Round Table

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The challenge of changing medical education and medical practice

Fundamental issues are being raised worldwide on the future orientation of health systems. Doctors who have been driving the systems and are seen to be largely responsible for the present situation must now respond. These issues are concerned with equity of access to health care, quality of care, consumer satisfaction, rationing of resources, individual versus community rights, environmental determinants of health, technology assessment, and cost. The search for a new model that integrates all these factors has begun. And if the medical profession is to continue to play an influential role in health policy-making and to be respected by society, it must definitely adapt to the health requirements now being expressed by political decision-makers and health consumers.

With surprising unanimity worldwide (1-5), there is a call for medical practitioners to be able to:

- assess and improve the quality of care by responding to the patient’s total health needs with integrated preventive, curative, and rehabilitative services;
- make optimal use of new technologies, bearing in mind ethical and financial considerations and the consumer’s ultimate benefit;
- promote healthy life-styles by means of communication skills and the empowerment of individuals and groups for their own health protection;
- reconcile individual and community health requirements, striking a balance between patients’ expectations and those of society at large, in both the short term and the long term;
- work efficiently in teams within the health sector and between the health sector and other socioeconomic sectors that influence health.

Dramatic changes are therefore needed in medical practice that call for important and
equally dramatic changes in medical education. The need for reforms in medical education was recognized even long before the Flexner report of 1910, a landmark event that led to the predominance of science in the education of doctors. Since its inception in 1948, WHO has consistently given high priority to human resources development in the health sector, and to the relevance of education for health professionals. In the late 1960s, WHO developed a programme for the training of teachers in educational institutions of health personnel in educational planning and methodology, and training centres were established at global, regional and national levels. During the 1980s, the state of medical education and its adequacy in reorienting health policies towards primary health care were extensively examined by countries, universities, professional groups and international organizations. Considering the important socioeconomic and political changes in the world and their inevitable influence on medical practice, medical education must now adapt to and even anticipate these changes and proactively contribute to the improvement of equity and quality in health care. The worldwide relevance of these observations calls for an organized exchange of information and a plan of action for changing medical education at global level (6, 7).

The change process

It is now realized that the needed changes in medical education should go beyond curriculum content and educational methods, and that the contribution of the medical school to the improvement of the health care delivery system should also be considered in the change process (8). As it is logical for changes in medical education to reflect changes in medical practice and vice versa, the advent of new practice patterns in medicine, which the socioeconomic environment calls for, will determine the reorientation of medical education and the new role of medical schools.

At present, medical education has limited influence to induce practice patterns with a fair balance between preventive, promotional and curative interventions, taking into account the total health needs of individuals and communities. Because social, economic and political pressures are now predominant, the currently proposed changes in medical education should be made in correlation with other important changes beyond the present mandate of the medical school. Medical education must therefore be seen in a wider context than the training of doctors. It could be defined as the science and the art of preparing future physicians to function for the benefit of society, with the responsibility for influencing the circumstances and conditions under which they practise.

Considering the need for more social accountability, the new mandate for medical schools will invite them to take up more responsibility in the areas of health care planning and organization, health service delivery, and quality assurance. The contribution of medical schools to the improvement of health care planning and organization will prepare the practice ground for their graduates. Further, by being
active in the area of health service delivery and quality assurance, medical schools have the responsibility to influence and support their graduates after they have been delivered to society.

The commitment of medical schools as regards the appropriateness of their graduates to meet individual and community health needs will not compromise the search for academic excellence which every university legitimately pursues. Due consideration should be given to the contribution of each institution towards progress in the sciences and humanities through research activities and to the education of future doctors with a broad intellectual base focused on society’s immediate and long-term needs.

An agenda for action

It is with this dual focus on medical education and medical practice that WHO launched in 1991 its initiative on “Changing medical education: an agenda for action” (6). The agenda consists of three components:

— defining and assessing quality medical education;
— implementing strategies for change;
— monitoring progress in change.

Quality medical education needs to be defined and measured with valid and reliable tools. Over the years several desirable features in medical education have been widely discussed, from which one may identify the key ones that are likely to be applicable to all situations. However, a debate on the concept of quality is inevitable and desirable, and appropriate indicators and criteria will be identified and repeatedly refined through research. Although measurement tools would certainly help to introduce more objectivity into the appraisal and monitoring of medical education worldwide, uniform medical curricula and standard certification of medical graduates throughout the world are not advocated, as it is the prerogative of individual countries to determine the shape of medical education and the conditions for licensure, according to the specific requirements of their environment. Because the concept of quality depends on established values, indicators are expected not only on educational content and process and on availability and use of resources, but also on how medical schools implement their social and health mission.

Change cannot be induced the same way in every situation. Depending on the political and sociocultural context, several routes to change — each with specific entry points — can be followed. One group of strategies, for example, stems from the concept that medical education must be conspicuously linked with an effort to improve the health of a given population. The practical involvement of a medical school, not just a department of community medicine, in the struggle to resolve a major public health problem may trigger self-doubts and

Changes in medical education should go beyond curriculum content and educational methods.

questions on the institution’s capacity to cope with the situation as an institution per se and/or through its graduates. The experience gained might result in better-directed educational reforms.

Change on a global scale

Countries, institutions, and individuals engaged in change need to learn from the
experience of others and, through solidarity, feel encouraged to persevere in their own innovative work. Global mapping of the progress of each change strategy, and the ability to retrieve this information through indicators that reflect the values of medical education, would be among the important functions of worldwide monitoring.

While approaching the turn of this century with a growing understanding of the shifting influences in health care policy-making and with a clearer understanding of the determinants for change, one realizes that changes in medical education are inseparable from changes in medical practice. New partnerships must be built, linking medical schools much more closely with the world outside their walls.

Global action is more desirable than ever before because of the many common features in the demand for change worldwide, the need for an easy and speedy exchange of information, and the desire to unite the political and technical forces engaged in a complex task.

Human rights and the quest for equity and quality in health care are universal values. Thus, all efforts to reorient health systems, social systems, and educational systems towards the achievement of a better state of individual and collective well-being deserve global attention. Change in medical education has greater significance when seen in that perspective.

References
Educating tomorrow’s doctors

Universities and medical schools must leave their cloistered environment. The time has come for them to venture out into the world and grapple with the problems of society, taking actual responsibility for the health of their local populations. And medical students should be educated in the ideals and practicalities of the new mission.

As the world approaches the twenty-first century, increasing attention is focused on trends and projections. The transition to the next millennium is taken by many as a time to address fundamental problems that afflict our world. So it is with the health sector and, inevitably, medical education.

The very title of this article, “Educating tomorrow’s doctors”, carries implications for change in each of its words. “Education” — increasingly an arena of ferment; “tomorrow” — something unknown and certainly different; and “doctor” — a professional in a rapidly expanding field of knowledge and a rapidly evolving world. A multitude of questions and ideas circle around the issue of how to prepare doctors for a today that is not yet adequately cared for and a tomorrow whose needs are not yet clear.

As we probe these questions, it becomes apparent that a number of factors influence change in medical education, both directly and indirectly. Some of them promote change, such as advances in science; some direct change, such as societal needs; and some temper change, such as humanism in medicine. Above all there is an increasing analytical capacity that establishes the need for change. Sometimes, however, change is resisted, perhaps because the need for it is not seen or because values that underlie existing systems are brought into question.

What are the directions of change being called up for the doctor of tomorrow? At the risk of oversimplification, one can say those directions are dichotomous.

On the one hand, there are calls for greater competence on the part of doctors in dealing with patients, a competence built on a scientific understanding of the clinical and social nature of the problems and of the technologies that are increasingly available. A recent commission on medical education in the USA called for medical education to give greater emphasis to the behavioural, social, statistical and information sciences, as well as to ethics (1). While change is urged, this is the familiar terrain of medical practice, much of it hospital- and clinic-based.

On the other hand, there are calls for new or enhanced roles for doctors in response to emerging or refractory social problems —
underserved populations, inequitably distributed health systems, rising costs of care, lack of community involvement, and imbalance between the curative services and the preventive and promotive services. Such problems lead to a demand for doctors with quite different orientations and

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competences. Here the ground is less familiar. The problems are beyond those of tertiary-care institutions and need to be addressed in ambulatory care settings, nursing homes, and community hospitals. The problems have a different complexity, and answers will need to be found by medical educators acting in concert with specialists in the fields of public policy, systems management and social development (1, 2).

Neither of these two directions of change can be ignored: finding a balance between them is difficult, yet either without the other loses much of its value to society. Seeking that balance requires turning to the large societal context from which the key questions are emanating.

Society and medical education

The societal perspective of medical education is, by its nature, a view from the outside. It is a view that is impatient with medical colleges and their products to the extent they fall short of meeting needs and expectations. The wider the gap, the more vocal the criticism (3).

Perhaps the factor that most brings the general weight of opinion to bear on doctors and the institutions that educate them is the inadequacy of the health care system. Again the dichotomy: does the health care system respond adequately to individuals who seek care and does it reach out to populations in need, whether they seek care or not? While there is great variation from one country to another in the demand for care and the capacity of the health care system to respond to it, which are particularly dependent on the country’s stage of development, the key issue remains: how responsive is medical education to the needs of society?

Academic health centres have been relatively unresponsive to the vexing health problems that have created doubt and frustration in the day-to-day practice of medicine. The focus of political debate is on the skyrocketing costs of medical care in the face of substandard indices of population health and on unequal access to care. Yet academic health centres have been unable to demonstrate leadership in solving this dilemma (3, 4). The Edinburgh Declaration voiced similar concerns (5).

