team will not be at its most efficient unless its members have some understanding of how individual and group relationships affect communications and interaction between them'.

A 'relevance' theme in fourteen courses is the role of social and psychological factors in illness: they deal with the role of these factors in the occurrence of illness in individuals and the community, in attitudes to illness, recognition of illness, in the seeking of help, and in the management of illness and recovery from it. The purpose is to explain the behaviour of the patient as a 'whole person'. As doctors, the students must have insight into the behaviour of the people for whom they will be professionally responsible. Another theme which is found in eighteen courses is the relationship between medicine and society. These courses discuss the expectations which communities hold in regard to health and health care, the institutionalization of medicine, and the development and nature of the medical profession.

A different type of objective was reported from four schools: the preparation of students for other courses at medical school. The teaching of behavioural sciences early in the curriculum is part of a wider strategy for teaching 'normal' structure and function before proceeding to study 'abnormal' and pathological states in the clinical course. The courses specified were child health and psychiatry: students will benefit from them more fully if they appreciate universal human needs and the importance of emotional and cultural factors in human development. This gives particular meaning to the designation of psychology and sociology as 'pre-clinical' subjects.

In addition to understanding the behaviour of others, it is hoped by twelve respondents that students will begin as a result of their experience in these courses to learn to understand themselves. The respondents would like to think that the students are a little more mature and a little more tolerant by the end of the course. They should have become more conscious of their own motives, their own responses to situations, their

own assumptions. For some respondents, this can be the most valuable outcome of their teaching.

Content

The basic topics and principles of psychology were cited in twenty-five replies to this question. Almost all of them gave sufficient detail to show that the subject matter is that of psychology as it might well be taught to a class of non-medical students. Twenty-four mentioned features of the emotional, psychological, and intellectual growth of children, and one or two follow a developmental theme throughout the course, starting with infancy and ending with senescence and death, discussing the changing needs and hazards of each stage.

The basic topics and principles of sociology were mentioned in twenty-two replies. The groupings of subject-matter most often referred to were role theory and interpersonal behaviour (eleven replies), social stratification, the family and other social institutions (sixteen replies), and social administration—the agencies of social policy, with particular reference to the growth and structure of the Welfare State in Britain, including the NHS (sixteen replies).

Topics with more directly clinical overtones were reported from a total of twenty-nine schools. Fourteen schools consider it important to teach such matters as social and psychological causes of ill-health and of the duration and outcome of ill-health, including psychological disturbance and 'psychosomatic' possibilities; 'what is a patient?'—the sick role, health perceptions, hospitalization, deviance, and dependence were mentioned in sixteen replies; an introduction to clinical psychology and its methods of investigation and treatment were included by twelve respondents; fourteen schools discuss 'what is a doctor?'—definitions of a profession, the emotional and social pressures on a doctor and how these are changing in the twentieth century; and the characteristics of a community which affect its health status were mentioned in eighteen replies. One respondent amplified the last of these content groupings by stating 'Our modern medical system . . . consists of a set of recently acquired, powerful and scientifically-based techniques and remedies embedded in a framework of beliefs, rituals and relationships of the same nature as those of primitive cultures and of our own mediaeval society. It is necessary to have some idea of how this cultural and behavioural framework influences both doctor and patient before the powerful scientific knowledge can be used efficiently and humanely, and matched to the individual needs of the patient.'

Finally, the nature of the doctor–patient relationship is specifically discussed in seventeen courses. There are two areas of particular interest to respondents here: communications and control. The art of communication features in nine courses and attention is given to interviewing

skills, history-taking and so on, and in some courses students witness and are encouraged to practise and acquire these skills with patients. Secondly, the difficult and distressing situations which a doctor is required to manage are analysed—hostile patients, terminal illness, breaking bad news, conflict between a patient and his relatives—and their resolution is discussed in the light of the doctor–patient relationship. Six courses at least refer to these matters.

Teaching Methods

Lectures are used in thirty-one courses, and only one school does not use them. Discussions in large groups, symposia or conferences take place in fourteen courses, usually with a panel of speakers. Twenty-two courses use small-group methods—tutorials and similar activities—to varying extents: some courses make considerable use of them and give as much or more time to them as to lectures.

Independent activities are an important part of the course in twelve schools: at eleven, students are required to undertake projects, either individually or collectively, which are likely to involve field work and interviewing. Two courses require students to be attached to a family to observe, describe, and interpret their behaviour. At one of these schools students are expected to develop personal relationships with members of the family and must visit them at regular intervals over five terms. (The family is chosen because it sustains illness or chronic disability.) At another school students pay a total of six hours of visits each to 'their' families: the purpose is to develop their interviewing skills and to see child-rearing practices and other family functions in the home environment. (Other medical schools have reported similar 'family attachment schemes' in other questionnaires—see the reports on 'General Practice' and 'Child Health'. They are all experimental; one or two are optional. They may spread over two or three years and the visits take place in the students' own time. The purposes of the attachments vary slightly, and so do the methods of supervision and the degree of involvement expected of the student. Staff reported them with great enthusiasm. Only two schools mentioned them in their psychology and sociology questionnaire.)

Teaching aids are used in a number of courses. Twelve use videotapes to demonstrate human behaviour and human situations (for example children at play) or for recording a patient–doctor interview. Documentary films are shown to students in thirteen courses. Three schools mentioned their use of educational games and role playing as a means to facilitate the understanding of social roles and behaviour. Laboratory work in psychology is included in nine courses.

Patients feature in eighteen courses. Some hold demonstrations of individual cases to the class of students; in eleven courses groups of

students are taken to see patients in hospital, in long-stay institutions, in hostels: one course makes these outings optional. In two schools where there is a strong element of clinical psychology, students attend clinics and therapy sessions to observe the clinical psychologists' contribution to patient care (although this may also be observed in psychiatry courses). At one Scottish school the course in behavioural sciences is combined with the introduction to clinical method, under the auspices of the professor of general practice. Community visits, in often unaccompanied small groups, support the more formal teaching. Students have reportedly found them 'stimulating and enlightening yet sometimes disturbing' and they subsequently 'talk out' their reactions with staff.

Miscellaneous 'Special Features'

The final question in the questionnaire invited respondents to decribe the outstanding features of their course: aspects they believe to be particularly interesting or successful. The features could be related to organization, objectives, course content, or teaching methods.

Four courses are well integrated, and reported this as their 'special feature': psychology and sociology are interrelated and teaching is focused on topics and problems. 'Behavioural science' is taught as a unified whole and this has reportedly brought many advantages over a single-subject framework. These respondents feel they have achieved an acceptable mixture of the different disciplines, and approaches, in a logical order and with a common purpose. Two respondents enjoy having a new course which has not found a rut: they hope to continue to experiment and to respond to students' demands and to what is perceived to be 'relevant'. Each school's circumstances are different, they say, and they would not wish to teach some stereotyped course.

The 'intellectual awakening' which behavioural sciences can bring to medical students is seen by two respondents to be the prime justification for it. The open-ended and non-exclusive nature of concepts in the social sciences are brought home to students and contrasted with other modes of thought. For example, they are taught to examine a theory in terms of its usefulness in explaining the world and of the historical circumstances in which it arose—and to accept that one theory may not be 'wrong' because another explanation for the same phenomenon is valid.

Two respondents referred here to the vocational need for learning something of the behavioural sciences. Most medical problems which the average doctor meets have some psychological or social-environmental component, not necessarily in their causation, but as a concomitant factor in illness, recovery and rehabilitation which has to be taken into account if the management of the case is to be as successful as possible. The need to appreciate this extra dimension to patient care

is stressed, and is also a criterion for designing the course. Circumstances in Eire mean that many general medical practitioners outside Dublin will be coping with problems which elsewhere might be the province of specialists; thus one respondent feels obliged to emphasize 'the clinical aspects of educational backwardness, the training and placement of the mentally handicapped, and the psychology of terminal illness' in preparation for independent practice.

Three other courses give special attention to comparative health care studies. The organization of health services is examined and students are encouraged to make constructive criticisms of the provision of health care which they learn about in formal sessions of instruction and in fieldwork. The emphasis is on evaluation, identifying where and how improvements in delivering health care are required, rather than on more factual learning about the administrative structures, etc.

Three respondents mention as a 'special feature' their hope that the course will encourage criticism. Teaching should strengthen the students' natural inclination towards radicalism and towards rejection of time-worn practices. Teaching should not dampen their idealism but make it better informed, more realistic and direct it towards genuine and specific areas of need. Indeed, many of the 'special features' (and many of the objectives already mentioned) are concerned with attitudes. Knowledge is discounted—the words predominating are 'understanding', 'appreciation', and 'outlook'. Again, two respondents believe their courses are especially valuable in 'helping students to know themselves'. Students become more sensitive to the effects of their own responses to other people and to the attitudes that lie behind their opinions and their behaviour.

The contact with 'real life' is regarded as extremely worthwhile in eleven courses and this is felt to make a course 'seem less academic'. Reality breaks through in family visits and attachments, clinical illustrations, patient interviews, and discussions where students talk about their personal experiences. In the course at one London school, for example, groups of students meet volunteer patients in a general practice who demonstrate 'the social context of illness, interpersonal processes in interviewing, including verbal and non-verbal communication, and problem-solving in diagnosis'. Efforts are made at a number of schools to co-ordinate theoretical teaching with independent learning and fieldwork, so that each supports the other and there is constant awareness of real people in a real community. Partly for these reasons project work is highly valued in five schools: it takes students out of the medical school into the real world: it makes them 'examine an area in depth critically. This gives an opportunity to get to grips with the subject and to consider all aspects of a problem—e.g. a mother's post-hospital experience of child-birth, or the extent of illness in a community, which does *not* turn up in the GP's surgery—and draw

conclusions accordingly.' Also it provides experience of collecting, arranging, and analysing data, and constructing a report with arguments based on the evidence collected and perhaps correlated with published research. It may be the students' first or most substantial opportunity for independent study-in-depth in their undergraduate life.

A special feature of two courses is the small-group teaching sessions which are often informal and encourage free exchange of views. Using other professional people to teach has been very successful in five courses: they bring the benefit of experience in their particular spheres. Three respondents mentioned clinical specialists and another mentioned representatives of voluntary and statutory bodies in the community.

STUDENT ASSESSMENT

'Critical' assessment of students' knowledge of psychology and/or sociology occurs at twenty-nine of the thirty-two responding schools. Often there was none until recently.

Information about end-of-course 'professional' assessment was provided by twenty-three schools: they all hold formal examinations in behavioural science. Eight of them hold an examination in the topic alone which students pass or fail without reference to performance in other subjects (except possibly in marginal cases). One school examines students critically and separately in psychology but not in sociology which has not yet been introduced. However, a number of respondents suggested wryly, that, whatever their school's regulations might say, it would be most unlikely that a student would be required to withdraw from the course on the grounds of poor performance in these subjects alone.

Fifteen of the twenty-three schools examine students in behavioural science within combined examinations, so that marks for the topic are not critical in themselves but only in combination with those from the other subjects which make up the examination. For example, some London schools assess the behavioural sciences with statistics. Furthermore, psychology and sociology may be assessed separately, on different occasions, and with different 'partners'. For example, sociology or medical sociology may be given a formal place in the examination in community medicine as at one Scottish and one Irish school. Other schools (eight confirmed that they do so) associate the topic with various 'basic medical sciences' in their examination system.

In-course assessment was reported from eleven schools. Four of them hold a class examination during the course and at one, this assessment constitutes the 'critical' one as there is no further examination. In five schools the report produced as a result of project or fieldwork is assessed and in three of them it counts significantly. At two of these schools a

series of modular assessments in which the multidisciplinary course subsuming behavioural sciences shares, continues through the first two years of the course and most students are exempted from a supplementary examination in all subjects and topics after successful performance in this in-course assessment.

PROBLEMS AND DEVELOPMENTS

Organization and Resources

Sixteen courses were reported to be new. Some of them are the first instance of the topics being taught in that school; in other schools the new course replaced previous teaching. Seven schools have recently seen the teaching of psychology and sociology expand and several minor improvements made to the original course(s). However, ten respondents reported that there is still insufficient time allocated to the topics. Changes in the structure and organization of the topic are expected in a number of schools: in six, the topics will get increased teaching time from general curriculum revision. Two English schools for example will include it in new multidisciplinary 'umbrella' courses entitled 'Human Development, Behaviour and Ageing' and 'Man: Behaviour and Biology': topics like genetics, statistics, and physical growth from infancy to adulthood will also be featured in them. At a third English school there will probably be an integrated course bringing in social science for the first time. The respondent hopes 'for a much more highly integrated course in which psychology and sociology can be taught in a way which is really relevant to medicine'. A fourth English school will devote more time to psychology and medical sociology, and there will also be a number of interdisciplinary two-hour topic teaching sessions on such subjects as human groups ('us and them'), migration, manipulation of behaviour, addiction, hospitalization, heart attacks, death, and subnormality. A Scottish school will incorporate into the course talks on sexual development and sexual problems, which are voluntary and extracurricular at present.

Some of the new developments have already been described under 'Teaching Arrangements'; for example, the introduction of psychology or sociology for the first time. All changes are expansionist: six respondents are sure of having more time for the topics in future. Two schools where the two elements have until now been taught separately will have integrated courses. There will be some teaching during the clinical course at one school as their new curriculum unfolds. Thirteen respondents would like to have similar opportunities and to establish some combined teaching with clinical staff and to contribute to other clinical courses. Another respondent would like psychology to merge with a neuroscience course in the early years, as he feels that this would be

more appropriate than the subject being studied in isolation. In five schools altogether greater co-operation with staff from other departments is confidently predicted.

Several respondents feel uneasy about the timetabling of behavioural sciences. They cannot decide whether it is better to teach it preclinically or clinically—or both. As a preparation for clinical training it should come early in the curriculum but preclinical students either do not appreciate the 'relevance' or are diverted by the clinical references away from the sociological or psychological concept which they were intended to illustrate (three respondents mentioned this). One respondent believes that teaching of behavioural sciences cannot make progress until the structure and ethos of the whole medical course is changed: it is all 'too physical' and too rigidly divided into preclinical and clinical stages.

A sense of being on the fringe was reported by ten respondents. Their topic is perhaps not fully accepted into the medical school. The dilemma is that on one hand they wish to be more fully integrated and to demonstrate interrelationships with various preclinical and clinical subjects, on the other hand they wish to demonstrate the contrast in methodology and approach and to offer a distinct alternative. Several of them regretted the lack of interest among students; their poor motivation may be due to the confusion engendered by this sort of difficulty.

Staffing problems inhibit expansion in several schools and prevent more interesting and effective teaching methods, such as small-group discussions, being introduced. Projects and practical classes when students work independently still require supervision. The lack of staff and the large numbers of students often result in more lectures than is desirable. Fifteen reports of insufficient full-time academic staff were received; several medical schools appear to have no full-time staff in basic psychology or basic sociology. Another problem lies in recruiting staff who are not only qualified in one or other subject (psychology or sociology) but also experienced and interested in teaching it to medical students, who have different needs from students reading for degrees in the subject(s). Two of the 'preclinical only' schools and a new medical school reported this, as well as an established school. For example: 'Teachers from outside the medical school lack a clinical focus, and teaching in their own departments is often based on individual tutorial relationships and an expectation that students will read widely and maintain an open mind regarding a wide range of possible theoretical models. They do not always appreciate that medical students have a 9 a.m. to 5 p.m. teaching day, a mass of rote learning and a clear vocational aim.' (Indeed many schools—as opposed to respondents to these particular questionnaires—reported great difficulties in acquiring the services of suitable and competent part-time staff to teach psychology and/or sociology, where they have none of their own.)

Teaching Activities and Content

The use of small group teaching has increased in six courses and has become an important teaching method. Seven respondents would like to increase the amount of small-group teaching but circumstances prevent them doing so. Fieldwork has also increased: six courses now offer projects and visits. Projects will be a feature of four more courses in future; they might be conducted individually or in groups. Two respondents would like to introduce or expand the 'field' activities, particularly to allow students more contact with patients and families, and a third would like to be able to arrange more visits to different types of health care unit, such as health centres.

Three psychologists would like to conduct practical classes in their subject, but one of them would need equipment before satisfactory classes could be held. Another respondent whose course includes some laboratory work would like to have more equipment both for laboratory experiments and for training students in interview techniques. One school however will definitely provide the psychologists with television facilities for teaching very soon.

The published student textbooks on behavioural sciences are not very useful to many of these courses; four respondents commented there appeared to be no textbooks written for undergraduates directed to the needs of health students.

It is up to the individual teaching staff to 'flavour' their course appropriately, and five respondents indicated that their courses have become more medically oriented and less 'general'. At one school the psychologists intend to train students in the art of the clinical interview, and another will develop a course dealing with the existing health and social services and evaluation of these services. A Scottish school has already made progress in this direction: new sections have been added to the original course which deal with demography, leading to the health care of the elderly and the long-term chronic sick, information and information systems in the NHS, biophysics and health care systems.

There are tentative plans at two medical schools for options in behavioural science topics to become available for the Honours year of study-in-depth for the non-medically qualifying degree. Both psychology and sociology topics would be featured.

Altogether, reports from twenty-five schools indicated that significant changes have taken place over the last few years. Further changes are definitely expected in eleven of these schools, and a total of fifteen reported plans for future changes. Another seven replies described possible developments whose implementation had not then been confirmed or indicated that their course is under review. Several course organizers maintain a policy of experimentation: changes in structure, content, methods, and staffing are introduced every year and they will continue to expand and improve their courses whenever the opportunity arises.

Radiology

Full questionnaires on the teaching of radiology were completed by thirty-one schools (information was also sometimes received in respect of radiotherapy—this is reported together with oncology in an addendum to the report on medicine; what follows is in respect of diagnostic radiology); three further schools sent administrative details relating to teaching time and assessment. One school omitted to complete its questionnaire, and the remaining three (preclinical only) schools regarded the questionnaire on the subjects as 'not applicable'.

TEACHING ARRANGEMENTS

Radiology is included in the curricula of all schools with clinical courses. Thirty schools have formal arrangements for teaching radiology; that is, radiologists themselves teach the subject to all students and this teaching appears in the timetables.

At twenty-one of the schools some or most of the radiology teaching is carried out separately from the teaching of other disciplines and specialties. Four schools have no formal arrangements for teaching radiology; it is only taught together with and in courses devoted principally to other subjects, and is consequently difficult to distinguish and quantify. Twelve schools which have some independent teaching also have timetabled joint teaching with other subjects, whereas four further schools have no independent teaching and schedule all the teaching of radiology jointly with other subjects.

Most correspondents pointed out that, in addition to the above, students learn (or have the opportunity to learn) radiology in almost every clinical specialty to which they are attached.

Position in the Course; Teaching Time

Radiology is formally taught in all three years of the clinical course in nine schools. It can be included in 'Introductory Clinical Methods'

courses, then in a systems- or topic-based co-ordinated clinical lecture teaching series, and later in small-group teaching and tutorials during specialty attachments; it may also be taught in final-year revision sessions. In addition, it has become common practice for radiologists to assist with preclinical teaching; this occurs in seventeen schools.

The time devoted to the teaching of radiology was estimated with difficulty by respondents. Estimates vary from a handful of lectures or tutorials, amounting to a few hours, to 50 hours or so (taking into account both single-handed and integrated teaching at which radiologists are present) or even more—one school mentioned a maximum of 102 hours per student.

Four schools offer a full-time or part-time clinical attachment. One school gives a full-time attachment of two weeks in radiology: another is shortly to introduce one, of a month. Three other schools have half-time attachments, spread over either one or two weeks.

Late Note (Autumn 1976). Since the information reported here was collected, two schools have introduced radiology attachments—one is four weeks full-time, the other is a quarter part of a four-week attachment.

FEATURES

Aims and Objectives

The value and the purpose of teaching radiology to undergraduate medical students was discussed by several respondents. They put forward a variety of possible aims.

Radiology is felt by many to have a unique role in the curriculum as a whole, as an illustrator of the concepts and the problems which other teachers discuss. It demonstrates 'living anatomy' and, to a lesser extent, 'living physiology'; it opens up to the student the normal characteristics and abnormal manifestations in the structure of the whole body. Radiology as an illustrating medium is therefore an essential part of students' general medical education. Sixteen schools hold this view.

Thirteen of these schools also emphasize the ability of radiology to show pathology as it occurs and develops in living subjects: it provides a visual representation of disease processes which the student learns to correlate with the findings of the clinical examination and the findings of biopsy or post-mortem examination. Radiology not only facilitates learning but makes up the 'whole picture': without it, an understanding of simple pathology is incomplete.

Five medical schools see as a principal reason for teaching radiology at undergraduate level, its role as part of the normal clinical repertoire. These schools hope that radiology will be seen as an integral part of

clinical medicine. Students will learn to acquire the skills of fitting radiological information into the scheme suggested by a history, clinical observations, and clinical knowledge. Again as a necessary preparation for clinical practice, eight schools believe it important to demonstrate the range and the value of radiological investigations, so that students when they qualify will make sensible and profitable use of such facilities. One school for example emphasizes during its 'core' teaching 'the scope and limitations of radiological investigations; logical application of radiological methods; the importance of consultation and discussion between clinician and radiologist prior to embarking on a course of potentially hazardous investigation'.

In the early part of one of the planned new clinical courses, there will be a whole day 'teach-in' on 'General Principles of Radiodiagnostic Investigation'. This is to orient students for the rest of their course and will include practical demonstrations of techniques and sessions on the radiology of each of the major body systems and anatomical areas. In schools such as this, special separately timetabled teaching is considered necessary for instruction in the basic concepts. At others it is considered that radiology should not appear as an isolated specialty and that its role in clinical practice can best be demonstrated by concentrating on joint teaching with other specialties; eight schools have decided as a matter of policy to do this.

Teaching Methods

A number of teaching practices and 'special events' in radiology teaching were particularly mentioned for their usefulness or popularity. One of the most successful practices has been joint case conferences, where radiologists and members of the clinical staff responsible for a patient discuss the case in front of a group of students. These conferences may be held either in the radiology department itself or near the clinical department's own ward. Occasionally pathologists are also present. Twelve schools arrange such case conferences.

