Medical Research Systems in Europe

A joint Wellcome Trust–Ciba Foundation symposium
Ciba Foundation Symposium 21 (new series)

1973

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Symposium on Medical Research Systems in Europe
held at the Ciba Foundation, London, 14-16 March 1973

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Editor: F. P. Woodford
Background to the symposium

This symposium was held at the Ciba Foundation at the suggestion of Dr. P. O. Williams, Director of the Wellcome Trust. It forms part of the Trust’s present programme aimed at increasing European co-operation in medical research, and accords with the Ciba Foundation’s task, defined in its Trust Deed, of facilitating every kind of international co-operation in medical and chemical research.

Membership in a Ciba Foundation symposium is limited to about 25. Consequently, one participant was invited from each of 24 European countries with medical schools. All but one of the invited participants was medically trained; all are university professors or are actively influencing in other capacities the current changes in medical education and arrangements for medical research; and all are, or have been, associated with the formulation of medical research policy in their country.

The object of the symposium was to examine the interlocking systems of medical education, health care, and medical research in each country, and then to discuss differences between the national systems and the possible application of solutions from one country to similar problems in another. Each participant therefore wrote an account of the organization and financial support of medical education and research in his country, and its interaction (if any) with the local system of health care. In some cases, the philosophical and political background for the systems were given as well. The accounts, which are reproduced in Part I of this book (pp. 3–239), were circulated to all participants before the symposium. At the symposium, participants discussed special features of the various systems, their advantages and shortcomings, and currently planned developments. These discussions form Part II of this book.

Professor Candela (Spain) was unfortunately prevented by illness from attending the symposium. Professor Donato (Italy) was unable to attend because
of strikes by hospital and university doctors, but his place was most ably taken, at very short notice, by Dr Saracci of the same institute.

The reader will note two woeful omissions: there are no contributions from Czechoslovakia or the USSR. Although distinguished colleagues from these countries had accepted invitations to participate, we were in the event denied the benefit both of their presence and of an account of their national systems.

To facilitate comparison of national expenditures on medical research between the European countries, the participants have converted their national statistics from local currency into US dollars, using the rate of exchange on an arbitrarily chosen date: 15 March 1972. Exchange rates have, of course, changed since then (some of them drastically), and the reader should bear this in mind.
Medical education, care, and research in Austria

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Abstract Admission to medical school in the three federal universities of Vienna, Graz, and Innsbruck is practically unrestricted; the consequent student numbers exceed the capacity of the teaching facilities and affect research adversely. Although the existing undergraduate curriculum neither obliges nor encourages medical students to engage in research, recent legislation makes provision for an optional medical dissertation. Imminent legal changes in the structure and management of the universities are, however, not likely to be favourable to research.

During the 3 years of compulsory postgraduate specialist training almost 40% of the trainees work in university clinics, where they have good opportunities for clinical research.

Medical research is mostly carried out in the universities, though contributions by hospital departments are becoming increasingly important. The universities receive most of their funds from the Federal Ministry of Science and Research. A major advance has been the establishment, some 5 years ago, of a Research Council which provides grants for specific research projects, both in and out of universities, and has been spending about a quarter of the money on medical research.

A compulsory social insurance system provides health care (with free choice of doctor) for 90% of the population. It is supplemented by State-sponsored private insurance schemes. At present, medical research is not strongly affected by the health care system.

MEDICAL EDUCATION

Austria has a population of 7.4 million. Medical education is provided by the faculties of medicine of three Austrian universities, namely Vienna, Graz, and Innsbruck. The establishment of an additional medical faculty at the university of Salzburg has been enacted by Parliament, but will not become effective before 1980.
All the Austrian universities are State institutions and financed predominantly through the federal budget. The Ministry of Science and Research is the government agency responsible for supervising the universities. Their organizational framework, the structure and pay of the personnel, the overall study regulations, and even the main features of the specific studies (such as medicine) are all outlined by federal legislation and further specified by ministerial decrees. Before legislation is enacted, however, the universities (and the Chamber of Physicians) are consulted. Faculty autonomy is restricted to curricular details, conferring of academic degrees (doctor and docent), and making applications and proposals to the ministry with regard to the recruitment of personnel, the filling of vacant professorial positions, buildings, and budgetary matters.

