THE MEDICAL CURRICULUM

AN OPINION SURVEY AMONG SCOTTISH GRADUATES*

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PART I.—FACTS

The impact of the National Health Service Act, recent advances in medical science, and the changing social conditions in this country pose the question: "Is medical education attuned to present-day needs?"

Major changes in the curriculum can be made only at infrequent intervals, but it seemed useful to attempt to assess the adequacy of the present system by interrogating by postal questionnaire a group of doctors who had qualified in recent years and had subsequently had a reasonably extensive experience of medical practice. The methods adopted in the interrogation and the facts which were elicited are dealt with here. The opinions expressed are set out in Part II.

Changes in the curriculum are usually considered, discussed, and decided by those whose interests are predominantly academic; it is their business to be interested in such matters. Their expert knowledge on the teaching of medicine entails, however, less intimate acquaintance with the humdrum matters of everyday medical practice, and it is hoped that these views from a more representative cross-section of the medical community will be of value in giving a broader basis for the discussion of any current changes that may be contemplated in the medical curriculum.

At the First World Conference on Medical Education (1953) the speakers were almost entirely confined to deans of medical schools, professors, and other teachers.

In the introduction to his book on medical education, Ffrangcon Roberts (1948) writes: "The proper person to have written a book on this theme would have been a general practitioner. Unfortunately, general practitioners, the class who have suffered most from the shortcomings of their training, display little interest in it."

The experience of this survey has shown that it is not so much lack of interest but the absence of any effective means whereby general practitioners may make their opinions heard; and that when effective means are provided for voicing their views an embarrassing wealth of material is made available.

The use of questionnaire surveys for collecting representative views on medical education is not new. One of the outstanding efforts was that undertaken in 1942 by the Joint Committee of the Association of American Medical Colleges and the American Association of Medical Social Workers (Curran and Cockerill, 1948), which was circulated to deans of medical schools in Canada and the United States.

Questionnaire surveys completed by the rank and file of the medical profession have been attempted for various purposes, ranging from their income (Bradford Hill, 1951) to their smoking habits (Doll and Hill, 1954). Success is only likely to be achieved if the subject matter

is one in which the medical practitioner is interested, and medical education in general terms is not likely to awaken such interest. Only if it is related to the medical training he himself received at his own medical school is any wide response likely to be obtained. This probably explains why previous surveys, as in this case, have been confined to the alumni of one particular university.

Meiklejohn (1953) reported the views of doctors who had graduated from Glasgow University in 1923-6. Of the 800 graduates surviving, 48% replied to the four-page questionnaire sent to them. The scope of his investigation was wide, including details of the doctor's family and views on problems facing the medical profession, but little detail is quoted of their views on the medical curriculum and training. Indebtedness must, however, be acknowledged to this previous publication, which seems to have been the pioneer attempt in this field.

The present inquiry is based on a smaller number of graduates but can claim two advantages. The medical education of these graduates has been more recent and they would presumably have a clearer recollection of their own training. Further, they were trained under conditions which are more like those obtaining to-day. In addition, a much larger proportion of the group replied to the questionnaire (Table I).

TABLE I.—*Response to Questionary*

Year of Graduation	No. in Class	No. Sent Questionary	No. Who Failed to Reply	No. Who Replied	Percentage Replying
1941	76	71	25	46	65
1942	92	90	19	71	79
1943	89	87	18	69	79
Total ..	257	248	62	186	75

The Graduates Interrogated

The graduates interrogated were those who qualified from Aberdeen University in the same year as I did, together with those from the previous and the following years—that is, 1941, 1942, and 1943—totalling 257 graduates. They would therefore all be familiar with my name, and so more likely to take a personal interest in the inquiry. They would have been qualified, on the average, ten years or so, having had time to acquire experience of medical practice in the armed Forces, in general practice, as assistants or as principals, and in consulting practice or other specialized fields of medical work.

At the outset it must be stressed that the aim of the inquiry was a constructive criticism of the medical curriculum in general, and not of the Aberdeen Medical School, whose high reputation precludes this possibility. Thus, it is an attempt to use the existing curriculum as a measure of medical education offered by Scottish universities in particular and provincial English universities in general.

The students were predominantly Scottish, nearly two-thirds coming from Aberdeen and Aberdeenshire. Fifteen per cent. of the graduates were the sons of doctors, and, in addition, 53% came of other professional families (including farmers). The recent Educational Acts in Scotland and

*Being the subject matter of a Postgraduate Lecture at Queen's College, Dundee, on December 16, 1954.

England have eased the financial burden of university students. It may well be that this has recently attracted more students from working-class homes. However, it is clear from this sample that during the war years medical schools were still skimming the milk of the old-established dairies of the upper social class.

The average age at graduation was 23½ years. One-quarter of the students were women, whose average age according to the replies received was slightly below that of the men. More of the women than men were married at the time of graduation.

Five graduates had since died; these, together with a few no longer in the medical profession, are, of course, not included in the inquiry.

The following request and explanation of the project was sent to the remainder at their last known address, and failing a reply inquiries were made through likely channels to determine current addresses. Follow-up letters were sent to those not replying to the first letter, and evoked replies from 85 doctors. The wording of the appeal probably had its effect on the replies received, and it is therefore considered desirable to print it *in extenso*.

Dear

The Future of Medical Education

To have the temerity to make this approach to my fellow graduates of 1941-42-43, to ask them to give of their time and leisure in order to study carefully and reply to the questions posed, must demand the assurance that the need for such a procedure is of urgent and pressing importance. This assurance I unhesitatingly give.

Since we qualified, major changes and additions have been made in the medical curriculum, both before graduation and prior to registration. You will recall that (1) the undergraduate course has since been extended from five to six years, the additional study being allocated in the main to the basic sciences of the pre-clinical years without any marked pruning of existing subjects; (2) the advent of the National Health Service (Scotland) Act, 1947, has precluded student participation in dispensary teaching, while domiciliary midwifery had ceased by 1941; (3) the Medical Act (1950) now demands a further year of training within a hospital before registration; (4) before or after this seven years' institutional training, the young graduate is generally required to undergo a further two years of compulsory military service before even starting in the particular sphere of his/her chosen profession.