At fifteen schools radiology is a regular element in the major series of clinical 'theoretical' lectures. Specific lectures in radiology are given in at least seventeen schools, either in a separate series or as part of a co-ordinated long-term course. Multidisciplinary teaching also occurs when individual radiologists are invited to teach with individual clinical teaching teams, sometimes on ward rounds, sometimes in small-group tutorials.

Tutorials themselves were mentioned by thirteen respondents, who regard them as one of the best—if not the best—method of imparting an appreciation of radiology. However, four schools added that attendance is voluntary because for example a student's clinical duties in the unit to which he is attached must take priority over 'formal' teaching

elsewhere. One school appoints tutors in radiology for each group of students doing their half-time attachment in radiology, and gives further tutorials to students as a revision exercise immediately before the Final examinations.

In two schools all students are conducted on tours of the main radiology department: this enables them to see what actually happens and what procedures are necessary for each type of investigation. In a third school, students are expected to witness all the standard procedures by the end of their clinical course and the checklist on which the items are ticked off one by one cannot be signed up until their experience is complete.

The X-ray film itself is of course a traditional teaching aid, but six respondents mentioned that cine-radiology and image intensification can now be used to great effect in teaching and can be reproduced on videotape for television replay. Three schools have standing displays of selected X-rays, mounted on screens or boards with brief written descriptions, for students to peruse in their free time. Two schools have tape/slide programmes for independent study: both these schools have no separate 'active' teaching by radiologists but encourage the independent, guided study of radiology.

A development reported in no less than seventeen schools is the participation of radiologists in preclinical courses: nearly always the discipline concerned is anatomy. This is felt to enhance the teaching of anatomy and also to give students some familiarity with the interpretation of radiographs. The objectives of teaching in the basic medical science courses have been described thus:

> To assist in the concept of learning by problem-solving.
>
> To illustrate basic anatomical principles.
>
> To demonstrate studies in '3-D'.
>
> To emphasize those aspects of human morphology which have practical significance.
>
> To help integrate human morphology with other basic disciplines such as physiology and pathology.
>
> To introduce pathological conditions that can be used to illustrate various anatomical relationships.
>
> To introduce students to radiographic techniques at an early stage.

At one school where a much greater amount of radiology is taught than at most others, one person is designated to plan the independent radiology course and to carry responsibility for integrating radiology with other subjects.

Nine schools offer elective programmes and attachments in radiology. In one case the elective is a new development and is reported as already having proved highly successful and popular.

STUDENT ASSESSMENT

Eleven schools reported that radiological understanding is assessed with various clinical subjects in MCQ papers and class examinations held during the clinical course. These are sometimes 'critical' in that marks are sent forward to be counted with marks from 'final' professional examinations. Another seven schools indicated that radiology probably appears in the 'final' assessment of clinical subjects. Radiological knowledge might be required in answers to written papers and, more likely, in clinical and oral examinations. Eight further schools indicated positively that radiology is a definite and regular feature of one or more stages of the qualifying examination and students would find it hard to avoid questions with radiological implications. Conversely, three schools reported that radiology is definitely not part of any major or critical assessment.

PROBLEMS AND DEVELOPMENTS

Resources

Eleven schools pointed out that radiology is a shortage specialty and that a high proportion of teaching is carried out by full-time NHS staff who have very full service commitments. Six schools would like to have academic appointments in the subject (or more academic appointments) and six would like an academic unit to be established which would take over much of the teaching load and would improve the situation in other ways, too. In fact a chair or an academic unit has recently been established in four schools.

Teaching aids, such as audiovisual programmes, require supporting facilities which are not readily available in the average hospital radiology department: seven schools would like to build up collections of such programmes but only two think that they will be able to. Five schools also urgently require a seminar room or 'learning laboratory' and to exploit the opportunities fully, three of these schools and two others would need librarian or secretarial assistance to edit, catalogue, and organize the teaching material, to issue and sign up what was borrowed, to change and rotate what was displayed. An arrangement somewhat along these lines will be possible in one school when the radiology department there moves to new premises: there will be a large demonstration and viewing room where radiographs will be 'permanently' on show, with a new set replacing the previous set each week and with each one having a commentary designed to facilitate self-testing by students.

Organization of Teaching

In five schools, radiology has improved its position *vis-à-vis* other subjects: at one of them a course proper has been introduced and at the other four the subject is now a regular feature of organized clinical teaching.

Elsewhere however the situation is felt by respondents to be less satisfactory. 'A large source of excellent material is to be found in radiology departments, unused for lack of general realization of how useful it could be' (thirteen schools). One reason may be that the whole curriculum is congested with no time to spare for special radiology teaching, and radiologists are reluctant to press their claims for fear of adding to the overcrowding. Another reason put forward is that there is a prevailing feeling in medical schools that radiology can be learnt without having to be taught, whereas radiologists believe it should be taught, by radiologists themselves. Eleven respondents think it necessary for their own departments to take on more responsibility for teaching. This, it is suggested, would not always mean more student time spent on radiology but it would mean a more purposeful and effective use of the time: 'radiology is too important to be left to non-radiologists'.

Five schools are concerned at the uneven teaching received by students in radiology. For their clinical work they are often scattered in different units or different hospitals making it very difficult for the main or academic department either to gather them all together for formal sessions or to co-ordinate and maintain a standard.

A short full-time attachment for all students, directly supervised by radiologists, is the frequently suggested solution to these problems. Four schools would like one but do not expect to achieve it, and one of the three schools which have recently introduced a clerkship would like the part-time system changed to a full-time system. There is one school with definite plans to introduce a clerkship, where a full one-month attachment will be coming into operation from the summer of 1976.

Other respondents feel that more is to be gained by joining one's colleagues rather than 'going it alone'. Four schools (including three Irish ones) suggest that radiologists should take part in integrated teaching, such as Topic Teaching, or if they are already doing so in a small way, should increase their participation. At one school the major development of the past few years is the integration of radiology with the teaching of medicine and of surgery. Three schools would like more seminars and tutorials in radiology for groups of students, rather than the whole class at once; another school has recently been able to abandon whole-class formal lectures and to replace them with small-group sessions. Contributing to preclinical anatomy courses is becoming an attractive proposition. Nine schools wish to introduce or expand this.

Five respondents would like to see a regular, compulsory question in the Finals examinations: a subject excluded may be regarded by students as a very minor one, not worth their attention.

Changes which are regarded as significant have occurred in sixteen schools over the last few years. Apart from changes in status, in methods, and in relationship to other subjects such as those already mentioned, they have sometimes involved re-timetabling or internal reorganization. Six schools intend to expand and improve the teaching they give in a number of ways, for example in exploiting the opportunities that new staff or, particularly, new facilities have presented. Two more schools hope to expand the scope of their teaching in response to progress in hospital practice: they will cover the new physical methods of investigation—radio-isotopes, etc.—'nuclear medicine'.

It is interesting that at four schools the students themselves have requested more teaching in radiology. They realize its value to all their other studies and see the need for a greater amount of actual teaching than had previously been offered, and for the radiologists to do it in structured sessions. This is in spite of a view, expressed by two respondents, that radiology is really a subject for the postgraduate period—but because organized instruction is not available then, radiologists must make what efforts they can to teach the subject thoroughly, but without undue detail, to undergraduates, *faute de mieux*. Three more schools are to introduce elective study programmes, bringing the total who do so to twelve—another indication that students can find relevance in the subject.

Social Medicine, Community Medicine

Questionnaires on this subject were filled in by respondents in all thirty-five schools presently offering or about to offer clinical courses. In addition, one of the three 'preclinical-only' schools completed a questionnaire, making a total of thirty-six schools who responded. Two of them, who were developing new curricula, were however only able to provide outline details.

The title 'Community Medicine' which we use here for convenience is not the only one used in the schools—'Social Medicine' or 'Community Care' or 'Community Health' are also used—and the questionnaires were marked 'Social Medicine; Community Medicine; Public Health; Epidemiology'. Indeed, there is much debate over the scope of the subject: does it and should it include preventive medicine, occupational health, medical sociology, and to what extent? This report is not concerned to contribute to the debate: it attempts simply to set out the practices of the individual medical schools in relation to this very broad subject, and to describe the ways in which the present generation of teachers view their discipline.

TEACHING ARRANGEMENTS

The majority of schools have formal arrangements for teaching community medicine. Only two of them do not give it on independent status in the timetable; however, even in these cases teaching is given on the subject and to no lesser extent than in many other schools, but it is less easy to identify. However, both these schools have plans for changing the status of the subject within the curriculum; they will be considered later.

The distribution pattern of the subject in the curriculum is generally one of multiplicity: in almost no case is it taught at one period only. In each school there is a 'scatter': it appears on two, three, four, or even more occasions. In seventeen schools this pattern is very marked:

Community medicine is taught at several stages of the curriculum sometimes independently, sometimes together with other subjects. One of these appearances is likely to be the main 'core' of teaching, with the others less substantial in themselves though with cumulative importance. They are variously titled.

Seven schools have multidisciplinary orientation courses in the early years in which community medicine staff figure prominently. Behavioural scientists, clinicians (including general practitioners), staff from the statutory or voluntary social services, also take part. All these schools have brand-new curricula, either because the schools themselves are new or because of recent radical curriculum change.

As the behavioural sciences enter schools' curricula, it is discovered that they overlap the concerns of community medicine: four schools take advantage of this. Without going to the lengths of an elaborate (from an organizational point of view) multidisciplinary course, they have found it advantageous for their preclinical introductions to sociology to be taught by community medicine staff. In fact, the community medicine department carries the responsibility for running these courses in medical aspects of social behaviour or 'sociology as applied to medicine'. Similarly, community medicine may be the prime mover behind instruction in statistics and biometric methods and can enhance its relevance with examples drawn from 'real' epidemiological data. (For further information, refer to the reports on 'Psychology and Sociology' and 'Statistics and Biometric Methods'.) Three schools concentrate most of their teaching of community medicine into the preclinical years.

Teachers of community medicine are then involved in the major course of general 'theoretical' clinical instruction at sixteen schools. These courses are interdepartmental and usually are formed of a co-ordinated series of systems-based lectures or, less often, of a series of topic-teaching sessions. Including experts in community medicine allows the wider social aspects of the onset of a condition and the management of the patient to be discussed together with the pathology and diagnostic and therapeutic aspects.

Particularly in newer curricula, there is great involvement with other subjects and more time is spent in combined teaching programmes than separately. Obstetrics, paediatrics, and psychiatry are the clinical specialties with whom close connections have been forged most often. They provide clinical contacts for 'applied' community medicine, as their hospital activities form but a part of their whole work.

Teaching Time

Policy and tradition vary over how to apportion time to community medicine. In the past it was often seen as a 'passive' learning area, to be

treated rather like preclinical subjects with time for lectures and some practical work being scheduled on an '*X* hours per week/term' basis, and in parallel with many other subjects. Indeed in four schools at least, all teaching on the subject is still a separate, basically didactic teaching exercise, at some point during the clinical course. The seventeen schools which have opted for community medicine scattered through the course still also present this pattern at first glance, but in many cases the teaching is now much more closely integrated with that of other subjects. However in some schools (including nine of the above) it is now treated as clinical specialties are treated, with a block of intensive teaching when either no other subjects are taken concurrently or only one or two are: students are 'attached' to community medicine in exactly the same way as they are attached to a medical or surgical firm, perhaps in rotation. Four schools have full-time attachments to community medicine itself; five have part-time attachments, usually on a half-time basis; and four others combine community medicine with general practice in full-time blocks. All thirteen of these courses are located in the clinical stage, and six are in London schools.

Because the amount of teaching on the subject during the clinical stage is often difficult to estimate (the chief reason is that the timetable is shared in some cases with general practice, especially where full-time or part-time attachments are given, and it is impossible for a school to demarcate between them), figures relating to hours of teaching must be treated with great caution. However, using the best estimates of teaching time from thirty-two schools who were able to provide this, and treating a full-time equivalent week as the equivalent of 30 hours, the average time devoted to the teaching of community medicine is 77 hours (SD 43·7): it is interesting that this mean figure is only slightly lowered when schools with attachments to community medicine are excluded. It should be noted that these figures exclude teaching on sociology as applied to medicine, statistics, and general practice, when this was included in the teaching time on community medicine, as these are the subjects of separate reports.

FEATURES

Aims and Objectives

Most respondents discussed their over-all approach to teaching their subject: they indicated their objectives or explained what they considered particularly interesting or important about their teaching as a whole. Four themes emerged which are contrasting but not mutually exclusive—several respondents put forward more than one and one respondent maintains all four. They are likely to be closely related to the way in which the teaching is planned.

Seventeen respondents are concerned to do more than impart information: they hope to influence students to adopt and retain new attitudes. They wish them to become permanently conscious of the wider context in which disease develops and medicine is practised, and to respond appropriately by being more 'rounded', competent doctors. Their care of individual patients will benefit from their understanding of the wider social picture. They should then be able to achieve:

> 'More effective preventive action, through knowing the previous achievements of preventive medicine, its present potential, and means for its evaluation.
>
> 'More rational use of health service resources, through identification of priorities and critical evaluation of results.
>
> 'Better care of patients through an understanding of the natural history of disease and its influence by social and environmental factors, and awareness of available community services.'

The information necessary for modifying attitudes in this way is of a different type to that presented by the clinical specialties, and a dozen respondents feel it important to emphasize particularly the peculiarities of this category of information. They attempt to train students to think in terms of populations and of 'the population as the patient'. This approximates to the classical epidemiological approach augmented by sociological concepts and supplies an extra dimension to students' knowledge of the pathology and natural history of diseases and the alternative therapies.

Two of the latter respondents and two others develop this aim a stage further in specifically trying to oppose the attitudes implicit in the rest of the clinical course. They deliberately provide a contrasting model of viewing medical practice, showing that the 'clinical cure' ethos of short-term sophisticated medical treatment for individuals should be supplemented and sometimes replaced by 'clinical care', which variously involves prevention, long-term surveillance, and non-medical health workers. It is also an alternative framework for decision-making. Specifically, it is hoped that students will not go away believing that hospitals and hospital specialties are the normal and only ambit in which to provide health care, but instead will see 'cure' as only one possibility under the heading of 'care' and will see a patient not only as an individual but also as a symptom of a community problem.

Finally, and especially in those schools where community medicine is linked partly or wholly with general practice in the timetable, the theme of the course is literally to demonstrate medicine in the community. The 'community' here is a real, local community, rather than an abstract population, and students are introduced to the demand for and the supply of health and social services in it, covering a wide spectrum of

clinical and non-clinical problems, but often concentrating on those rarely referred to a hospital. This is intended to give a more realistic picture of the incidence, prevalence, and management of ill-health and is reinforced by the clinical exposure in general practice. It applies in fourteen schools.

Individual aspects of the courses were mentioned if they are considered especially important or apposite, or if they are thought to be unusual ones which other schools would not necessarily include. Six schools' courses give some emphasis to statistical fluency; they make use of demographical material and of mortality and morbidity data.

The aim is frequently also at the same time to give students some historical perspective and some idea of the current national or international situation in the major diseases. Two schools are particularly concerned with methods of gathering and analysing and storing this type of information. One has special courses in 'Epidemiology and Medical Statistics' and 'Experimental Design and Data-Handling', and the other discusses information systems, and the potential computerization of medical information during the community medicine course (see also 'Statistics' Report).

The development and organization of the Welfare State (and in particular, the health and social services) is featured in eleven courses. The role and structure of these services are described, that of the students' likely future employer in greatest detail. One of these schools and one other ensure that students are introduced to the role of the various professional health and welfare workers in these services so that they know what expertise each one has to offer and how they relate to each other. One of the eleven schools also outlines the health care systems of other countries and compares them with those in Britain.

Four courses endeavour amongst other things to explain the concepts of medical sociology and how they illuminate the study of social medicine—none of these schools has a separate course in sociology. Six courses discuss the nature of chronic illness and malfunction, the problems of the chronically ill, the physically and mentally disabled and their families, at home or in special institutions: they consider what this means for the individual, for the community, and for social policy-makers. The related areas of occupational medicine, environmental hazards to health, and industrial diseases are given particular weight in five schools.

Teaching Methods

Individual teaching methods were reported when they were considered by respondents to be particularly valuable or interesting. Nine schools for instance highlighted the visits which students make to 'community'

situations—factories, health centres, special clinics and assessment centres, old people's homes, etc.—and one of them presents the outings to see screening programmes as an opportunity to witness preventive medicine in action.

Three respondents particularly encourage students to criticize the provision and distribution of the health care services: after their visits or at the end of the course they must present a report to their tutor or to the whole class on the benefits and shortcomings of some aspect of the delivery of care, and make recommendations for improvement.

NHS community physicians are involved in teaching at two schools, bringing, it is asserted, an air of reality to bear on the topics discussed, in addition to their personal experience. Home follow-up of selected patients discharged from hospital or attending out-patient clinics under the auspices of the Department of Community Medicine, is established in four courses. There again students are expected to evaluate as well as to observe. Contact with 'real' individual patients—apart from the scheduled general practice teaching—is achieved in six schools. Liaison teaching between community medicine specialists and clinical specialists takes place on the ward and at the bedside, and the clinical features of the case and proposals for management are considered and discussed in the light of social and epidemiological concepts and information.

Fieldwork projects carried out independently by students individually or in groups are a popular feature in no less than fourteen schools: many regard them as more valuable exercises than the academic teaching. They correspond to the clerking of patients in clinical subjects: they give students the feel of the reality of the subject and the reports can be scrutinized to evaluate the effectiveness of teaching. Students in one school are told that 'theoretical instruction in a practical subject is an inadequate experience which becomes completed only when shoe leather and direct observation are added'. In at least one school, a major part of the total time devoted to community medicine is spent on project work, and in another approximately half the timetabled time is allotted to it. Apparently, many students devote much of their spare time over a period to their projects. The work can be at macro- or micro-level: one school gave some detail—topics there 'range from frankly statistically oriented surveys on health topics and/or attitudes to health and social services, to studies in depth of issues such as the reorganization of the NHS, democratic representation in relation to health service management, school truancy and psychiatric disturbance, etc.' Students share the fruits of their labours in at least four schools—they read out their reports and lead a discussion on them.

Small-group teaching and the tutorial system were mentioned by eleven respondents, as being particularly successful methods. Three schools mentioned the elective attachments which they offer, consisting mainly of in-depth project work.

STUDENT ASSESSMENT

Early courses in sociology as applied to medicine and medical sociology, and the preclinical courses in behavioural sciences are normally assessed separately from community medicine and will not be considered here, although several respondents indicated they have a hand in conducting them.

Arrangements for examining community medicine depend largely on the system adopted by a medical school for all critical assessments, and especially on the system for grouping subjects for assessment purposes. In nine schools community medicine is included in the general medicine examination, while in at least eleven schools it is likely to be included in more than one paper or appear in company with several other subjects where there are integrated examinations. However, twelve schools, including most in Scotland and Ireland, have separate examinations in community medicine which students must pass independently of other subjects. One school sets a separate paper in the subject but though marked separately, it is not 'critical' separately: other subjects are taken at the same time and compensation between all the subjects in this part of the Final examination is possible.

No school debars community medicine from its final, professional, or qualifying assessment system. Two respondents however voiced some dissatisfaction with present arrangements; one would like to be sure of adequate representation in various multidisciplinary examinations as separate subject-based assessment is not practised. The new curriculum at one school will establish joint assessment with other, clinical disciplines and specialties in place of the present, separate examination.

In addition, a number of courses have relatively informal in-course assessments. In twelve cases, this is concerned with community medicine alone, but at one English school it is combined with the assessment of general practice: a report is compiled on students' performance during the whole multidisciplinary block. Projects or the long essays on chosen topics are formally assessed in five cases. In three schools where community medicine is interspersed with, or contributes to, a number of other courses, students' understanding of the community medicine parts is assessed with these other course modules as an integral part of their assessment.

Marks or reports based on in-course performance contribute to the marks of professional examinations (or exempt students from taking the latter) in four schools. At the school just mentioned, for example, satisfactory progress in the block will constitute part of the critical assessment, though in addition all students are examined orally in community health at the end of their final year.

PROBLEMS AND DEVELOPMENTS

Resources

The number and suitability of staff teaching community medicine are causing anxiety in approximately half the schools: fifteen reported their over-all staff–student ratio to be poor. Small-group teaching and supervision of individual project work is too staff-intensive for some schools to do as much as they think desirable and without straining their resources. At the extreme, one school mentioned that it has no department of community medicine and no full-time staff (it is not alone in this); an immediate stop-gap solution would be to 'borrow' staff from other medical schools or other departments in the University. One school has in fact recently established a new department of community medicine and two London schools have formed a joint Board of Studies in Community Health to organize and promote teaching of all aspects of the various branches of the subject. Students in both schools will follow the same core subjects and there will (one day) be joint chairs. Other London medical schools have created shared staff appointments.

Three schools intend to draw on NHS community physicians and general practitioners to help with teaching, although two schools which already do so have encountered consequent organizational difficulties, because of the overriding demands of their own work. These schools however believe that the extra efforts are worthwhile because things are made more real and immediate to students. Two other schools would like to follow suit, and a third proposed joint university/NHS posts in community medicine on exactly the same lines as sessional appointments in clinical specialties. One respondent commented in detail about the general desirability of such joint posts and the difficulties surrounding their establishment.

Lack of audiovisual material is considered a handicap by two respondents, one of whom would like to see a central library of tapes, slides, and films exclusively in this subject area. A different problem obtains in another school in central London: it is housed amid a local population totally unsuited for undergraduate field studies. Students are obliged to travel considerable distances in order to carry out their projects among settled communities whose features are more typical.

Organization of Teaching

Thirteen schools have established new courses in community medicine which were described in the questionnaires, and three others where the whole curriculum is being reorganized have reached an advanced stage of planning the new courses in community medicine. In several schools, this process has brought a higher allocation of teaching time, often

doubling or even trebling the previous amount. The most striking change is the increase in the number of full-time or part-time attachments.

