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REFLECTIONS ON SOME CURRENT TRENDS IN MEDICAL EDUCATION IN AMERICA*

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The title of my discussion was carefully chosen as a restrictive one. American medical education to-day is an unusual mixture of discrete and often discordant parts—a heterogeneous collection of different schools, different techniques in teaching, and different philosophies of what the finished product of medical education should be. It would be impossible to present you with a clear distillate from this troubled brew, for the fermentation is still in progress. I shall therefore venture to examine briefly a number of seemingly unrelated topics which I believe to be of basic importance in this transitional phase of academic medicine in the United States. It is not without serious misgivings that I undertake this ambitious task, for much of what I have to say has been previously and skilfully examined here by a number of my distinguished predecessors. Their clear appraisals of our mutual problems in medical education have established a remarkable standard for this occasion.

Since the last war much thought and some experimentation have gone into many aspects of medical education in the United States. There have been a spate of conferences, a flood of articles, and a deluge of speeches concerning such topics as premedical education, the selection of students, the composition of the undergraduate curriculum, the recruitment of instructors, economic support of students and of the faculty, the pattern of postgraduate education in a profession marked by an increasing specialization, the responsibility of the medical school to medical research, the relative value of full-time *versus* part-time teachers, and so forth, *ad infinitum*. After attending many conferences, taking part in numerous discussions, and hearing the analyses of the few “experiments” on what ails medical education to-day, I think that some of the current confusion may be manufactured. Please do not misunderstand me; problems exist in medical education, and they need to be clearly defined and constantly met, but I am not convinced that the prognosis is so grim as to warrant radical measures at this time. One often hears such rotund phrases as “the complete physician,” “the whole patient,” “the fundamental or basic principles,” “integrated teaching,” “psychosomatic medicine,” in ever-recurring themes and variations. My faith in such slogans is feeble. This is not to deny that

many of the new programmes in American medical education have a firm footing based on careful thinking of what may be accomplished by these innovations. I would only hope, however, that as we grope for “principles” in the teaching of medicine we do not ignore the words of your professor of medicine, Dr. W. M. Arnott (1955), who last year said:

“In education to-day we hear much about principles—always ‘fundamental’ or ‘basic’ principles, the teaching or inculcation of which is the proud prerogative of this school or that department. A good deal of snobbery is attached to these terms. The more basic or fundamental the principle is deemed to be, the nearer are all those concerned to some mystic state of academic grace. Much of this is little more than an example of the limitations of language. Logically it presupposes that there exists somewhere a finite body of fundamental truth. The detailed curricula of medical schools, the itemized requirements of examining bodies, even the recommendations of the General Medical Council, tend to be regarded as a supreme polypharmaceutical prescription, the accurate dispensing of which will result in the ‘complete physician.’”

Some Generalizations

In the United States, as here, some would claim that there is desperate urgency to reconstruct the medical educational system. The problems we face are by no means unique to the field of medicine, and I may venture at this point to preface my scrutiny of American medical education with a few general remarks. We should realize at the onset that regardless of the educational systems we evolve, there will be a sizable proportion of medical graduates who will never be the physicians we would like them to be. This is a reality which we have to accept. One of the reasons we must accept is that all men are not born equal, although we may prefer to think they are. But whether or not they are born equal is of less importance than the basic obligation that we construct an environment permitting men to function at their maximal capacities, whatever these capacities may be. In a just world men may not be equal, but opportunity should be. This idealistic goal cannot be achieved by decree but should be constantly pursued in a democratic society. Despite how carefully they may be chosen, we know that our medical students are not of equal ability.

As candidates for our medical schools we should select young men with strong vigorous minds, stable personalities,

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and warm interest in the welfare of others. If we place such men in an environment that stimulates them we need have little concern about the type of doctor who will be produced. In this case, the spread between the first man in the class and the last man in the class will assume less significance. In a medical school, as in any other institution of learning, the challenge is to teach with the zeal and skill that will elicit a high minimal level of competence from all students, yet with the flexibility and imagination required to draw forth the best performance from the few exceptionally gifted candidates who appear among us. I hope that any change in the educational programme will not be to the detriment of the strong students and will not fail to challenge our most competent candidates.