All of us are sufficiently young to recall our impressions of the adequacy or otherwise of our teaching and yet perhaps not old enough to accept changes readily without suggestions or criticism. This is my reason for troubling you at this time.

For five to seven years prior to 1948, with interruptions due to war service, we all experienced the shortcomings and advantages of medical practice before the advent of the National Health Service. Is the new curriculum attuned to the needs of the so-called Welfare State? How can it be improved? The annual student intake, apart from the immediate post-war peak, is apparently falling on both sides of the border, for reasons which are not quite clear. Is this a direct result of the undue length of medical training, the decreasing popularity of medicine as a profession, or what?

These are but a few of the many questions posed in the following pages. Only your whole-hearted co-operation in this joint investigation can help me to elucidate the solutions to these problems.

It is hoped that when all replies are received the composite story will be published in one of the medical journals, when you will share with me the pleasure of a survey whose impact on the future of medicine and medical education in this country may well be salutary and far-reaching.

Yours sincerely,

The Doctors Who Replied

In view of the exacting labour required to complete the closely typed six-page foolscap schedule, the fact that 75% of the doctors replied to the questionnaire must be considered a highly satisfactory response. Postage delays, pressure of work, and wrong addresses contributed to the difficulty in gathering in all the replies. Although most of the graduates were of Scottish domicile at the time of graduation (Table II),

the position was reversed when the questionnaire was answered, for 52% were now living in England and Wales and only 36% in Scotland. (The 1951 census showed 12% of doctors in Great Britain to be living in Scotland.)

TABLE II.—*Domicile*

	Before Graduation		After Graduation	
	No.	Percentage	No.	Percentage
Scotland	166	89.3	67	36.0
England	14	7.5	97	52.2
Wales	—	—	1	0.5
Ireland	—	—	—	—
British Empire ..	6	3.2	20	10.8
Other	—	—	1	0.5
Total	186	100	186	100

These proportions are very close to those found by Meiklejohn (1953) for Glasgow graduates. Of the students domiciled in Scotland before graduation, 52% had migrated south across the border.

The majority of the graduates were now married, the proportion being higher among men (88%) than among women (68%). (In the Glasgow investigation only 75% of those graduating in 1923-7 had married by the end of 10 years.) Consultants married later than others; at the end of five years the proportion married was only two-thirds that of general practitioners, but the difference between the two groups was smaller by the end of 10 years.

Twenty-six had emigrated to other countries, five of whom had subsequently returned to this country.

Many respondents gave details of their professional experience during the years since graduation, but such information is difficult to summarize adequately. The present appointments, classified according to the principal occupation (Table III), afford a convenient means of determining to what extent these doctors are a representative cross-section of the medical profession.

TABLE III.—*Present Appointment*

	No.	Percentage
General practice	103	55.4
Consultant/specialist	22	11.9
Senior registrar	15	8.1
Junior	4	2.1
University lecturer	6	3.2
Armed Forces medical service	2	1.1
Other hospital appointment	5	2.7
Local authority	19	10.2
Other	6	3.2
Part-time	4	2.1
Total	186	100

Those with more than one appointment (added into first group):

General practice and other hospital appointment ..	2
Consultant and university lecturer	1
.. local authority	1
General practice (part-time)	1

5

More than half the doctors (55%) were now in general practice, and 12% were consultants, these two forming the largest groups. Service with local authorities or as hospital registrars accounted for 10% each. Other categories accounted at the most for 3% each.

The rapid expansion of specialties since the advent of the National Health Service perhaps afforded greater opportunity for specializing to this generation of wartime medical graduates. The position might well be different for those now qualifying.

The corresponding proportions found in the replies to the Glasgow questionnaire were 59% general practitioners and 18% consultants. There is reason to believe, however, that the proportion of consultants in the medical profession is a good deal smaller, and that possibly (a) consultants tended to reply more readily than general practitioners, or (b) the

term "consultant" is not sufficiently well delineated for comparative purposes. The 1951 census figures for the medical profession and the number of whole-time consultants in the National Health Service (Ministry of Health, 1953; Department of Health for Scotland, 1954) were used to find the proportion of consultants: it was 5% for England and Wales and 7% for Scotland. It is likely that the proportion of consultants will be found to increase with the increasing age of the group.

The proportion of women medical practitioners seems rather higher (one-quarter) than would be expected; for Scotland as a whole it is one-fifth, and for England and Wales one-sixth of all medical practitioners. This ratio is likely to fall with the passage of time, since five-sixths of doctors who retire from practice before the age of 50 are women (Goodenough Report, 1944). The same report also gives the ratio of women students to men students as 1 to 3.7 during 1942-3, so that the present sex ratio is not exceptional.

Of the 186 doctors who replied, 110 had the basic qualification of M.B., Ch.B. alone. The remainder had acquired additional qualifications; 56 had one further qualification and 20 had two other qualifications, making a total of 96 additional qualifications (Table IV). All had the basic qualification of M.B., Ch.B. Aberdeen.

TABLE IV.—Combinations of Postgraduate Qualifications

	M.D.	M.R.C.P.	F.R.C.S.	M.R.C.O.G.	D.R.C.O.G.	D.P.H.	D.C.H.	D.M.R.	D.P.M.	D.A.	Other	Total
M.D.	1	4	—	1	—	1	1	—	—	—	1	9
M.R.C.P.	—	4	—	—	—	—	—	—	—	—	—	11
F.R.C.S.	—	—	10	—	—	—	—	—	—	—	—	12
M.R.C.O.G.	—	—	—	1	—	—	—	—	—	—	—	2
D.R.C.O.G.	—	—	—	—	4	—	—	—	—	—	—	6
D.P.H.	—	—	—	—	—	22	1	—	—	—	—	28
D.C.H.	—	2	—	—	—	—	—	—	—	—	—	5
D.M.R.	—	—	1	—	—	—	—	3	—	—	—	5
D.P.M.	—	1	—	—	—	—	—	—	2	—	—	4
D.A.	—	—	—	—	—	—	—	—	—	4	—	4
Other	—	—	1	—	—	2	1	—	—	—	5	10
Total	9	11	12	2	6	28	5	5	4	4	10	96

Note.—56 graduates had one additional degree and 20 had two additional degrees.