These criticisms may be strongest in developing countries, where the dominant professional values are often derived from the specialty and tertiary-care hospital orientations of the developed countries, while the greater need is for health systems oriented towards poor and underserved populations.

The role of the university

Medical colleges are generally inseparable parts of universities, and it is therefore useful to examine the role of the university in the context of the needs in the health
sector and the production of health personnel (6).

A classic question facing the university is whether it should remain in the academic cloister, protecting its independence and stability, yet risking its relevance to societal need, or venture out to grapple with the problems of society and prove its capacity for dealing with reality, even though this might put its independence and stability at risk (3, 4, 7).

The response of a university to society’s needs is exemplified by asking whether the medical college does most of its clinical teaching in a university hospital, which generally functions at the tertiary-care level, or whether it associates itself with the larger health system, which includes primary, secondary and tertiary care? In short: a university and its teaching hospital versus a university and its teaching health system (8).

In his seminal book *Universities and the future of America*, Derek Bok (formerly president of Harvard University) writes: “It is fair to ask whether our universities are doing all they can and should to help America surmount the obstacles that sap our economic strengths and blight the lives of millions of our people.” He makes the point repeatedly that “most universities exhibit a pattern of effort that seems uncomfortably out of line with the nation’s needs” (9).

Bok’s observations raise a question about the relationship between medical schools and their parent universities: where is the locus of change? Is it in the universities, which are changing and pulling the medical schools along, or is it the other way round? If a medical school attempts to become more fully engaged in the health problems of the surrounding population, will it clash with the traditional academic values of the university?

*The university and the community*

Perhaps the most difficult challenge to universities and their medical colleges at present is that of associating themselves with communities or larger populations in general. Once the institution decides that it is important to do so, the central question will be “what do we do out here—observe and study, or participate in health-related programmes?” In practice, experience has ranged from gingerly putting an academic toe in the social waters of a community to becoming extensively involved in the development of the health system at a national level. Two examples of university involvement can be usefully described.

First, the International Network of Community Oriented Educational Institutions in Health Sciences, founded in 1979 and now with more than 170 participating institutions, has focused attention on innovative educational methods, such as problem-based learning in community settings (10). Sixteen of these institutions branched off in 1992 with an extra effort called the University Partnerships Programme, which aims to explore the usefulness and feasibility of partnerships of universities, governments, students and communities in pursuing research to improve health and health services (11).

Second, the Health of the Public programme (HOP) involves some 18 institutions in North America that have reshaped their missions to include a population-based orientation to their educational, research and service efforts. This programme has been launched on the basis of the further criticism that academic health centres have been relatively unresponsive to such severe problems as the escalating costs of medical care, the substandard indices of population health, unequal access to care, and growing...
deficiencies in the number and distribution of primary care physicians. Several thorny issues result from this perceived unresponsiveness of academic health centres to the public’s health concerns, including a growing public distrust of science and technology (3).

Educational programmes designed in the past for one set of circumstances are still being used under changed circumstances.

The HOP institutions urge the revision of mission statements to include: the teaching of population-based subjects to all health professional students; the assumption of institutional responsibility for maximizing the health of a defined population within available resources; and the involvement of institutions in the deployment of health-related resources and in the social/political process as an advocate of the public interest.

The development of networks of institutions with common interests, like the two mentioned above, is a recent phenomenon in the health sector internationally. Over the past 10 years, more than a dozen such networks have appeared to focus fresh interests and resources on selected problems.

Academic values and the pursuit of institutional missions

Two forces can be identified that may divert interest from a concerted institutional response to societal needs. One is the set of academic values that relate to career promotion through the academic ranks. The other is the influence of the financing of medical care — the shift towards so-called corporate medicine.

Lively debates are under way in many countries about the values assigned to various academic pursuits that determine the promotion of staff members through the academic ranks. Changes in medical education that would carry faculty staff and students out of the traditional university setting and compete in time and resources with more fundamental research obviously raise questions about university values and purposes. The practical concern is that institutions with a strong research orientation may devalue field work and service-oriented tasks to the extent that academic staff may be dissuaded from such involvement.

Ernest Boyer provides a fresh perspective on how there can be a broadening of the ways in which the university defines, encourages and rewards scholarship. In his book Scholarship reconsidered: priorities of the professoriate, Boyer reviews the history of how universities have handled the meaning of scholarship, ranging from a predominant emphasis on research to a seeking of balance between research, teaching and service (12). Boyer’s conclusion, widely applauded by academic leadership in the USA, is that it is time to redefine these issues. He recommends four forms of scholarship to be incorporated into university perspectives:

- the scholarship of discovery (research);
- the scholarship of integration (making connections across disciplines);
- the scholarship of application (using scholarship to solve problems); and
- the scholarship of teaching (transmitting, transforming and extending knowledge).

These changes in academic perspective would have a special value in developing countries, where new universities are being established to deal with the nearly intractable problems of development and where it is necessary to obtain some release.
from the constraints of research as the dominant academic theme, especially if there is often an imported disdain for service.

A second set of forces that may divert interest away from institutional response to societal need is embedded in the financing of medical care. Under the relentless pressure to contain costs and increase revenues, many medical colleges and their associated hospitals are developing arrangements whereby faculty members contribute to institutional resources through income generated by clinical practice. The result, sometimes referred to as “corporate medicine”, may involve a shift in institutional priorities from teaching and research to income generation through clinical practice. Such shifts in institutional priorities may seriously distort the balance between research, teaching and service (13, 14).

Enlarging the boundaries of medical education

Against this background of societal challenges to medicine and the role of the university in response, we can look more directly at medical education. A theme that emerges constantly from discussions is that the boundaries of medical education are being broadened — pulled from outside by societal demands for more responsive institutions and pushed from within by those who are struggling towards responsive change.

Of the many ways in which this is being done, we will focus on five:

— changing of institutional missions;
— revision of outdated curricula;
— development of new methods of teaching and learning;
— development of a population-based medical education; and
— application of ethics in medicine.

Changing of institutional missions

Mission statements, treated seriously, can serve as explicit expressions of institutional purpose. Here we call attention to two examples of missions that are purposeful responses to societal needs.

The Aga Khan University in Karachi, Pakistan, recently revised its institutional mission statement to say that its education, research and service are oriented towards improving the health of the people of Pakistan (and the developing world) and the health services that serve them. This statement focuses on improving health, rather than simply providing health care, and on improving health services as well, rather than accepting the notion that health services are only the responsibility of government.

The mission statement is given operational practicality by the objectives of the University’s Department of Community Health Sciences, which emphasizes the development of health systems in Pakistan through education and research, the development of health system prototypes in collaboration with local and national authorities, and the education of health personnel for leadership in dealing with health and development problems, particularly in the more deprived communities of Pakistan. These statements are serious expressions of institutional policy, and relevant inputs and outcomes are measured through careful monitoring and evaluation (15, 16).

In North America, among the several goals and objectives recommended by the HOP
programme, one can find paired objectives directed at achieving change:

- within the academic health centre, to provide basic competences in population-based subjects to all health professional students;

A substantial part of the potential for advancing development resides with the community, and much of the role of the health professional is to enhance the capacity of the community for its own development.

- with respect to the academic health centre’s role in the community, to assume institutional responsibility for maximizing the health of a defined population within the limits of available resources.

While these ideas were developed mainly in response to the situation in North America, it may be noted that the educational and research programmes at the Aga Khan University are in keeping with precisely the same goals. This is an instance of the potential for instructive interaction between universities in developed and developing countries.

Revision of outdated curricula

It is in the nature of change that the past gives way to the present, and the history of medical education is one of change from generation to generation. Here are two examples, one from the developed countries, the other from the developing world.

In North America, advances in technology, rising costs, and associated changes in the structures of health care have shifted the locus of much of medical care beyond hospitals to ambulatory and community-based settings. Under these circumstances, the need for generalist physicians — general internists, general paediatricians and family physicians — is rising. Simultaneously, increasing numbers of medical school and residency graduates are entering subspecialties, attracted by a desire to gain mastery over a well-defined and circumscribed field and by greater financial rewards.

Training programmes have played a part in these trends. The educational environment in the field of internal medicine has often focused on the care of hospitalized patients by subspecialists of internal medicine. Generalist internists, as role models, may not have been much in evidence. Serious concern over this issue is now expressed by leading figures in medical education and the generalist specialties. Calls for curriculum reform are insistent and widespread (17).

A curiosity here is that educational programmes designed in the past for one set of circumstances are still being used under changed circumstances — yesterday’s programmes are a misfit for today’s problems. That time leads to new circumstances is inevitable, but will appropriate change follow? National leaders in this field are calling for urgent change.

While the developed countries are far from immune to outdated and stagnant curricula, the problem can be severe in some developing countries. The “colonial legacy” often included the establishment of medical schools and associated postgraduate programmes. There are recurrent historical examples of programmes that were appropriate for the time but are now out of
date because needs and curriculum concepts have changed.

The reasons for failure to advance with time are several. It could be due to reverence for what worked well for those now in leadership roles, or to the simple fact that change is difficult in a complex technical area in the face of competing demands from other problems of underdevelopment. Ironically, such curricula have usually been abandoned in the country of origin, and newer patterns adopted.

Methods of curriculum supervision may restrict change. National medical educational councils may set curriculum guidelines or national qualifying examinations in ways that obstruct experimentation and change by individual medical schools. The intention may be to maintain standards, but the result quenches the flexibility required for constructive change (18, 19).