Universities and their faculties are entitled to accept private funds and donations. However, the lack of extensive private wealth in Austria and the scarcity of large industries other than those owned by the State make the universities highly dependent on public funds and funding policy. Austrian students need not pay for university education, all courses and examinations being free of charge. Foreign students do have to pay fees, but these are low and can be further reduced. Every Austrian student whose study records are satisfactory and whose family income is below a certain level is entitled to a public study grant which partially covers his living expenses.

All Austrian citizens who have successfully completed 8 years of secondary school training and passed the final examinations (Reifeprüfung) are entitled, irrespective of the marks achieved, to enroll at a university and to engage in any study. There is no university entrance examination or any restriction in admissions. For medical studies, the only additional requirement is a working knowledge of Latin. Most students going into medicine do so immediately after the completion of their secondary school training or after a subsequent half-year of military service (so that 84% of freshmen are 20 or younger). The admission of foreign students to Austrian universities is contingent on having a secondary school training which is equivalent, in scope and quality, to that provided by Austrian schools. In addition, such admission may be restricted or stopped entirely, as it has been in medicine since 1970, because of the lack of training places (laboratory space, dissection facilities, etc.).

Whereas in the late 1950s the number of foreign medical students enrolled was about the same as that of Austrian nationals, the steep increase in Austrian student numbers since then resulted in a steady lowering of the percentage of the non-Austrians (to less than 30% in 1969–70). Whereas in 1959–60 the number of Austrians entering medical studies was hardly above 600 per annum, it has since risen to about 1500 and has quite overwhelmed the training capacity of the three medical faculties. From past experience it is to be expected that 60–65%
of the entering students will complete their medical studies successfully. This ample supply of medical graduates far exceeds the anticipated future demand for physicians.

The legal basis for the present medical curriculum was laid down by the Medizinische Rigorosenordnung 1903. According to this law, which has not been substantially changed during the last 70 years, the student has to undergo 2 years of pre-clinical training, the fields of study (and subjects of examinations) being physics, chemistry and biochemistry, anatomy, histology and embryology, and physiology. After these examinations (collectively called the 'first Rigorosum') have been taken, three subsequent years of study are devoted to theoretical and clinical medicine. Instruction is given mainly by formal lecturing and demonstration. Bedside teaching is the exception rather than the rule, and the present course of medical studies neither obliges nor encourages the students to engage in research. It is entirely left to the individual student to seek and gain practical bedside experience (particularly during vacations) by voluntary work in hospitals, or to make contact with people engaged in and willing to introduce him into research. In any case, the 'second Rigorosum' (comprising examinations in pathological anatomy and histology, pharmacology and toxicology, internal medicine, paediatrics, neurology, and psychiatry) and the 'third Rigorosum' (which covers surgery, obstetrics and gynaecology, ophthalmology, dermatology, hygiene, and forensic medicine) have to be taken successfully before the student will be admitted to receive the doctor's degree. Failed examinations can be repeated three times.

Most medical students need between 6\( \frac{1}{2} \) and 7\( \frac{1}{2} \) years of study to attain the doctor's degree. Only 14 % manage to complete their studies in less than 6\( \frac{1}{2} \) years, whereas almost a third of the recipients of the doctorate have studied for more than 7\( \frac{1}{2} \) years. Consequently, about 40 % are 28 or more when they receive the medical doctor's degree. Long periods of study are mostly due to delays during the pre-clinical part of the curriculum. Of the 35–40 % dropouts, most give up before the end of pre-clinical training.