There were no particularly strong complaints of insufficient time for teaching, but two respondents would like more 'learning' time for their students to spend on independent project work: possibly the extra time could be spread over a period at the rate of a few hours a week to enable students to conduct the research and write their reports in a more appropriate and considered way.

The problem of where and how to fit community medicine into the curriculum is giving more anxiety than the question of time. Four schools, three of them actively preparing new curricula, are finding this especially difficult. Six schools would like their main course to be held earlier, 'before students are institutionalized': by the time they come to the present community medicine courses they have spent two years or so in hospital-based medicine and are unwilling to accept new ideologies. Five of these respondents and one other would also like community medicine staff to undertake some preclinical teaching (or to do more of it): this has been a significant development in four schools where community medicine staff now take part in the early courses in behavioural sciences and statistics—laying the foundations for the community medicine course proper.

Three respondents envisage an early 'core' course for all students, to be followed up by various elements of joint teaching with clinical departments and also long-term independent project exercises under supervision. This is likely to be the arrangement at one English school in future: basic topics of epidemiology, statistics, comparative health care, medical sociology, etc., will be taught in the first two years, with environmental medicine and occupational health. The subject will also be included in the early 'Human Development, Behaviour and Ageing' course; later teaching will be more informal and more *ad hoc*.

Integration with other subjects is a matter of current interest. Ten respondents are keen to join clinical staff in patient-based teaching, for example, to deal with the opportunities for preventing some of the conditions they treat, or to supervise students following up patients whose hospital treatment is complete and investigating their after-care. For 'theoretical' aspects, a start has been made in four schools; recently, community medicine has been incorporated into the main systems-based course of instruction for junior clinical students. On the practical side, three courses are to become linked with general practice in the same block, which will give students contact with patients and demonstrate the relevance of community medicine as a discipline to routine patient care. In five schools there will be liaison with several clinical specialties, during students' attachment to those specialties, and if these experiments are successful they will be extended. At an English school,

a two-week module of 'Community Health' is being introduced in the first clinical 'year', beginning in the summer of Year 2 of the course; students will be seeing general practice and geriatrics, and generally going out and about. An Irish school would like a similar arrangement —a 'community module', incorporating community medicine, psychiatry, and geriatrics—in place of some of the traditional teaching.

At another English school, community medicine will enjoy a 'three-day event' at the end of the psychiatry attachment. A topic (for example, epilepsy) will be chosen, and after an introductory talk students will scatter to compile some research data about the topic—its epidemiology, its impact on family life, and so on; a final session will attempt to integrate the different pictures. The new curriculum at a third English school will see both joint topic-teaching and long-term follow-up of patients. During the courses in obstetrics/gynaecology, paediatrics, and psychiatry, there will be joint sessions on family planning, school health, alcoholism, drug dependence, etc. Unfortunately, it will be impossible for all community medicine to be integrated or coterminous, some will have to be separate.

Changes in timetabling and in organization have frequently been accompanied by changes of course content: one could sum these up as 'modernization'. The trend is away from traditional 'public health' towards what one respondent calls 'the health of the public', but is clarified by the new titles of many of the courses (for example, 'Community Medicine', 'Man in Society', 'Medicine in the Community'). The emphasis is on personal health and the social factors which can be exploited in its favour as well as those which threaten it. One school for instance has replaced a four-week period of 'Public Health' with nine weeks of 'Community Medicine' (including general practice) which provides a framework for multidisciplinary studies in the social aspects of medicine.

Unfortunately, teachers still have to struggle with prejudices carried over from a previous era, and this is sometimes compounded by suspicions of (particularly) sociology, and other innovations such as attempts to measure the effectiveness of care. Seven schools mentioned this difficulty; they are conscious of their image as a woolly, unglamorous, allegedly unscientific subject. Two of them and two others however feel they can go no further in pioneering their philosophy without radical change of the whole curriculum. The unwritten assumptions beneath the rest of the medical course are too much to contend with.

In order to make the subject more attractive to students and to implement the newer approaches to it, more varied and more active teaching methods have developed. Five schools reported decreasing the role of lectures with corresponding increase in tutorials and fieldwork. Nine schools altogether now conduct more small-group teaching sessions and a tenth strongly feels the need to do so, if staffing and

timetabling were to permit. A total of nine schools are now requiring students to undertake projects, conducted tours, home visits and so on which appear to be very popular, and five of them are keen to widen those opportunities and weight the course further in this direction. Three other respondents regret being unable to expand these extramural activities. One school definitely expects to offer more in future and to reduce its formal teaching; this school and two others also expect to offer independent work in the form of self-instructional and audiovisual programmes. Experimental schemes for independent learning will be offered under the new curriculum at an English school: pairs of students will be assigned to patients discharged home from hospital, or to physically and mentally handicapped children at home, or to pregnant women receiving antenatal care. Their observations will continue for a year or so and a report must be written on the experience.

It is hoped that the four courses where involvement with individual patient care has grown will be able to maintain and increase it, but the difficulties are considerable. If community medicine staff are to conduct clinical teaching regularly it might be an advantage for some of them to have recognized service commitments. Conversely, one school has arranged for students to be attached to AHA community physicians who now have a regular teaching commitment. Students observe them at work and learn about administering and planning medical services for a defined population. This school believes the reorganized NHS will present more opportunities of this sort, and for more non-hospital learning in general.

One school, as part of its redesigned course, will offer an elective in community medicine to interested students.

A total of twenty-one schools reported major changes in recent years; five of them anticipate more changes, as do nine others.

Statistics and Biometric Methods

Questionnaires were distributed to all medical schools in the Survey except those schools who offer only clinical courses: they, in discussion, indicated that they did not formally teach the subject, regarding it as more appropriately taught in the preclinical stage. The questionnaires were concerned with formal scheduled teaching of statistics, biometry, and experimental methods (subsequently referred to generally as 'statistics') and not with the incidental exposure to the subject which inevitably occurs from time to time throughout the course.

All thirty-four schools offering preclinical courses replied. In addition, one school sent in a very full return on the broader subject of 'Experimental Medicine'; this is reported upon briefly as an addendum.

TEACHING ARRANGEMENTS

Twenty-nine of the thirty-four responding schools make formal arrangements for teaching statistics in their present curricula, and they completed the questionnaire in respect of existing courses. Some of these courses are very new and final arrangements had not yet always been made, and in these cases full answers to all questions were not possible.

Five of the thirty-four schools do not include statistics as a formal subject in their curriculum at present; one completed the questionnaire with information about future teaching when the new curriculum has been introduced (and its answers have been included in this analysis); three were able to report briefly their plans to introduce statistics but did not complete the rest of the questionnaire. They are not referred to further in this report, which is therefore based principally upon thirty replies, but their plans, respectively, are as follows:

> A London school plans a 20-hour (plus) course of lectures, seminars and practicals in statistics and health statistics in Year 2, with a separate examination at the end of the course. This plan is definite.

An English school proposes to introduce two lectures on computational techniques and some specific instruction on statistics during courses in human growth, genetics, and pharmacology. There will be no separate assessment in the subject. Again, this is a definite plan.

A Scottish school may offer twelve lectures on 'medically relevant matters' in a separate course entitled 'Medical Statistics' in one of the preclinical years. There are as yet no proposals for assessment, and the plans are tentative.

The fifth school (an English one) does not intend to arrange specific teaching in statistics, because 'medical students are not interested in statistical methods. They should be taught after qualification to those doctors who feel the need for appropriate instruction. It should be noted that reference to many statistical concepts occurs during the course in community medicine and no doubt during other parts of the medical course too.'

Nineteen schools mount separate and independent courses on statistics and its related subjects: they are known by a variety of names—for example, statistics and biometry, medical statistics, biostatistics, measurement in medicine, and biomathematics. The remaining eleven schools have no 'separate' arrangements: all statistical teaching is given during courses primarily or equally concerned with other subjects and topics. 'Separate' and 'integrated' teaching coexist in six schools.

Nine physiology courses include some statistical instruction and so do five pharmacology courses: in four cases the subject is taught with both physiology and pharmacology. In nine schools statistics is included in courses in community medicine, particularly the epidemiological aspects. Some of these courses are multidisciplinary and also include the behavioural sciences (for example 'Man in Society').

In a few schools the teaching of statistics is specifically linked with that of psychology and sociology. One school has placed the main teaching of the topic in an early, multidisciplinary course linking the biological and behavioural sciences but continues to include medical applications in the course on community medicine in the clinical stage.

In at least two schools where project work or 'study-in-depth' is a major enterprise, students are given advice on necessary statistical methods and presentation immediately before embarking on their research.

Position in the Course; Teaching Time

Almost all the thirty schools teach the subject in the preclinical stage. Twelve have some scheduled teaching during the clinical stage, and one English school teaches it only during the clinical stage. Two Irish schools have a substantial amount in their premedical year (this is taken by the

majority of students entering these schools); one of them teaches it in all three stages of the curriculum. Eighteen schools confine it to the preclinical stage. One school where a significant proportion of students are exempted from the premedical year—where some statistics is taught—arranges a few hours of extra tuition for direct entrants to the first preclinical year; this is in addition to the course on statistics in this year which the whole class attends.

Teaching time devoted to the topic varies widely, and in some cases was an estimate: the lowest amount of time reported was three hours, and the highest was 51 hours. The average amount of time identified as being devoted to the teaching of statistics was 23 hours (SD 10·2). Half the schools give between 20 and 30 hours on the subject; five give 10 hours or less, and two provide more than 40 hours.

Teaching Staff

Eleven schools have professional staff in medical statistics or biostatistics who carry the main responsibility for teaching statistics to medical students. Mostly they are individuals who are borrowed from other departments (for example a basic science department) or who are attached to departments representing other major interests—for example, community medicine. Exceptions are a 'department of medical statistics' and a 'professor of medical information science'—both in English schools, and an Irish school's 'professor of experimental medicine'. Seven schools use mathematicians or pure statisticians to teach their students.

Due to the teaching arrangements which provide for statistics to be taught within various other subject courses as well as or instead of a separate course, the staff in these departments are necessarily involved in teaching statistics. Conversely where no statisticians are available, individuals or departments with a special interest in data collection and research methods will volunteer (or be persuaded) to run a course in statistics for undergraduate medical students.

Physiology is the basic medical science most often involved in statistics courses: eight schools use physiologists. One of them also uses staff from anatomy ('Human Morphology'), and biology and biochemistry were mentioned occasionally. Other disciplines and specialties involved are: genetics (1), pharmacology/clinical pharmacology/therapeutics (10), pathology (1), chemical pathology (1), haematology (3), medical physics and bio-engineering (5), computer science (2), and the behavioural sciences (4). In nine schools, specialists in community medicine and particularly in epidemiology are responsible for some or all of the teaching.

Clinicians regularly help to teach statistics at three schools. At one of them a large number of preclinical, paraclinical, and clinical staff come

together 'on a voluntary basis—because there is no teacher specifically employed to teach this topic'. Here, students are divided into small groups, and two teachers from different fields are assigned to each group, so that, for example, a haematologist is paired with a computer programmer to give complementary points of view.

FEATURES

Aims and Objectives

Correspondents were asked to describe their aims and objectives in teaching statistics: all except one were able to give statements approximating to objectives and they have been grouped together to show the common themes that emerged. The themes are not incompatible and several respondents gave more than one; they are for the most part only slightly differing views as to why statistics should be taught to medical students, and to what standard.

Twenty-three courses are designed to introduce students to statistics in general—the main concepts and the reasons for employing statistical analysis. They deal with statistical practices which are used in all and any scientific field of study, and not necessarily just those most used in medicine and the Health Service. Students will have a sound understanding of the general principles of statistics, which is a more realistic objective, it is asserted, than attempting too ambitious a coverage and 'losing half the students en route'.

Eight respondents emphasize the objective of equipping students to manage the references to statistics which are made in other courses in the undergraduate curriculum. Many disciplines and specialties present manipulated data during the course of their teaching, use statistical terminology, or refer to current research findings; it would be confusing for the student who did not appreciate them and annoying and time-wasting for the staff to have to stop and explain what was meant. An early course in statistics can therefore perform a service function to the rest of the curriculum.

Four of the above schools and three others are also concerned to equip students to manage the 'statistical hazards' they will encounter after graduation. As doctors, they will be bombarded with claims for new treatments, and they must keep up to date through reading journals and attending conferences; in these activities they should be able to form their own judgement, to see through spurious claims and to exercise their right to remain unconvinced of claims based, for example, on insufficient evidence or faulty reasoning. In addition to helping here, a training in statistical habits of thought may also stimulate students to monitor their own later clinical practice, to perceive the patterns that occur, and prompt them to improve it in ways suggested by their

observations. Naturally, it is further hoped that some students will go on to contribute to research literature and to the body of medical knowledge for which a reasonable fluency in statistics is essential. Such a standard is moreover highly desirable for all doctors who are likely to be in practice in the last decade of the twentieth century.

Ten respondents expressed a perhaps more philosophically based view: they see a course in statistics as helping to develop certain attitudes quite apart from the skills which students may acquire from it; it should be part of students' general education, part of attuning them to a scientific mentality. They hope to inculcate critical attitudes so that students will question statements and not accept them at their face value. It is the need to evaluate which must be appreciated—the need in itself. A healthy scepticism, not the methodology, is the goal.

Four schools have slanted much of their statistical teaching towards topics more closely related to medicine and medical requirements, towards biometry rather than statistics. Principles and techniques of physical measurement are taught in the context of human biological growth and variability. The methods and complications of measuring health are also discussed, and the concepts of normality and abnormality as they would be interpreted in clinical and in non-clinical investigations. This approach supports the teaching of anatomy and physiology and also prepares students for the clinical experience of later years of the course.

The ability to perform actual statistical calculations is not rated very highly but four courses aim to teach students how to carry out the more basic ones. In these four schools this is a primary aim of the course, but elsewhere although students may be expected to acquire these skills they are not thought important enough to be mentioned as an objective. One respondent stated explicitly that his course is not designed to produce statisticians.

Course Content

Respondents were asked to provide outline information about the content of their courses; this was in order to shed further light on aims and emphases, rather than to ascertain an 'average' curriculum. The following list of topics is thus not comprehensive, but it includes the main features that were mentioned.

Twenty-seven returns detailed the various statistical principles and formulae that students are expected to learn about (not necessarily 'how to do') and the methods of ordering, grouping and presenting data. In addition, twelve courses require students to learn how to carry out the calculations for the most frequently used analyses: skills of performance are required as well as a general understanding of the principles involved. Among the concepts to which students are introduced is that

of normal variation and the normal distribution curve (fifteen courses): examples can be drawn from physiology and from clinical studies.

Fifteen courses deal with the methods most commonly used in medical research: prospective and retrospective studies, therapeutic trials and so forth; they discuss the advantages and disadvantages of each method and how to recognize a well-designed study that is likely to yield useful results.

Seven of these courses and three others give time to epidemiological principles and methods. They discuss matters such as sampling techniques, population characteristics and vital statistics, demography, screening, the design of surveys and their different types and purposes, and how information derived from population studies can be correlated with that from other sources such as clinical observations and laboratory experiments. (See also the report on 'Social Medicine'.)

Computers feature in nine courses. Their uses and abuses are discussed—as information storage systems, as research tools and, with a view to the future, as diagnostic and retrieval agencies in medicine. Eight courses deal with the interpretation of organized information with particular reference to medicine. They are concerned with case records, disease registers, national and international inquiries, etc., emphasizing how the very way in which information is recorded can help or hinder the formation of useful conclusions.

Several respondents mentioned several of these features, but they are not necessarily taught in the same course. Especially where the teaching of statistics is 'farmed out' to one or more other disciplines, some aspects will be taught on one occasion and other aspects quite separately, perhaps at another stage altogether. Where separate courses exist on the subject, they may not include all aspects, leaving certain topics to be taught by physiologists, clinicians, specialists in community medicine, and social scientists, in their own courses. Also, some features will inevitably be duplicated by different teachers reviewing them in the context of their own discipline or specialty.

Teaching Methods

All the responding schools except one (in England) use lectures, and this is the most frequently mentioned teaching method. Two schools combine lectures with practical demonstrations. Small-group activities such as tutorials and practical work take place in sixteen courses; in some they are especially important and the course is built around them. Five courses include symposia and large-group discussions. Three courses require project work from students—field work, mini-research exercises in which students, individually or in groups, collect their data, analyse it, and write up reports.

Teaching aids are employed in fifteen courses to supplement the other methods. They include projection slides and the overhead projector

(four courses), cine-film (one course), tape/slide programmes for independent study (three courses), prepared handouts and summaries (three courses), and a computer (three courses). The computers are demonstrated to show what are their capabilities, and students are encouraged to try out simulated problems on them and to have a go at data-processing themselves.

Practical classwork was reported in twenty-four courses. Sometimes it is co-ordinated in time and content with lectures and tutorials; sometimes it is supervised by other teachers quite separately from the rest of the course. The course at one Irish school consists mainly of laboratory experiments—the time spent on them is about three-quarters of the total teaching time of 22 hours: for each experiment, students are briefed in groups of about fifty and then split into tutorial groups of about fifteen to do the practical work. This has reportedly proved to be a successful way of 'solving the very difficult problem of teaching statistical methods at the elementary level' compared with the formal lectures which used to predominate.

The practical work in statistics at a Scottish school is integrated with physiology and pharmacology laboratory work, which is a feature of some other schools' arrangements, too. The data derives from the laboratory experiments in those subjects and is analysed statistically after a short introductory explanation of the recommended procedures.

'Special Features'

Respondents were asked whether there were any features of their courses which had proved particularly valuable: they were free to highlight themes they had chosen, individual topics, or the teaching methods they used. They were also free to highlight something because it is felt important or because they believe their own practice is not typical or is unusually successful. Consequently, several respondents selected more than one feature as a 'special' one.

Emphasizing the uses of statistics is considered a major feature of ten courses. Statistics is presented not as a subject but as a skill to be applied to the understanding of natural phenomena. Statistical know-how has direct, practical relevance to both preclinical and clinical studies. This approach is strengthened where teaching is integrated with various standard courses.

Nine respondents mentioned the use of practical exercises. Students learn to appreciate the statistical concepts through designing and analysing their own experiments and using data from material they have handled themselves: practical, mathematical competence is not an end in itself. They allow participative learning instead of passive learning, as in lectures. In one of these schools the laboratory classes are directly linked with seminars, to encourage peer-group learning and

communication in groups. This employment of 'real' data is mentioned as the exciting feature of five courses. In practical classes students might measure their own haemaglobin; in lectures and tutorials the findings of current clinical trials and the vital statistics of local and national populations might be used as examples. This emphasizes the relevance of statistically processed knowledge and information.

On the same lines, project and fieldwork is highly valued in one school where it is part of the community medicine programme. Students go out and about conducting surveys, and report their findings in an objective, structured format—including statistical results. (Laboratory practical work in this school is also considered important.)

The particular qualities of their teaching staff were discussed by three schools: they argued the positive advantages of not having specialist 'pure' statisticians to teach all aspects of the topic in a comprehensive course. Two schools use staff who have experience of statistical applications in almost all fields of medicine and are in contact with current and anticipated research developments: these people can gauge what students need to know in order to survive in clinical practice. According to the third, 'There is no need for all statistics to be taught by statisticians. As more clinical teachers have become aware of the necessity of this numerical approach, they find themselves teaching it. But the statistician has an important task in trying to ensure a common terminology, to co-ordinate the teaching in which the subject is mentioned, and to try to keep up to date the vital statistical component in all topic teaching.'

Finally, one respondent believes that the most important aim of the course—and the result which gives greatest pleasure—is a critical outlook, healthily independent, which the students who attend the course will retain.

STUDENT ASSESSMENT

Statistics is included in major 'critical' professional assessments in twenty-one schools. None of them arranges a separate examination in the subject, although it is likely that it has a separate section of a combined paper in some schools. (One respondent, describing a course which is so far untaught, was unable to predict what arrangements would be made for the assessment of statistics.)

Statistics is combined with the behavioural sciences for examination purposes in eight schools (seven are London schools). In nine schools it is examined with one or more of the other 'major' preclinical disciplines: anatomy, physiology, biochemistry, or pharmacology. It is assessed jointly with community medicine in three schools; and in four schools (three of them Irish) it is assessed with clinical subjects during the clinical years.

In general in these combined examinations, it will be the examination as a whole and not the statistics component separately, which is 'critical' —and must be passed.

Eleven schools mentioned the in-course assessment of statistics. Project work or long essays and research exercises are used for assessment purposes in two schools, and in three schools students' practical work is assessed; laboratory notebooks are checked, or a small practical test is held. In one school, tutors' reports are formally gathered together and inspected. The in-course assessment is to some extent 'critical' at three schools: at two of them there is no further assessment in the subject but students must reach a 'sufficient' standard at the time of the course. However, in discussions with respondents it was generally admitted that, however 'critical' an assessment in statistics may in theory be, it would be most unlikely that an otherwise good student would be held back solely because of poor performance on it.

One school invites first-year students to take a test when they arrive; if they fail or omit to take it, they are required to attend the first-year course in basic statistics, but otherwise need not. All of them however receive scheduled teaching in more advanced statistical techniques during second-year physiology.

Two respondents expressed themselves dissatisfied with the arrangements for assessment: they would both like students to be assessed in the topic in an identifiable and preferably critical way. Teaching is largely integrated at one of these schools and it is not possible to discover how sure is the students' understanding of statistics generally.

PROBLEMS AND DEVELOPMENTS

Organization and Resources

Fifteen courses described in the questionnaires were completely new ones: in these schools the topic was not previously taught formally at all, or was taught occasionally and haphazardly. Three more schools are likely to have new courses in the near future: two of them reported the possibility of radical reorganization of existing arrangements while the third will definitely have a new system as part of a revision of the whole curriculum. This school feels that too little time is allocated to the subject in the present curriculum. Another respondent complained strongly at the paucity of time given to the topic in his school: three hours.