Education is a simple process. It begins when two people of different life experiences meet and talk. It is this communication between those who are willing to learn from one another which is the essence of the educational experience. The structural design and organizational setting of this exchange, necessary as they may be, are of secondary importance and of themselves productive of no miraculous results. Teaching stands or falls with the teacher. The good teacher, the teacher who is professionally skilled, who is critical, who fosters a spirit of inquiry in those around him, who has some understanding of people—their strengths and their frailties—is the key figure in any system of education. With such a teacher, we need worry less about hours, programmes, assignments, laboratory reports, and the formal paraphernalia of the school. This teacher helps to forge an intellectual climate in which critical thinking flourishes, and exemplifies humility and compassion in his approach to human illness. Himsworth (1951) expressed this idea very nicely in another way:

"Men are not entirely free to develop their thoughts and mental attitudes. According to the environment of opinion in which they live, some attitudes of mind are more easy for them to adopt than others; and, indeed, if the intellectual environment is unsuitable, it becomes impossible for certain mental attitudes even to exist. Nowadays we cannot conceive of a mental attitude which accepted the existence of witchcraft; yet men, as intelligent and as conscientious as any to-day, accepted the idea without question."

Premedical Education

With these few broad generalizations, let us now examine the structure of American medical education. Education is the cultivation of the ability to think, discriminate, and make wise judgments. It is the acquisition of the art of utilizing knowledge. This process must begin early. We may be sure that it does not appear in a clap of thunder when Young Man meets Cadaver on his first day at medical school. By the time the student arrives at a medical school in the United States his intellectual habits of a lifetime have been formulated and in some cases fixed. To those of us in medical education two objectives remain: (1) the selection as candidates for medical schools of those students who have acquired the rudiments of an education as we have defined it; and (2) a constant attempt to define what programme in premedical education is most fruitful of this kind of education. It will be recognized that this concern with the total educational experience of our medical students could rightly be extrapolated further and further back in the student's life. For practical purposes we must begin by turning our reforming attention to the most immediate premedical education, that furnished in our colleges and universities.

A disquieting trend in American colleges has been an apparent loss of regard for a liberal education. There does not seem to be the esteem, in the population to-day, for knowledge of languages, the classics, and important areas in the physical and biological sciences. Knowledge for knowledge's sake is in retreat before the curt pragmatic tests of applicability and immediacy. Perhaps our society has become so preoccupied with applied technology, so impatient for quick practical results, that we no longer have time in school to get an education. It should be stated

explicitly that I do not intend to hold up the humanities in opposition to the sciences. They are not antithetical in any sense. I do not see how it is possible for a man to consider himself educated to-day if he does not have some understanding of the sweep of the physical and biological sciences in the last fifty years and the implications that this holds for the future. Are not science and the humanities merely different methods by which the human mind attempts to view itself and its environment and reach an understanding of them?

In education, as in microscopy, a true sense of depth perception can be obtained only by such a binocular synthesis of different images. The student preparing for medicine does not need from science a narrow proficiency in some obscure corner of chemistry or physics, but rather an understanding of the scientific method. Likewise, the student preparing for medicine does not need from the humanities a pedantic intimacy with the Chaldeans or have tabulated the number of metaphors in *King Lear*. He should have, however, a sense of familiarity and perhaps an affiliation with the best that has been said, done, written, composed, and painted in man's incessant effort to understand and justify himself. When we have men who can successfully fuse these two methods of looking at reality into a single image we shall have educated candidates for medical schools.