Not all the doctors to whom the questionnaire was sent replied, and the effect of omitting this fairly substantial proportion must be considered. Residence abroad led to delay in transmitting questionnaires, and many of the late returns were from those living overseas. Comparison of the facts and opinions expressed by the doctors submitting late returns does not, however, indicate any marked deviation from the remainder. Failure to reply is in itself of interest. Can we assume that those who did not reply are less concerned with medical education? that they may have left medicine for other professions? or that they have perhaps undertaken fields of medical work which made the discovery of their whereabouts more difficult, and in all probability their views the more diverse? It is known, for example, that one at least was on an Antarctic survey team. While the absence of their replies is to be regretted, the loss may be minimized by these considerations. In any case, even if all those not replying were unanimous in their views, they would only affect the replies by 25% either way.

To what extent can the replies from this group of graduates be considered representative of the medical profession as a whole? This sample seems reasonably representative so far as the type of appointment is concerned, and the proportion of women in it; it is not quite so satisfactory in the present geographical distribution of the doctors, although this factor in itself seems unlikely to affect their views on medical education. It is unrepresentative in so far as it is restricted to a limited group of doctors whose age averages about 35 years, and to graduates of one medical school. It

can, however, claim to be more representative of the medical profession than those whose views usually receive the greatest consideration in discussion of this topic—professors and teachers in medical schools—since it is an attempt to reach *all* branches of the profession.

The Questionary

The questionnaire, too lengthy to be included *in extenso*, consisted of two sections, the first and shorter dealing purely with *facts*, and the longer second part dealing with *opinions*. The facts related to personal data and professional experience since graduation, and have been summarized briefly above in so far as they bear upon the representativeness of the sample. In passing, they provide information bearing upon other matters, such as losses to the profession through death or marriage, and prospects of attaining consulting status or becoming established in general practice.

The opinions which were solicited are discussed in detail in Part II. They fall into three categories. First, a list of 36 subjects in the curriculum was presented, and a decision asked for as to the adequacy of the time allotted to each subject in the present curriculum as revised in 1948. Five categories were allowed for the answers—"adequate," "insufficient," "very insufficient," "too much," and "far too much"—and to help in the decision a note was added of the regulation hours for each subject in the period up to 1937, from 1938 until 1947, and from 1948 onwards (see Part II). A second category consisted of 19 questions, several with subdivisions dealing more generally with the length of the curriculum and the nature of the tuition, which provided opportunities for comment on the teaching methods experienced and suggested improvements in the tuition. A relatively short final section was devoted to the future of medicine: whether or not medicine under present-day conditions is a satisfying career, and the problems which seem of greatest importance to the medical graduate in his professional life.

The Response

The response was good; 75% of those to whom the questionnaire was sent replied. The possible effect of the absence of 100% response has been discussed. For those who did reply, it would be no exaggeration to call the response enthusiastic. It was obvious, from the care taken in completing the questionnaire and the numerous additional comments inserted, that the inquiry had evoked a lively interest and had inspired a good deal of careful and searching thought.

The additional comments were found to be so valuable that they were abstracted and analysed according to their content. While they are not so readily summarized as the numerical count of votes in favour of more or less of a given subject in the curriculum, they frequently assist in explaining the views expressed and provide a clearer insight into the underlying reasons.

PART II.—OPINIONS

An "opinion" survey suffers from certain disadvantages which do not attend a sample survey of "facts." The difficulty lies not so much in the objective or subjective nature of the two types of survey as in the lack of a single fixed standard to which judgments can be related. If the survey is of several people's opinion, their standards are usually undefined and the extent to which they vary is unknown. The difference between "too much" and "far too much" will take as many different values as there are participants in the survey, and the same variety of standards applies to every level of decision in each question. The result is a heterogeneous collection of categorized statements to which it might be hazardous to apply even the simplest of arithmetical operations, that of adding one to another to make two.

It must be recalled, however, that this criticism applies equally well to all methods of assembling the opinions of different persons, whether in a general election, on a hospital board, or in any committee discussions. In practice, views are customarily summarized by a show of hands, and this method is therefore adopted here, with the full realization of its limitations.

One further disadvantage results from having to use numerous personal standards which are not susceptible of definition—namely, that the answers to different questions may not be comparable. "Inadequate" may mean quite a different thing applied to a major subject—for example, anatomy—as opposed to a specialty occupying only a brief interval in the curriculum. If the minor subject has 20 hours' tuition, its inadequacy might be amply remedied by the addition of another 20 hours, or an increase of 100%; but what is the comparable remedy for the major subject of 200 hours' tuition—20 hours or 100%?

For all questions there were at least three alternative replies—"yes," "no," or "no opinion"; even so, it was

FIG. 1.—Adequacy of time devoted to individual subjects. The direction of each pointer shows the balance of opinion, using a weighted mean score. The length of each pointer is in proportion to the number who hold this view. 1=Psychology. 2=E.N.T. 3=Clinical pathology. 4=Medicine. 5=Surgery. 6=Statistics. 7=History and philosophy. 8=V.D. 9=Biology. 10=Dental surgery.

the last two have been amalgamated so as to form the groups of "too little" and "excess," with the remaining group who thought the allocation of time was "just right" (Fig. 1).

Some difficulty is created through recent changes in nomenclature and regrouping of subjects in the Aberdeen curriculum—for example, mental health and psychopathology; or public health (including infectious diseases and maternity and child welfare) and social medicine; or child health (including infant infectious diseases). Decisions whether to combine or contrast these subjects are necessarily arbitrary and it is important to beware of basing conclusions on these purely nominal antitheses.