A related issue has to do with the limited capacity for change in developing country settings in which the academic staff are both scarce and part-time (the latter because of the need to contain costs — the developing country equivalent of corporate medicine), budgets are tight (sometimes to the point of being absurdly inadequate), and patient loads are overwhelming.

**New methods of teaching and learning**

The boundaries of medical education are also broadening because methods of teaching and learning are continuing to change in ever more interesting ways. As illustrations we shall discuss, first, problem-based learning, and then an interesting perspective on training for clinical decision-making.

Problem-based, student-centred learning is a well-established method of proven effectiveness in the teaching of clinical reasoning. A specific clinical problem becomes the stimulus for identifying what is necessary in order to understand and manage that problem — at a level appropriate for the student at that time. This differs in a subtle but significant way from “problem solving” *per se*, which focuses on bringing a body of previously learned information to bear on finding the correct answer to a problem (20).

The University of New Mexico, in the USA, has developed a second curricular track in the form of a student-centred, problem-based programme called the primary care curriculum, which has demonstrated that students can cope surprisingly well with clinical problems from their earliest weeks at medical school, learning the language and principles of the basic sciences through interaction with clinical problems (21).

The Association of American Medical Colleges has recommended widespread curricular changes favouring problem-based, student-centred learning with an integration of basic and clinical sciences (22).

A shift in the nature of residency training is under way. Instead of being seen mainly as a hospital-based service programme, it is becoming a more formally planned educational programme (23, 24). Ende & Davidoff have explored the nature of a curriculum for this purpose (23). Most curricula for residency programmes in internal medicine have been built from the traditional or technological model. The curriculum-maker determines the knowledge and skills the learners already possess and those that they are expected to acquire, the difference being parcelled into discrete learning objectives. Curricula formed in this way possess an internal, almost seductive,
logic but for graduate medical education Ende & Davidoff say that the model simply does not fit.

Learning in graduate education begins with an experience, a new clinical encounter that throws into question the learner’s previous assumptions. An alternative process of

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reflection (or mental exploration of the experience) and action follows. Previous knowledge is critical—one cannot think about things one does not know—but knowledge in this model of learning is not so much received as discovered. The authors call this an “experiential curriculum”.

The technological model focuses on outcomes but uncouples the outcomes from the actual learning process. In the technological curriculum, lists of knowledge and skills represent final destinations; in the experiential curriculum, they provide only points of departure.

This approach, which breaks away from traditional approaches to curriculum design, can have applications that go beyond patient care to, for example, community-based problems. It is in the community, too, that the student will undergo experiences in the social, political, environmental, economic and health sectors that lead to learning by discovery.

**Population-based settings for learning**

The call for academic health centres to broaden the scope of their responsibilities to include institutional responsibility for the health of a defined population is a change of major proportions, arguably one of the most significant in the recent history of medical education.

The implications for research and for educational and service responsibilities are profound. Just as the care of individual patients finds its foundation in basic medical and clinical sciences, and the locus of care embraces settings of importance to those patients, so the care of populations needs to be founded on an expanded view of the relevant sciences, and the locus of action is where the population lives, works, and is cared for. Therefore we must attempt to master the disciplines that help us to understand the determinants and dynamics of disease in populations and how to prevent, control or manage those patterns of disease. Further, the boundary of influence of the university on the health of those populations expands to include other sectors — social, behavioural, economic, environmental and occupational.

The teaching and learning settings for population-based medicine must include settings in which (i) students, residents and faculty are present within those populations, (ii) they become aware of the factors that bear on health and well-being, and (iii) they can come to grips with those factors. While many examples can be given of universities involved in such settings, the Aga Khan University provides an illustration of a curriculum that is largely community-based and closely integrated with health system development (15). Over the five-year medical course, 20% of curriculum time is devoted to community health sciences, from the first to the last week of medical studies. The
curriculum leads students and faculty progressively through the problem-solving steps required to: determine the problems of the population and the health services that serve them; plan for the solutions to those problems; combine the solutions into an integrated health system; and implement, manage, monitor and evaluate that system. Much of the curriculum is student-centred, problem-oriented and competency-based.

This process carries the university, students and faculty deep into the problems of underdevelopment. They inevitably become involved in social and political advocacy in the interests of communities. They learn that a substantial part of the potential for advancing development, including health, resides with the community, and that much of the role of the health professional is to enhance the capacity of the community for its own development. They come to appreciate the dynamics of health system reform and to realize the importance of developing science-based prototypes for change and of collaborating with the government, nongovernmental organizations and the community in building the lessons from the prototype into large-scale systems.

A critical issue in this process is that the curriculum, to a substantial degree, rises from the development process in the field. Baseline surveys require an understanding of the epidemiology of the disease pattern. The response, or failure of response, to interventions gives an indication of the determinants of health and disease. Changing patterns of disease over time raise questions about the health transition. Differing degrees of cost-effectiveness call into question priorities and possible conflicts between cost-effectiveness and equity. A management information system that is effective in a research setting may need major modifications in a broad public setting (16). Such issues continuously form challenges to both students and faculty.

Analogously, the Health of the Public programme pinpoints the importance of measuring the impact of interventions on the lives of people as they live in their communities (25).

As universities in both developed and developing countries become more and more involved in population-based programmes, their experiences can be complementary; the problems and responses in developing settings may be found to be different from those in developed settings but nevertheless very useful in the latter, particularly when universities in the developing country become more involved with deprived communities.

Ethics in medical education

Ethics has become more prominent in the health sector over the past two to three decades. Issues such as abortion, patient autonomy, truth-telling and distributive justice have attracted considerable attention. The basic principles of medical ethics—autonomy (respect for persons), non-maleficence (doing no harm), beneficence (doing good) and justice—have found their way quickly into the medical educational and patient-care environment. Further ethical questions, some dramatic and urgent, are raised by the new biomedical technologies and changing social perspectives.

Ethics has a well-deserved place in at least three aspects of university life: in the education and personal development of students; in the care of patients; and in the university’s involvement in population-based health care.

- In education, ethics should not be seen simply as a set of moral truths to be conveyed to students like any factual
subject-matter in the curriculum. Rather, the objective should be to encourage students to think carefully about complex moral issues and to become practised in moral reasoning.

The computer will be a dominant factor in the education and practice of physicians.

- Staff and students can continuously interact around the ethical content of the problems arising in patient care — whether a patient should be told a disturbing truth (which may be decided differently in different cultural settings), whether the results from amniocentesis should be used to save a life and whether that life would be worth living, and who has a right of ownership of the knowledge that a patient has an inheritable disease or AIDS.

- In population-based health care, other ethical issues arise. A commitment to equity, for example, places strong demands on health-system design and management. There is an ethical requirement to solicit community agreement before undertaking research involving the people in that community. There is a moral obligation to undertake interventions if a problem is identified for which there is a feasible answer (26).

While in these three ways ethics clearly fits into the university environment, its potential for integration into a holistic ethical construct should not be lost. Ultimately ethical principles and moral reasoning are best appreciated in their application to real world problems. Students and staff sort them out together, in the classroom, on the wards, and in the community, as experiences leading to their own moral maturation.

The university should be more than a location where these experiences occur; it should be fully integrated into the process. The values, missions and practices of the university should reflect its own ethical values, such as honesty, keeping promises, free expression, helping others, and making commitments to respond to societal problems (9). It is when ethical interest and concern surround students as a natural part of the academic milieu that there is the best opportunity for moral growth.

What will tomorrow bring?

Some of what tomorrow will bring is predictable, at least in direction. It is accepted that there will be extensive technological advances in methods of diagnosis and care, in library systems and methods of supporting learning (27), and in communications and data management systems. The computer will be a dominant factor in the education and practice of physicians (28). Continuing medical education will need the support of these advances in an era when the rates of change in knowledge will continue to accelerate (29). There will be an increasing need for interactions among educational programmes for the health professions in support of teamwork and the mutual understanding of roles. Environmental concern will mount with increasing threats to the ecology and growing awareness of the interactions between health and the environment.

In the function, staffing, financing and organization of health systems there will be strong trends in the direction of equity as a social and economic guideline for health care, and it is likely that universities will
become ever more involved in the changes in health systems and in the care of the people they serve.

The developing world will become more developed, but not all of it; some parts will remain hopelessly trapped in change-resistant conditions. And some parts of the developed world will recede into disturbing examples of “development gone wrong”. Increasingly, international partnerships in social, economic, environmental and educational programmes will evolve, and these will naturally include medical education. The simple fact that 2400 medical students from North America experienced electives in developing countries in 1990 is indicative of the scale of interaction that is possible (30).

Other aspects of tomorrow will remain as surprises: unforeseen health problems (tomorrow’s versions of AIDS); radical shifts in the economics of health care (with more explicit approaches to rationing health services); and new ways of making social decisions about the allocation of health resources (with communities or local government being more prominent in the process). There will be a continuing evolution in social values and to the meanings given to life and to human relationships, from highly creative and constructive responses to deeply disturbing and cruelly distorted responses. Medicine must evolve too, towards a deeper understanding of the social context in which people live.

One of the great risks of tomorrow is that technology will displace humaneness in medicine. The response to this will be twofold. There will be those who champion technological advances and use their skills and creativity to maximize the usefulness of these technologies to the needs of patients and communities, and there will be those drawn to the personal and social needs of people and their communities but who will maintain their links with the technological side. There need be no contradiction between these extremes, and one of the important challenges to medicine and medical education is to encompass both.