Most of the practical professional instruction, for both general practitioners and specialists, is left to the postgraduate training which the graduate has to undergo before he is entitled to carry out independent medical work. The regulations concerning postdoctoral training and the medical profession are laid down in a law (Ärztegesetz 1949, largely revised in 1964) and in decrees issued by the Ministry of Social Administration (since 1971, the new Ministry of Health and Environment Protection).

The obligatory postgraduate training for general practice comprises at least 3 years of competent work in 'approved' training places, and includes 9 months of internal medicine, 6 months of surgery, 8 months of obstetrics and gynaeco-
logy, 6 months of paediatrics, and 3 months each of dermatology and oto-rhinolaryngology. In addition to the clinical university departments, hospital departments are approved for this training if they are directed by a qualified specialist, are adequately equipped, and provide the required clinical and teaching facilities. Approval is given by the Ministry of Health and Environment Protection, after consultation with the Chamber of Physicians.

For doctors wishing to specialize in one of 16 different fields of specialization, postgraduate training extends over a legal minimum of 6 years, 4 or 5 years thereof being reserved for the chosen field. University clinics and 'approved' hospitals share the instruction of the specialists. Almost 40% of the doctors engaging in specialization (but only 11% of those preparing for general practice) receive their postgraduate training in university clinics, where there are good opportunities for doing research. On the average, physicians require 2 years more than the legal minimum of 3 years to obtain the general practitioner's decree, and about 5 years more than the minimum of 6 years for getting the specialist's decree. The most important reason for the protracted training time is the scarcity of training places. Before desired training positions become vacant, considerable waiting periods may elapse. The long duration of postgraduate training results in a relatively high age of the physicians qualifying as specialists: only a quarter are under 35 and a third are more than 40 years old.

Both the universities and the Chamber of Physicians have legal responsibility for continuing education in medicine. In addition, several organizations such as the Van Swieten Society and the Vienna Medical Academy (which, although private bodies, have close personal and organizational relations with the medical faculties and the Chamber) arrange courses, seminars, and congresses to promote and bring up to date the physicians' knowledge and experience. Participation in continuing education is not compulsory, however, and still suffers from lack of system and thoroughness.

MEDICAL CARE

Previously, the Ministry of Social Administration was the government agency responsible for all social and health matters. In 1971, an additional Ministry of Health and Environment Protection was established which, with the exception of the social and health insurance system, is now in charge of all other problems of public health care.

More than 90% of the Austrian population is provided with medical care within the framework of a compulsory social and health insurance system. Financial contributions to this health insurance are made by the insured in-
individuals and their employers, and are supplemented through the federal budget. The insurance scheme covers medical treatment, hospital care, and sickness allowance. Private insurance schemes enjoying tax benefits offer additional and more extensive health services. The great majority of practising physicians work under contract with the health insurance institutions. Patients are free to choose from among the doctors under contract.

The running costs of the hospitals, most of which are owned and managed by states, local communities, and charitable institutions, are only partially covered by the contributions received through the public health insurance system. Most hospitals are therefore in a critical financial situation and heavily dependent on additional public grants.

Numerically, the availability of physicians (1 doctor per 560 inhabitants) and of hospital beds (1 bed per 1000 inhabitants) appears to be satisfactory, but there is an imbalance in structural and regional respects. The ratio of general practitioners to specialists has been changing steadily in favour of the latter. Some rural districts suffer from a serious shortage of physicians, and particularly of general practitioners, while in urban areas some fields of medical specialization are considerably over-represented. In some larger towns, on the other hand, especially in Vienna, a severe shortage of nurses has resulted in a considerable reduction in the number of available hospital beds and even in the closing of wards and of whole hospital departments.