The results obtained were not always those expected, and it became of interest to determine what factors influenced the views of graduates. The following possibilities need to be singled out for special mention:

(1) *Conservatism*.—It was noticed that subjects whose hours of tuition had been reduced in 1948 tended to be classified as "too little," while "upstart" subjects whose hours had been increased were often branded as "excess." On correlating the change in the hours for each subject with the mean score of the opinion expressed for each of

the 34 subjects listed, one obtains a coefficient of correlation of 0.42, an association that is just significant. In other words, graduates tended to favour a reversion to conditions as they themselves knew them. It should be noted, however, that this tendency, even if real, can explain away less than 20% of the total variance in the mean score of opinions.

(2) *Bias Due to Postgraduate Specialism*.—It might be expected that doctors would tend to give more weight to subjects intimately bearing upon their own work, and would underestimate the importance of subjects which did not come so prominently into their everyday professional life. The numbers in any one group of specialists, however, were rather small, but some interesting comparisons were made.

(a) *General Practitioners v. Consultants*.—There were definite divergencies of opinion between these two groups on seven subjects—namely, anatomy, materia medica, forensic medicine, dermatology, E.N.T., ophthalmology, and anaesthetics. In each case general practitioners thought the tuition too short and consultants thought it too lengthy (by comparison with the mean of all opinions). The first five out of these seven comparisons were significant at the 0.05 level.

(b) *Local Authority Doctors v. The Rest*.—There is a tendency (not reaching statistically significant levels) for doctors working under local authorities to consider the tuition given in psychology, psychopathology, and mental health to be insufficient.

(c) *Females v. Males*.—A greater proportion of women than of men considered the tuition in anatomy and tuberculosis inadequate. On the other hand, women seemed better satisfied with the hours allotted to child health and for midwifery in the hall of residence (where students resided near the maternity hospital).

For convenience of reference, a summary of the hours devoted in the curriculum to each subject is given (see Appendix) for the period up to 1937, from 1938 to 1947, and subsequently to that date. The graduates were asked to comment on the adequacy of the new curriculum according to their own experience of present-day medical needs.

Premedical Subjects

One of the outstanding disagreements voiced with the present curriculum was in the amount of time devoted to the premedical subjects—physics, chemistry, and biology—

FIG. 2.—Views on adequacy of tuition of basic sciences.

that is, botany and zoology. More than half of those replying (73% and 68%) considered that excess time was spent on chemistry and physics respectively, and to a lesser degree (39%) they said the same of biology. The comments which accompanied the questionnaire enlarge upon this theme. It was generally agreed that at any rate the basic knowledge in chemistry and physics should have been completed at school. Some went so far as to urge that these subjects should be made compulsory, either in the Leaving Certificate Examination or in a special pre-enrolment examination, for those wishing to become medical students. It is interesting to note that a few graduates had been to English public

schools where vocational study in the last year was given in preparation but not as a substitute for the university first M.B.

An alternative proposal which they favoured was to teach in the medical course those topics in the basic sciences which had special reference to medical practice; for physics, x rays and nuclear radiation; for chemistry, organic chemistry as applied to medicine; for botany, only the bare minimum of botanical data, taught as a subsidiary of *materia medica*; and for zoology, no dog-fish.

One other premedical subject where teaching was thought by many to be excessive was the newly introduced subject of statistics. It was considered by 22% that a total of 20 hours was "excess" as against 8% who thought there was "too little," but there was no comment to elucidate the reasons. Psychology, on the other hand, was considered to have insufficient time allotted to it (36% "too little," 9% "excess"): Fig. 2 shows the contrast with chemistry and physics.

Preclinical Subjects

The consensus of opinion indicated that considerable pruning was required in the preclinical subjects. Although many graduates obviously included the premedical or basic sciences in their strictures, yet the other introductory subjects—*anatomy*, *physiology*, and *materia medica*—came in for criticism individually. The feeling was expressed that these subjects were being taught too academically—for example, "anatomy for anatomy's sake"—rather than for their value to the student later on in his career when studying surgery, medicine, or therapeutics. This is a theme which recurred constantly, the need for better links between the different parts of a student's tuition—integration, "cross-referencing," "applied anatomy or applied physiology taught by physicians"—it was expressed in a variety of ways. The student needs to be convinced and satisfied that the foundations of knowledge being laid in the earlier years have some connexion with the finished edifice. For this purpose, it was voiced, "most anatomists are incapable, by training and by outlook"; and it was often suggested that the applied aspects of anatomy and physiology should be taught by clinicians who would be more closely concerned with the "essential subjects."

Clinical Subjects

The antithesis between preclinical subjects and clinical or "essential" subjects was well to the fore. To a student, essential subjects are presumably those remaining examination hurdles which separate him from his title of "qualified doctor"; but to a qualified doctor in practice the essential subjects were specified as diseases of children, obstetrics and gynaecology, therapeutics, and minor emergencies such as are seen in casualty—subjects which cause most heartaches and the greatest disturbance of the night's rest. These, moreover, are the most difficult to learn, except by experience.

The second group included public health and social medicine (fairly well balanced—16% "excess," 11% "too little"); public health and infectious diseases, where those answering thought the time to be insufficient (56%, against 3% "excess"); sick children's hospital, insufficient (17% against 2%); fever hospital, insufficient (20% against 1%); child health, fairly balanced (insufficient 10%, too much 8%). Here again, lack of definition concerning the boundaries of the subjects due to changes which were then taking place in the curriculum may have blurred the point of view. The overall suggestion in these subjects is one of moderate insufficiency.

Practical Experience

The most pronounced adverse voting and the most outspoken comments centre round the present lack of facilities for practical experience in the medical school under conditions approximating to those which the student will have to

contend with when a fully-fledged medical practitioner; facilities for the student to deal with the patient all by himself, for taking the responsibility of making a diagnosis, and for arranging treatment on his own initiative, whilst guidance from more experienced doctors is kept in the background. Three-quarters of the graduates assessed the adequacy of the present system with no dispensary, and 86% of them thought it inadequate and insufficient.

In the former Aberdeen Dispensary students saw patients who needed medical or surgical care in the patients' homes, and were responsible for prescribing treatment under the guidance of a general practitioner. This dispensary system was described as "one of the greatest assets of Scottish medicine" and several used the epithet "very valuable." Its main value was considered to lie not so much in its training for general practice but for developing a sense of responsibility under supervision.