Prospects for change

At one time there was a general belief that the necessary corrective changes in medical education could be achieved through teachers who were better prepared for their work in medical education and through better curricula.

There is increasing recognition, however, that the context within which medical education takes place — the university, the health care system, and the larger needs of society — must be taken into account as well. Indeed, much of the criticism of medical education is that it remains unresponsive to these broader issues.

As a straightforward and contemporary example we may remark again on the rising need in North America for generalist physicians, which is in contrast to the small and diminishing numbers of medical and residency graduates choosing such careers. Something is wrong and must be corrected. It may not be easily correctable, because the determinants of career choice are complex, but there must be a determined response from the medical educational establishment or it will risk a further erosion of public confidence (17). Here is an example of a problem that has been identified and for which a response is under consideration. Unfortunately there are other examples in many countries of mismatches between medical education and societal need that have not been identified and for which no responses have emerged.
Even with those deficiencies in full view, however, it is apparent that there is no shortage of innovation in medical education. There are numerous university projects that are responsive to national need, that link with communities and government, that

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One of the great risks of tomorrow is that technology will displace humaneness in medicine.

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involve planning among a consortium of medical educational institutions, and that result in changes in methods of education and the strengthening of the scientific component of clinic- and population-based education (31).

While for some there is a lack of vision regarding the new directions medical education might take, for others there is a conviction that there is no shortage of models or educational imagination. Rather the problem is identifying the obstacles to change and developing strategies for overcoming them (32, 33).

Critical questions remain. Is it possible to bring about the necessary changes in medical education through current approaches, which, while of serious concern to many parties, are largely informal and without systematic organization at the global level? Would it be possible to develop a global strategy and a global organizational arrangement through which to address this problem?

WHO has taken the first steps. It has:

- suggested a method of assessing the quality of medical education (34);
- put forward “an agenda for action” in pursuit of widespread change in medical education (35).

The consequence of these steps allows us to consider a world agenda for changing medical education. It could have three components that combine into an integrated approach to both local changes and the international coordination of such changes:

- a tool for assessing the quality and relevance of medical education, which could be adapted to local, regional and international needs;
- a set of strategies for change, which could be shared and adapted for local, regional and international conditions;
- an arrangement for monitoring progress on a global scale—an essential component for serious pursuit of an international change process.

The instruments required to proceed in this direction are at an advanced stage of development, the ideas that underlie them continue to evolve, and there is interested leadership. The question remains, is it workable? Would a global approach to this problem be feasible? The answer has to be yes. The investments in medical education and health care are so high and the human and fiscal costs of falling short so serious that even the possibility of success in a global programme would warrant every effort.

A cautionary note: a radical shift would be required in the approach to generating change in medical education. Hitherto, approaches have been largely local and regional, ad hoc, and without sustained attention. The periodic international conferences—WHO’s technical discussions in 1984 on the roles of universities in
strategies for health for all (7), and the World Conference on Medical Education held in Edinburgh in 1988 (5)—have been of first importance but by themselves are insufficient to mobilize change on the scale required.

Change on that scale is possible. A base of knowledge, experience, expertise, and commitment is there, and methods and technologies for managing large, complex, international programmes are already at hand and should be used.

The roles of networks should be kept in mind (31). The past decade and a half has brought a dozen or more networks onto the scene of international health, some of them focused specifically on medical education. These networks bring fresh approaches to international change, particularly through their involvement of institutions or people that might otherwise be overlooked, and in their promotion of decentralization of initiative, an important ingredient for an international movement. Further, there is a potential for synergism in interactions among the networks.

In formulating a global approach, a central focal point would be necessary (why not WHO?) to help conceptualize, coordinate, bring the partners together to develop general guidelines and materials, and disseminate information. The Regional Offices of WHO could further the process. Beyond the WHO system could be a variety of participants; some of the networks would certainly be interested, including bodies such as the Network of Community Oriented Educational Institutions in Health Sciences and the World Federation for Medical Education. Other national and regional organizations could contribute. The medical educational literature would play a critical role in communicating the directions of change, by supporting, probing, criticizing, and emphasizing particular points.

In the end, it will be the scale of interest, commitment and resources that will be at issue. In a world where disaster and opportunity stand side by side in competition for scarce resources, where will the needs for change in medical education fit? The answer depends on how the case is presented, and on how much emphasis is given to the costs of stagnation and the benefits of change.

Thomas Kuhn has brought an important scientific perspective to concepts of change (36). For Kuhn, the central concept of scientific progress is the paradigm—universally recognized scientific achievements that provide model problems and solutions to a community of scientists. A given field of knowledge evolves as research based on existing knowledge produces new observations that overturn previous understandings. These transformations of paradigms are scientific revolutions, and successive transitions from one paradigm to another constitute the usual development pattern of mature science. While Kuhn applied the concept of paradigm change to the natural sciences, the same concepts are valid in other sectors of science as well (37).

And why not for medical education? Is the time not right for a careful delineation of what is needed in the education of tomorrow’s doctors and the generation of the transformations required for that accomplishment?

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Discussion

Arthur Kaufman

— Resistance to change has to be overcome in medical schools

Dr Boelen summarizes the views of many study groups to the effect that medical education should extend beyond its traditional boundaries to link up with health care systems and address the needs of populations rather than just of individuals. Professor Bryant discusses the associated challenges that confront academic health centres. Despite the clear need for educational change it is strongly resisted by the great majority of medical schools.

Physicians and medical schools occupy a prestigious position in society and are accorded considerable self-regulatory authority. This creates problems for society in general and for the medical profession itself, since physicians’ professional priorities and decisions may not match society’s main health care requirements. Furthermore, the high social status of the medical profession relative to that of other health workers means that failed applicants to medical schools tend not to seek careers as, for example, nurses, but to opt for other professions with power and prestige. For many applicants to medical schools, high status and upward mobility may provide greater motivation than serving society.

Academic medicine is dominated by rewards for successful biomedical research and for the use of high technology in the treatment of individual patients. Faculty members in bio-medical research and clinical subspecialties assume leadership roles and determine how resources are used. This state of affairs is reinforced by government grants and both private and public payment schemes.

It is a matter of only marginal concern to most faculty members whether such a system can meet the needs of communities for more primary care physicians, more emphasis on prevention, and more equity in the distribution of services. Faculty members are remote from their patients’ communities and the complex social, political and economic forces underlying ill-health. Unfortunately, the health service sector tends neither to communicate effectively with the education sector nor to have a major influence on the latter’s decisions. Those in academic centres who have a broader vision are usually too few to exercise significant influence on their own. They need to combine with powerful outside forces, such as health care consumers, government bodies, licensing boards, physicians’ practice groups and the business sector.

Early, sustained exposure of medical students to the work of primary care physicians in the community can influence them to practise in this setting. Nurses, social workers and community development workers should also play a part in the training of these students. The service sector can become an important partner of the academic centres in identifying varied learning sites and a new mix of teachers.

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Communities and health care consumer groups can help to recruit and select future physicians. The admission criteria for selection should include predictors of later service. In the USA, for example, applicants with rural backgrounds are three times more likely to practice in rural areas than are those with urban backgrounds. Since faculty members tend to select people like themselves, admissions committees should be expanded to include people who reflect community needs, for instance members of minority groups and inhabitants of rural areas.

As the wall between academia and the community crumbles, the responsiveness of medical schools to communities can be expected to increase, as urged by Dr Boelen and Professor Bryant.

Medical school admissions committees should be expanded to include people who reflect community needs.

Robert Blacklow, James Boex, & Lowell Gerson

— The physician’s workplace should be the community

Dr Boelen and Professor Bryant examine a matter that was raised in the early years of the twentieth century by George Bernard Shaw (in the preface to *The doctor’s dilemma*), when he called for physicians whose primary responsibility would be to maintain health, not treat illness.

In the USA there are far more medical graduates now than there were 20 years ago, but today fewer doctors are willing to practise the kind of medicine needed by the nation at large. Furthermore, subspecialty-orientated education does not prepare them for the realities of community practice.

American society is now demanding that the community should be the physician’s workplace. How can a balance be struck between care for individual patients and population medicine? At the Northeastern Ohio Universities College of Medicine, a community-based medical school founded in 1973, over 90% of the students participate in an accelerated BS/MD programme. Clinical education is given in eight community teaching hospitals. Through the Division of Community Health Sciences, instruction is given on population medicine, research is undertaken, methodological support is provided to other researchers, and consultative and other services are made available to the communities of the region.

Early in the course, students working in teams are asked to develop a strategy for helping to solve a community health problem, and they present their solution to community and state legislators in a mock budget hearing. Thus the students come into contact with community problems, the mechanisms by which these are addressed, community professionals, and elected officials. Second-year students are based for

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60% of their curricular time in medical education centres in outpatient facilities of community teaching hospitals, and in general the second-year medical students spend 50% more time learning patient-related skills in the ambulatory setting than do those studying elsewhere in the state.

In the junior year all students take a four-week family medicine clerkship, which is primarily an ambulatory training experience with a large component of population medicine which includes patient education and preventive medicine. In their senior year the students take a four-week, office-based primary care preceptorship. This again takes them away from the tertiary care environment of the hospital; general internists, general paediatricians and family physicians train the students in the realities of community-based practice, and there are major population medicine components.