How can this ideal kind of premedical education be attained? I believe that a three-to-four-year college course, with approximately equal division of time between the liberal arts and the sciences, is in general a good preparation for the study of medicine. The student's choice of subjects, beyond a minimal number of required courses for admission, should be governed by his own interests and by the intellectual stimulus to be derived from his work. I do not think that medical schools in the United States should consider the inclusion or supervision of premedical courses similar to the British programme. The formulation of a specific premedical training imposes a premature rigidity in the education of young men of various interests and talents in the preparation for a profession of diverse specialties and requirements. It seems to me to be unnecessary, misleading to the student, and possibly inhibitory to his full development as a professional man. The student would be faced with the immediate decision to embark upon a restrictive professional career before he is fully aware of alternative disciplines where his interests may lead him. The earlier the student is forced to this decision the earlier he will be shut off from the more varied educational aspects of his college life.

The paradox remains, however, of how we can allow this precious freedom for the student to pursue his intellectual interests and yet ensure that he obtains a balanced conceptual scheme of both the humanities and the broader aspects of science. Perhaps through the co-operation of various departments in our colleges and universities a few such survey courses can be gradually evolved as the basic requirement of premedical education, still allowing latitude for the individual to explore and expand his own particular intellectual interests.

Selection of Students

The selection of the student should be the prime concern of every medical faculty. A good student will often become a good physician regardless of the instruction he receives, while a poor one rarely does. Selection obviously implies that there are more applicants than student places. During the few years following the last world war an enviable situation in this regard existed in the United States. For every place there were four applicants. This ratio of 4:1 has now dwindled to 2:1. With rapid developments in technology in the United States, medicine often does not have the same glamour to the intellectually gifted as, for example, atomic physics has. To the extent, then, that we have a selection, we must take as much care as possible to make the right choices. Accurate appraisal of a student's qualities

is no easy task. Although we gather information from many sources, including the student's curricular and extracurricular college record, confidential appraisal by teachers who know him personally, interviews with members of the admissions committees, his scholastic grades carry the maximal weight with these admissions committees. This is perhaps unfortunate, but we have very little else to tell us how to select correctly. Barring any gross defect, evaluation of personality based on brief interviews or letters from college instructors has not been reliable.

Although we have never evaluated our prognostic errors and successes, in my view grades are the best guide. Allowing for exceptions to prove the rule, poor students, who are "the despair of their teachers and the sorrow of their examiners," rarely turn out to be excellent physicians. The initial selection of the medical student is probably the single most important factor in the making of a competent, wise, compassionate physician. It is surprising to me that no critical evaluation has been attempted of how we can improve our ability to select good candidates for medical schools. Much more careful thought must be given to this.

Undergraduate Curriculum

Once we have selected our medical student, what shall we do with him during the four years he has placed himself at our disposal? The most important questions are: (1) What shall we teach him? (2) How should he be taught? (3) Who is best qualified to do the teaching? Curriculum committees in the majority of schools in the United States are wrestling with the problem of undergraduate medical education. There is considerable enthusiasm for radical change. Elimination of departmental barriers and integrated teaching programmes are being advocated. A bold frontal assault on the entire entrenched medical curriculum has been made at the Western Reserve University, and similar adventures on a smaller scale are being contemplated at other medical schools. I use the word adventure advisedly, and not experiment, for inherent in the use of the latter word is the implication that some method of assessing the results of a given endeavour is available, and such is not the case.

Is there a need for radical changes in the curriculum today? The present structure of medical education was introduced more than fifty years ago, at a time when the undergraduate curriculum was considered the whole, or nearly the whole, of medical education. It was expected to supply adequate competence in the practice of medicine. Since 1900 medical knowledge has grown enormously. It has long been evident that no individual man can master more than a small fraction of it. The bedside has become crowded by experts who command relatively small areas of medicine but command them well. We have benefited greatly from this new knowledge, but the undergraduate phase of medical education can no longer turn out physicians ready to embark upon the competent practice of medicine. It has to be satisfied with the building of general competence, leaving the acquisition of special knowledge and skills to the graduate training programme.