Some system of arranging for students to see patients in their homes under the guidance of a general practitioner, or in the practitioner's surgery, was also urged. The importance of seeing the patient "in his home environment," "as a member of society with his own particular role to play," "with emphasis on the individual's adaptation to his particular life situation" was stressed time and again, and the disturbing social and emotional effect of even a minor illness in a family was underlined, together with the need "to prevent long-term morbidity."

It was generally admitted that opportunities for contact with the patient in hospital were adequate but only if the student made full use of them. The amount and content of teaching in both medicine and surgery met with the greatest degree of unanimity.

The practical teaching of obstetrics was realized to be a difficult problem to solve. Commentators maintained that it was desirable for graduates to be able to apply forceps with some degree of confidence, although it was admitted that "a few stillbirths would be inevitable."

Normal Standards of Health

A further point brought out was the lack of opportunities of learning the appearance of the normal in healthy persons and their physical and emotional adaptations to life. The importance of this, so that early signs of disease could be clearly recognized, was also remarked upon, although some contributors thought that it was only with children that special study of the "normal" was required. For older age groups, as one graduate put it, "the Forces medical services give ample opportunity for this study."

Rare Versus Common Diseases

Most comments deprecated too much time being devoted to diseases rarely met with in general practice. Some tolerated them, with strict provisos—for example, "that the demonstrator should state the relative rarity or otherwise of the condition" or should lay "more stress on the comfort of the patient as a whole, rather than on the disease itself." A few dissentients insisted that the "rare diseases must form a background on which to build clinical proficiency," and that "diseases we were told were rarities and only seen once in a lifetime are being encountered quite frequently in general practice."

The need for more instruction in and experience of common conditions was often reiterated. Simple fractures, paronychia, acute otitis, backache, and arthritic conditions—these are some of the gaps students have found in later life. A similar viewpoint was urged in the replies to the Glasgow questionnaire (Meiklejohn, 1953)—"the focus" should be "on everyday ailments and the beginnings of disease."

Changes in the structure of the practice of medicine, it was held, have brought with them new demands on teachers. Instruction was required in the "administrative structure of

the 'National Health Service,' and a lesson which should be impressed on students was "the need for liaison between various branches of the Service."

Long Summer Vacation

The long summer vacation of 22 weeks was considered "very pleasant, but unnecessary." Suggestions for utilizing this time fell into four groups: (a) to "broaden the mind by travel or other non-medical work"; (b) to "digest the year's work"; (c) to "attend casualty departments or hospital wards of the student's choice, non-teaching hospitals, work with general practitioners, or in industrial centres, etc."; (d) "National Service—some military training during summer vacation which could count towards two years of service."

Methods of Teaching

"Less rigid application of curricula" was urged. The failure to stress "the applications of the basic subjects" has already been discussed when dealing with the premedical subjects, and co-ordinating studies were suggested. These could be of several different types. There might be grouping of subjects, dealing with related cases at one time. Anatomical regional co-ordination would bring preclinical and clinical subjects into closer relationship, anatomy with surgery, and physiology with medicine. Several graduates thought the co-ordinating links with both physiology and medicine were particularly needed in isolated specialties such as endocrinology and toxicology.

The order in which the students progressed from subject to subject was important. A student "fresh from anatomy and physiology would find surgery and clinical chemistry easier—not as we did, medicine first." Closer links were thought necessary between the specialized branches of medicine—for example, adult and child psychology. Lectures in the minor specialties (ophthalmology, dermatology, radiology, etc.) were reported to be "far too academic." These subjects should be taught in the wards—"in their true clinical context." Clinico-pathological conferences were also requested.

Suggestions for new methods of teaching and for improving the teaching included: (a) more symposia and clinical meetings for senior students to be held in the wards, preferably with specialists present; (b) staff consultation on actual subject-matter of lectures to work out an integrated course—that is, "more co-operation between teachers"; (c) a "friendlier" relation between surgeon and physician and less adverse criticism between the two; (d) "educating clinical teachers in social medicine" and courses for preclinical teachers, to relearn what is needed by their students; and (e) encouraging general practitioners to take part in medical student education.

Change of Emphasis

"Too much diagnosis, not enough treatment" was a common complaint. Such therapy as was taught—usually referred to as *materia medica*—needed to be co-ordinated more closely on the one hand with biochemistry and on the other with general medicine.

The sharp line of demarcation made in the studies between "preclinical" and "clinical" was thought to be an unnecessary handicap. It was suggested not only that clinical aspects should be introduced earlier—"introducing live patients in the study of anatomy and physiology," "showing films of operative procedures at the time of the dissection of parts"—but revision and reinforcement of the basic sciences should continue later in the course to illustrate practical applications of these subjects as they arise.

Standard of Teaching

Most of the remarks by past students on the teaching standards of their teachers were highly flattering; but it was noticeable that, while some teachers stood out in the

memories of their students as being exceptionally good, others did not make such an impression. "Some very good indeed, and some were the opposite." The contrast between the standards of lectures and of clinic instruction, as judged by these past students, is strikingly shown in Fig. 3.

FIG. 3.—Comparison of views on standard of lectures (left) and clinic instruction (right).

"I have often wondered," wrote one respondent, "why a school teacher has to be trained in the art of teaching, but a university teacher is supposed to be divinely endowed." Several others thought the teaching ability of lecturers should be studied. "No lecturer to be appointed unless he has proved himself a lecturer." Another suggestion was to encourage future teachers to undertake a term as general practitioners.

Aim of Medical Education

There was no doubt that the suggestion of deliberately training specialists during the undergraduate course was not at all popular—only two replies supported this proposal. Most support, according to the voting, was for good general-practitioner qualities (92% in favour), but the replies supported by additional comments tended to concentrate on discussion of the all-round training, combining a cultural basis with a scientific background.