MEDICAL RESEARCH

Careers

Most medical research in Austria is undertaken in clinics and theoretical institutes of the universities. Young doctors interested in a research career or anxious to gain research experience during postgraduate training usually take the position of an assistant (Assistent, Assistenizarzt) in an institute or clinic of a university. The number of university assistantships has been increased considerably within the last 12 years, and applicants for an assistantship do not usually have to wait long for a vacancy. The degree of involvement of assistants in teaching and patient care varies greatly between different departments. The staff of the institutes engaged in pre-clinical instruction bears a particularly heavy and still increasing teaching load, which severely limits the time available for research.

An important step in a university career is the title of university 'docent'. This degree is conferred on members of the scientific staff, but also on scientists
working extramurally, and signifies that they have carried out significant and original research work and are entitled to engage in independent teaching. Professorial positions are usually filled from the ranks of the docents, and the heads of hospital departments are often chosen from them. More than half of the docents of the medical faculty in Vienna have positions outside the university, mainly as heads of hospital departments.

Notwithstanding the prominent position of medical research in the medical faculties, a significant portion of the total output in Austria is made by research workers in non-university hospitals, despite the fact that permission is given to hospital physicians (as well as to docents and professors working in university clinics) to run a private medical practice in addition to their hospital (or university) work. Such a dual occupation leaves little time for thorough research.

Whereas the medical faculties of the universities provide adequate research careers for physicians, they fail to open up comparable opportunities and careers to non-medical scientists such as biologists, biochemists, physicists, engineers, and statisticians, who might greatly assist clinical research and development but are usually kept in minor and subordinate positions. A great handicap to medical research is also the low pay of the non-academic technical and laboratory staff in the universities and public hospitals. The more ambitious people therefore tend to move to industrial laboratories.

Societies and communication

Numerous specialized scientific societies help to stimulate the scientific activities of medical research workers and to create contacts between them. They are, as a rule, members of or closely linked to the respective European or international societies. The smallness of Austria accounts for the fact that purely Austrian medical journals, with papers in German, such as the Wiener Klinische Wochenschrift or the Wiener Medizinische Wochenschrift, are limited in scope and circulation. The more significant research papers are usually published in international journals, many of which have Austrians on their editorial boards.

Financial support

Medical research carried out within the universities is financed to a large extent by the federal government, through the agency of the Ministry of Science and Research. Five years ago, an Austrian Research Council comprising two Research Funds (for basic and for industrial applied research) was established.
One of the Funds (Fonds zur Förderung der Wissenschaftlichen Forschung) gives financial help to individuals and teams engaged in research projects both in universities and without. The monies, which come almost exclusively from the federal budget, are administered autonomously by a body consisting predominantly of scientists; they are allocated on the basis of advice given by independent referees. The budget of this agency has, from small beginnings, been increased steadily year by year. In 1971, from a total of 88 million Schillings ($3.5 million) disbursed by the Fund, $0.8 million was used to cover the costs of medical research projects. The Austrian Academy of Sciences, also a recipient of public funds, is developing more and more from a learned society of distinguished elderly gentlemen into a body which supervises research activities carried out by research commissions and specialized institutes. Among the latter, a Brain Research Institute and an Institute of Molecular Biology have recently been called into existence. The Boltzmann Society, a private organization which has been quite successful in raising funds from governmental and local sources, has set up teams, mostly in hospital departments, which carry out clinical research, e.g. in haematology, neurology, experimental surgery, urology, endocrinology, geriatrics, oncology, and nuclear medicine. Grants obtainable from Foundations set up by the Austrian National Bank, the City of Vienna, the Chamber of Commerce, etc., have also provided valuable assistance to workers in various fields of medical research. For cancer research and cardiology substantial sums have been raised by appealing to the general public, with the generous help of radio and television.

Contribution of pharmaceutical industries

Most Austrian pharmaceutical companies and manufacturers of biomedical equipment are small in size and/or not very research-minded. An important exception is the Austrian Nitrogen Works, which has a strong and productive pharmaceutical branch. Research settlements of foreign pharmaceutical firms in Austria, particularly a newly established sizeable research institute of the Sandoz concern in the outskirts of Vienna, have enlivened the scientific scene and resulted in valuable biomedical research contacts.