While there was generally little comment about the amount of time available for teaching, there was considerable interest in the question of timetabling. Two respondents believe their location in the course is wrong; altogether five would like some or more teaching to be scheduled in the clinical stage of the course. One suggestion was for an

early core course taught by statistical specialists to be followed at intervals by combined teaching with other disciplines and specialties as and when appropriate. This is not unlike the pattern envisaged for one English school developing a new curriculum: a brief orientation will be given separately first, but more applied teaching will be distributed among other courses throughout the curriculum, though the difficulties of achieving predictable, co-ordinated teaching in the clinical years is recognized.

One school has recently and successfully integrated statistical teaching with several other preclinical subjects; separate teaching has been eliminated. In two schools there is likely to be liaison with clinical staff; at one it is less certain than at the others. At another school, the teacher responsible for statistics is exploring ways of linking up with psychologists, especially for practical work, but it may not be possible to fit into their teaching sequence. Four respondents (including the last-mentioned) would like to integrate their practical class work with the laboratory classes of the basic medical sciences or to increase the integrated arrangements: this would probably mean more student time being spent on this sort of work and would, more to the point, mean more relevant activities with a constant supply of subject matter to be analysed.

The difficulties which a solo teacher of statistics may encounter in keeping abreast of the expanding role of statistical and computational methods in all branches of medicine and referring to them in teaching sessions, were reported from one school. More generally, staffing ratios can make it difficult to provide an adequate presentation of the topic. Seven replies indicated a shortage of staff or staff time which for example prevents small-group teaching being developed, or topic teaching with representatives of other departments. Four London medical schools feel the need for a full-time appointment in medical statistics, or at least for a person with statistical training and expertise (they are presently managing with shared or co-opted staff). Two of the courses affected by staff shortages are also handicapped by inadequate space for tutorial sessions: the situation forces them to rely on lectures.

Teaching Activities

Small-group teaching has been either established or increased in amount recently in four cases, and a fifth course will be based more on this method in future. This latter school will also provide opportunities for self-instruction during laboratory work, to allow students of differing abilities to work at their own pace. Four courses would expand the opportunities for practical work if more equipment, especially calculators, could be made available. Others would like practical statistical work to be part of the laboratory work of the basic medical sciences (see

above). Large numbers of students make separate practical classes on statistics difficult to organize well: several respondents find this. One course will give more attention to computer science in future, and another would if the facilities were more accessible. Projects for individual students and for groups of students will feature more prominently in the courses at two Scottish schools.

At one Irish school teaching handouts are much used: increasing numbers of these are being prepared, summarizing published papers or projects in the medical school which illustrate how statistical procedures are employed in everyday research activities.

To bring all students to the same level of statistical competence requires considerable effort, when some are naturally more numerate than others and some have had sixth-form mathematical training and others have not. Six respondents mentioned this problem; three of them proposed a division of the class into two or more streams, although logistically it might prove difficult and politically it might be inadvisable—the 'slow' students might feel that they were receiving second-class treatment. Another respondent wishes to abandon the more complicated statistical procedures in the course as some students find them very off-putting, but they are too widely used in medicine for this to be done.

Students' attitudes towards the topic are the greatest problem in ten schools. Students perceive statistics to be 'irrelevant', because it is not directly vocational; the image they create of the subject makes them even less willing to try to appreciate what the staff admit are conceptually difficult and sophisticated ideas. In three of these cases and one other the poor motivation shown by some students reflects the distrust evinced by members of staff. They do not accept the need for the topic to be taught in its own right: special efforts are not needed because they themselves managed to pick up sufficient working knowledge of statistics without being formally taught the subject. As one respondent said, 'the profession is not statistically minded'.

However, the questionnaires have shown the topic to be well-established in most medical schools, with many courses continuing to evolve. The trend is now for teaching to become more varied and 'personal' in its methods, in order to make the topic more attractive to students and more clearly relevant to the world of medicine and the medical sciences. Altogether there were nineteen reports of significant changes which have taken place over the last four years; five of these courses will undergo further change in future. A total of eight respondents indicated firm and detailed plans for some change to occur in the near future, while ten described plans which they hope may be implemented, if circumstances permit.

Addendum: Experimental Medicine

One Irish school sent a supplementary questionnaire describing its special course in experimental medicine.

This course is held during the school's first clinical year and lasts 100 hours; most of this time is taken up by lectures but there are also tutorials and 30 hours of practical work. Not all students complete the course, but all are required to produce an extended essay of 1,000 words prepared from the literature 'relating two entities currently of investigative interest to the profession'.

Statistical concepts and methods feature in the course, although basic ones have been covered earlier, but the scope is far wider than this and concerns information processing in medicine. The content evolves from year to year but basically the aim is 'to show how one can reduce the real world to material criteria which are either present or absent'. It includes accessing and reading medical journals, organizing records (POMR and other systems), factors in perception, analysing social interactions, defining clinical criteria, the diagnostic process, clinical trials, probability theory, and computation in medicine, including programming.

Problem-solving exercises have been instituted which follow the shift in the emphasis of the course from laboratory to clinical information processing, as the body of knowledge on objective methods for use on clinical data has grown over the last few years.

The department would like to have recognized clinical connections with hospital departments but meanwhile collaboration has begun with the medical school departments of medicine, surgery, and paediatrics who have agreed to collect standardized data on common diseases and their treatment for new learning programmes on decision-making in medicine. To computerize the learning programmes would be the next step but so far only those students who spend their summer elective period in the department gain computer experience.

Assessment forms part of the same diet of examinations as pathology, microbiology, and pharmacology. The component in experimental medicine is separate and, in theory, 'critical'. The thesis and the practical classwork count for in-course assessment.

Surgery

Questionnaires inquiring into the teaching of surgery were sent to all medical schools offering (or soon to offer) clinical courses. There was a 100 per cent response, constituting a 'field' of thirty-five medical schools.

An abbreviated reply was received from a medical school whose first students had not begun the clinical course at the time of writing. Five other replies dealt with teaching which would form part of a new curriculum which had not come into full operation—these schools were still teaching some students according to their 'old' curriculum. Some answers, therefore, are speculative, and the field for a few individual questions does not amount to the full thirty-five.

TEACHING ARRANGEMENTS

Structure: Position in the Course

Surgery as a major subject takes up a considerable part of the clinical course. Its teaching time is measured in weeks rather than hours. The most common timetable pattern is for clinical instruction in surgery to be given in two stages: the first or 'junior' attachments to clinical units occur in the first year of the clinical course or rotate within the early stages; the second or 'senior' attachments occur in the final clinical year. This pattern can be seen in two-thirds of the schools responding. Only in four schools do significant clinical surgery attachments occur in all three years of the clinical course.

In three medical schools the early arrangement is for students to move between several clinical specialties in the first period of clinical teaching, not 'belonging' to any single unit but experiencing a spread of them, going from one to another in order to learn the basic skills of clinical practice and the peculiarities of each specialty's examination techniques, etc.

Clinical attachments to surgery can be categorized into full-time and part-time attachments. Twelve schools give only full-time (or virtually full-time) attachments; almost all are double ones—an earlier full-time

attachment plus a later full-time attachment. These are all schools in London and England. Nineteen schools have 'mixed' systems of early part-time attachments followed later by full-time attachments. Two schools operate the reverse; early full-time attachments are followed later by part-time attachments. Two schools in Eire apparently arrange only part-time attachments at all stages.

In addition, six schools offer 'selective' attachments to final-year students who may choose one of the major specialties for a full-time attachment, and this might be surgery. It must be taken in a hospital regularly used for teaching by the medical school and because the choice is severely limited and the experience closely supervised it does not correspond to an 'elective'. Some schools offer some freedom to final-year students by providing 'open' clinics, ward rounds, case conferences, and so on, in the hospitals which they attend. Also, five schools arrange a special residential attachment in either general medicine or general surgery, with about half the class doing each, and these are administratively distinct from the normal clinical teaching blocks in the two subjects.

The arrangements for 'theoretical' teaching in surgery merit separate consideration (although the separation may be an artificial one). There are three main possibilities: that a special lecture course will be held, given by surgeons to the whole class of students at a time when some of them, and perhaps most of them, will not be taking clinical courses in surgery; secondly, that the department of surgery will combine with other clinical departments and sometimes with the pathology departments too, in a co-ordinated series of lectures based on systems or in a topic-teaching cycle designed around problems, systems, and topics, which extend usually over several terms and aim to be comprehensive in scope; thirdly, that neither departmental nor interdepartmental courses of theoretical instruction will be given to the whole class and instead all teaching is carried out within the period of clinical attachment so that lectures and seminars are given to each group of students in turn as they rotate through the clinical attachment.

Formal teaching by surgeons may occur in the 'preclinical' part of the medical course where they contribute to anatomy courses or present cases which make the basic medical sciences come alive. The sessions may be *ad hoc* and organized informally, or they may form part of a series of weekly or monthly presentations as a regular item in the curriculum. Students would not perceive these sessions as 'surgery', nor are they intended to be so, but they constitute an extra teaching commitment for staff.

Teaching Time

In comparing the amount of time given to surgery in different schools the main drawback is that in some schools 'surgery' means general

surgery only, but sometimes 'surgery' on a timetable means general surgery plus surgical specialties such as urology, vascular surgery, ENT, and plastic and reconstructive surgery. There is, however, a growing number of schools who schedule the specialties separately, pairing the medical and surgical teams of cardiology/cardiac surgery or neurology/surgical neurology, etc. It should be noted too, that formal teaching in anaesthetics and in radiology and perhaps radiotherapy may be scheduled in 'surgery' timetabled time. Those factors no doubt account for some of the variations in teaching time.

Many respondents were unable to estimate the time devoted to teaching in co-ordinated courses and the like. It was therefore decided to ignore such teaching for the purpose of presenting average figures and to concentrate on clinical attachments. Furthermore, two schools with significant amounts of clinical teaching approximating to part-time attachments were not able to estimate the length of these very precisely; two schools in Ireland were similarly not able to be very specific about teaching time generally; and one school yet to run its clinical course could not answer.

The average is therefore based on thirty estimates. It is 17·9 weeks (SD 5·13), or 537 hours (SD 153·9), equating 30 hours with one week. The range is from 11 to 34 weeks, but in some schools at the lower end of this, students have the option of doing some extra surgical attachments (see above). In nine schools the period is less than 15 weeks, in thirteen schools from 15 to 20 weeks, and in seven schools from 21 to 26 weeks.

Co-ordination of Teaching

Respondents were asked to describe how their teaching is co-ordinated —how different aspects of the course in surgery are interrelated and how surgical teaching is co-ordinated with that of other disciplines and specialties.

Twelve respondents indicated that formal arrangements are mounted to co-ordinate the different aspects of their own teaching. Seven respondents indicated that their arrangements are relatively informal, but work satisfactorily. In eleven cases, the arrangements which exist deal with only part of the course, for example only the clinical teaching or only the 'theoretical' teaching. Four respondents did not report any arrangements.

One of the problems in planning clinical teaching is that the different units to which students are attached each have their own interests and style and therefore students may gain disparate experience. Two respondents made the point that this is inevitable and in their hospitals the teaching firms are deliberately formed of specialists so that students do not go away with an erroneous impression of uniformity; a variety

of approaches has many educational advantages. Groups of students rotate around several teaching units. The composition of a teaching unit may be carefully constructed to balance the 'general' with the 'specialized'—one or two general surgeons being linked with one or more specialized surgeons for teaching purposes. At one school all students are rotated through the gastro-intestinal unit of the teaching hospital, which is a combined unit of surgeons and physicians. Another arrangement, described by five respondents, is to gather together the students attached to a number of different firms for special case demonstrations, tutorials, or bedside teaching by academic staff. This makes good use of patients who are particularly suitable for teaching and 'harmonizes' the teaching received from different sources.

Regular contact between clinical teachers is fostered by six departments. The heads of the units involved in teaching, whether NHS or university staff, are brought together for meetings and keep each other informed of teaching matters through personal contact. They themselves make efforts to keep in line with the over-all objectives. At one school, university staff have been allocated to each surgical teaching unit in order to pass on their knowledge of the curriculum and make sure there is a degree of uniformity. Some of the larger schools now have two academic departments of surgery who share administrative responsibility for teaching.

Clinical teaching may or may not be directly related to 'theoretical' teaching. In two cases it is related both in time and content as the theory and the practice are taught together within the attachment. One of these schools also runs a systems-based course which connects the basic medical sciences with pathological changes in the systems but is not fully 'clinical'; the second school has no separate lecture series or 'theoretical' teaching, whether it be a surgery-only course or a multi-subject course. It is possible for some correlation to be achieved so that the two aspects are not made wholly incompatible; in seven schools the lectures, for example, follow the same sequence as the clinical instruction.

Five respondents referred to a standing body such as a board of study, a departmental sub-committee or a working party which is specifically entrusted with planning and monitoring the undergraduate teaching of surgery and with devising a coherent programme. Two departments however have designated individual members of staff to co-ordinate all aspects of the teaching of surgery.

Tutors and tutorials may be used in a co-ordinating role. If the tutorials are arranged to cover set topics then all students will be sure of receiving 'core' teaching; if the topics are left to be chosen by tutors or students they can be selected to fill the gaps in other teaching. The tutor can tie together the 'theoretical' and practical elements, and use his personal knowledge of the students to check they are benefiting from

the programmes as they should. Nine respondents see the tutor's role as a co-ordinating as well as a teaching one. In Dublin, the three medical schools have developed a system of 'hospital tutors'; in each major specialty in each major hospital where clinical teaching in that specialty takes place, a tutor is appointed to take care of the interests of all students sent to that hospital. He will do some teaching himself but will carry general responsibility for all their clinical experience there. He is of registrar or senior registrar status. Over the months and years in which students attend that hospital, close personal relationships are built up.

Three respondents mentioned their clinical sub-dean(s) or the director of clinical studies, who have an important part in organizing and monitoring the clinical course. Especially when they are based in individual teaching hospitals they have similar activities to the Dublin tutors; they would also keep surgical teaching in step with objectives for the whole course and raise with the teaching staff problems encountered by students.

In eight schools there is a revision course for final-year students which summarizes and standardizes the previous instruction: it may also incorporate 'recent advances'. Occasionally these consist only of lectures but more often tutorials and clinical sessions are available too.

Topic-teaching sessions provide opportunities to broaden the picture given to students; they usually involve more than one staff member of different backgrounds, and being less formal than lectures, can blur the distinction between theory and practice. Ten respondents mentioned them. Surgeons of different specialty fields appear in them, but the feature of most sessions of this sort is that non-surgeons and even non-clinicians appear together and discuss a clinical problem from all points of view. A few schools have low-frequency cycles of topic-teaching in which most clinical topics are taught; in effect, these sessions are adjuncts to formal lecture courses and to the course in clinical surgery. One of the schools offers a course of integrated 'symposia' for senior students.

In fact, surgeons and surgery make contributions to the co-ordinated series of lectures or topic-teaching sessions in twenty-two medical schools, where this course carries much of the 'theoretical' teaching relating to clinical subjects. Frequently, the sessions are one-man lectures, grouped according to body systems; normally the series runs through the earlier stage of the clinical course and some departments try to correlate their early clinical instruction with it, but generally it is true to say that there is no direct relationship with concurrent clerical experience. This is believed to be outweighed by the advantages of a non-specialty approach to the principles of medicine. In at least five schools, representatives of the department of surgery are among those who plan these courses and revise and update them annually.

There are two other main areas where surgery meets other specialties in the scheduled teaching programme. One is co-operation with anatomy departments: a number of schools have surgeons who make 'guest appearances' in the preclinical anatomy courses, and two have devised special arrangements. One has a lecture course in 'surgical anatomy' held a year later than the basic anatomy course and at the same time as students' first clinical attachments. The second has special teaching clinics in the hospital for preclinical students where cases are presented and discussed by a surgeon and a scientist together; they are held weekly, towards the end of the 'preclinical' course. They are known as 'clinical lectures' and also cover some 'surgical physiology'; the part of the body demonstrated in the surgical classes is that studied in the medical school that week. Secondly, there are the Introductory Courses in Clinical Method which schools arrange at the beginning of the clinical years (or at the end of the early years) to teach the basic skills of physical examination and history-taking. Surgeons take part in such a course in at least sixteen schools with representatives of other major and some minor disciplines.

It was reported that stronger arrangements for co-ordination will be practised in three medical schools in future, as a result of curriculum reorganization. This will apply particularly to the correlation of 'theoretical' with 'practical' teaching. There will be better definition of objectives, new timetabling, and in one case, new constitutional structures, which will make co-ordination easier as well as more successful than in the past.

Course Evaluation

Respondents were asked to describe the arrangements for evaluating the teaching of their subject. This aspect of course development is not entirely unrelated to co-ordination as the procedures for both may be similar. Three respondents whose new clinical courses had not begun at the time of writing, declined to answer this question.

Of the responding schools, twenty-one described formal arrangements for evaluating teaching in surgery. Seven have relatively informal arrangements. Five do not apparently review their teaching formally. Nine departments formally and regularly co-ordinate and evaluate their teaching; one department does both informally. There is no department which attempts neither to co-ordinate nor to review teaching.

There are eleven departments where the scope of the review covers all teaching; the clinical and the non-clinical, the early and the later courses, the departmental and the non-departmental. The different aspects might be subjected to review on different occasions and by different procedures; co-ordinated theoretical courses by special committee and by balancing views of surgeons with those of other departments, the clinical attachments by the department of surgery alone, for example.

One respondent explained that analysis and modification on a minor scale is carried out fairly constantly, and the courses are never the same twice running, but major reviews are held at much longer intervals, perhaps every two to three years. Regular reviews are held annually in six cases. The formal reviews are held monthly in three departments; one also holds reviews of a different status yearly. Another respondent indicated that the most noteworthy reviews are held at the end of each period of clinical attachment. A total of three departments undertake regular reviews each term. Another holds them at irregular intervals—when the need arises.

As a major subject, surgery is included in the review of the clinical course and its component stages which is carried out from time to time at medical school level by inter- or supra-departmental bodies. Eleven respondents mentioned this process; for some it is the only formal review activity.

Within departments the composition of the groups who are active in review varies. In five cases it is restricted to the academic members of the department, while in eight it is normal for most clinical teachers to be involved and in these cases it is felt to be extremely beneficial to hear the comments and consider the suggestions of the part-time and full-time NHS staff. One department, where academics are the only surgeons involved in the formal review, also involves the anaesthetists and pathologists and others who have shared the teaching. The professor and some of the senior staff conduct the review of one school's courses in surgery. There are departmental sub-committees, working parties or boards of study charged with doing so in five other schools; they also have responsibility for planning and supervising the courses. Comments of external examiners are acknowledged and noted in the evaluation of two courses.

Students are involved in the review in nine schools. There are regular staff–student meetings and in a few cases questionnaires are distributed for anonymous comment. One department in a very large medical school has appointed an individual member of staff to gather in all students' comments and to analyse them.

The most widespread problem occurring in connection with course evaluation is, how to organize it usefully. It must allow different opinions to be expressed and yet result in a consensus view which can be translated into action and lead directly to improvements. The increasing numbers of students have often had to be spread around larger and larger numbers of clinical units in order to give them all useful experiences, yet paradoxically this has led to greater unevenness and greater variation in standards. Respondents ask, 'How can a thin spread of students and small-group, in-depth experience be subjected to quality control?' The academic department cannot impose its own views on the other clinical teachers. Three respondents are particularly anxious about this.

AIMS AND OBJECTIVES

Twenty-nine respondents described the aims or objectives which guide their teaching and determine the main themes to be pursued. Six were unable to describe objectives in any detail, but gave some information. The objectives fall into two broad categories: those relating to general themes of medical education, and those which relate to surgery as a specialty and to teaching the knowledge, skills, and attitudes peculiar to it. There is some overlap between the two categories; many respondents gave objectives of each type.

Eight respondents see their course in surgery as an integral part of the whole clinical course and do not wish to 'disassociate' themselves in any way: they are concerned with helping undergraduates to become doctors, and the whole ethos is different from that of programmes for training postgraduate doctors to become surgeons. Especially in the early course(s) they are primarily teaching 'clinical medicine'. It applies equally to clinical and to non-clinical experience: both should reinforce what is taught in other courses; participation in multidisciplinary courses underlines the 'emphasis that Surgery is a further extension of Therapeutics as a whole and that the place in an undergraduate curriculum is to provide further experience of clinical problems even though the emphasis may differ somewhat from the other aspects of medicine'.

A special contribution of surgery to the general training of medical students lies in its ability to relate the basic medical sciences to clinical events. It provides daily demonstrations of the changes which take place in the structure and function of the body when pathological processes are at work, and these changes can be perceived by students at first hand. It refreshes their knowledge of anatomy and physiology, and shows how to draw upon this knowledge to solve clinical problems. The surgeon must impress upon students the supreme importance of always thinking anatomically, of never forgetting the normal features of the body's construction. Ten respondents mention this approach.

Three respondents believe that their course should not merely prepare students for clinical practice but should also prepare them for other requirements of their subsequent careers, the need for further and continuing professional training. They must be given a foundation of knowledge to support later learning but equally or even more important, they must acquire good habits of learning. They should be encouraged to be opportunistic—to pick up new ideas, to extend their range 'without waiting for a teacher to spell it out'; they should learn to use a library; they should develop independent judgement and at the same time be willing to recognize their deficiencies and to use initiative in finding remedies.

The acquiring of general clinical skills was most often mentioned as an objective for the course. Twenty-two respondents intend that students should develop competence and confidence in performing the basic physical examination of a patient. This is a major objective of early attachments, to be achieved by active 'teaching by example' and by allowing students to practise: by the end of the senior attachments it should have become second nature to them. In similar terms, seventeen respondents referred to the basic skills required for interviewing patients and taking histories. There is very little here that is restricted to surgical practice; the attachments in clinical surgery should be regarded as simply opportunities to perfect the techniques which are the foundation of all branches of clinical medicine. Sixteen respondents emphasize the diagnostic process. The major concern is to train students to correlate the physical signs and symptoms they have obtained with the history supplied by the patient and the patient's own doctor; to build up a picture or construct a list of possible explanations. They must then learn what further questions to ask and what investigations should be conducted. To fulfil this objective they must become familiar with the services of the laboratory and radiological departments. These skills of interpretation, of problem-solving, are intellectual ones which the teachers of surgery are to encourage.