Since the first class graduated in 1981, over 65% of graduates have remained in Ohio. Almost 50% are in the primary care specialties of family practice, internal medicine, paediatrics or obstetrics and gynaecology. As yet a sufficient number have not been placed in the small towns and rural areas. In order to improve matters further the following curricular changes are planned for the 1994–95 academic year.

- A “continuity of care” clerkship will be introduced at the beginning of the junior year. Students will be assigned a physician and a family of patients from the medical education centre where they were located during their second year. In this way they will learn more about both community-based primary care and the types of health-related problem encountered by families in their communities.

- During the senior year all students will take a four-week community clerkship, which will revisit the problem-oriented approach (encountered earlier in the course) with a higher set of academic and clinical expectations. Community health problems identified as part of a community diagnosis will be allocated to interdisciplinary teams of students from the medical and other health professions. In addition to being submitted to academic evaluation the results will be presented to a citizens’ group overseeing the community health planning process with a view to implementation.

There should be greater congruence between the needs of society, the rewards for practice, and the readiness of medical education to embrace individual patient care and population medicine in balanced measure.

To conclude, it is clear that there should be greater congruence between the needs of society, the rewards for practice, and the readiness of medical education to embrace individual patient care and population medicine in balanced measure.
George E. Miller*

- Establishing national value systems and priorities: the central role of politicians

During the second half of the twentieth century, medical faculties have become embroiled in controversy over medicine-as-science versus medicine-as-service. To varying degrees this polarization has characterized debate on curriculum organization and content and it has profoundly influenced the priorities of academic staff. So far it appears that biomedical science has prevailed. Thus rewards go to individuals and institutions whose contributions are primarily to the advancement of basic or clinical sciences, rather than to health promotion, disease prevention and comprehensive health care. The status of medical schools is commonly judged by the size of their research budgets, the prominence of faculty members as investigators, and the numbers of graduates who enter academic careers. Consequently, the attention of both students and teachers is diverted from community service.

Educators should intensify their attempts to make the training of physicians more consistent with national needs.

Of course, one cannot deny the immense advances in medical care that have come about because of this orientation. Yet, as Professor Bryant wrote in Health and the developing world many years ago, “Large numbers of the world’s people have no access to health care at all, and for many of the rest the care they receive does not answer their problems. The grim irony is that dazzling advances in biomedical science are scarcely felt in areas where the need is greatest.”

Medical schools are undoubtedly producing graduates ill-equipped to grapple with most of the requirements that Dr Boelen outlines for physicians of the future, but of equal importance are the social, cultural and economic factors that influence health service systems. Economic considerations lead practitioners to do those things that bring the greatest rewards in the settings that offer the best opportunities. Is it any wonder that they are attracted to specialties of high prestige and remuneration and to urban centres? The controllers of health system budgets seem more often to exacerbate maldistribution than to alleviate it. In developed and developing countries alike the main weight of investment tends to be in tertiary care hospitals and in diagnosis and therapy based on high technology, rather than in measures that might reduce the need for these things or in the more equitable distribution of resources.

Both authors call for a global programme deriving from a logical analysis of the problems. Yet the central issue still seems to be one of values, which ultimately determine priorities. Dr Boelen writes: “Human rights and the quest for equity and quality in health care are universal values”. However, in the real world the response seems to be “Yes, but...”. Because resources are limited, choices have to be made. Sadly, they seem to be dictated more often by special interests than by universal values. Even in the field of medicine there is little agreement on priorities. Where decisions are reached through political negotiation, calls for basic health services rarely compete.

* Adapted from a paper provided by George E. Miller, who is Emeritus Professor of Medical Education, University of Illinois College of Medicine. His address is RR4 Box 405, Clinton, NY 13323, USA.
successfully with demands for armaments, farm subsidies or other social programmes.

The actions suggested by Dr Boelen and Professor Bryant are unquestionably appropriate and desirable. Educators should intensify their attempts to make the training of physicians more consistent with national needs. Health service sectors should be equally vigorous in pursuing changes required to accomplish the goals of equity and quality. But the main aim should be to convince politicians of their central role in establishing national value systems and priorities to assure health for all. Without dynamic political leadership at all levels we are likely to continue scratching at the surface of the problems.

Bryant believes that international partnerships in educational programmes will evolve and argues that large movements of medical students from developed to developing countries in recent years indicate the potential for interaction. However, in most developed countries the present barriers to the migration of doctors are bound to have a negative effect on international partnerships. On the other hand, economic factors have forced medical schools in some developed countries to attract foreign students even if this has meant denying places to their own nationals.

The imbalance between curative services on the one hand and preventive and promotive services on the other is undoubtedly serious. Medical schools have made attempts to address this issue but with only limited success. The production of doctors with a new orientation cannot be undertaken by medical education alone. The curative orientation reflects an implicit priority of both the public and employers, and it is favoured by the structure of budgetary allocations, appointments and salaries. Unless this state of affairs is corrected, educational changes have little chance of making a significant impact on doctors' orientation. Dr Boelen rightly argues that such changes are inseparable from changes in practice. But which should come first? Should medical education change, in the hope that a differently trained product will influence the orientation of health care? Or should health care be changed first, leaving medical schools to respond appropriately?

Curricula change gradually. Fortunately, the seeds of change have already been sown and curricula have moved towards community orientation. Some developing countries, notably Indonesia, Iran, and Nepal, have given a lead in this respect. In Australia, community hospitals have

Raja Bandaranayake

— All departments in medical schools should actively promote community orientation

Professor Bryant predicts that universities will become more involved in changes in health systems and in the care of populations. But are there good grounds for thinking that this will happen? Medical educators have repeatedly advocated curricula reflecting societal health needs but medical schools have responded slowly, if at all. What new forces would induce them to change their outlook? Professor

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been providing increased opportunities for undergraduate training. Why have such movements had so little influence on health care? One reason could be that community orientation has been seen solely as the domain of community medicine. A much broader approach is desirable. Clinical contextual issues of health and society, has been given little recognition by the universities, and consequently academics are deterred from becoming involved. Perhaps the same fate could befall the proposed strategy, which is likely to take the academic away from the laboratory and the library.

The notion of curricular integration has had slow acceptance, affecting as it does the philosophy of the medical school. Pessimism is likely to give way to optimism only if the magnitude of change is diminished. If medical educators, clinicians and basic scientists can become jointly involved with service providers in tackling population health problems, medical students may gradually change their outlook.

Engagement in community health issues need not compromise the traditional academic values and standards of the medical school.

Vic Neufeld

– Medical education should reflect societal needs

Dr Boelen and Professor Bryant have laid out some major themes and strategies for reform in medical education. The challenge, of course, is to translate these ideas into sustained action.

Medical education clearly has to become responsive to emerging or refractive problems of society. Problems and needs have to be defined, and programmes and practices then have to be reformed. Two examples are offered below to illustrate what can be done in this area.

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In 1985 a task force of the Network of Community-Oriented Educational Institutions for Health Sciences, consisting of members from Canada, Egypt, Finland, Indonesia, Nigeria, and Thailand, was asked to develop tools for the identification of major health problems in a region served by a particular medical school, and to incorporate the resulting analysis into its curriculum. The work was completed in 1989 with the production of a model of priority health problems. Specific examples were given of how an objective assessment of health needs could be incorporated into a medical education curriculum (1).

In Ontario, Canada, there were indications for several years that the performance of physicians was not meeting the expectations and needs of the public. Supported by a consortium including a charitable organization and the provincial government, five medical schools began a five-year project in 1990 entitled “Educating future physicians for Ontario”. The project’s main goal is to make medical education more responsive to the evolving requirements of Ontario society, and its initial task was to define the needs and expectations of the public as they related to the roles and competences of physicians. Information was obtained from the global scientific literature, reports on health care reform and medical education, direct interviews and discussions with citizens’ groups, written submissions, focus group discussions, surveys of groups of health professionals, and discussions with educators in the medical schools. Various roles for future physicians were identified, including those of medical expert (clinical decision-maker), communicator (healer, educator, humanist), collaborator, gatekeeper (resource manager), health advocate, scientist (scholar) and ordinary human being. A systematic analysis of health data for Ontario is under way. This information has been released to the leaders of the five medical education programmes and is being incorporated into the curricula of the participating institutions (2).

An underlying assumption in the main articles is that changes in medical education will ultimately lead to improvement in the health and well-being of individuals and communities. Is this too much to expect? The following points should be considered.

- Health is determined by more than the interventions of the health care system; at least as important are factors such as economic status, literacy, social supports and early childhood development.
- The efforts of physicians are only a small part of the work of the health care system.
- Only some of the interventions used by medical practitioners have been shown scientifically to be effective.
- The day-to-day performance of physicians is probably determined more by practice factors (e.g., how they are paid) than by a few years of basic medical education.

**Educators should create opportunities for medical students to acquire the skills and knowledge needed to assist communities in the development of their capacities for identifying, analysing and solving problems.**

It seems that the gap between what students learn in medical school and the health of the people they eventually serve is too wide for there to be a causal link. Yet some schools are determined to produce graduates who can help to identify and solve the problems of the communities they serve, in the expectation that the health of the people will thereby be enhanced.
There are several examples — two are mentioned below — of medical students participating in community-based research and action projects in which problems are identified through a partnership arrangement including the university, the community and a component of government.