Information about research activities in Austria

A list of the research institutions in Austria, with indications as to their main scientific activities, has been published (Österreichischer Forschungsstätten-
CURRENT DEVELOPMENTS

A new bill concerning medical studies was passed in February 1973. The regulations will come into force in the winter of 1973–4. Among several important changes (obligatory bedside training; inclusion of previously neglected subjects, such as medical psychology and social medicine; condensation and intensification of the studies by co-ordination of courses and examinations, etc.) the new law makes provisions for an optional medical dissertation. The students will have the alternative either of choosing an optional subject for more intense theoretical study or of carrying out research for a dissertation. It is to be hoped that this regulation will channel some of the more scientifically motivated and gifted students into medical research.

The government intends to change the structure and management of the universities drastically. According to the ministerial draft of a bill to be introduced into Parliament, the faculty boards of professors, commissions, and the heads of departments will be replaced by bodies containing representatives of students, and of assistants, equal in number to the number of professors. These bodies will decide or make proposals on matters of teaching, personnel, budget, and research. It is unlikely that the effects on medical research of this 'democratization of the universities' will be favourable.
The medical research system in Belgium

JOSEPH J. HOET

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Abstract  Admission to medical school is open to all who have completed any type of secondary education. This results in classes of 600–850 in the first year, and a dropout rate of 50% at the end of it. Differences in ownership of the universities (State or autonomous, both State-supported), in language (French or Flemish), and in philosophical options (confessional or nonconfessional) influence the academic scene.

The general trend of medical education is towards more instruction in the delivery of health care. Despite some experiments in encouraging an interest in research during medical training, fewer physicians are entering basic research now than 10 years ago. An optimistic feature is the increasing number of teaching and clinical university positions, which bring research opportunities in their train. Most funds for research come indirectly from the State. A few national and foreign (U.S. and U.K.) foundations also support research, and a few independent research institutes exist.

Health care is private, with partial reimbursement of patients by insurance companies to which citizens and employees pay legally imposed contributions.

Some problems for research workers include the multiplicity of financial sources, uncertainty and delay over parliamentary appropriation of funds, and the lack of salaried research careers. The Ministry of Scientific Policy with the Ministries of Public Health and of National Education tries to co-ordinate the science budget of the country and allocates a special budget for priorities in medical sciences. Despite cultural, confessional, and political tensions and financial uncertainties, medical research is maintained and yields internationally well-accepted results.

Active participation in European associations has broadened horizons and improved the quality of research and its communication. It is unfortunate that better-structured research opportunities are not being organized at the European level.

The medical scene in Belgium (population, 9.7 million) is influenced by the free access of all Belgian and foreign students with secondary education to the six or seven medical schools.

The universities of which the medical faculties form a part are basically State-
supported. Since 1971, their subsidies have been calculated on the basis of the number of students and of a student:teacher ratio of 9:1 for the first three (pre-clinical) years and of 6:1 for the last four (clinical) years. The budget of the medical schools is part of the total university budget, decided by the Ministry of Education. The university allocation has to cover all aspects of education and research, including the salaries of academic, scientific, technical, and administrative personnel.

University hospitals have an additional allocation, which has also been provided by the State during the last decade, but which may not be available in the future. Another source of funds is the income derived from patient care, which is covered by the Health Insurance scheme. Some of this income is used to pay permanent clinical teaching staff in the hospitals affiliated to the autonomous universities. Members of the staff of hospitals affiliated with the State universities are on a State budget.

There is continuous growth in the university hospitals, and a proper planning of the openings for medical teaching is aimed at. However, the policies of the Ministries of Education and of Public Health as well as the compulsory health insurance system have to be placed in a continuously changing political scene. A Ministry of Scientific Policy co-ordinates the different scientific endeavours of the country and advises the different Ministries involved in scientific affairs in and out of the country.