Skills of communication are equally important to six respondents. Here again the clinical attachments in surgery, because they last for such a large portion of the clinical course and because they present patients of all ages, sexes, conditions, and social backgrounds, provide unparalleled opportunities for meeting patients and their families. It is hoped that students will acquire, through personal relationships and observation of the staff, a suitable manner and an appreciation of what is appropriate and ethical behaviour towards patients.

Among the specialty-oriented objectives, that of introducing students to the principles of surgery is the most common. Fourteen courses aim to convey the 'core' of surgical theory so that all students who will not take up surgery as a career will have a broad grasp of the subject. A related aim though expressed in a different way, is that of introducing students to modern surgical care—showing them the scope of modern surgery and explaining what conditions and what stages of these conditions are amenable to surgical intervention. Again this objective bears in mind the needs of the future non-specialist. The aim is to present a balanced view of the specialty as it is practised today (twelve courses).

Surgical care requires a very high standard from all members of a great variety of staff. The role of the nurses, theatre staff, anaesthetists, physiotherapists, etc., is crucial, and highly specialized technically: students have the opportunity to learn how each profession fits into the team and to learn how sophisticated the management of surgical patients is. Two of the above-mentioned courses put forward this view.

Two courses are specifically designed to provide an introduction to all the surgical specialties, demonstrating the methods, caseload, and future prospects of each branch.

Eight respondents regard clinical exposure as an objective itself. They try to ensure experience of all the major surgical conditions which are frequently found in the country and also the 'important' ones (in terms of seriousness) which may not be so common. Some courses are more selective than others in the range of conditions which feature in teaching. The rationale is to enable students to recognize these conditions clinically, by becoming familiar with their typical and atypical symptoms. This is part of the diagnostic process.

The management of the 'major' surgical conditions is noted as an objective in eight replies. They aim at an appreciation of the role of surgical operations compared with other methods such as drug treatment, radiotherapy, and conservative management, and of the circumstances in which these methods are alternatives or allies of surgical treatment. Though the teaching is concerned with the management of conditions for which surgeons are usually responsible, it is as much a part of the teaching of 'therapeutics' in general.

A more extensive view of patient management is provided in two courses where 'community surgery' is emphasized. Teaching must make students aware of the 'before and after' of surgically treated illness and to comprehend the whole process of the illness from onset, through diagnosis, referral, treatment, recovery (whether full or partial), convalescence, rehabilitation, and resumption of normal life. Surgical teams belong to the wider spectrum of the Health Service and the social services and do not work in isolation. This objective can be more easily met when the teaching hospitals are also community hospitals, serving a local population, as at one of these schools where 'we hope to show that surgical disease begins in the community, is dealt with by a brief sojourn in the hospital, followed by a return to the community again. This applies for not only what is considered general surgery but also for the surgical specialties.'

The psychological impact of surgery is given emphasis in three courses, again reflecting the need to consider the 'whole patient', to see the patient as a person with fears, emotions, and family pressure to contend with. There are particular psychological problems associated with surgery but respondents consider that it is no bad policy to draw attention to them in view of the role of personal and psychological factors in all types of illness.

A special ability which can be developed during a course in surgery is decision-making. Six respondents are particularly concerned to show how decisions must be taken and cannot be avoided, however difficult it may be. They wish to pass on a sense of urgency: in clinical practice there is always a need to determine priorities and to think quickly and

positively and surgery brings this to the fore. One respondent believes 'the greatest contribution that surgery can make to the undergraduate curriculum is decision-making. Surgical problems are often more clearly structured and permit black and white answers or go/no-go decisions.'

Finally, six respondents would like to think that students enjoy the courses. They should develop enthusiasm for clinical practice, and enthusiasm for surgery, appreciating the dedication it calls for and that it brings its own rewards: 'I hope they will get fun, a sense of enthusiasm, and an appetite for hard work.'

TEACHING METHODS: NON-CLINICAL

Lectures are used in thirty courses to some extent. In nine schools a considerable number of lectures given by staff from the department of surgery are incorporated in the major co-ordinated cycle of 'theoretical' clinical instruction: in some other schools they contribute rather less to these courses. Five questionnaires showed separate—separately time-tabled—lectures on surgical topics. Two schools have both separate lectures and co-ordinated lectures relating to surgery. Visitors are occasionally brought in as guest speakers (three reports) at lectures or seminars and staff from 'preclinical' departments come to teach on a regular basis in three cases, with surgeons in topic-teaching sessions. 'Mini-lectures' and 'lecturettes' were reported from two schools. Revision courses of lectures are given to senior students in six schools; they are optional.

Discussions with large groups of students are held in twenty-five courses: in four schools they take the place of lectures. They can take the form of seminars, for a rotating group rather than for the whole class of students. In five schools topic-teaching sessions are featured under this heading and more than one member of staff, representing more than one specialty, would appear on the 'panel'.

Small-group teaching and tutorials are regular methods of almost all courses: thirty-one reports mentioned them. They can be classed as both 'theoretical' and 'clinical' teaching. Several departments appoint tutors who take the same student group for tutorial sessions throughout their surgical attachment.

Independent study is encouraged in a number of courses. Students are required to undertake a research project on a surgical subject, or a surgical-pathological exercise in three schools. At two other schools all students must write up a project sometime during the clinical stage of their course but the topic would not necessarily be a surgical one; and four other respondents explained that students are invited to take up a project option while they are attached to a surgical unit, but are not

actually required to do so. Free study time is provided during scheduled teaching time in three courses, to enable students to use the library or follow up special interests. Teaching aids and audiovisual equipment are employed in twenty-two courses. The amount of use and the degree of importance attached varies quite widely. Ten departments make tape/slide programmes available to students for 'self-instruction' in their spare time or in timetabled free study time, or while they are waiting for an emergency to occur, in casualty, for example. Television facilities and films are used in five courses now as a normal feature.

CLINICAL TEACHING

There were several questions which inquired about aspects of clinical teaching. The style and depth of replies varied considerably.

Teaching in the Differential Clinical Settings

Respondents were asked to indicate and differentiate the relative roles of the different learning situations and clinical settings.

Seven respondents explained that the styles of their earlier and later attachments are very different. Teaching activities such as ward rounds and special tutorials are more frequent and more necessary for junior students; involvement in patient care and independent learning are the keynotes for senior students, who need a much looser kind of supervision. Only four courses always make the teaching activities—the special ward rounds, case conferences, etc.—the most important.

In five courses patient care is always the primary concern: students follow 'business' rounds and attend case discussions, clinics, and so on which would be organized in virtually the same way if they were absent. Opportunities for student–patient contact are maximized and students are encouraged to participate in management and to learn from talking to patients and observing their progress. One of these respondents added that the staff aim to teach 'by example'.

The majority of courses cannot be easily classified as following one of these patterns more than another. Two of them explained that plenty of teaching sessions, patient-care activities and time for direct student–patient contact are provided, yet what students actually learn and remember depends ultimately on their own initiative and willingness to take advantage of the opportunities for fuller experience than a 'core' programme can ever give. In seven courses, however, ward rounds and in-patient teaching and learning are generally more important than outpatients.

Sessions in the operating theatre are included in eleven courses as a normal feature. Attendance at post-mortem reviews of surgical patients

is a part of two courses. Out-patient clinics are used for teaching in all courses. Two respondents mentioned the breast cancer clinics which all students would attend in order to learn of the management of the disease and to learn something of the concomitant psychological and social problems.

Non-teaching hospitals (district or 'peripheral' hospitals) are used for surgical attachments by a number of schools. This began as a solution to 'overflow' difficulties but has expanded because of the perceived educational advantages. In two schools at least, all students spend part of their course in surgery at district hospitals.

Visits to convalescent homes or hospitals and to limb-fitting centres are arranged in three courses. Visits to patients' homes with or without the general practitioner are a feature of five courses, as part of 'follow-up' schemes: this is known as 'community surgery'. Another department encourages students to make contact with a patient's general practitioner by telephone, to discuss the patient and hear his views. Altogether, general practitioners take part in eight courses, either in patient-based teaching and *ad hoc* case discussions or as members of topic-teaching panels. Community physicians (specialists in community medicine) appear in one of these courses, for the same purpose.

Other non-surgical staff involved regularly in clinical teaching are social workers (five courses), nurses (three courses), physiotherapists and occupational therapists (two courses). Pathologists take part in twelve courses, either formally or informally, and so do anaesthetists and radiologists, particularly in six courses. Their contributions are mainly connected with individual patients though they may join surgeons in topic-teaching sessions. Radiological conferences and clinico-pathological conferences are featured in nine courses as regular and important events in the teaching programme. They are regarded as a 'special feature' of the course by some respondents—they are very effective and very popular techniques. Altogether non-surgeons are involved in teaching activities in twenty courses.

The size of clinical teaching groups—'the number of students round a bed'—was inquired into briefly. However, the size of the group of students attached to each 'firm' or clinical teaching unit was not always easy to identify, one reason being that re-timetabling and expanding intakes have made the situation quite unpredictable for some departments.

The early attachments often distribute students in larger teaching groups than the later ones. There are nine schools where no more than 5 or 6 students belong to a group for 'junior' attachments; there are eighteen schools where the average size of a 'junior' group is from 6 to 12. Respondents in other schools could not be so precise—numbers vary from '6 to 14' to '5 to 20', some of these would presumably be later subdivided for patient contact. In twelve cases it is clear that fewer

students are attached to clinical units in the senior or final year programme. This sometimes corresponds to 'junior house officer' posts when numbers per unit are usually between one and four. In fifteen cases it appears that numbers do not change significantly from stage to stage; on the whole they fall into the middle range of numbers—about 4–8.

The number of students taught at one time also varies according to the setting. Very few would be present at out-patient consultations, for example, compared with a teaching ward round or a 'grand round'.

The numbers may increase in the new medical schools as their intakes rise to more 'normal' levels: however, some London schools are hoping for a smaller size and a more consistent size of student group as a result of their new curricula and of single entry to the clinical course.

Student Experience of Emergency Care

The majority of schools make special arrangements for students to gain experience of emergency care situations (twenty-nine schools). Four do not make special arrangements, or do not consider their arrangements are 'special'; and one not only does not have a system but believes this type of experience is best postponed to postgraduate training. Two respondents whose new courses had not begun preferred not to answer. Frequently, whatever arrangements are made they are more stringent and more extensive for senior students—they must 'participate', while junior students need only 'observe' (three respondents).

A period of residence is required as part of the surgical course in nineteen schools. The most popular lengths of time are two weeks or four weeks (four schools each) though two schools expect eight weeks of continuous residence. Often it is possible for students to remain in residence for more than the minimum specified period; and in some schools where residence is not compulsory for surgery, students can opt for it, especially where 'selective' final year attachments are offered. There are also five schools where a fixed period of residence is stipulated and students choose whether to take it in general medicine or in general surgery. In twenty-one schools, of whom some do not insist on a period in residence, students are required to attend the hospital on a rota for 'waiting' days and nights, and possibly weekends. This can be additional to a period of residence but more often within it; whatever they do on other nights students must involve themselves in all events on particular dates. Bleeps are provided for students in at least five cases.

Emergencies enter hospital through the accident and emergency department and sessions here are compulsory in eighteen schools. These may be integral to the course in surgery. While on duty here, students will see emergencies of all descriptions, but the rota would frequently be organized by the department of surgery. At one school the arrangement for students in residence to attend the accident and emergency

department is worked on a rota basis: 'each evening/night two or three students are assigned specifically to the Casualty Department and two or three are assigned each to the medical and surgical team on call. Each student in residence is thereby involved in the A. and E. department about once a week.'

Special post-waiting ward rounds are conducted for teaching purposes in four schools.

As part of the 'core' programme, the recognition of an appropriate response to emergency conditions is included in all 'theoretical' courses and illustrated where possible by examples. One department puts on special demonstrations now and again—'it is proposed to formalize them in the new curriculum'.

Specified Requirements and Experiences: Student Responsibility

General objectives have been reviewed earlier. They relate generally to the clinical examination, interviewing, the diagnostic process and so on, as skills; and to the recognition and sometimes the management of the main categories of disorder.

Specific objectives for students' clinical experience are possible. Eighteen departments have lists of the tasks, the conditions, or the activities which students must see and perform by the end of the course. Five of them and four other departments have a system for recording the achievements of students individually, so that staff know what progress has been made and what remains to be done. At one school a booklet is given to students covering 'Practical Procedures in General Medicine and General Surgery', listing by system the procedures which may be 'undertaken' and those which are to be 'witnessed' in either one of the two courses. Twelve respondents stated they do not specify requirements and do not keep records of this sort. One respondent about to inaugurate a new course, could not be sure what arrangement would be possible; and another felt unable to give a categorical answer as practices vary from hospital to hospital and from year to year, and some teaching units are more precise in their demands than others.

A distinction is frequently drawn between the objectives for earlier work and those for later work. In the first, the experience is meant to be more structured and more controlled whereas later on students are free to see and do what they like: the experience is opportunistic and very little, if anything, is specified. Three respondents emphasized this distinction. In eight schools, students in their final year are attached as 'junior house officers' to surgical units and are expected to take part in all activities, seeing and doing almost as much as a preregistration house officer would.

Five reports indicated that the teaching staff on the firm keep a running list of what their own group of students have experienced each

Table A. *Practical Experience*

Procedure	No. of Schools in which Students would: *See Procedure*	*See and Do Procedure*
Subcutaneous injection	32	27
Intramuscular injection	33	28
Venepuncture	34	34
IV drug administration	34	18
IV blood and fluid administration	34	26
Bone marrow aspiration	21	1
Lumbar puncture	21	6
Abdominal paracentesis	31	8
Pleural fluid aspiration	31	8
Microscopic examination of urine	29	27
Biochemical examination of urine	25	20
Haemoglobin estimation	21	19
Staining and examining a blood film	19	16
White blood cell count	19	15
Estimation of erythrocyte sedimentation rate	20	18
Wound suturing	34	28
Anaesthesia: local	33	23
Anaesthesia: general	31	15
Endotracheal intubation	30	20
Cardiac resuscitation	24	5
Procedures frequently added by respondents (max ≠ 34)		
Catheterization (usually bladder)	11	9
Endoscopy (various)	9	5

day or each week; this might be a wall chart in the office. It helps to balance the types of cases and disorders which are seen by individual students and to avoid overteaching on patients.

Respondents were asked to indicate on a pro-forma the level of students' practical experience and the extent of their normal permitted responsibility. In the first case, they were asked to indicate which procedures out of a standard list students would normally be expected to have seen or done in the specialty by the end of the undergraduate course. The list together with the results from the thirty-four schools who answered the question, appears as Table A.

Similarly, the level of responsibility entrusted to students was investigated by presenting respondents with a list of responsibilities which students might be given, and asking them to indicate for each one whether it would 'routinely', 'occasionally', or 'not normally' be entrusted to students by the end of the undergraduate course. The list, together with the results (from thirty-four schools) appears as Table B.

Respondents entered several qualifications to their answers to these questions. Many of them say they attach little importance to manual skills and investigative techniques; the crux of the matter is for students

Table B. *Responsibility entrusted to Students*

Responsibility	No. of Schools in which the Responsibility is entrusted to Students: *Routinely*	*Occasionally*	*Not Normally (or na)*
The results of students' initial examination and history taking form a part of the patient's records	19	8	7
Students' records of the patient's progress and treatment form a part of the patient's record	13	13	8
Students recommend medication	1	4	29
Students recommend clinical/laboratory investigations	7	15	12
The practical arrangements for clinical/laboratory investigations which involve other departments (eg radiology, bacteriology) may be entrusted to students	7	9	18
Students might be a 'first contact' in an emergency	3	19	12
Students assist the operator in the theatre	22	12	0
Senior students have the opportunity to play a role in the clinical team similar to that of the pre-registration house officers	22	9	3
Senior students act as student assistants ('locums') in the absence of house officers	21	9	4
Students act as a contact between the hospital and patients' relatives	0	11	23

to understand the general principles of diagnosis and of surgical care, and above all to acquire desirable attitudes. The level of activity can fluctuate from firm to firm and from hospital to hospital and also of course with the type of case available. It is normal for the senior students and for students on elective attachment and on locum house-officer appointments to exercise more responsibility than others. One or two respondents are pleased if students volunteer for duties, and allow the more interested ones to do more (and have more responsibility) than the others. Events connected with a student's own patient would involve the student more closely.

'SPECIAL FEATURES' OF COURSES

Respondents were asked to select the features which they have found to be especially valuable or successful in their teaching of surgery. They

could be features of organization, objectives, teaching activities, or a combination.

The outstanding feature of five courses is that very little of them is devoted to 'pure' surgery. There is no thought of training students to be surgeons and the technical side is only expounded when genuinely relevant to the wider purpose of training them in general clinical principles and clinical method. This is a particular feature of newly established courses.

Surgery helps in building up a student's all-round clinical competence and appreciation of the human body through its very clear, direct relations with the basic and applied medical sciences: it demonstrates living anatomy and living pathology. Six respondents say this, and that it is therefore an exciting as well as an essential learning experience.

Comments opposing the teaching of 'pure' surgery were linked in four replies to references to the success of integrated courses. Two referred to the introductory courses in basic clinical method which staff from several departments teach together: they ensure that all students have a good grasp of the basic skills before they are attached to individual units who can then concentrate on passing on their special expertise. The two other replies commented on the multispecialty 'theoretical' teaching or topic-teaching cycles: these only became possible when different departments sank traditional rivalries and specialty preoccupations.

A few respondents mentioned teaching methods under this question. Two believe the 'special feature' lies in not concentrating on a single method, claiming that it is best: instead there is a deliberate variety. They are balanced to meet the students' different personal preferences for styles of learning. One of these respondents and one other, however, has found one activity to be especially productive. This is the independent study which students are expected to undertake: they must write essays or conduct projects. At one of these schools the written reports are read at 'research symposia' in front of other students. The value lies in 'teaching both self-expression and the ability to draw deductions and learn to be original in thought. They are also useful for progressive assessment.'

Tutorials and the system of personal tutors are the main features of two courses. Students receive personal attention, and topics are investigated in depth.

The opportunity to attend postgraduate clinical meetings, research discussions and staff conferences is stressed in one reply. This 'stretches' the students, stimulates their interest, and helps them to feel at the centre of things.

However, the most numerous and the most enthusiastic claims were drawn from clinical teaching experiences: almost all aspects of the subject are best taught and best learnt clinically. It is in the clinical

context that decision-making is demonstrated. This is an important facet of surgery and a stated objective for some courses: four respondents mentioned its importance to their philosophy of teaching in their reply to this question.

Having only a few students to each clinical unit is of great benefit. Ten schools are fortunate in this respect—three respondents mentioned it specifically. Staff get to know students well and the students can get to know patients. The full-time attachments in the final year, contrasting with earlier perhaps part-time ones, have proved very successful in five schools. Only one, two, or three students would be attached to each unit and they assume the status of a junior or assistant house officer: they are totally immersed in the clinical situation. It is a truly adult part of their student career, and therefore enjoyable.

Fourteen respondents drew attention to the amount of contact with patients which students are allowed in their courses—not necessarily only in senior attachments. It is felt that patients are the best teachers. One respondent said ('unashamedly') that the 'apprenticeship' model cannot be bettered. It implies long periods of time generally, on the wards and in clinics, and specifically, clerking individual patients and investigating their problems. In four of these medical schools and in five others a very wide range of disorders, a high turnover, and large numbers of patients are available for teaching so that students get ideal exposure to the various conditions, their typical and atypical manifestations and the ways of managing them. They see all this 'in the flesh'. Another school mentioned here that it sends students to the surrounding district hospitals as the teaching hospital has a limited supply of patients. They gain a wider and more balanced view of surgical problems and surgical care while they are there. Yet another school has circumvented the problem of inadequate and unrepresentative patients by investing heavily in television facilities. Closed-circuit relays and recorded videotapes present a great variety of conditions, carefully selected for their teaching value; and many symptoms and many techniques are, it is said, demonstrated much more effectively by television than by traditional bedside sessions.

One respondent commented that apart from the quantity of patients available for teaching in his school, the patients themselves are extremely pleasant and helpful—far from objecting to being taught upon, they enjoy it and are friendly towards students.

Learning through responsibility is the policy in five courses where (senior) students actively participate in the care of their 'own' patients. They follow them to investigation departments, accompany them into theatre, maintain their case-notes, carry out tests and simple procedures on them and assist with more 'advanced' ones, and help with the numerous administrative tasks that fall to nurses and doctors. One of these courses mentioned its use of a problem-oriented record system:

each student faces an 'audit session' on his management of the patient. Traditional case presentations are a feature in six courses particularly; students discuss the cases with which they have been involved with reference to the literature in front of their tutorial groups and may be criticized by staff and other students for their approach. Three (more junior) courses have developed problem-oriented record systems as a teaching device to enable students to assume the skills and mental reflexes for case management: they help to structure and guide their thinking; they combine in-depth involvement with individual patients with a standardized, universally applicable framework. As a teaching method for junior and middle-stage students they are very successful.

In their approach to patients, students are schooled always to think of 'the total patient' in three courses especially. They must be aware of the emotional stress to which hospitalized people are subjected, and of the context of family, work, and other factors. They are shown how patients enter and discard the sick role, each in a slightly different way. All these factors have direct relevance to the care of patients: surgeons cannot afford to ignore them and students would go away with a wrong impression of surgical practice if they thought otherwise. In one of these courses social workers take the groups of students for tutorials in order to explain the necessity of this outlook; the respondent believes these sessions are extremely important.

In another of these schools and in two others a 'special feature' is the emphasis on the whole theme of 'community surgery'. Students come to appreciate this by following up discharged patients and liaising with general practitioners. For example: 'Each student is allocated a patient in the out-patient department. The student then sees the patient at home and discusses the patient's problem with the general practitioner before admission. When the patient is in hospital he is looked after initially by the student who also visits the home to see how the family cope when the breadwinner or mother is in hospital. When the patient returns home the student then follows his or her convalescence. An essay is written which is looked at not only by the surgical staff but by the GP. Ultimately, there is an individual case-conference attended by the GP, members of staff (surgery), and the student. The aim of this exercise is to indicate to the student that a surgical operation is only a small but very important event in a patient's life but the context of the patient as a whole is as important as the surgical treatment of an individual organ or tissue.'