In the Mexican state of Guerrero, medical students took part in a series of community-based studies, in each of which a single priority health problem was identified by the community; existing information was analysed in order to find out what data were lacking, a questionnaire was developed and field-tested to obtain precise information on the problems, data were collected simultaneously at different sites or sequentially, and a summary report was presented to the community in a relatively short time. An action programme was implemented on the basis of the results, and follow-up studies were performed to determine changes in health outcomes \(^9\). Experience with this approach in several countries has demonstrated improvements in the health of the communities concerned.

Following an initiative of village leaders who had identified some recurrent community problems in Egypt, medical students from the Suez Canal University were involved in the creation of a partnership arrangement that included a village community, the university and local government. Specific research and action projects were designed to address the problems. In addition to improvements in health and social outcomes, the community’s own capacity for problem identification and analysis and for the implementation of solutions was strengthened.

Educators should create opportunities for medical students to acquire the skills and knowledge needed to assist communities in the development of their capacities for identifying, analysing and solving problems. One way to do this is to have the university itself functioning as a role model, as outlined by Professor Bryant, and providing the institutional framework in which students can prepare themselves for their new roles.


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A. A. M. Roslani

— Curricula: space needed for innovation

The articles by Dr Boelen and Professor Bryant bring into focus the interconnected issues of political will, community needs, and institutional commitment to change. Why does change in medical education proceed so slowly? First and foremost, politicians are largely influenced by what is visible and tangible, as with hospital-based services. The specialties fight tooth and nail to protect their interests, and national bodies that regulate medical practice often do the same.

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With increasing amounts of specialized material being forced into medical courses only the very brightest students can handle the work involved, and then only by rote learning. Consequently, the medical profession tends to become dehumanized. Courses on the behavioural sciences and the holistic approach to health care are likely to be viewed merely as obstacles to be overcome.

As course content expands, medical schools in the developed world are moving on to graduate programmes, a step that hinders rather than helps curricular innovation. Government and society should prevail on medical schools not to proceed with such measures, which are only likely to raise the cost of producing doctors.

Professor Bryant points out that the corporatization of medical institutions becomes a reality as governments seek to reduce expenditure. Subspecialties are given indirect incentives in the form of fees-for-service, an acceptable situation in the developed world, where a balance has been attained between the provision of health services and the availability of personnel. This is not the case in the Third World, however, yet the fee-for-service system is overtaking health education as a priority. The specialties take pride of place, education is secondary. The developing world cannot afford this, and personal interests are imposed on education under the guise of the maintenance of standards. But, one might ask, whose standards are they and for whose benefit are they being applied? Where and when are they to be brought into play?

An easy solution is at hand if common sense prevails: the core elements of curricula could form the basis for an international standard. Finally, faculty systems should be replaced by school systems which, centrally controlled, would allow for innovation; programmes could be directed by the schools, and implementation and collaboration would be easier to manage.

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**Zohair M. Nooman**

*– Wanted: graduates to serve their communities humanely and effectively*

The main articles emphasize that medical education is not an end in itself but a means of serving people's health needs and contributing to health development. All worthwhile efforts to modify medical education in conformity with the circumstances of the late twentieth century have recognized the necessity of coordinating such change with the reorientation of health care systems. It is much more difficult to alter medical practice and health care systems than medical education.

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Professor Bryant declares that universities and medical schools should take responsibility for the health of their local populations, a view that has gained acceptance in some quarters. In so far as education is concerned, it is clearly the responsibility of medical schools to design or redesign curricula in order to produce graduates who can humanely, efficiently and effectively serve the health needs of their communities. In addition to basic medical education there should be responsive specialty training and continuing medical education. Professor Bryant also mentions that, in the USA, residency opportunities for generalist physicians are limited. Unfortunately, this is also true in many developing countries, where the need is greater. Continuing education is vital for practitioners who strive to meet societal needs, and medical schools should be strong advocates of its provision and even its enforcement. Innovative curricula approach the need for lifelong study by stressing self-directed strategies in basic medical education, e.g., problem-based learning.

In health services the newly proposed responsibilities, with the inclusion of primary as well as tertiary functions, imply great expansion of the contribution of medical schools to community health services. It is incumbent on the schools to provide a role model for quality care relevant to the needs of the populations concerned. The university health system has to address issues like cost containment, cost efficiency, the utilization of appropriate diagnostic and therapeutic interventions, ethics, and accessibility to care. Health services research is essential for the advancement of health care delivery. In collaboration with communities and local governments, medical schools should be capable of influencing health policy and increasing its relevance to people's needs and development.

In the domain of biomedical research the main responsibility of medical schools is to encourage work aimed at solving the priority health problems of populations, alleviating the burden of illness in communities, and contributing to their health development. All departments should be involved, not just those of community health. It is important to overcome the dichotomy, mentioned by Professor Bryant, between the biomedical and population-based paradigms of medical education; this should be possible if the educational, service and research responsibilities towards defined populations are properly fulfilled.

Both of the main articles highlight the need for concerted global action to develop, generalize and sustain efforts to modify medical education and practice. It should be noted that much of the experience gained in conceptualizing, planning and implementing change in health education resides at global level in institutions forming the Network of Community-orientated Educational Institutions for Health Sciences (1). As Professor Bryant says, partnership with this and other international and regional bodies is essential if worldwide change is to be achieved. Otherwise a promising agenda may vanish from sight. Such partnerships are likely to strengthen the initiative and heighten the degree of interest of major funding agencies.

M. Manciaux

— Closer contact needed between the educational and health care systems

Although it is widely acknowledged that changes are needed in medical practice and in the training of future physicians, there are but few indications of such changes in most countries. Medical faculties are often more resistant to progress than, and indeed lag behind, many paramedical schools. By and large, over the past quarter of a century, the introduction of new watchwords and the partial modification of concepts have not been accompanied by decisive advance in either the training of doctors or the health of populations.

Professor Bryant shows that change is possible, but the examples he gives are reminiscent of the pilot centres, programmes and experiments which were so fashionable a few decades ago in developing countries but which proved unsuitable for expansion. With regard to Dr Boelen’s comparison of health and education, it is perhaps of interest to refer to René Dubos, winner of the Nobel Prize for Medicine, who remarked “Health is a potential: it is the ability of the individual and the group to adapt constantly so as to function better at present and prepare for the future”. Education could be defined in exactly the same way, and the adaptability that Dr Boelen mentions is more than ever necessary for physicians who are to work, as Professor Bryant reminds us, in rapidly changing conditions.

The young people who are beginning their medical studies now will not start practising until the end of the century. However, it should not be necessary to wait so long until medical practice develops, health systems are reformed, and people’s dissatisfaction with their health services is assuaged. In most medical schools, training is focused on hospitals, whereas most health problems are in the community. This kind of training puts more emphasis on technology than on humanistic approach. Theoretical knowledge is quickly forgotten and soon becomes obsolete, whereas the acquisition of skills in the use of technological resources and of the capacity to listen to and sympathize with patients is of more lasting value. Professor Bryant rightly advocates training in ethics so that students can develop a sound approach to complex moral problems.

In-service training could help to make up for what is lacking in initial training. Because of their day-to-day experiences, physicians change their views on training and practice. In many countries, doctors form groups for mutual instruction or at least discussion. This can lead to new roles for general practice in prevention, epidemiology, health education, evaluation and so on. In France, general practitioners help to train final-year medical students.

Public health offers valuable opportunities for training future doctors.

Some, acting as supervisors, take on students for a term so that they can observe the physicians’ work at close hand. General practitioners are also engaged by medical faculties as associate lecturers in their field, thus helping to redirect training to meet the needs of community health.

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The training of physicians could make an effective contribution to the reform of health systems if contact between the educational and health care systems became closer and more trusting. In this connection it is to be hoped that WHO will extend and strengthen its collaboration with universities and with the ministries responsible for higher education. Working together, the educational and health systems could address themselves to priority health problems, resources for medical training, and the evaluation not only of the goals of training but also of its impact on the state of health of populations. Some faculties are already involved in programmes of this kind.

Public health tends to be spurned by universities that concentrate on technical progress, and sometimes by teachers fascinated with the advances in biology and technology. Yet this vast field, encompassing social and community medicine, epidemiology, health economics, prevention and environmental hygiene, offers valuable opportunities for training future doctors.

Professor Bryant seems to suggest that the situation of medical education is worse in the developing than in the developed countries, yet the vast majority of medical schools in the developed world have outdated curricula and are resistant to change. If change is to be achieved, attention should be mainly concentrated on established schools and their products. This does not mean that new schools should be neglected, many of which have teachers and students who are effective change agents.

During the past 25 years or so, the two principal developments in medical education have been the quest for relevance, i.e., community orientation, and the emphasis placed on process rather than content, mainly through problem-based learning. Professor Bryant refers to the fear that institutional engagement in social health problems might clash with the traditional academic values of the universities. However, the present author’s experience in developing countries indicates that medical schools, mainly through the services they render, bring the universities’ mission to the notice of the public. Thus the students and staff of the University of Gezira’s Faculty of Medicine have had a wide influence in Sudan and elsewhere. If institutions are advocative and strongly committed they should be able to carry the universities beyond their traditional boundaries and into the communities.

As regards equity and university involvement in population-based health care, much remains to be done, notably in the setting of examples. How many senior medical and surgical staff emerge from their hospitals to offer students balanced training away from the bedside? How many offer their services to the communities where they live and work? Progress is unlikely if all such endeavours are restricted to

Bashir Hamad

— The health sector could do more for medical education

Until recently almost all the blame for poor progress in medical education fell on the education sector itself. Yet the health sector has much to answer for, not having provided a suitable environment in which doctors can put into practice what they have learnt.