MEDICAL SCHOOLS IN UNIVERSITIES

Every complete medical school is part of a university. There are six universities which differ in language used, the broad philosophical trends adhered to, and the ownership (State-controlled or autonomous). They are:

Rijksuniversiteit Ghent (R.U.G., State-owned; situated in Flemish-speaking part of Belgium; courses in Flemish).
Université d'Etat de Liège (State-owned, situated in French-speaking part of Belgium; courses in French).
Katholieke Universiteit Leuven (K.U.L.; autonomous university, confessional, situated in the Flemish part of Belgium; courses in Flemish).
Université Catholique de Louvain (U.C.L.; autonomous university, confessional, temporarily situated in the Flemish-speaking part of Belgium; courses in French).
Université Libre de Bruxelles (U.L.B.; autonomous university, non-confessional, situated in bilingual Brussels; courses in French).
Vrije Universiteit Brussel (V.U.B.; autonomous university, non-confessional, situated in bilingual Brussels; courses in Flemish).
The Université Catholique de Louvain is in the process of moving from the Flemish-speaking to the French-speaking part of Belgium. The new university campus, Louvain La Neuve, will be situated close to the town of Ottignies. Because the number of the medical students is increasing at U.C.L., as it is in the other medical schools, the faculty of medicine has taken the opportunity of creating a new medical school where the basic sciences, preventive medicine, research laboratories, and a new university hospital will be integrated. The university hospital will serve a large population. The new campus of the medical faculty will be located in Woluwé St Lambert, a bilingual expanding suburb of Brussels where acres of land were still available. It remains to be seen how a separation of 35 km between the medical faculty and the rest of the university will affect medical teaching and research.

The medical faculty of the V.U.B. is also expanding, and State funds have been provided to build a university hospital for it too.

Legally valid pre-clinical instruction in medicine is also organized by a special Faculty of the Jesuit Fathers in Namur. This school is attended by about 10% of the pre-medical students of the country.

Recently, the province and town of Antwerp have been allowed by the State to create a seventh university, which will be autonomous and will contain a medical faculty (Universitaire Instelling Antwerpen, U.I.A.; courses in Flemish). The medical school is already operational for the pre-clinical years, and university hospital services are being organized in community and private hospitals in order to have a complete medical school with all services in the coming years.

The political prospects are that still another university may be created in the French-speaking part of Belgium, in the towns of Mons and Charleroi. One of these towns may contain the medical school and the other, all other faculties of the university.

The State-owned universities are administered directly by the Ministry of Education and therefore the Government. The free universities are subsidized nowadays on practically the same basis as the State Universities. They are administered through a body which is elected by the university community in five universities and is self-perpetuating in one. An officer of the Ministry has access to all financial documents of the autonomous universities so that he can supervise expenditure within the budget.

In 1972, the six universities and the medical faculty in Namur totalled about 70 000 students, of whom 6000 were foreign and 22 000 were studying for a doctoral degree in medicine or pharmaceutics. There are 24 000 girl students—5000 in their first year of university—and 6100 of them are in the medical and pharmaceutical sciences.
AUTONOMY OF UNIVERSITIES

The universities have various degrees of autonomy. State-owned universities are dependent for development on the initiative of their academic community, which is controlled by the government of the day. The policy of these universities is under the supervision of the Ministries of Education. Autonomous universities enjoy freedom in policy-making and staff appointments in accordance with the student:teacher ratio, which has been decided by law as stipulated above. An overall co-ordination of the policies of the different universities is made by the Ministries of National Education. Both types of universities depend on the government for their financing. Every university, State and autonomous, has some endowment of its own which may be used at its own discretion, usually for social budgeting (special pension plans, improvement in lodgings, etc.).