STUDENT ASSESSMENT

Two medical schools whose clinical courses had not begun could not give detailed answers to the questions on assessment.

Information was received about 'critical' and 'formative' assessment. The former constitutes the assessment which can normally affect students' progress towards graduation: the latter does not affect their prospects of graduating and is used as 'feedback' to staff and to students themselves.

In-Course Assessment; Class Examinations

Thirty questionnaires reported the use of in-course assessment carried out during the clinical attachments, or immediately at their end: three added that the methods and the amount vary considerably from firm to firm. Almost all schools require written reports from each head of a teaching unit commenting on the progress of each student; sometimes grades are given (twenty-seven replies). They comment on such qualities as 'knowledge; responsibility; performance in problem-solving and communication'.

Six courses use MCQ tests for in-course assessment. Six involve clinical examinations based on cases. Three use oral tests of clinical competence; for example 'regular clinical confrontations or quiz sessions on a one-to-one basis either formally at the end of appointments or informally in clinical practice (wards, theatres, etc.)'. Written case-studies and project reports are submitted for assessment in eight courses.

Nine schools allow some marks from in-course tests to be added to the results of 'final' examinations; they thus make a 'critical' contribution. At two others, good performance in clinical attachment assessments—one or more of them—can exempt a student from further examination in some aspects of the subject. Elsewhere these assessments are not critical in the strict sense but a student could of course be required to repeat the attachment if the report or performance on other tests proved very unsatisfactory.

Class assessments are taken by the whole class of students together, usually at the end of an academic year, rather than only by a rotating group: they are held in twenty-one cases involving surgery. Most frequently the method used is an MCQ paper (nineteen replies) but two also set written papers of essay questions. Clinical examinations based on cases are held in six schools, of whom two also conduct oral examinations. Sometimes these assessments are confined to surgery; more often several clinical subjects are combined, especially in the MCQ papers.

Marks from class assessments contribute to the results of final examinations in four cases, but it is possible that a bad failure might result in a student being required to repeat the assessment.

Assessment in the Qualifying Examination

Critical assessment within the 'Final Examination' is held in all respondents' medical schools except one, where in-course and intermittent class assessments constitute the 'critical' assessment, with a 'Final' examination being taken by borderline students only.

In many schools there is more than one stage of 'Finals', one being taken a year or more before the second. For example, the written and theoretical examinations may be completed a year or more before the 'practical' clinical assessments. In twenty-one schools a separate examination is held in surgery with some or all surgical specialties. In sixteen schools surgery is combined in integrated examinations with other clinical subjects; in three of them, surgery is examined separately and jointly, on different occasions.

PROBLEMS AND DEVELOPMENTS

Respondents were asked to describe what changes had occurred recently, what changes will occur, and what problems prevent improvements to the teaching programme.

Organization and Resources

Surgery has been affected by over-all curriculum revision in many schools; changes are currently being implemented in some schools while in others the detailed plans are still under discussion. Further curricular changes were expected by eleven respondents when answering their questionnaires.

Four schools have allocated less 'independent' teaching time for surgery. Three have re-aligned the sections of the course so that surgery is now taught in two tiers with a clear distinction in objectives and methods for the junior and for the senior attachments. Four have recently established the 'junior house officer' or 'junior intern' concept for final-year students on full-time attachments: only one, two, or three students are attached to each unit. Another department is debating whether to make this arrangement a feature of their course. However, a respondent from a school which has not had a curriculum rearrangement finds the course in surgery is arranged very inconveniently. Some teaching—clinical and theoretical, until the final year when it is all 'clinical'—is given in every year of the course and the general effect is fragmented and scrappy. More concentrated, less dispersed timetabling would allow a more coherent programme to develop.

There are two schools where the respondents would like a radical change in philosophy as well as in structure to be adopted. There should

be thorough-going 'vertical integration' of preclinical and clinical, with staff from each sphere teaching in both stages of the course.

Collaboration with other clinical departments is proceeding well in several schools. However, it has decreased or been abandoned in two schools where administratively it was found complicated and time-consuming. Meanwhile, a co-ordinated systems-based lecture course has been established in three schools and a new topic-teaching series in a fourth; all are the main vehicles of 'theoretical' clinical teaching in their schools and the majority of departments contribute. Multi-disciplinary topic-teaching sessions will become a feature of the 'senior' course at another school, while two other respondents would like some or more of this type of teaching to be arranged.

Joint patient-based teaching is being pioneered in three schools where surgeons and physicians together teach students on the ward. One department hopes to continue and repeat this experiment which has proved extremely successful: this department would also like integration with pathology and is acutely conscious of all the opportunities for joint teaching sessions, both formal and informal, clinical and 'theoretical', which the pathology department 'has rejected'. Courses of introduction to clinical method are special developments in two schools; one has introduced a new course, the other has expanded and improved an existing one.

At one school, restructuring of the course has led to surgical sub-specialties—urology, surgical neurology, orthopaedics, and reconstructive surgery—being separated from the main clinical course of general surgery. They are now paired with their medical counterparts in independent programmes through which all students rotate. The respondent in another school also feels better arrangements for the sub-specialties are needed. Through the vagaries of their allocation to clinical teaching units, students receive very uneven and unpredictable exposure to the various branches of surgery; it ought to be possible to rotate them in such a way as to give them all an equal exposure.

Staff–student–patient ratios are causing concern in several schools. Six reported that staff teaching time is insufficient—their other commitments are heavy—and two departments urgently want more academic appointments to be made. Eight other respondents indicated that the major problem confronting them is the sheer amount of service work and the constant demands of patient care: almost always this must take priority and teaching takes second place. Another school is particularly anxious at the effect which reallocation and redesignation of junior hospital staff posts may have, directly or indirectly, on clinical teaching.

Pressure on full-time and on part-time staff is reported to be accentuated by increased or excessive numbers of students: three respondents mentioned this problem though measures are in hand to alleviate it in one of their schools. As the intake to clinical courses rises, respondents

from schools where numbers at present are regarded as satisfactory think that it will be extremely difficult to maintain the present close relationships between teachers and students and between students and patients.

Two schools in Scotland stated that they face the problem of too few surgical patients in the teaching hospital to support the clinical teaching programme. One is resorting to television, the other to the district hospitals in the neighbourhood. In fact, five respondents indicated that recently the teaching of surgery has been extended into other 'non-teaching' hospitals where students go for full-time attachments. They are often some distance away from the medical school. Another school is to make substantial use of other 'district' hospitals in future: far more beds and patients will be made available this way.

However, there are disadvantages in scattering students so widely. One department which has begun sending students away finds the question of control very difficult. Most schools give the 'core' instruction and experience in the teaching hospital and view the 'peripheral' attachments as schemes for reinforcing this and widening students' clinical experience—'less teaching, more learning'. The same problem is due to other circumstances in three medical schools where more than one main teaching hospital is used. The academic staff cannot easily maintain contact with all the students nor, for example, assemble them together for tutorials and grand rounds. One of these medical schools is awaiting rebuilding, which will concentrate the clinical teaching on one site: meanwhile the facilities are 'physically deplorable'. This is said to be the case in another medical school where the surgical departments are using accommodation which is inadequate in size and space and 'totally unsuitable for teaching undergraduates'.

Teaching Activities and Content

In parallel with the introduction of new curricular provisions, four courses of surgery are to be remodelled to give a more carefully planned and graduated programme. Objectives have been formulated in detail for each stage, in relation to knowledge, skills, and attitudes.

Six respondents have found their colleagues are unwilling to plan their teaching in such detail. They are reluctant to discuss teaching matters or to evaluate the course and examine its shortcomings. Possibly their lack of concern is due to innate conservatism, possibly it is due to their extensive clinical responsibilities, but certainly teaching is incidental to their main preoccupations. Three respondents feel very strongly that a positive policy for teaching surgery to undergraduates must be determined—surgeons must convince each other and then the medical school that the subject has a role in the undergraduate curriculum, and this will only happen when justifiable objectives are drawn up and

agreed. Meanwhile, students cannot be blamed for lack of interest when the staff are not interested in them: two respondents have observed that students do not seem committed—they do not expect to get much out of studying surgery.

In many courses the emphasis is indeed changing, towards making the course more attractive and more 'relevant' to the average student. Three courses in particular are now less technical and less specialized: general principles of diagnosis, pathology, and management form the main themes. The points of contact with other specialties and non-surgical disciplines are stressed, the features which are specific to surgery are played down.

While some courses are requiring more teaching and more control from staff, others are encouraging more independence in their students and allowing more unselected clinical contact. One department has recently opted for fewer lectures and a greater amount of time for general clinical experience. Three respondents would like students to have more experience in out-patient clinics, but these are always extremely busy and the presence of students could be a liability. There will be greater clinical responsibility and better opportunities for independent work in three courses in future. Another respondent would like students to have community experience—to follow-up patients at home and become involved in their rehabilitation.

Altogether, eighteen respondents described changes which have recently affected their teaching. There were reports from fifteen schools describing changes which were about to be introduced.

POSTSCRIPT: PLASTIC SURGERY

One medical school returned an extra questionnaire describing the teaching of plastic surgery. This specialty features in several curricula (see the 'School Profiles'), but it may be of interest to report the teaching arrangements at this school.

Students spend a full two weeks on a combined attachment to the departments of radiotherapy, plastic surgery, and oral and maxilla-facio surgery. This is a logical arrangement as their work is closely related and they are sited in the same hospital. About one-third of the total time is spent with plastic surgeons.

Plastic surgery is not taught to undergraduates as a specialty; rather, the patients who are available and the skills of the staff are drawn upon to illustrate general principles and to improve the clinical competence of future non-specialists. Certain themes are considered important and are the main features of teaching: the recognition and management of skin loss in injuries: the management of burns; the maintenance of fluid balance; the handling of children with severe congenital

malformations (and their parents)—about one-third of the case-load is paediatric; and the management of patients in various stages of malignant disease. One advantage is that injuries and most other conditions are visible and tangible to students. It is hoped they will learn the types of case that should be referred to a department of plastic surgery, and, particularly important, the correct timing of such referrals.

This attachment is reported to be very popular with students.

Venereology

All thirty-five medical schools offering—or about to offer—clinical courses responded to the questionnaire on 'Venereology' (although several respondents prefer the title 'Genito-Urinary Medicine', or 'Sexually Transmitted Diseases' in preference to 'Venereal Diseases'). Full replies were received from only thirty-one of these schools, as two schools are only in the early stages of planning and two (Irish) schools indicated that, to all intents and purposes, the subject is not taught there at all.

TEACHING ARRANGEMENTS

Clinical teaching in venereology is always a 'separate' arrangement, conducted by venereologists: this is true for all schools teaching the subject. In addition, in many schools all the teaching of venereology is independent of other subjects and courses, and venereology is thus a self-contained unit in the timetable. In several schools, however, some 'theoretical' teaching is combined with other disciplines, with venereologists contributing to other courses or other specialists helping to teach venereology. Ten schools include lectures or panel discussions on the topic in the 'systems' course or other main vehicle of 'theoretical' clinical teaching.

In two schools the subject is linked with the course in communicable diseases; in one it is linked with teaching in community medicine, and in another with teaching of urology. Seven schools place the teaching in venereology within the period given over for the majority of time to obstetrics and gynaecology. Three schools made it clear that all teaching—theoretical as well as patient-based teaching—is contained within a 'self-contained' venereology course. Another way to schedule 'venereology' is with a group of other subjects which do not warrant major sections of the clinical curriculum in their own right, and students work their way through all these 'special' subjects one by one, either

on a full-time or on a part-time basis and usually in rotation. These 'special' subjects are rarely content-related.

Position in the Course; Teaching Time

The location of venereology is by policy generally kept away from the very early stages of the clinical course. Only one school arranges the main teaching effort in the first clinical year, whereas eleven place it in the second clinical year and six place it in the final clinical year. In other cases, the main body of teaching may appear in more than one year.

Two schools (both in London) give students a full-time attachment to a venereology unit: in one school this is for two weeks, and in the other for one week, but in the latter case this is in addition to certain other teaching. Four schools offer part-time attachments, ranging from the equivalent of half a week to the equivalent of two weeks; three of these schools are in London.

Taking a week's attachment as the equivalent of 30 hours spent on the subject, and ignoring the two schools doing no teaching of venereology and the two who are as yet only planning their courses, the average time spent by students over-all on venereology is 19 hours (SD 18·8); the range is from 3 to 83 hours. (The mean teaching time in the twenty-five schools not offering any form of attachment is 12 hours (SD 7·6).) Ten schools give ten hours or less on the subject—they include all but one of the Scottish and (remaining) Irish Republic schools. Thirteen schools, mainly provincial English ones, give between 11 and 20 hours, and eight devote periods ranging widely from 21 to 83 hours. The latter include many of the London schools, who teach noticeably more venereology than do the rest (mean = 32, SD 24·7).

Three Irish schools and one Scottish school do not arrange any patient-based clinical teaching: the inevitable problems of trying to be fair to students and to patients and the feeling that the subject is not altogether suitable for undergraduates have led to purely 'theoretical' treatment of the subject in lectures and seminars. However, individual students are free to attend clinics in their spare time if they so wish.

FEATURES

Aims and Objectives

Attitudes towards the subject and towards teaching it were implied in the answers of most respondents. Some answers concentrated on one main aim while others mentioned several.

An aspect of the practice of venereology which thirteen courses endeavour to show is the special nature of the doctor–patient relationship. It has overtones not usually found in other specialties, although

the importance of the doctor's response to his patients is relevant to all specialties, and it is hoped that students will appreciate it more after doing venereology. Students see venereologists dealing with embarrassed, frightened, or reluctant patients, having to gain their confidence and persuade them to accept treatment, without imposing another set of values upon them. They learn something about the doctor's role in society.

Another special quality of the subject is that it provides excellent opportunities to see 'whole person' medicine: eleven respondents highlighted this. Many patients present with social or psychological problems inextricably connected with the physical ones. To represent the subject accurately and to exploit these learning opportunities, it is considered necessary to emphasize the interrelationships of physical and personal factors in the natural history of the diseases and their management.

A number of schools do not wish to present venereology as entirely a separate entity: instead, they are concerned to demonstrate its overlap with other clinical disciplines. Some expertise in, for example, psychiatry, social medicine, gynaecology, and general practice is called for in the venereologist himself, or must be drawn upon through consultation with colleagues. In this way integration is encouraged in the student's mind in seven schools. Venereology is presented as one more branch of clinical medicine—not an independent entity.

Six schools feel a responsibility to emphasize the scientific approach which must prevail—appropriate treatment must follow accurate diagnosis. As with all communicable diseases—it is emphasized that the same principles apply to them all—diagnosis must be established by accurate laboratory tests and the treatment must be prompt and specific to the particular type of infection. It is this framework for practice which is the important learning objective.

The value of the subject is perceived by five respondents to lie in health education. A course in venereology is almost bound to make students aware of practices they have not encountered before and to give them some understanding of sexual matters and the sexual mores of contemporary society. It helps students become more mature, but calls for much tact on the part of the teacher. Therefore 'the teaching of venereology to medical students is an essential part of the undergraduate curriculum. . . . Since there is general clamour for health education of the general public including school children regarding venereal disease it is essential that the medical profession is also educated. . . . It has been said by many of the students who pass through the Special Clinics that listening to histories and talking to some of the patients gives them some insight into, and represents their first real contact with, aspects of life which had until then been little known to them. This represents part of their general rather than their specialized education.'

Teaching Methods

Three schools make sure that students see the physical signs of venereal disease and learn to recognize on examination the symptoms of these diseases. One reason given for this is the role of general practitioners who will have to identify and possibly treat such patients, possibly without the help of further training. The transmission of venereal disease and detection of the routes of its transmission are considered important topics to be taught at six schools. They demonstrate the principles of epidemiology operating in a particular context. The work of contact-tracing, for example, is introduced and explained.

Four courses endeavour to show the work of the special clinics, so that future doctors, few of whom are likely to become venereologists, will appreciate that their multidisciplinary expertise is the best way of using the personal and technical resources to combat venereal diseases. Three schools introduce students to the role of the special clinic's laboratory: in five courses, students actually spend some of their time working in a clinic laboratory. They carry out tests and learn the common procedures employed there.

In general, students are given no clinical responsibility. In five schools, however, and this corresponds with a higher than usual allocation of teaching time—students themselves interview and examine patients, and learn through their own direct experience. Four of these schools and four others are fortunate in being able to teach students in extremely small groups and sometimes individually. This is felt to be essential if students are to learn anything from the patients in this very delicate situation. Some schools clearly have decided that if very low numbers, ideally 1 : 1, cannot be achieved for administrative reasons, then it is better not to attempt clinical teaching at all.

One school augments the clinical teaching with standing displays and demonstrations which bring in the microbiology and immunology of the subject. Seven courses make use of audiovisual aids—coloured slides, and, in a few cases, cine-film. They can be used for showing clinical features which students who come for very brief sessions might not see 'in the flesh', or ones which patients cannot reasonably be asked to exhibit to an audience.

Health visitors and medical social workers join in the teaching programme in four schools. For example, they take part in case conferences and have students accompany them during interviews or on visits.

Course organizers in four schools take the opportunity to discuss family planning and sexual relationships and attitudes: they believe sex education is an important part of their work. Three go one stage beyond discussing these matters in general terms: they deliberately seek to challenge the students' own assumptions, to force them to analyse their own attitudes and then to develop more tolerant or at least better

informed attitudes and help them to learn to separate their private views from their professional role.

Elective attachments are offered to interested students in at least three schools.

STUDENT ASSESSMENT

Some form of in-course assessment is carried out in ten schools. In nine of them, students are assessed informally at the end of the period of clinical teaching, and usually this consists of a brief report from the head of the unit commenting in standard format on each student's attendance and performance. However, multiple-choice questions have recently been devised and collected for informal tests at one school. Another includes venereology in a class examination with various other 'special' subjects; this examination is not 'critical' in its effect on a student's progress through the course or on his prospect of graduation, but it must be repeated if failed. Eleven respondents stated firmly that no in-course assessment is conducted.

The major end-of-course 'critical' assessment in the subject never occurs independently; the pattern is for one or more questions concerning venereology to be included in an examination mainly devoted to another subject (or, in schools where the professional examinations are integrated, in a general multi-subject paper). It is possible that questions may be asked at medical, surgical, or gynaecological clinical and oral examinations. Seven schools are most likely to table venereology questions in the final medical examination; two, in the final obstetrics/gynaecology examination (one of these also in the final surgical examination); and nine in some more general examination. At one of these a venereal question might be added to the quota of communicable diseases questions in the integrated class and professional examinations.

Nine respondents stated that no assessment in venereology occurs, neither in-course nor end-of-course, neither 'critical' nor otherwise. Three of them consider this to be a serious fault which should be rectified by making the subject a regular and identifiable element in the qualifying examination.

PROBLEMS AND DEVELOPMENTS

Resources

Three respondents described the unpleasant and inadequate accommodation in which they work, in convincing detail. All three expect to move to larger, more salubrious premises when new hospitals are opened, but meanwhile patient care and teaching is unsatisfactory and

depressing, and the whole impression given to students must be bad. Departments in two other schools also will shortly move to new accommodation and another has recently moved to a 'purposely-planned and up-to-date clinic' with a separate and well-equipped teaching room which has already reportedly had a great impact on teaching. Two other respondents would like to have specific teaching space allocated to them, so that routine work could carry on without interruption, teaching could be done in privacy, and teaching equipment could have a permanent home. It should be remembered that a venereology 'department' usually consists of the clinic and no more, and traditionally was not designed for teaching at all. A third school with allegedly generally inadequate facilities says that a teaching room or a seminar room is the most urgent need. The staff–student–patient ratio is causing serious concern in many places. Fourteen respondents pointed out that venereology is the classic 'shortage specialty' with too few staff (there are unfillable vacancies) coping with ever-increasing numbers of patients. Most teaching is carried out by NHS staff: one respondent suggested that their contracts should recognize this and have teaching time written in; while two suggested that more academic appointments are needed. Nurses, social workers, and other trainees also have to be taught and this of course is a further strain on staff and on the supply of patients. Teaching can thus seem a particularly onerous burden. Furthermore it is unfortunate that the ebb and flow of patients—which can fluctuate seasonally—does not always coincide with the peaks and troughs of student attendances. The type of condition presented is also unpredictable and the conditions most suitable for teaching may not be available when the students arrive. It is generally impracticable to ask selected patients to re-attend for teaching purposes, according to six respondents.

The very nature of the physical complaints and the need to preserve confidentiality make patient-based teaching of students fraught with problems. Nine respondents find it to be a crucial problem, though not all of them find it insuperable. Much depends on the numbers of students attending at once—whether the staff and patients at the clinic can absorb them. At two schools the number of students in each group has recently fallen, but in two other schools the number has increased. Two respondents in particular intend to concentrate their efforts on reducing the student load: their goal is a one-for-one student–patient ratio and this must be achieved by rearranging the system without any new resources. Another school is to extend teaching to clinics in 'other' hospitals in order to balance the patients and the students more evenly.

The inherent difficulties of clinical teaching can to some extent be overcome with audiovisual presentations. Five schools have recently increased their use of these aids—two of them will continue to expand—and another is to begin to develop in the same direction; one plans

to record patients' histories for later playback to a student audience from a tape-recorder. A further four respondents see the possibilities of these methods and regret their lack of them—videotape facilities particularly are desired.

Organization of Teaching

Altogether nine respondents reported the time allocated to the subject is inadequate to teach the basic topics thoroughly—although it should be said that their schools represented the full range of teaching time devoted to venereology, and not just the lower end of the spectrum. In two cases the time has been increased but one respondent finds it still inadequate. In the near future, four courses on the subject will probably have a greater portion of the curriculum, and firm plans have been drawn up in three cases. Regarding the location of the teaching in the course as a whole, two respondents would like all their teaching to be given in the most senior stage or final year of the curriculum. However, the course at another school will be moved to an earlier stage.