The general view of this latter aim is summed up as "rather Utopian, but a good ideal to have before us," and individual comments stressed either the desirability, or the impracticability, of achieving this ideal. "A cultural basis in medical education is essential—this has been sadly lacking" and "the cultural basis should be laid before the medical course," say the idealists, whilst the pragmatic iconoclast exclaims, "God pity the future medical student if he is also to suffer an introduction to the classics." Among the practical suggestions were that "students should be encouraged to mix with other faculties," and that the solution was "a reasonably good all-round man who knows how and where to get further information and help if required."

The important point was clearly brought out that the general practitioner is not just an immature type in the scale of evolution from undifferentiated medical student to specialized consultant; but that "general practice could be regarded as a specialty in itself."

The aim of a medical school to turn out all-round general practitioners does not by itself automatically produce good practitioners. "Training for general practice can only be acquired after leaving hospital" or "by years of work in general practice." "A medical graduate is not, never has been, and will never be a finished product." As another former Aberdeen graduate has written (Cruikshank, 1952): "The main objective in medical education is to produce a *potentially* good and wise doctor in a rather amorphous state; but ready and capable of developing into a good general practitioner, a good specialist, teacher, research worker, or administrator. . . ."

So far as the training of specialists is concerned, "specialization should come after an all-round grounding

in general practice terms." The opinion was expressed by one that "the majority of so-called consultants are incredibly ignorant of diseases out of their specialty." The differing needs of medical practice in other countries are important. "Here," writes one graduate now in Australia, "every competent general practitioner is expected to be able to do any appendectomy or herniotomy on his own."

Other Factors of Importance

Factors other than the medical curriculum were pointed out by some respondents. One felt that "the faults of medical education lie in earlier education." Another thought that "some form of personnel selection board, as for the Services, might be of value." A third considered that "personality defects in students have been of much greater moment than standards of medical education . . . lack of interest in medicine, laziness, over- or under-confidence, inability to get on with one's colleagues," although it was admitted that only a small number showed these traits.

Compulsory Hospital Appointments Before Registration

"The belief that our young doctors are being thrust into responsibility too soon after qualification was accepted in the Medical Act passed by Parliament in 1950" (*Lancet*, 1952).

A large majority (77%) agreed that the present arrangement was desirable, but many expressed doubts about it being entirely satisfactory, and voted in favour only with reservations, one in particular being reversion to the five-year course. The value of the extra year was considered to lie, firstly, in inculcating responsibility, under supervision; and to be of value "only if the young doctor is given maximum responsibility compatible with his training"; and, secondly, "only then one begins to realize what are the common conditions requiring hospital treatment." The similarity of these advantages to those possessed by the dispensary system referred to above is noteworthy, and was indeed noted by several graduates.

A secondary advantage of the compulsory preregistration year was summarized rather cynically as "a method of forced, cheap labour." Little importance seemed to be attached to any additional medical knowledge acquired. "I doubt if . . . this has any great advantage, especially as he may be placed in largely specialized wards," although some did suggest logical extensions of this system to ensure complete indoctrination in all subjects "extending the period of internships (with pay) with rotation through other specialties, including the psychoneurosis unit." An alternative was to make internships in midwifery and diseases of children compulsory for all entering general practice.

Modifications of the present system were also put forward. One suggestion would "allow more experience outside hospital while doing internships, emergencies in the home, and helping general practitioners during rush hours." Another view put forward frequently was that service in the Forces should count as, say, six months' postgraduate internship under supervision.

Present-day Disadvantages Attached to the Medical Profession

A wide variety of reasons were given to explain the fall in the number of entrants to medicine. Some believed that it was not a real fall, that the post-war years were inflated by ex-Service men who represented in part a time-lag due to the war, and in part decisions to enter medicine as a result of the experiences of war; others held that restrictions on entry were being enforced; "many more young people were applying, but not being accepted," and "in the Colonies it is becoming increasingly difficult to gain entrance to British medical schools."

Two-thirds of the replies maintained that medicine had become less attractive and was too long a course. The cost of the course was not considered a deterrent by the majority. This latter statement does not mean that Aberdonians are insensitive to financial implications; indeed, monetary consideration bulked largely in the reasons for finding medicine, as a career, unattractive.

It was urged by one that the monetary recompense for newly qualified doctors in hospital "was far from adequate for a man and his family"; another referred to "the failure to implement Spens"; and the risks of actions for negligence was frequently aired as a reason for despair. The lowered prestige of the doctor also counted. Medicine under the State was thought to have become too much "shop-counter" medicine, and patients "treat their doctor as a grocer, a necessary person to supply the drugs their patients order." The blame for this loss of prestige was at times laid at the doctor's own door for tending to lose the confidence of the public by becoming too scientific and less human.

The changes introduced by the National Health Service in 1948 and the difficulties of becoming established, once qualified, were thought to be influential. "Medicine to a prospective student . . . has an uncertain future in view of the vast changes which have taken place so rapidly . . . especially since the advent of the Health Service." He may feel uncertain of the state of affairs by the time of his graduation. References were made to "the export market for Scotland shrinking" so far as medical graduates were concerned, and to the difficulties of becoming established in general practice. A recent report (*Health Bulletin*, 1955) shows an average of over 30 applicants for each vacant medical practice in Scotland.

As to the relative advantages of hospital appointments or general practice, the views expressed tend to favour general practice. The present difficulties of those in the registrar grade are leading to "unfortunate bitter attitudes" was the comment of one who feared that the posts of hospital consultants "will not again fall vacant in large numbers until 1975-80." Not that general practice was without its tribulations, two matters in particular being ventilated. One was the lack of any differentiation between standards of work: "better service ought to get better pay." The second was the lack of freedom of access to hospital departments: "nothing was more calculated to break down the doctor-patient relationship than having to refer to a second man for a simple procedure in a hospital department."

What of the women? Two contrasting opinions illustrate how differently a woman can view these matters. "Medicine is one of the few professions where it is comparatively easy to fit in part-time work after marriage and where children of one's own are a great asset in understanding other mothers' problems." The second comment was: "My wife, a medical graduate, would prefer a 9 a.m. to 5 p.m. office job."