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departments of community medicine. As Dr Boelen says, community orientation is a matter for total faculty commitment.

In general the medical profession has been rather selfish and inward-looking. Perhaps it would be a good idea to add to Dr Boelen’s definition of medical education the words “humanely, effectively and efficiently”

The health system should take an active part in curriculum planning, course design, teaching and evaluation.

...to describe the manner in which future physicians should function. After all, the community provides the means for the profession to exist.

It is worth mentioning the problems that can be caused, especially in developing countries, by sudden changes in policy in both the health and education sectors. Abrupt political decisions can have devastating effects if they fail to take account of previous painstaking reorientation, training and development of personnel.

Neither of the main articles refers to the desirability of health system involvement in the affairs of medical schools. Yet the health system should take an active part in curriculum planning, course design, teaching and evaluation, in order to maximize the relevance of medical education.

Jacques E. Des Marchais

— The problem-solving approach to learning can be a powerful change agent

Dr Boelen and Professor Bryant suggest that faculties of medicine should play a leading role in changing the paradigm of medical training, which, for the most part, is no longer appropriate to the needs of society. The task, however, is a mammoth one.

It is clear that medical training can no longer be based solely in centres of tertiary care attached to universities. In 1987 the Faculty of Medicine at Sherbrooke University in Quebec initiated a community-orientated programme using the problem-solving approach to learning almost exclusively. The mission of the faculty was to help improve the health of the population and to advance the health sciences through research and teaching programmes and health services of high quality, on a foundation of social commitment. To these ends the faculty:

— trains physicians and other health workers;
— undertakes a balanced programme of health sciences research, fostering interdisciplinarity;
— exercises leadership in care provision and provides services of high quality;
— participates actively in health promotion, disease prevention, health policy development, health service management and the work of professional bodies.

Teaching in the first three years has the following objectives:

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— the training of specialists, general practitioners and other health professionals in scientific method, problem-solving and teamwork, with a humane global approach, concern for the needs of the community, and dedication to self-instruction and the maintenance of skills;

The university has had to reconsider its mission in a context where knowledge and skills are no longer concentrated in a single urban location.

— the training of research workers;
— the provision of programmes and resources to enable health professionals to improve their knowledge and skills.

Research was to be developed in the areas of clinical epidemiology, clinical medicine, educational methods, behavioural sciences, and the evaluation of technologies and models for care provision.

Attempts to encourage interdisciplinarity by holding joint courses for nursing science and medical students have so far been unsuccessful, partly because of an unfavourable attitude among the latter group. The subject of interdisciplinarity has been combined with those of medical ethics and humane medicine in longitudinal units spanning all four years of the MD course.

Since 1988, general medical training has included a two-year practical course in family medicine, based on community needs. The government has laid down that equal numbers of specialists and generalists should be produced, and there are quotas for the numbers of entrants into the various specialties. In order to achieve uniform coverage of the province by specialist physicians, faculties are encouraged to develop training programmes based on traineeships in the community for such disciplines as internal medicine, general surgery, psychiatry, paediatrics, anaesthesia, and obstetrics and gynaecology. Interns are expected to spend between 6 and 18 months of their 60-month training period in university hospital branches throughout the province.

The university has had to reconsider its mission in a context where knowledge and skills are no longer concentrated in a single urban location. This results from rationalization and strategic planning of the categories and numbers of health professionals, and is an expression of the government’s determination to provide training that meets the principal needs of medical care and health promotion.

One should not underestimate the power of the problem-solving approach to learning as an agent of change. If the approach is merely regarded as a new educational technique it can have only a minor effect on the social system. If, on the other hand, it brings in a new educational system it becomes a powerful force for change. In Quebec it has proved possible to increase learning geared to community requirements and to introduce activities in the community at the preclinical stage. This has necessitated educational training for the teachers and adjustment of their frame of reference. In Quebec the problem-solving approach has been unequalled as an influence on the development of the medical education system.

Perhaps the vision of Dr Boelen and Professor Bryant of a leading role for medical schools in changing the paradigm of training in order to achieve a new social contract goes beyond the bounds of the
mission of universities. Universities should take their place alongside other social partners, each with its remit in an increasingly complex society.

O. Ransome-Kuti

– Training for the real world

I believe that a newly trained doctor should be able to function as a manager, motivator and provider in primary care services and as a house officer at the secondary level. Yet medical students are largely trained by and emulate specialists in the tertiary services.

I also believe that medical schools should produce doctors with the skills needed to develop health systems and confront the problems associated with them. This requires, in each country, account to be taken of political, cultural, economic and ecological factors. Regrettably, medical schools in developing countries frequently refrain from changing their training programmes in case their students fail to pass examinations set in France, the United Kingdom, or the USA. Confidence has to be developed in the ability of these institutions to produce physicians of high quality who can cope with the realities of their own countries.

The notion often exists in the minds of both teachers and students in developing countries that they should have qualifications that would, in times of economic, political or social upheaval, enable them to leave their own countries and obtain employment elsewhere. Regarding the new paradigm and new strategies of Professor Bryant and Dr Boelen, the question arises as to whether tomorrow’s doctors, with their new skills, will be able to function in any culture or environment. Will it be possible for doctors trained in the Third World, for example, to practise in developed countries? And conversely, will a doctor trained in a developed country be able to practise in Africa, with its different social and medical problems and where the health care infrastructure is weak or absent? Is it possible to devise a global standard and process of training for internationally acceptable doctors whose skills are applicable in any setting? It is certainly very difficult to reorientate present methods of training in medical schools and lead them towards the new trends in medical education.

The Aga Khan University in Karachi, where Professor Bryant now teaches, is a new medical school with a modern outlook and the courage to embark on an innovative programme. It remains to be seen whether this will take root and flourish. Some other medical schools in developing countries also began with advanced ideas but were eventually dominated by traditionalists determined to produce what they saw as proper doctors.

We therefore need to know how to establish balanced, community-orientated medical training programmes that cannot easily be converted into a programme in the teaching hospital mould, and also how to reorientate the latter so that they become community-
based. Successful models should be compiled and published in order to guide those wishing to make progress in this field.

In the interest of creating strong health teams, increased attention should be given not only to doctors’ training but also to that of nurses, laboratory and dental technicians, occupational therapists, physiotherapists and others seeking to establish professional identities and gain the ability to diagnose problems and apply solutions independently of doctors. Protocols have been developed defining the limitations of nurses and community health workers and indicating when patients should be referred to doctors. For example, should a laboratory technician whose test indicates that a child has malaria refer the case to a doctor, or should he or she start treatment just as a nurse would treat fever? The areas of independent decision-making by each member of the health team at each level of care should be clearly studied and redefined.

The reform of medical education and practice should therefore take account of the nonmedical members of the health team. Because of the scarcity of doctors and the high cost of using them at the primary level, village health aides, nurses and other health workers have well-defined areas of responsibility in health care. Laboratory technicians, physiotherapists and others need similar consideration.

Abraham Joseph

—Medical schools should focus on population-based education

Dr Boelen and Professor Bryant identify issues critical to the improvement of health services, which should have been addressed at Alma-Ata 15 years ago. Clearly, the training of doctors and nurses should have been changed in accordance with the principles of primary health care. Even today, newly graduating doctors are often unaware of these principles and of societal needs.

Professor Bryant mentions factors that hinder progress, one of them being the pressure on faculties to finance medical care, especially in private institutions. Also important, and occurring in most developing countries, is the involvement of faculty members in private practice. Salaries paid by governments are far lower than those earned in the private sector. An effort should be made to reduce this income gap so as to encourage faculty members to provide full-time service in teaching hospitals. Today’s teachers, whose main aspirations seem to be to go into private practice and attend international conferences, do not offer students the role model of the caring physician.

Professor Bryant lists ways in which institutions could move towards responsive change but does not mention the revision of student assessment methods in this connection. Unless this occurs and the focus is shifted to population-based education, students will not give societal needs the

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attention they merit. Both authors stress that it is important for medical schools to take more responsibility for the planning and delivery of health services. These institutions should be able to provide promotive, preventive and curative care for defined communities; this is as important as having well-equipped hospitals. If the health care of specified communities is made a prerequisite for the recognition of medical schools their involvement in population-based education can be expected to improve.

The Christian Medical College, Vellore, India, has taken direct responsibility for providing primary health care, including social and economic development, for a population of 200 000, while in collaboration with government health staff it is responsible for another 180 000 people. This has led the College to provide community-based education for medical, nursing and allied health science students. Intersectoral collaboration and community participation are essential elements in the College’s approach to primary care. The students are involved in community diagnosis, prioritization, and the planning, implementation and evaluation of health programmes, in parallel with the ward processes of history-taking, examination, investigation, care, and the assessment of its effect. Thus realism is injected into their training and they are enabled to understand the importance of community health and population-based health care.

The Christian Medical College’s work in community health care led to suggestions for strategies that have, in fact, been adopted by the state and central governments. The immunization schedule, the pulse vaccination strategy, the high-risk approach and the patient-retained card in antenatal care, the health information system, and the vitamin-A prophylaxis schedule are some examples of the College’s input.

The community, medical education and the government health services all benefit from such interaction. This is the greatest challenge facing medical schools today; unless they accept it, medical education cannot be expected to meet societal needs.

Thomas S. Inui

— Partnership for change

Medical schools exist, or should exist, to serve the public. In the USA, even though many academic health centres were historically private institutions, the majority

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of their operating budgets today are derived from public sources, including state and federal funds for research, education and the care of patients. In return for this support the public may expect scientific discovery, new technology, appropriate human resources for the health system, state-of-the-art care for referral cases, basic care for patients belonging to populations in need, and so on.