Over the years large masses of unrelated facts and myths have sedimented out in our curriculum, stultifying original thinking and correlation of what is taught, encouraging rote memory rather than incisive thinking. It has been difficult to exhumate what is important from this morass of self-perpetuating facts, on to which new facts are deposited from each issue of our technical journals. The difficulty is compounded because few agreements can be reached regarding what is important to teach and what may be safely relegated to the reference library. The older departments struggle to keep their traditionally assigned proportion of time. Newer ones clamour for more, lest they may appear to profess a subject of little importance. The following excerpt from a recent convocation address by Dr. G. W. Pickering (1955) contains a colourful description of the situation:

"Unfortunately, it tends to happen, in our country at least, that each professor feels it his duty to his subject to see that

sufficient hours are allocated to it in the curriculum and that his subject has a separate examination in which the student must pass before he is allowed to leave that department. In my more detached moments, I see these worthy gentlemen each determined to exact his pound of flesh, like a flock of vultures descending on the student, until only the bare bones are left. And I sometimes feel when I listen to these eminent scientists that their arguments are all perfectly valid, except that they have forgotten one thing—that the subject of their improving exercises is a living, feeling, and, we hope, thinking human being whose capacity to take intellectual punishment is extremely limited."

I would like to think that I am not a blind defender of the *status quo*. I have no sympathy for the point of view that there is no need for improvement. I would, however, hope that in our enthusiasm for integrating the curriculum we do not ignore the facts that defy integration. We have not yet reached the stage in medical science where we have perceived the Divine plan behind it all. Certainly we all agree that the best physician and the greatest scientist is one who can separate the relevant from the irrelevant, who can see new and significant relationships that elude others, who can generalize accurately from a study of particulars. We want doctors and medical investigators with this competence. It does not follow that the laying of things in pedagogical juxtaposition insures that such a unity can be achieved. To attain the desired maturity the student must ultimately learn to make these correlations for himself. The newer programmes of "integrated teaching" are interesting devices wherein teaching may occur, but do not of themselves guarantee good teaching.

We have before us the problem of the mounting mass of facts gleaned by specialty investigators. We cannot teach them all. There are two broad ways to attack this problem:

1. We can delete certain facts from the teaching—that is, require that a given discipline clean its own house of irrelevancies and be covered in a limited amount of time. This is the way we do it now, within the necessary confines of a four-year course. Still there is the clamour of newer subspecialists to be included in the teaching programme. The problem of what to drop from the requirements, and what to keep, is a very difficult one.

2. We can investigate the borderlands among certain disciplines, say, for example, anatomy, physiology, biochemistry, and pharmacology, and attempt to find a more unified and coherent way. This is integrated teaching on a small scale for efficiency's sake. This has great merit, theoretically, but we must not overlook the uncommon ground, where many a discovery may lie.

I do not know how best to resolve this question, except to say that it is going to take all our ingenuity to prevent ourselves from being inundated by the productivity of our research laboratories. Perhaps I am playing the Devil's advocate here, for I admire the vigour and enthusiasm with which the unified approach is being executed in certain American medical schools. May I leave it with the following quotation from Santayana: "... Vitality of any sort, even if expressed in fancy, can blunder through many a predicament in which reason would despair"?

There is an urgency, in some quarters, to accentuate the social, psychological, and environmental facets of the patient's problem. This is unquestionably of importance, but adds another burden to the bulging curriculum. Some American schools are experimenting with home-care programmes at the undergraduate level in an attempt to quicken the student's understanding of disease as something which happens to human beings rather than as a thin, stained slice of tissue under a microscope. But are we asking the students merely to play at being doctors, or are we teaching them medicine in the broad sense of the term? The question should be asked not if such a programme is helpful, but rather is it the most economical expenditure of the student's time and effort? Does he gain more than he would normally gain under the maturing influence of the patient contact in the ward and out-patient setting. Those who advocate such a home-care programme for undergraduate medical students should be prepared to answer these justified scepticisms.