DISCUSSION

The President of the General Medical Council (1955) has emphasized how the Council, in discharge of its duty to ensure under the various Acts that those who qualified possessed "the knowledge and skill requisite for the sufficient practice of medicine, surgery, and midwifery," had periodically issued recommendations on "the subjects in which students should be instructed and examined, the order in which the subjects should be taken, and the period to be covered by the curriculum. . . . It might be, however, that with the passage of the years the recommendations had acquired the force of regulations, and thus had come to have a restrictive effect on the diversity, freedom, and responsibilities of universities and medical schools."

In this regard it is hoped that the publication of these views and suggestions for improvement in medical teaching will serve a useful purpose. The doctors who were asked for their opinions are probably more representative of the

whole profession than those who usually discuss and decide this matter; they are younger, and, having qualified more recently, retain more vividly impressions of their earlier training. They view matters from the opposite side of the lecture theatre or laboratory bench to that of their teachers and are thus able to bring to the task what those who are still students lack—the ability to see how their training prepares them for the life and needs awaiting them in medical practice.

Medical practitioners have all in their time been objects of tuition. A few return to medical schools as teachers or take their place on official or professional bodies concerned with medical education, but the vast majority remain general practitioners, having little direct concern with the problems of training future doctors. What importance can be attached to the views of these general practitioners? Surely this, that they are the men and women who know from experience what is required for the majority of graduates in medicine. They may not be vocal, they may not have any definite ideas of how changes should be effected, but they are the people who have to tackle the problems that lie ahead of the profession in its everyday work.

The views they have put forward do not claim to be original, and many have already been expressed in multitudinous discussions of medical education. It is probable that those who replied to this questionnaire had read articles on medical education and followed discussions in the medical press. To this extent their views may be considered an endorsement, giving them popular confirmation on a wider basis. It is realized that the very form in which the questionnaire was framed might lead to some moulding of the results obtained, but the critical nature of the individual answers did not indicate undue suggestibility on the part of those who replied. The questions may have limited the channels within which opinion was expressed; they did not influence the direction in which the stream of opinion flowed.

It was scarcely to be expected that doctors not directly concerned with teaching would have given much time to questioning the adequacy of the present system of tuition and of any changes needed in the curriculum, or that they would be able to formulate detailed proposals for reform. Nevertheless, the nature of the replies indicated that most had given keen consideration to these problems. It has often been noted that, although new proposals are put forward from medical schools, there is a dead weight of inertia that checks any tendency to progress. The support given by the rank and file of the profession to the proposed changes should serve to undermine that inertia and remove one hindrance to changes that are needed.

It is necessary to be certain that this is the opinion of the rank and file of the profession. By the inclusion in this group of Aberdeen graduates of such a large proportion of general practitioners, and not being restricted to one branch of the profession, it attains a high degree of representativeness. The limitations to its completely representative nature are of three kinds: sampling errors due to the size of the sample; errors due to non-response; and bias from the sample being restricted to a group limited by year of graduation from one Scottish university. It is this latter restriction which seems to be the most important. Differences from other age groups may be expected, since their training will be different and their outlook will have altered after experiences varying in type, in duration, and covering different years. Yet differences of temperament and inclination seem to overshadow those due to age alone. From analysis of the replies it is apparent that the views must be interpreted against the background of the particular form in which tuition was given in Aberdeen, but the general principles embodied in them apply universally. In so far as the comments deal with matters peculiar to Scottish universities or the training obtained in Aberdeen, they are of limited local applicability, but proposals based on experience of medical

practice throughout Britain enjoy a much wider applicability and indeed command attention by their variety and the range of experience covered.

One final warning in interpreting these comments may not be out of place—the comments express the inadequacies felt by practitioners, but not all these shortcomings are entirely the fault of the undergraduate medical curriculum. The introduction of streptomycin and the extended use of mass radiography have transformed our outlook on the treatment and diagnosis of meningeal and pulmonary tuberculosis; it is doubtful if this could have been foreseen when these practitioners were being taught as students. On the other hand, venereal diseases have declined considerably in importance since the war, but during the war were in fact of enhanced importance. Current teaching should be related to current needs, with perhaps some inspired guesswork about the future trends. The graduates in this inquiry seem to be making the point that medical teaching lags lamentably far behind medical advances. Rigidity should give place to reform.

Again, practitioners may feel the need for better psychological insight into patients and their problems; it does not follow that increasing the number of lectures on academic psychology from 20 to 30 is an adequate remedy for the situation. It is at this stage that we need to call in the help of the experts, the teaching staff of medical schools who may appear to have been rather unduly maligned in the preceding comment. It is here they come into their own—in order to find remedies for the defects noted by former students.

SUMMARY

A questionnaire was sent to 248 doctors who had graduated from Aberdeen University in the three years 1941–3, requesting their views on the suitability of the medical curriculum to present-day needs. A 75% response was obtained.

A clear-cut majority expressed the views that there was too much chemistry and physics in the premedical curriculum, and insufficient practical teaching (as in the old Aberdeen Dispensary) during the years of clinical instruction. A small majority favoured more time for instruction in dermatology.

In some other subjects there were substantial minority tendencies one way or the other, the balance of opinion in the outstanding cases being “too much” for biology, statistics, history and philosophy of science, dental surgery, and venereal diseases; and “too little” for psychology, E.N.T., and tuberculosis.

The general impression produced by the replies was twofold: (1) the basic sciences, apart from special applications to medicine, should be acquired before entering the medical school; and (2) tuition during the medical course needs to be better integrated and more sharply focused on the common and practical aspects of medical practice. The relevancy of all the subjects taught to the needs of the doctor's career should be made abundantly clear right from the beginning.

Views were also solicited on the future of medicine. The changes in medical practice under the Health Service, with the lowered prestige of the doctor and the uncertainty of prospects both in general practice and in hospital appointments, were stressed in the replies.

The completion of a questionnaire of this nature demanded much thought, effort, and time from busy practitioners. That the response was so gratifying is a measure of their appreciation of the importance of medical education now and in the future. To all these doctors who co-operated I am most grateful. I wish also to express my gratitude to Dr. W. A. Wilson, who

helped in the statistical interpretation of the data, and to Miss M. McRostie and Miss A. Brinkler for their assistance in the secretarial and computing work.