The medical schools must seek affiliation with hospitals for undergraduate and postgraduate training. These hospitals are often community hospitals (U.L.B., V.U.B., U.C.L., Liège, Antwerp); rarely, private (K.U.L., Antwerp) or State-owned (Ghent). The University of Liège and U.C.L., amongst others, have a policy towards having university-owned hospitals. The University of Liège plans to move from its present location inside the town towards the suburb Sart-Tilman, similar to the move of the medical faculty of U.C.L. to Woluwé St Lambert, where a new 800-bed hospital, together with a large geriatric hospital, will be the centre of the medical campus. The university-owned hospitals will be governed by a board comprising representatives of the general body of the university, the dean of the medical school, and representatives of the clinical academic personnel of the medical school.

GENERAL MEDICAL EDUCATION

Education and professional standards are set out by law. This means that the type of course, the number of teaching sessions, and the number of years of training are similar in each university. There is a distinct tendency towards more integrated teaching and more practical experience in the delivery of health care amongst the students. The restrictions on entering medical schools have been relaxed over the last few years. Anyone who has completed secondary education (Latin and Greek, Latin and mathematics, Latin and sciences) can enter the first year of medical school without examination. Those with a secondary education in sciences without Latin have to pass an examination before entering medical school. Any foreigner who produces a valid certificate of secondary education is considered by a Faculty Commission, which may accept or reject
the candidate. The governmental bodies have in the last 2 years asked universities to be rather restrictive in the admission of foreign students.

There were 4500 first-year students in medicine for the six medical faculties in 1970–71 and about 5000 in 1971–72. This means that the first-year class in nearly every university consists of 600–850 students attending theoretical courses. Competition starts at the end of the first year, when only 45% are successful in entering the second year (see Table 1). (This figure and the ones that follow are from one medical school; they are fairly representative of the whole country.) For the three pre-clinical years the average success rate is around 61%; for the four clinical years it is 88%.

TABLE 1
Follow-up of students enrolled in the first year of one medical school in 1967-68

| Successful at the end of the year | 45%  |
| Repeated the first year in medicine | 31%  |
| Transferred to other, non-medical faculty | 6%   |
| Dropout rate at the end of the first year | 18%  |

In the first year, physics, chemistry, animal biology, and botany are taught. During the next two years, students are taught normal morphology, physiology, and psychology. In each, a general introduction is usually followed by more detailed study in workshops, standard laboratory work, and practical assignments. Some courses are already given by audio-visual means such as video cassettes which may be used by the students at any time.

The four clinical years consist of theoretical and practical courses in medicine, surgery, obstetrics and gynaecology, and other specialities. Emphasis is increasingly laid upon clinical workshops and clerkships. Clinical demonstrations and case-history lectures are a major part of the medical education. The trend to reduce the length of theoretical courses and increase emphasis on the more practical aspects of health care is occurring in all the medical schools in accordance with continued requests by the students. An integrated system for teaching (combined theoretical and clinical courses) in view of the practical aspects of medicine is aimed at.

The seventh year is devoted to a rotating clerkship in university hospitals or affiliated institutions. In some medical schools the total time spent in this activity may be up to 18 months.

The medical student has the opportunity of joining a research laboratory during his training. In some medical schools (e.g. U.C.L.) the students who want to do research are screened according to their scholastic achievements and may receive a special status (étudiant chercheur) which exempts them from cer-
tain classes, lectures, and exercises. For 1972–73, there were 50 students at U.C.L. with this special status, out of about 1000 students in the clinical years. They are evaluated at the end of the year by their supervisor with regard to their ability to integrate in a team and to achieve a limited research project. This experiment has been much appreciated as a means of introducing students to research and evaluating their research ability before they undertake a research career.

Some medical schools (e.g. K.U.L.) have a special curriculum in which an option for general or specialized medicine can be exercised. Progressive specialization towards research is also possible.