Restructuring the timetable—with or without more student time being permitted—could it is felt bring considerable improvement. Four respondents plead for regular sessions at regular intervals held at times during the normal working day when students are more likely to remember to attend and be more receptive when they are there (at the moment two of them have to teach at evening clinics which are perhaps not unexpectedly unpopular with students).

Greater clinical experience for the students has been found possible in five courses which now give closer, more interesting, and more active contact with patients. Similar experience is still too scarce in seven courses where teachers would dearly like students to see the typical work of a typical clinic, to appreciate the range of problems and to go away with a less superficial idea of the subject. One respondent believes students ought to be more involved in practical procedures—they should have the opportunity to take samples from patients and carry out the laboratory tests.

Partly to overcome these problems, partly to improve the course as a whole, other teaching activities are being explored. For example seven schools now conduct more seminars and tutorials on set topics, or plan to do so: these are replacing routine clinical attendances at one school where new students are required to attend only one male and one female clinic—wider aspects of sex-related disorders will be presented in the new topic-teaching sessions.

Two schools have introduced handouts, summarizing the 'core' topics and course objectives and one intends to operate a checklist and to record students' comments and reactions to the course. The development of audiovisual material, mentioned above, will likewise broaden

the scope of teaching and give it more variety. A successful experiment in two schools has been asking social workers to do more teaching than they used to.

Changes are also happening in the subject-matter being taught. One course in future will deal with contact-tracing and its problems—the wider, social aspects of venereology. Other courses (four gave details) have shifted their emphasis away from traditional preoccupations to the sexually transmitted diseases prevalent today, and concentrate on the examination, diagnosis, and management of the acute infections which are most likely to confront the average doctor. One Irish school is especially conscious of the modernization of the subject and its image: 'The school has been in the vanguard of breaking down old prejudices and encouraging students to realize the importance and fascination of the work involved in the specialty.' The teaching is acquiring something of a dramatic 'frontier-of-medicine' flavour.

Barriers within some medical schools are beginning to fall. Two venereology courses are to be combined with microbiology, immunology, and (the other) communicable diseases, to cover the whole topic of infection. A third school has similar hopes, but regards the chances of fulfilling them as low; a union of all laboratory-dependent medical specialties is envisaged. Three courses are to enjoy closer links with obstetrics and gynaecology; there will be some joint teaching, and two of them will also join forces with community medicine and general practice for more appropriate teaching of certain themes.

Respondents who are themselves trying to integrate their subject with other courses and who are concerned with their role in the whole curriculum expressed views of possibly general interest. They proposed that sex education and the sciences of human behaviour should be taught more thoroughly and more meaningfully than has, in their experience, been the case: venereologists should not have to make up the deficit when students reach their clinical studies. The other proposal from this group is for a new 'systems' course or module to be added to existing series, which would be multidisciplinary, dealing with all sexually caused or related conditions; their pathology, diagnosis, and management. Ideally there should be a new department to co-ordinate all teaching and research in the field.

APPENDIX

General Medical Council Recommendations as to Basic Medical Education

Contents

GENERAL MEDICAL COUNCIL

Recommendations as to Basic Medical Education

PREFACE

1. In November 1964, the Council appointed a Special Committee on Medical Education with the duty of reviewing the Recommendations as to the Medical Curriculum which had been adopted by the Council in 1957. The Committee were requested to review all aspects of the training of the young doctor, including both the undergraduate course of study and examinations and also the duration, content and purpose of the pre-registration period. The Committee were asked to 'take into account the various forms of subsequent postgraduate training for which the previous stages in medical education should provide a suitable basis'. In addition to the Recommendations of 1957, the Committee had before them the Memorandum on Medical Education (including a section on 'The Future of Medical Education') which had been submitted on behalf of the Council in 1961 to the Robbins Committee on Higher Education.

2. The Special Committee received written evidence from the Licensing Bodies and Medical Schools, from a number of specialist societies, associations and faculties, and from various bodies which have taken a special interest in medical education and have been active in devising new curricular patterns. A number of the foregoing bodies gave oral as well as written evidence, and the Committee were greatly helped by the Association for the Study of Medical Education, from whom they received not only evidence but a number of papers embodying the results of their studies and researches. Both written and oral evidence was received from the British Medical Association and from the British Medical Students' Association. In addition, the Committee issued at the end of 1964 a Press Notice which contained a general invitation to submit evidence. In response to this invitation a great deal of evidence was submitted by associations and other bodies of various kinds, by individual doctors, and by members of the public.

3. The general tenor of the evidence submitted to the Special Committee was that the simpler and more flexible Recommendations introduced in 1957 had been welcomed as a stimulus and a challenge. Many new features have since then been introduced by Universities and Medical Schools into the pattern and content of their courses of study, teaching methods and examination arrangements. The Council warmly welcomes and is encouraged by these developments. The members of the Special Committee were glad to have opportunities of discussing some of these experimental ideas and suggestions with their authors. Evidence was also available from a variety of sources, including personal knowledge, concerning recent developments in medical education overseas. The questions which the Special Committee had to consider in relation to medical training in this country are evidently being asked in many countries throughout the world. For example, the following sentence appears in a Law adopted by the Soviet Union in 1958 with reference to medical and other professional training:

> In training specialists with a higher education, serious attention must be paid to developing in the students a scientific method of cognition, a creative approach towards the study of sciences, a responsible attitude towards study, and the ability to work independently.

With this the Council would readily agree.

4. Whereas previous Recommendations of the Council have been limited to education before and during the undergraduate curriculum, the present Recommendations are concerned also with the pre-registration period. The pre-registration year is an extension of undergraduate education by experience and responsibility. It is thus the end of the beginning, and is not the beginning of the next stage—that of preparation for vocational practice. Only if the pre-registration period is planned as a continuation of earlier studies and is part of basic medical education can it be used to best advantage and related effectively to the amount and content of clinical experience during the undergraduate curriculum. The whole concept of basic medical education (as defined in paragraph 6 below) implies the need for subsequent vocational training for independent practice in each branch of the profession. The Council has accordingly given some consideration to subsequent vocational training. Its views on basic medical education in relation to subsequent vocational or specialist training are set out in the final section, entitled 'Medical Education in the Future' (paragraphs 65–72).

5. The Recommendations have necessarily been drafted on the basis of the existing legislation comprised in the Medical Acts, 1956 and 1958. It is however in the Council's mind to propose certain legislative changes as indicated below (paragraphs 22, 27, and 67–72).

Recommendations: General

The Objective in Medical Education

6. Medical education is a continuing process which starts with pre-medical studies and continues through pre-clinical, clinical and pre-registration studies towards vocational training for a particular career in medicine. The Council accepts the advice which it has received that all doctors, including general practitioners, will require in the future special and extended vocational training for their chosen careers. The Council is aware that the undesirable barrier which formerly separated the 'Period of Pre-Clinical Studies' and 'Period of Clinical Studies' (no such terms were used in the Recommendations of 1957) has been in general reduced. The curricula in many Medical Schools now indicate that subjects which were taught only in one or other period in the past are, by a process of integration, taught at both stages. Basic education for a medical career does *not* end at qualification, but continues throughout the pre-registration period, for which one year has been provided. At qualification the graduate should be equipped to practise medicine under supervision in pre-registration posts. Basic medical education is completed at full registration.

7. In order to clarify thought, the Council suggests that the periods of medical education can be defined as:

(1) The period of Pre-Medical Studies;

(2) The period of Basic Medical Education (including the so-called 'pre-clinical', 'clinical' and 'pre-registration' periods of study);

(3) Vocational Training for a particular career in medicine; and

(4) Continuing education thereafter for all doctors.

8. Despite the welcome and necessary variations from School to School, the Council believes that in medical education there should continue to be a single *objective* for all doctors up to the time of full registration,

whatever their subsequent career. The object of this basic medical education should therefore be to provide doctors with all that is appropriate to the understanding of medicine as an evolving science and art, and to provide a basis for future vocational training; it is not to train doctors to be biochemists, surgeons, general practitioners, or any other kind of specialist.

9. The necessary understanding of medicine has to be attained through the study of the physical, biological and social sciences, and by the study of man himself in health and disease. It is the responsibility of Universities and Medical Schools to determine the type and details of the courses which they will provide in order to help their students to reach this objective. The Council's responsibility lies in its duty to indicate the general requirements and the standards which, in contemporary conditions, ought *in the public interest* to be achieved and maintained. The word 'contemporary' will be noted. In medical education a 'standard' is not something immutable. It is something much more interesting, more flexible and more difficult to define. Broadly speaking, the Council would adopt for practical purposes at any given time one of the most authoritative of current definitions:

> Something that is established by authority, custom, or general consent as a model or example to be followed; a definite level or degree of quality that is proper and adequate for a specific purpose.*

Duration of Basic Medical Education in the Light of Developments since 1957; Clinical Responsibility

10. In 1957 the Council reached the conclusion that the minimum duration of the undergraduate medical curriculum should remain at five academic years. The Council's reasons were stated as follows (Introduction to the Recommendations, paragraphs 13 and 14):

> They [the Council] are impressed by the importance of ensuring that the practitioner of the future is adequately trained in the medical sciences, and think it would be unwise to attempt to curtail the time spent on the study of these sciences and on the cultivation of scientific method. Moreover, the Council feel that the primary task at the present time is to find means of reducing the congestion in the curriculum: to instruct less and to educate more. If, however, the curriculum were simultaneously to be shortened, the principal object of the proposed reform would be thwarted. Congestion might well be preserved if not intensified, and the course would be liable to become still more vocational and less liberal in approach.

* *Webster's Third New International Dictionary* (1961). The dictionary cites this illustrative sentence by C. W. Eliot: 'The ideal of general cultivation has been one of the standards in education.'

The Council accordingly advised 'a lighter and more flexible curriculum', and carefully refrained 'from specifying the period of time to be allotted to particular subjects or the sequence in which they should be taught' (Introduction, paragraphs 14 and 10–11).

11. These decisions were generally welcomed by Licensing Bodies and Medical Schools, and they have resulted, as the Council had hoped, in increased attention being given to the medical sciences in the education of the student and (in some Schools) to the planning of curricula which are widely different in content from one another, although of common purpose. The Council has noted with satisfaction the wide variation in the method and content of medical education which is emerging between different Schools. The last decade has seen great changes in medicine, and there is every reason to believe that these advances will proceed at an accelerated rate in the next decade. Medical education has to keep pace with these changes, and the Council is anxious to encourage and increase the new flexibility in the planning of curricula in the different Schools. The Council thinks it is now widely accepted that in medical education there is no single pathway to success. Identity resides not in the paths but in the goal.

12. Against this general background the Council has again reviewed the question, which it considered carefully in 1957, whether the minimum duration of the undergraduate curriculum should be reduced. The view has been expressed by a small minority of Licensing Bodies and other bodies and persons who have given evidence that the time has now come for such a reduction. The commonest suggestion made by those who hold this view has been that the total duration might be reduced to four academic years through curtailing by one year the latter part of the undergraduate course, when the studies are primarily clinical. Coupled with this the suggestion has sometimes been made that the pre-registration period might be extended from one year to two years. The Council has considered these views most carefully, and with some sympathy, but it does not consider that the time has yet come for a major change in the duration of the curriculum.

13. Moreover, in the Council's view, the experience so far gained with the pre-registration year suggests that educational supervision during this period has not yet become so effective as to justify abandoning the effective control at present exercised by Licensing Bodies over the final year of studies. As explained below (paragraphs 22–23) the Council is now proposing steps which should materially increase the educational value of pre-registration posts. If the outcome is satisfactory, the Council might then feel able to take a different view of the suggestion that the undergraduate curriculum should be reduced.

14. The Council sympathizes however with the wish, earnestly expressed by many, that the senior student should be given a greater measure of responsibility, and that his period of clinical learning should preferably be less hampered by a need to study at length for written and other examinations. The Council wishes to make clear that these Recommendations take account of suggestions which have been made on these lines, and that the Recommendations will allow a Licensing Body which so desires to move close to the realization of such an objective. If suitable arrangements are made to assess and test the student's knowledge before the final year begins, that year could then be free from written examinations, and might in addition be a year spent largely in residential senior clerkships with increased responsibility. A clinical and oral examination at the end of the last year would be the culmination of progressive assessment of the student throughout his undergraduate course. (These suggestions are further discussed in paragraphs 26–30 below.)

15. The matters referred to in the foregoing paragraphs 12, 13, and 14 are given further consideration in paragraphs 26–30 and 71–72 below.

The Nature and Aims of Basic Medical Education

16. The first fundamental requirement is that *basic medical education should give the student knowledge of the sciences upon which medicine depends and an understanding of the scientific method.* The sciences basic to medicine, although all related to the study of man in health and disease, today cover so vast a range of ascertained knowledge that it is difficult for the student to have a profound understanding of any of them. Yet it has to be impressed on him that superficiality of study is inimical to the very spirit of science. Hence, in the Recommendations of 1957 the Council emphasized the need for reducing the student's factual load and for ensuring that 'the memorizing and reproduction of factual data should not be allowed to interfere with the primary need for fostering the critical study of principles and the development of independent thought'. The student should also acquire and cultivate the ability to work independently.

17. To these ends the Council sees much advantage in offering opportunities for special study during the undergraduate period. The pursuance of study in greater depth in a selected area will not only bring the student into closer contact with the members of the staff but will allow him, with the incentive of his own interest, to learn to think scientifically in a field whose elements he has already assimilated. Studying material outside the basic text-books, he may learn 'to follow the argument whithersoever it may lead', and obtain some insight into the way in which

scientific advances are made: not the mere technical details, but the creative 'pain in the mind' (as Almroth Wright described it) which dispels complacency and is a spur to discovery. Such special experience, judiciously planned and employed, although confined to one discipline or to selected fields of limited scope, may well have a general educational value which will increase the student's appetite for knowledge, his capacity to learn, and his power to think clearly and to some purpose. The Council is impressed by the uniformly favourable reports which it has received of the value of the additional year of study for the honours B.Sc. or B.A. degree which is offered by a number of Licensing Bodies.

18. The Council has also been impressed by the evidence which it has received of the use of elective periods of study, the involvement of students in research projects, and a variety of methods which have been employed to enhance, through work done independently, the student's capacity for thought. Within the normal period of study, including that of clinical subjects, the Council welcomes the development of such opportunities, arranged to suit the individual needs and capacities of all students. The Council recognizes that such arrangements to increase the opportunities for study in depth may carry as a consequence a reduction in the time available for study in other fields.

19. The Council would also like to encourage interdisciplinary teaching throughout the undergraduate curriculum. This has the one disadvantage that it is expensive of teaching time. It cannot therefore be extravagantly employed. On the other hand, it has several advantages both for staff and students. Stimulating in itself, it serves to demonstrate that, although it is convenient and in many respects helpful that separate departments should be responsible for the various subjects of the curriculum, the subjects nevertheless cannot without loss be compartmentalized in teaching. Each subject may well have a contribution to make to the understanding of the whole man in health and disease. It may illuminate overlapping areas of different disciplines, and help to keep teachers abreast of advancing knowledge in fields other than their own. The members of various departments are given an opportunity of demonstrating to their colleagues the importance of their subjects and their competence in teaching them. One increasingly adopted form of this combined interdepartmental activity is 'topic teaching', in which teachers from several disciplines unite to demonstrate the many-sided aspects of one chosen topic.

20. The second fundamental requirement is that *basic medical education should give the student a comprehensive understanding of man in health and in sickness and an intimate acquaintance with his physical and social environment.* Clinical method, which is not entirely identical with

scientific method although increasingly becoming an application of it, is the student's daily occupation. He should be given an opportunity of studying the 'before and after' of disease as well as the 'here and now' in the ward, laboratory and clinic. He should see the patient in his home and family, and in school and industry. He should learn about the organization of medicine, the scope of its various specialties, the role of the general practitioner, and the role of the Public Health Services in the promotion of health. He has to learn the ethos of medicine, the responsibility which the doctor has to his patients and the community, and his obligations and duties under the law. The role of history in illuminating the evolution of medical knowledge and practice should not be neglected.

21. The development of clinical judgement, through history-taking and physical and mental examination, remains the essential basis of all clinical training. With these methods well learnt and practised the qualified doctor can enter with confidence on the pre-registration year. The methods require to be applied constantly, and they are most quickly and efficiently performed when the student is given a share in the responsibility for the care of patients. As already stated the student is ready for such responsibility, under supervision, in the final year before qualification, and this supervised responsibility should be continued and extended in the pre-registration year.

22. The third fundamental requirement is that *the pre-registration appointments should complete the student's basic medical education and prepare him for the vocational training which is to follow.* Almost universal disappointment has been expressed to the Council in regard to the pre-registration year. Although experience of practical procedures is essential, too often a pre-registration doctor is excessively occupied with routine activities ('a pair of hands') and his further education is consequently neglected. It is clearly not sufficient to maintain that *any* practical experience of the craft of medicine is of value to the student at this stage. The good habits of study and reflection which (it may be hoped) have already been formed can be irrecoverably dissipated in a year of unresting labour. There are many reasons for such an unhappy state of affairs, where it exists. Probably they include deficiencies or limitations in this part of the Medical Act, 1956, which reproduces without alteration the provisions originally enacted in 1950 before practical experience was available.* Nevertheless, within the ambit of the existing statute it appears to the Council to be possible to effect great improvements in the pre-registration period. The very unanimity of the criticism encourages the Council to hope that Bodies and Schools

* It is in the Council's mind to propose certain amendments in this part of the Medical Act as soon as opportunity offers.

will be prepared to co-operate closely, not only with the Council but with each other, in seeking to endow the pre-registration period with a true educational value.

23. The Council has reached the conclusion that a considerable degree of University supervision offers the best prospect of major improvement. It hopes that Universities will regard it as a duty, not only to look after *the posts* (by way of inspection and supervision) but also to look after *the persons*, that is, the young men and women who are completing their basic medical education in those posts. The Council feels that there can be no substitute for the continued interest of Medical Schools in the welfare of their young graduates in the pre-registration year. At the same time the Council recognizes that the period needs to be a shared responsibility among Medical Schools, since many of the graduates hold pre-registration posts at a considerable distance from their parent School. Success will not be easy to achieve, but the Council would welcome the opportunity to collaborate with the Universities and Medical Schools in devising plans for this purpose. Further proposals are made in paragraphs 61–64 below.

Principles and Facts in Teaching

24. The written and oral evidence recently received by the Council abundantly indicates that difficulty is found as to the extent and nature of the instruction to be given in certain subjects, within the limited time available in the undergraduate curriculum. Anatomy, Physiology and Biochemistry are by no means the only subjects where such a question needs to be considered. It arises in a different form in relation to the scope of the instruction to be given in certain clinical subjects, where the student does not require to be instructed beyond a certain point because many aspects of the subject are appropriate only for later vocational training, after full registration.

25. In basic medical education 'the road of excess' does not lead 'to the palace of wisdom'. Many subjects have to be taught, and teachers have to ask themselves what general principles are implicit in their subjects and what essential facts they should give the student in illustration of these principles. The decision to omit information is admittedly hard for the specialist teacher to make. However, the omission of information which is irrelevant to basic medical education is more acceptable to the teacher when he recalls that its design is founded on the assumption that the period of vocational training should repair these inevitable omissions. Medical Schools will have to ask themselves whether certain subjects, identifiable as specialist aspects of medicine or surgery, still

have an appropriate place in basic medical education or whether they may not be better left to the vocational period. Specific suggestions in regard to particular subjects are made in the next part of the Recommendations.

The Examination System; Progressive Assessment of Students

26. The Council invites Licensing Bodies and Medicine Schools to give consideration to the timing and form of their existing examinations, and to the possible use, to a greater extent than hitherto, of a system of progressive or continuous assessment throughout the student's career.

27. In order to conform with the provisions of the Medical Act, 1956, there has to be 'a qualifying examination in medicine, surgery and midwifery' held for the purpose of granting registrable qualifications, such as the M.B., B.S. degrees of a University. A section of the Act, which reproduces without alteration some words from the Medical Act of 1886,* provides that 'the standard of proficiency required from candidates at a qualifying examination shall be such as sufficiently to guarantee the possession of the knowledge and skill requisite for the efficient practice of medicine, surgery and midwifery'. This provision has nowadays to be read in conjunction with subsequent provisions of the Act of 1956 (reproducing the Medical Act of 1950) which limit newly qualified doctors to practice under supervision in approved hospitals. The Medical Act however does *not* provide that the various subjects of the qualifying examination need be taken at the same time, nor does it require that the written, oral and clinical examinations in a particular subject need be held at or about the same time.

28. Subject to the statutory provisions, the Council considers that *the examination system should be designed so as to apply effectively the principles embodied in the programme of basic medical education.* In reducing the load of the all-embracing final examination, it is important to avoid the hazard of burdening the student with excessive and too frequent assessments. There may be a risk that in these matters of assessing and testing students a teacher will 'see and approve the better but follow the worse course' (Ovid).

29. The Council considers that special weight should be given to the student's record throughout his course, and recommends that a system of continuous or progressive assessment should be established and maintained for this purpose. It is clear however that the most suitable

* The Council intends to propose certain amendments in this part of the Medical Act, 1956, as soon as opportunity offers.

arrangements in each Medical School must depend to a large extent on the teaching methods and programme in that School.

30. Every undergraduate, in the Council's opinion, should have as his objective the medical degrees of his own University.* The examination system designed by the University should aim at contributing to the education of the student. Since the educational process and the system of assessment and examinations are inseparable, the Council now refrains from making any special recommendations as to the sequence and timing of the several parts of the degree examinations. The system of progressive assessment and examinations should be so planned that the student unsuited to medical studies may be identified at the earliest possible stage in his course. The primary object should be to test (and in doing so to foster) the student's understanding of what he has learnt and his capacity for thinking for himself, and not simply his factual knowledge.

* The Royal College of Surgeons in Ireland, which trains students for the Irish Conjoint qualifications, is a special case.