APPENDIX

Subjects (Lectures, Demonstrations, Practical, and Clinics)	Curriculum		
	Up to 1937 (Hours)	During 1938-47 (Hours)	From 1948 + (Hours)
Precinical:			
Chemistry	210	230	280
Physics	140	175	245
Biology	180	180	210
Anatomy, osteology, embryology, etc.	970	1,130	940
Physiology and biochemistry ..	420	380	445
Psychology	—	—	20
Statistics	—	—	20
Clinical:			
Materia medica	190	150	165
Pathology	240	170	190
Bacteriology	50	70	70
Forensic medicine	50	50	50
*P.H. and social med. (incl. occup. med.) (60 lectures)	—	—	90
†P.H. and I.D., M. and C.W., and fever hospital	70	95	—
Mental health (40 lectures)	30	30	80
Psychopathology	—	10	—
Radiodiagnostics	14	14	14
Veneral diseases (lectures and practi- cal)	40	40	45
Dermatology (10 lectures)	30	37	37
E.N.T. (10 lectures)	40	40	37
Tuberculosis (2 lectures)	20	20	20
Ophthalmology (10 lectures)	30	40	40
Surgery and operative surgery (lectures 160, 150, 100)	487	537	500
Medicine (100 lectures)	475	593	675
Dispensary	120	120	—
‡Midwifery and gynaecology (50 lec- tures). Hospital and district ..	195	175	175
Child health (infant infectious diseases) (30 lectures)	—	37	110
Sick children's hospital (clinics) ..	100	100	100
Fever hospital	—	—	15
Anaesthetics (10 lectures)	172	172	105
Dental surgery (10 lectures)	60	60	60
Clinical pathology	30	30	30
chemistry	30	30	30
History and philosophy of science ..	—	—	10
Compulsory year in hospital	—	—	1 yr.

* Social medicine, a new emphasis on the social component of disease causation, treatment, and prevention.

† Infectious diseases now transferred to medicine and/or child health.

‡ Obstetrics in addition—hours unknown. From 1943 onwards the hall of residence (new accommodation, where students are housed temporarily in proximity to maternity and general hospitals) replaced domiciliary midwifery.

N.B.—Some of the subjects in the above list have the number of set lectures shown in brackets. The balance of the hours is made up of practical work, clinics, demonstrations, etc., generally attended by the class in sections, so that the total hours shown do not represent the hours devoted to those subjects by each individual student.

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Reviews

THE STORY OF MALARIA

Man's Mastery of Malaria. By Paul F. Russell, M.D., M.P.H. (Pp. 308+xiv; illustrated. 25s.) London, New York, Toronto: Oxford University Press. 1955.

The Heath Clark Lectures of 1934, delivered by Dr. Lewis Hackett and published under the title *Malaria in Europe*, are universally regarded as a classic contribution to medical literature. Dr. Russell's book, which embodies the Heath Clark Lectures of 1953, is clearly destined to occupy an equally honoured place on the malarialogist's bookshelf.

Like Hackett, Dr. Russell is a member of the health staff of the Rockefeller Foundation, and like him he has devoted the greater part of his professional life to the study of malaria and its problems. In *Man's Mastery of Malaria* he presents a fascinating and scholarly account of the development of malarialogy from the pre-Grecian era to the present day. As the author points out, "mastery of malaria" does not necessarily imply eradication of the disease, which is still responsible for immense economic, social, and physical damage and is likely to remain a serious problem in underdeveloped countries for many years to come. It is now recognized, however, that the disease is universally controllable, and already no fewer than 160 million persons living in countries formerly devastated by malaria are enjoying the protection of modern measures of control.

The book is not intended to be a history of malaria in the generally accepted sense, though it is obvious that its preparation has involved a very considerable amount of historical research. The first section traces the progress of malarial aetiology from the speculations of the Dark Ages to the final elucidation of the life-cycle of the parasite through the researches of Shortt and Garnham. The second is devoted to a history of malaria therapy from the pre-cinchona period to the evolution of the modern synthetic drugs. The third deals with the development of malaria prophylaxis—a most impressive tale. The author may be well assured that profit will derive from his attempt to lift out of the envelope of the past some of the events and careers that have contributed to the immense expansion of malaria control. The fourth section relates to certain international aspects of malaria, including the activities of the Pan-American Sanitary Bureau, the Health Organization of the League of Nations, and the World Health Organization. An interesting account is also given of the outstanding contribution made by the Division of Medicine and Public Health of the Rockefeller Foundation. In the final section Dr. Russell discusses the social aspects of malaria, with particular reference to the problem of population pressure, and vigorously refutes the suggestion that control measures should be curtailed as a means of restricting population increase. This book will be of interest not only to malarialogists but to all those interested in the social and economic problems of our time.

GORDON COVELL.

COMMON SKIN DISEASES

Common Skin Diseases. By A. C. Roxburgh, M.A., M.D., B.Ch.Cantab., F.R.C.P. Tenth edition. (Pp. 515+xxxii; 215 figures and 8 illustrations. 30s.) London: H. K. Lewis and Co., Ltd. 1955.

This eminently practical handbook of skin diseases has justly been a favourite with student and practitioner for more than twenty years. It is fortunate that the author was able to complete the revision of this last edition of his work before his untimely death. Advances in dermatology, as in other fields of medicine, have been considerable and rapid, and Roxburgh's ability to see medicine whole and in a very practical fashion has enabled him to gather the more valuable advances into his simple presentation of the whole.

This work has always held a reputation for its clear exposition and its balanced assessment of the many difficult

A new quarterly journal, the *Papua and New Guinea Medical Journal*, is published by the Department of Public Health, Port Moresby, Territory of Papua and New Guinea. Until now records of the studies on medical problems in this territory have been published in external journals and departmental circulars. The new journal is intended to keep local medical men in touch with world progress in the prevention and treatment of diseases peculiar to the area. An editorial forecasts an intensified programme in the near future against tuberculosis and yaws, though malaria remains their "major disease problem."