At the end of the 7 years of medical school, a diploma is delivered by the University, which has to be approved by the ‘Ordre des Médecins’ or ‘Orde der Geneesheren’ (a legally constituted body of physicians with their own disciplinary rules set by law). The physician so registered may work as a general physician, in administration, in an insurance company, or in pharmaceutical houses, or may undertake further training for specialist qualification.

POSTGRADUATE TRAINING

The type, length, and requirements of specialist training are set by law. A third to a half of the training must take place in Belgian university hospitals situated in Brussels, Antwerp, Ghent, Liège, or Louvain and the remainder in affiliated hospitals of the medical school. Most registrars remain for specialist training in the university hospitals where they have received their undergraduate instruction. This is a consequence of the language and philosophical differences in the country as well as of the distinction between autonomous and State universities.

Full-time physicians in training have in the past few years been paid by the hospital. The number of openings for training in any one specialty depends on the hospital budget and is not yet calculated in relation to the needs of the community. During this training, the physician-candidate is allowed to devote one or two years to research (often clinical), some portion of which time will be accepted for the specialist qualifications. Not many candidates take this opportunity, as it necessitates special fund-raising, which at that stage is not part of the system. In general, there is a declining research orientation in the early postgraduate years (Table 2).

The general postgraduate programme is under continuous review by the Royal Academies of Medicine and recently by representatives of the general medical profession as well as of the specialties.

In order to prepare some physicians for a long-term research career, some
TABLE 2
Declining research orientation in early postgraduate years

<table>
<thead>
<tr>
<th>Year</th>
<th>Absolute numbers</th>
<th>% Total university enrolments</th>
<th>Clinical orientation</th>
<th>Research orientation</th>
<th>Research/Clinical orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964-5</td>
<td>5 528</td>
<td>15.23%</td>
<td>737</td>
<td>30</td>
<td>4%</td>
</tr>
<tr>
<td>1967-8</td>
<td>8 912</td>
<td>15.27%</td>
<td>1 130*</td>
<td>45</td>
<td>4%</td>
</tr>
<tr>
<td>1970-1</td>
<td>12 304</td>
<td>16.27%</td>
<td>1 410*</td>
<td>52</td>
<td>3.6%</td>
</tr>
<tr>
<td>1971-2</td>
<td>13 612</td>
<td>17.05%</td>
<td>1 432*</td>
<td>44</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

* The number of clinically oriented trainees is increasing, but as a percentage of the total number of medical students three years previously it is decreasing:
  - trainees 1967-8 versus students 1964-5: 22%
  - trainees 1970-1 versus students 1967-8: 17%
  - trainees 1971-2 versus students 1970-1: 12%

Medical schools (U.C.L., K.U.L.) have introduced a special certificate which is delivered at the end of a personalized 2- to 3-year postgraduate curriculum (Licence en Sciences Médicales). About 1–2% of the newly graduated physicians follow the courses, which are planned to produce an expert in a highly specialized field; mathematics and biochemistry are usually at the core of the curriculum. The candidate has to do personal research and presents a thesis before a jury of his medical school. The qualification, which may be regarded as an advanced Ph.D., is available only in some universities. It has no legal status.

In addition, the physician may acquire a complementary diploma after several years of personal research carried out in a Belgian or foreign university. His research has to be presented in a thesis, publicly defended before a highly selected jury of members of other Belgian and foreign medical schools which are approved by the medical faculty.

The thesis is usually presented in book form. After a successful defence, the candidate must deliver a formal lecture on a stated subject, after which he will receive a degree (Agrégé de l'Enseignement Supérieur) which has legal status. This, while not a requirement, is very helpful in gaining appointment to an academic faculty. It is usually obtained 5–10 years after graduation.

THE HEALTH SERVICE

Medical care at home, in the doctor’s office, or in hospital is charged on a fee-for-service basis. There is a sliding scale for the fees requested according to the qualifications of the physician, general practitioner, specialist, surgeon,