Recommendations on Particular Matters

GENERAL AND PRE-MEDICAL EDUCATION

31. *General Education.* The Council recommends that, before admission to the course of basic medical education, each student should be required to have passed a preliminary examination in General Education, recognized for University entry or equivalent.

32. *Physics and Chemistry.* The Council recommends that, before admission to the course of basic medical education, each student should be required to have passed examinations conducted, or recognized, by his Licensing Body in the subjects of Physics and Chemistry, or an equivalent examination in the physical sciences. As regards the question whether it is preferable for the courses in these subjects to be taken before or after admission to a Medical School, the Council gave reasons in its Memorandum of Evidence for the Robbins Committee on Higher Education (paragraphs 22–24) to the effect that the courses should preferably be taken in a Medical School. The Council still considers that this arrangement is desirable in principle, and wishes to encourage those Licensing Bodies which already provide such courses of instruction to continue to do so. The Council appreciates however that, while some Universities are able to provide this opportunity for varying numbers of their students, it cannot in present conditions be generally provided.

33. *Biology.* The Council considers that applicants may appropriately be examined in Biology either before or after admission to the course of basic medical education.

34. *Mathematics.* The Council thinks it is important that all medical students should have a knowledge of the commonly used biometric methods. Mathematics is required for the proper understanding of normal variation in human biology. Experience has shown that these

mathematical skills are not beyond the intellectual capacity of the medical undergraduate and are indeed necessary to the proper understanding of the basic physical sciences at this stage. They are also essential to the study of epidemiology and medical statistics, human genetics, the several applications of physics to medicine, the use of computers in medicine and, in general, throughout the study of the basic medical sciences. On the basis that students may offer themselves for examination in Biology *after* embarking on their basic medical education, it is open to the Licensing Body to permit the entry to a Medical School of a student who has taken Physics, Chemistry and Mathematics in the pre-medical examination.

35. The Council is of the opinion that there is much to be gained in the general education of the student by his taking some other subject, such as English or a foreign language, up to University entrance standard. If however a third subject other than Mathematics has been taken, the Council considers that the student should be given instruction in Mathematics, if this is found to be necessary, during his first year of professional study. Such instruction is already being provided in some Schools.

DURATION OF BASIC MEDICAL EDUCATION

36. The Council considers that the minimum period of basic medical education should be five academic years followed by one pre-registration year. The general principles which in the Council's view should be borne in mind, in planning basic medical education within this period, have been described in the general section of these Recommendations.

SUBJECTS OF THE UNDERGRADUATE CURRICULUM

The Study of Human Structure and Function, and Human Behaviour

37. The Council recommends that the instruction given in *Human Anatomy, Physiology,* and *Biochemistry* should include instruction in *Human Genetics* and *Human Growth and Development*; and that instruction should also be given at this stage in *Psychology, Sociology,* and *Biometric Methods.*

38. In the Council's opinion the aim in teaching such subjects as Anatomy and Physiology should be to give the student sufficient knowledge of normal structure and function (including their interrelation)

to enable him (*a*) to learn the basic principles underlying each of the sciences concerned and to obtain a grasp of the scientific method; (*b*) to know the range of normality so as to recognize deviations from the normal and thus to interpret and understand common clinical phenomena; and (*c*) to learn how and where to find the sources from which further information may be acquired if and when he needs it in the future. Undue emphasis on detail is not desirable; for example, in Anatomy it is not necessary that the whole body should be dissected. Detailed topographical anatomy is best regarded as a subject for specialist vocational training, after full registration (compare paragraphs 24 and 25 above).

39. In the Council's view the study of human structure and function should be combined with the study of human behaviour. The Council considers that instruction should be given in those aspects of the behavioural sciences which are relevant to the study of man as an organism adapting to his social and psychological, no less than to his physical, environment. Instruction in the biological and sociological bases of human behaviour, normal emotional and intellectual growth, and the principles of learning theory should be included.

40. The Council considers also that instruction should be given at this stage in the principles of measurement of biological functions, in the assessment of scientific evidence and in the analysis of data.

Clinical Studies and Related Sciences

41. Although many subjects are involved, emphasis should be given to the presentation of a coherent picture of the nature of disease and its control. The instruction should embrace the study of human disease, both physical and mental, in its preventive, diagnostic and therapeutic aspects, and the study of human reproduction. The relevance to clinical problems of Anatomy, Physiology, Biochemistry, Psychology, Sociology, Pathology, Microbiology and Pharmacology should be illustrated throughout the whole period of medical studies.

42. *Pathology and Microbiology.* These subjects may be taught in part before clinical studies begin. Pathology should be presented as a basic clinical science which helps the student to understand the mechanism of disease processes—the 'pathology of the living'. The various divisions of pathology—morbid anatomy and histology, clinical pathology, chemical pathology, microbiology and immunology—should be closely integrated with one another and with clinical studies, and to this end the student should be given opportunity to attend clinico-pathological conferences.

43. *Pharmacology and Therapeutics.* Pharmacology also may be taught in part before clinical studies begin. Instruction should include systematic instruction in the mode of action of drugs, their distribution and fate in the body, their possible hazards and their therapeutic uses. Therapeutics is a part of clinical Medicine and is essentially a subject which should accompany clinical studies. Students should become acquainted with the principles governing the design and interpretation of clinical trials.

44. The Council uses the term *Clinical Studies* to embrace *Medicine and Surgery*, *Obstetrics and Gynaecology*, *Child Health and Paediatrics*, *Psychiatry*, *Social and Preventive Medicine*, and *Ethics and Legal Medicine*. During the study of these subjects the attention of the student should be constantly directed to the importance of the interrelationship of the physical, psychological and social aspects of disease, and the increasing importance of the problems of disability and disease in an ageing population.

45. *Clinical Clerkships.* The Council regards clinical clerkships as the indispensable method of clinical teaching. It is important that the student should have a wide range of clinical experience, and the specialist interests of his chiefs should not be allowed to limit the breadth of his education. The clerkships should be held in Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, and Psychiatry for a total period of not less than 18 months. The aim must be that the student should be resident in the hospital, or within a convenient distance of it, for not less than half the time spent in his clinical clerkships. The Council regards such periods of residence as valuable for the study of the sick on their admission to hospital, for the continuing observation of patients, and for the gradual introduction to clinical responsibility. Residence allows the student more readily to become a member of the clinical team, his speed of learning is accelerated, and the quality of his experience and the opportunity for his seeing a wider spectrum of disease are enhanced.

46. *Medicine and Surgery.* The student should be introduced to these subjects less as separate disciplines than as different facets of medicine in the wider sense. He should become familiar with the contributions which clinical pathology, radiology, and other special disciplines make to Medicine and Surgery, and also with the contribution which professions supplementary to medicine make to the care of patients. Teaching in Medicine and Surgery, and in their special branches, should be directed to aspects of prevention, diagnosis, treatment, aftercare and rehabilitation of the common conditions or those which illustrate general principles, rather than to those aspects of the subjects which are appropriate to later specialized vocational training.

47. *General Practice.* In addition to systematic instruction and clerkships in hospital, the student should be introduced to the field of general practice, which includes the study of health and disease in the environment of the home and the place of work. Such experience is facilitated where teaching Health Centres or Departments of General Practice have been created. A period of attachment to a general practitioner is desirable. The student is thus given an opportunity to study the types of illness which do not normally require hospital treatment and the early manifestations of many diseases seen in hospital only at a later stage. He also obtains first-hand knowledge of services available in the community for domiciliary care and the promotion of health, and observes general practice as a means of providing continuing care of the patient and his family. Finally the student is able to observe general practice as a vocational opportunity for himself.

48. *Obstetrics and Gynaecology.* The Council considers that the teaching should include instruction in the principles of human reproduction and family planning and in the principles and practice of normal obstetrics. The teaching should emphasize ante-natal and post-natal care, the management of normal labour and its minor complications, the impact of pregnancy on general disease and of general disease on pregnancy. Teaching in Gynaecology should avoid those aspects of the subject which are more appropriate to later specialized vocational training (compare paragraphs 24 and 25).

49. *Child Health and Paediatrics.* The teaching should emphasize the study of normal growth and development and the deviations which occur in disease. The study of foetal growth should be undertaken conjointly with the Department of Obstetrics, and teaching on the newborn should be given in the wards of Maternity Hospitals. The growing child should be studied in his family setting and in association with members of the domiciliary services. The student should be made aware of the varied services for the care of children provided by the Local Authorities. The Council suggests that child psychiatry and mental subnormality should be given increasing attention in the teaching of paediatrics (compare the next paragraph).

50. *Psychiatry.* Emphasis should be laid on the common neurotic and personality disorders and on the ubiquitous nature of emotional disorder in all types of illness. The Council considers therefore that Psychiatry can be usefully taught, not only in the psychiatric wards and out-patient departments, but in all wards of the hospital, as an integral part of the study of clinical medicine. The student should obtain understanding of the range of psychiatric disorders, including acute mental illness, and should receive instruction in clinical methods basic to the

subject. Students should be introduced to the care of the chronic psychiatric sick. Instruction in psychiatry should include the elements of mental subnormality and child psychiatry; this instruction should, where opportunity permits, be integrated with the teaching of paediatrics (compare the previous paragraph).

51. *Social and Preventive Medicine.* The teaching should include systematic instruction and demonstration in the community aspects of medicine and its responsibilities; the epidemiology and the demographic, social and environmental associations of disease; and the organization of medical care and policies for the prevention of disease and the promotion of health. It is desirable that some of these aspects should be integrated in the teaching of other clinical subjects.

52. In all clinical subjects the student should study the influence of heredity on health and disease, both in terms of the individual and of the population as a whole.

53. *Ethics and Legal Medicine.* Instruction should be given in the statutory obligations of registered medical practitioners, the principles of medical ethics, and the functions of the General Medical Council. While some aspects of medical ethics can be dealt with appropriately by systematic instruction, the Council considers that day-to-day teaching, particularly in the clinical context, is of greater importance, especially as it gives the student an opportunity to discuss the issues involved in normal clinical practice. His attention should also be directed to the ethical responsibilities of the medical profession in research and in the development of new therapeutic procedures. In Legal or Forensic Medicine, the instruction given should be concerned with those aspects of the subject which are part of the responsibilities of all practitioners (compare paragraphs 24 and 25).

ASSESSMENTS AND EXAMINATIONS

54. The general views of the Council on this subject have been set out in paragraphs 14 and 26–30 above. It is necessary to test the student's knowledge and understanding in the subjects principally required for the study of

(*a*) Human structure and function, and human behaviour (paragraphs 37–40 above);

(*b*) The several sciences upon which clinical medicine depends (paragraphs 41–42);

(*c*) Clinical practice, including the principles of diagnosis and treatment (paragraphs 43–53).

The Council again emphasizes that it has refrained from making specific recommendations either as to order or as to timing of any given assessment or examination, with the exception of the qualifying examination (which is determined by statute), thus leaving Licensing Bodies to resolve such matters in the light of their own educational programmes and their plans for integrated teaching. At times, to be decided by Licensing Bodies, External Examiners should take part in the examination of students.

55. The Council recommends that careful note should be taken of the student's record throughout the course, and that systems of progressive or continuous assessment should be established and maintained on the lines indicated in paragraphs 26–30 above. Such a continuing process of assessment will among other things tend to reduce the load on the student of a comprehensive examination taken at the conclusion of his undergraduate career.

56. The final requirement for qualification is that the student should satisfy his examiners that throughout the undergraduate medical curriculum he has acquired knowledge and skill, at a level sufficient for him to be allowed to practise thereafter in pre-registration posts under supervision.

57. The clinical knowledge and skill attained by the student should be tested in the qualifying examination. As explained in paragraphs 14 and 26–30 above, it is open to Licensing Bodies to arrange for students to take the examination in stages, and in conjunction with a progressive assessment; but the examination should not be completed before the end of five academic years of basic medical education.

58. The Council considers that all clinical examinations should be held in properly equipped hospitals or centres where a sufficient number and variety of patients are available.

59. In all examinations, tests, or assessments of a student's progress, the Council recommends that at least two assessors should take part.

60. Students should not be admitted to any part of the Final Examination before satisfactory completion of all previous stages of assessment and examination. A student rejected in any part of the Final Examination should normally be required before re-examination to complete, to the satisfaction of his Medical School, a further period of study in the relevant subject or subjects.

PRE-REGISTRATION PERIOD

61. As explained in the general section of these Recommendations, the Council regards the pre-registration period as the last stage of the period of Basic Medical Education. The Council is concerned at the evidence which it has recently received concerning the limited educational value of the period under the existing arrangements, and recommends that present arrangements be changed (paragraphs 13 and 22–23).

62. The Council suggests that all pre-registration appointments should be held in posts affording *general experience* in Medicine or Surgery.* The duration of the period should continue to be one year, of which (as at present) six months should be spent in Medicine and six months in Surgery. The hospitals, and also the posts, should continue to be approved in each instance by the University associated with the Hospital Region (in the Republic of Ireland, by the Medical Registration Council of the Republic). Approval of suitable posts should be kept under constant review by all Universities, or (in practice) by the component Medical Schools acting on behalf of the Universities. All posts should be regularly supervised, and the holders of the posts should also receive regular supervision, of an educational nature.

63. The Council appreciates that substantial difficulties arise from the number of students who will hold, as happens at present, posts outside the Region which is the responsibility of their own parent Medical School. In these cases the responsibility for the supervision of the post rests with the Medical School associated with the Region. In such circumstances, however, the Council feels that the parent Medical School should maintain a close interest in its young graduates, and that arrangements should be made between Universities or Medical Schools, as may be necessary, for the effective supervision of young graduates holding pre-registration posts outside the Region with which their School is associated (compare paragraph 23 above).

64. The Council suggests, for consideration by Universities and Medical Schools, that the following criteria for the approval of pre-registration posts should be generally adopted:

(*a*) Posts should be in general hospitals with adequate laboratories for clinical investigation, radiological departments, and a working library.

* Under the Medical Act, time spent in Midwifery (up to six months) may be counted as time spent in Medicine or Surgery.

(*b*) Each pre-registration post should be in the charge of a chief, or chiefs, who should each have not less than four consultant sessions per week in the hospital and should be directly responsible for the training of the holders of pre-registration posts.

(*c*) The non-consultant staff of each hospital department providing pre-registration posts should include at least one Senior Registrar or, if not, one or more Registrars in residence.

(*d*) The responsibility of the holder of each pre-registration post should be limited to that number of beds which allows him adequate time for his further education, and sufficient free time. The number should normally not exceed 30 beds, some of which should be for acute cases.

(*e*) The educational nature of the post should be fully understood and accepted by all concerned, and the student should be allowed at least six hours weekly for educational purposes, apart from his free time. There should be an educational programme for holders of pre-registration posts, including case conferences, teaching seminars and meetings of a journal club.

Medical Education in the Future

65. The latter part of the Council's Memorandum for the Robbins Committee on Higher Education (1961), which has been circulated to Bodies and Schools, was concerned with this subject, in response to a request made by the Robbins Committee. Referring to possible developments in medical education 'within the next ten or twenty years', the Council said that it could 'surmise the possibility of a basic course of instruction, reduced to four-and-a-half or eventually four years instead of the present five, but followed by a carefully orientated clinical course lasting for two years or more, depending on the field of medicine in which the graduate seeks to practise. Unlike the present pre-registration year, such a course would involve a substantial amount of careful supervision by Universities over the further training of their young graduates.' The Council went on to say that, if the time ever came for such arrangements, the Council would need to make appropriate Recommendations and to take some responsibility. Questions of vocational registers would arise, and legislation would be needed.

66. The forecasts in the foregoing paragraph were set against a wider background, common to the Memorandum of 1961 and to these Recommendations. 'It is no longer possible', the Council suggested (paragraphs 30 and 14), 'for anyone to obtain a comprehensive medical training during his School years. Graduation has become neither the end of medical education nor the beginning of the end, but rather the end of a beginning . . . In medical education, as in other kinds of education of which Plato spoke long ago, what matters most is not the knowledge imparted to a man but what the man himself becomes in the course of acquiring knowledge. The medical student needs not merely to learn, but to understand how to learn, and how to continue to learn long after he has qualified . . . The prospects of the patient become parlous when the physician has to say to himself,

> Where is the wisdom we have lost in knowledge?
> Where is the knowledge we have lost in information?'*

* T. S. Eliot, 'The Rock'.

67. In the present Recommendations, with similar thoughts in mind, the Council has defined (paragraph 7) four educational periods in a doctor's life. The first two are those of Pre-Medical Studies and Basic Medical Education. The third is that of Vocational Training for a particular career in medicine; and the fourth, which extends to retirement or death, consists of 'continuing education' after the completion of vocational training. The following questions have to be asked: 'What schemes of vocational training are now being planned, and what plans may develop within the next five or ten years; and how far—and how soon—are they likely to affect basic medical education?' To these questions the Council can give no more than tentative answers. Matters of national policy are involved; a further Medical Act, introducing new concepts, would evidently be required; and the more uncertain factors appear to include, as possibilities, the entry of the United Kingdom and of the Republic of Ireland into the Common Market. Nevertheless, it appears to the Council that the present trends in medical practice and educational thought indicate probable developments. The time is approaching when it will be necessary to identify programmes of training for each of the vocational branches of medicine (including general practice) and to arrange by an extension of the Medical Act for some form of official recognition to become available (such as the inclusion of names in a vocational register) for individual doctors when they have satisfactorily completed the training-programmes for their selected career in medicine. A great deal must depend upon the views of the Universities and of the Royal Colleges, which have such important responsibilities in the field of vocational training. The British Medical Association, the College of General Practitioners, and a number of other bodies are also deeply interested.

68. Organized courses of vocational or specialist training and arrangements for certification of specialists now exist in various forms in a number of countries, and the Council believes that they will need to be introduced in this country—especially in the event of its entry into the Common Market. On educational grounds, the Council would welcome the introduction of vocational training-schedules. Since the Medical Act of 1950, it has been recognized that the undergraduate medical curriculum ought not to be the end of the young doctor's training. The present Recommendations, in harmony with current trends, regard Basic Medical Education, including the pre-registration year, as a prelude to planned vocational training. The criterion, as always, has to be the public interest.

69. In considering the scope of any new legislation in this field, it has to be remembered that in this country, unlike some others, unregistered persons though subject to some restrictions are not forbidden by law

to practise medicine or surgery or any of their branches. The Council provisionally assumes (*a*) that this will remain the fundamental statutory position, and (*b*) that in consequence any vocational lists or register in this country would have an informative, as distinct from a restrictive, function: that is to say, such a register or lists should serve to *identify* those persons who had satisfied carefully formulated criteria for practising their chosen careers in medicine. History would in a sense be repeating itself in a new field, for the first words of the original Medical Act, which established the Council and the Medical Register in 1858, were: 'Whereas it is expedient that persons requiring medical aid should be *enabled to distinguish* qualified from unqualified practitioners.' A vocational register, to which a doctor would have access upon the completion of his training-requirements, would similarly identify those doctors who had reached certain standards. It would be available for consultation by Government departments, hospital and other authorities concerned with making appointments, general practitioners, and members of the public.

70. In the meantime the Council looks forward to further developments within the period of Basic Medical Education. The Council referred in 1957, in words which it would again endorse, to the 'right' of Bodies and Schools, 'which may equally well be described as a duty, to experiment with different courses and various methods of teaching'. There is abundant evidence of the extent to which Bodies and Schools have in fact introduced innovations and are now proposing to make further changes. These 'experiments' are not to be thought to have arisen from isolated ideas. On the contrary, new patterns for curricula, involving comprehensive and radical changes, have appeared, and it is likely that variety and diversity of pattern, within the period of Basic Medical Education, will continue.

71. The Council continues to bear in mind the possibility of shortening the undergraduate course of medical studies. It seems clear however that any developments in the course which take place now or in the future must have the effect of strengthening still further the basic scientific preparation of the doctor if he is later to construe correctly the fast-expanding corpus of scientific medicine in the interests of his patients. A constructive shortening of the curriculum would require a redeployment of undergraduate and subsequent studies, rather than a simple amputation of time—for example, by cutting one year from the existing programme. It is not yet clear that Medical Schools have had enough time to implement fully the intentions of the 1957 Recommendations—'to instruct less and to educate more'. For example, one University said in its evidence to the Council:

> Established subjects have been reluctant to sacrifice their teaching-time, while new subjects have made substantial demands; in combination, their claims have stood in the way of the Council's avowed object 'to reduce congestion in the Curriculum'. Such a reduction must nevertheless remain a prime objective, but in our view the time for reducing the duration of the curriculum up to full registration does not yet appear to have come.

Furthermore, the experience with and control over the pre-registration year is still not sufficiently satisfactory to enable that year to be seen as effectively replacing the existing final year of clinical studies, during which at present the student can develop his capacity for responsibility while still under the close supervision of his teachers. It may be said also that University teachers will continue to be in difficulty in treating the undergraduate programme as a truly basic experience of preparatory education until such time as effective steps are taken to ensure a planned experience of vocational training for all doctors after the pre-registration period.

72. Nevertheless, the Council is anxious to ensure that preparation for practice is not unduly prolonged. It proposes therefore to ask all Licensing Bodies and Medical Schools to report in two years' time. The Council will then be in a position to consider what progress has been made with the undergraduate curriculum and what steps have been taken to establish closer control over pre-registration appointments. The Council will also be able to take into account at that time such new opportunities as may have arisen for subsequent vocational training.

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Note

The School Profiles (Section 2 of Volume 1, pp. 138 ff.) and Discipline/Specialty Reports (Volume 2) are presented in a standard format. To save space in the index, instead of making an entry for each medical school or discipline/specialty (where this would be appropriate), the reader is directed to the appropriate section of each profile or discipline/specialty report by means of the abbreviations 'SP' (=School Profiles) or 'DSR' (=Discipline/Specialty Reports). Thus, the entry

Hospitals, Peripheral/District, use of: 62, 685, SP (Features of the Curriculum)

indicates that, in addition to general mention being made of peripheral/district hospitals on pp. 62 and 685, their use (if any) is detailed in the section of each school profile entitled 'Features of the Curriculum'.

Substantial entries only are indexed.

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DSR = Discipline/Specialty Reports
SP= School Profiles