Institutions are encouraged to assume responsibility for maximizing the health of defined populations within available resources.

The centres may adopt individual missions focusing on molecular biology, technology derived from this science, the production of referral subspecialists, and the needs of regional or even global users rather than local populations. Choices made in these fields exacerbate problems of access, cost and quality. In the absence of central management or substantial accountability, it is possible eventually to become one’s own worst enemy and fail to fulfil public expectations.

Dr Boelen and Professor Bryant take a balanced view of the need for new teaching methods, new curriculum content and new alliances. In North America the Health of the Public Program seeks to restore a population perspective to the activities of academic health centres and to promote their community roles. Encouragement is given for the achievement of basic competences in population-based subjects by students of all the health professions, in advanced population-based education by selected students, in clinical prevention and skill-building activities at all levels, and in substantive research in subjects related to population medicine. In order to change the centres’ roles in communities, institutions are encouraged to assume responsibility for maximizing the health of defined populations within available resources, to participate in decision-making on the development and deployment of community health resources, and to serve as advocates for the health of the public in social and political processes.

Such activities are a necessary precondition for fundamental change in academic health centres and their medical schools. Of particular importance is the forging of community partnerships — substantial, enduring, mutually beneficial and mutually risk-taking interactions between medical schools and their communities. The communities and the schools consult regularly with one another and refrain from undertaking substantial new ventures in the health sector without prospective mutual review and goal-setting. These relationships lead, among other things, to refinement of the academic mission, the opening up of new settings for education, the enhancement of curriculum content, the production of alternative methods for dealing with complaints, the establishment of research programmes, the provision of new community services, and the expansion of work opportunities for citizens.

These partnerships can be expected to help institutional leaders and their students to learn new approaches to health problem identification and programme evaluation. Indispensable personal and institutional relationships are bound to develop with members of government. The linking of policy-makers, populations and health providers completes the circle of stakeholders in the development and implementation of policy in the health sector. Through this partnership, medical
schools can legitimately claim to be acting in the interests of the public and conducting essential national health research. It should be possible to progress towards a reasonable health status for all in return for an affordable social investment.

The schools involved in the Health of the Public Program are forming partnerships concerned with such problems as outreach schemes for vulnerable, underserved populations, or state-level efforts to develop health care financing for everybody, and the abatement of major new epidemics. They are beginning to share approaches, problems and resources with one another through the Program and other networks. It is undoubtedly time for the schools to establish regular communication with the international network of institutions attempting to effect change of the sort described by Dr Boelen and Professor Bryant, in order to benefit from contemporaneous experiences in other countries.

However, there has been some resistance from people arguing that standards have to be maintained, and without doubt it would be desirable to have concerted international action on this matter in order to avoid difficulties related to the movement of students and doctors between countries.

The notion of a new breed of physician is unavoidable in a world where the perception of health has broadened, doctors’ roles have expanded, and the technological, social and economic environment changes incessantly. Physicians should no longer wait for patients to seek their help but should proactively lead teams in the service of community health. Of course, working at the periphery is extremely difficult because information and facilities are scarce. The best results can only be achieved if physicians have adequate knowledge and skills and a holistic outlook. It is vital that they keep up to date with developments in their field.

Can medical education produce doctors of the required calibre? Curricular reform and new learning experiences are needed, but it would be wrong to sweep away the old order entirely in the absence of proper appraisal of the new. To do away with autopsies as part of the training of students, for example, could have profoundly negative consequences in so far as the qualities of future physicians are concerned. Learning through experience and problem-solving certainly gives rise to motivation and understanding but is very time-consuming. Education should not neglect basic information and skills. Naturally, lectures should be made as interesting as possible and students should feel free to ask questions and discuss the subject matter. Teachers who are heavily involved in narrow fields of research or clinical work often find it difficult to conduct suitably interactive sessions, and their behaviour may

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Charas Suwanwela

– The reorientation of medical education demands international action

Dr Boelen and Professor Bryant are right to call for global action on medical education, which, in the developing countries, usually follows the pattern established in the West. In Thailand, reforms of medical education have been agreed by the Thai Medical Council, and changes have occurred in all eight of the country’s medical schools.

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not change in response to training in teaching methodology.

Problem-based learning, small-group discussions, and student-centred education need both space and facilities. Special efforts have to be made by faculty members in order to bring about community orientation.

The notion of a new breed of physician is unavoidable in a world where the perception of health has broadened.

Partnership between universities and communities requires both organizational and communication skills. Change itself demands a lot of energy, especially in long-established institutions. Because there are strong opposing forces, pressure for change has to be applied over a long period. Durable leadership is essential but difficult to find. Administrators with poor leadership qualities yield to resistance from conservative and complacent elements, and the process of change can even go into reverse.

The reorientation of medical education on an international scale is undoubtedly needed but is only feasible if a strong political will exists. The goals have to be clear and the methods of achieving them efficacious and workable.

Henry Walton

– Redesigning the doctor:
a matter for global action

The academic staff responsible for planning curricula are often unaware of developments in the health service sector. The marked shifts in clinical practice that have occurred are given no educational attention. In particular, the preclinical years in most medical schools are virtually isolated from the realities of clinical practice.

Therefore, in maintaining that curriculum planning should relate closely to service delivery, Dr Boelen and Professor Bryant do not go far enough. It is necessary to demonstrate convincingly to teachers why a curriculum is pointless unless it has a direct bearing on the tasks performed daily in the health care services. By and large, medical schools remain unaware that teaching practices have been made obsolete by the shift to primary care and the community, and by the new technologies, the increase in day care and outpatient treatment, and the need for teamwork involving various health professions.

Professor Bryant urges that medical schools should take on functions that, in many countries, are assigned solely to the health services. The impediment, however, is that these functions are controlled by health ministries, whereas medical schools almost always come under ministries of education. Medical schools are not viewed by politicians as the source of the nation’s doctors, and are usually subject to the same academic procedures, e.g., admission criteria,

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as other university departments. The schism between ministries of health and education is profoundly damaging.

A strong tide of change is now flowing in medical education. In 1988 the World Federation for Medical Education issued its Edinburgh Declaration, a global mandate of twelve principles for change in the education and training of doctors.

- Widening the settings in which medical education now has to take place.
- National health priorities as the context for education.
- Lifelong learning, and reform of the examination system.
- Professional competence as the purpose of learning.
- Training of medical teachers as educators.
- Health promotion and the prevention of illness.
- Integration of science and clinical practice.
- Selection of entrants on the basis of noncognitive as well as intellectual attributes.
- Coordination of education with health delivery services.
- Production of doctors in accordance with national requirements.
- Cooperation of the health professions, and multiprofessional training.
- Continuing education as a major component of medical education.

As Professor Bryant points out, philanthropic foundations have been prime movers in reform, and their initiatives have led to the creation of community partnerships with university participation. However, their major projects are not made known internationally, and remain unduly localized in consequence. The great enemies of reform in medical education have been insularity, fragmentation, failure to cooperate, and, above all, the absence of a spirit of internationalism.

In August 1993 the World Federation for Medical Education, at its top-level meeting in Edinburgh, will intensively review the medical education system, and focus on the interface between medical education and the health care services. The three major sections are:

1. **The wider context:** the external pressure on health care and education systems, including that caused by social transformation, patients’ rights and demands, the economic recession, political upheaval, and ethical factors;

2. **The changing nature of medical practice:** privatization, market forces, accountability, cost containment, quality assurance, the development of the health professions other than medicine, teamwork, and new diseases and morbidity patterns;

3. **The educational system:** coping with the growth of knowledge and technological advance; problem-based learning; and communication skills.

This meeting will give particular emphasis to ethics. Doctors should be able to analyse

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**The great enemies of reform in medical education have been insularity, fragmentation, failure to cooperate, and, above all, the absence of a spirit of internationalism.**

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the complex ethical issues affecting their clinical work. Dr Bryant rightly insists that the treatment of this subject in conventional
courses is inadequate. His criticism of current narrow teaching practices can go further. Even if medical schools could help future doctors to understand medical ethics, would that suffice? The relationship between doctor and patient does not exist in a vacuum. Most ethical problems in clinical practice are seen narrowly in terms of tensions between the doctor’s duty to care and the patient’s rights and autonomy. Ethics in medicine is much broader than that. Doctors also have to give consideration to social justice, equity and the common good.

Professor Bryant is also correct to insist that the medical school and the university should, in their day-to-day functioning, embody and express the ethical values they seek to inculcate. An approach is required which encompasses ethical review of the policy of the medical school and the conduct of its teachers. The subject matter should extend beyond clinical ethics to the political ethics of health care delivery services, the ethics of medical research, public health and health service management, and the critical understanding of the ethical culture of the country concerned. Clearly, this is possible only if suitably equipped trainers are on the staff of medical schools.

The 1993 meeting of the World Federation is certain to endorse the global strategy for change which was initiated at the 1988 Conference. Senior representatives from the co-sponsoring organizations (WHO, UNICEF, UNESCO, UNDP and the World Bank) will help extend the global collaborative programme, and ensure that progress is shared and that the developed world concerns itself in an enduring way with the developing countries.

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**People are most important**

*Since the health workforce is the largest and most important resource of the health infrastructure, it merits the priority attention which is now being given to improving its management, particularly in respect of motivation and productivity.*