Opportunities for Students

May I now tell you about the experiences of medical students in a teaching hospital in the United States? One of the strongest points in the education of the student is the highly individual attention given to him in his clinical teaching. He is assigned to a ward with one or three more students, where he learns the methods available for studying and evaluating patients. Along with the resident and the intern, he is an integral part of the ward team. He has the responsibility for the complete clinical work-up of a certain number of patients. The pace is set such that emphasis is on thoroughness and quality rather than quantity. He must put his observations and evaluation into writing which forms part of the official hospital record. Each morning before the senior visiting ward physician and the rest of the ward team, he presents the history, the physical findings, the routine laboratory data, and his formulation of the case based on these facts. These findings are checked. There is a detailed discussion of the case in a spirit of free give-and-take. He is encouraged to speak his own mind freely, in agreement or disagreement, which he soon learns to do. Interpretation of clinical observations in terms of basic physiological and biochemical principles is emphasized. Stimulated by discussions of the case, the student acquires the healthy habit of reading journals to find the latest information about a disease, and this, in turn, stimulates further discussion. The visiting physician welcomes the opportunity to be drawn into a debate with the student. The atmosphere is created in which each is willing to learn from the other, without undue regard for rank on an academic scale.

Educational opportunities in a teaching hospital are unlimited, and, gratifying enough, most students take advantage of them. They spend much time in leisurely discussion regarding various medical topics with the senior ward resident and with various members of the consulting services. They attend and often participate in the weekly clinico-pathological conferences, the grand rounds, and other group discussions, and are assured of a patient hearing at any of them. At the weekly ward social service rounds attended by social workers, the visiting physician, and the ward team, the student presents the social problems of his patients and learns something about rehabilitation, available social agencies, and the part they can play in alleviating the effects of illness.

The student thrives in this environment. He feels that there is no sharp distinction between students and physicians—all are students of medicine. Responsibility is given to him in so far as he demonstrates his ability to discharge it. His education is rapid, and is based on a genuine and active interest in his work.

University Teachers

Selection of academic staffs is a heavy responsibility. The faculty is composed of two types—full-time members, who receive relatively little income from private patients, and part-time staff, who can treat as many private patients as they wish, so long as private practice does not interfere with their assigned duties of instruction and, in some cases, research. The full-time members of the faculty are paid by salary and include almost all teachers in the preclinical science departments but relatively few in the clinical departments. A large proportion of clinical teaching in many medical schools, particularly those in large metropolitan centres, is carried on by part-time teachers who receive little or no salary. They are given hospital staff appointments and privileges to use the hospital facilities. The full-time teachers accept their positions because they are genuinely interested in academic medicine and are willing to serve at a financial sacrifice. Many of the part-time teachers donate their services out of the same motivation. Medical schools must find a way of raising salaries, particularly in the preclinical years, in order to attract promising medical graduates, for one of the main reasons for the dearth of physicians in the preclinical sciences is economic.

The full-time system at Harvard is rather unique in that private practice is allowed, with the proviso that income from this source is not to exceed the amount paid by salary. The system has worked well at Harvard, where the care of the patient and teaching responsibilities are shared by a large part-time clinical staff—and where, by tradition, the full-time men have voluntarily undertaken little or no private practice. A disquieting trend is the misapplication of this system in many university hospitals located in small suburban communities where little or no part-time staff is available to carry the heavy routine load. In these areas, prior to the introduction of the Harvard system, the bulk of the clinical faculty was, of necessity, so occupied with routine duties—ward rounds, out-patient clinics, and teaching activities—that there was little time for research. Now, with a full-time system that permits the clinician to earn in practice the equivalent of his university salary, the "full-time" clinician has even less time for research, reading, and furthering his own educational growth. This system is not in the best interest of academic medicine in America. This unfortunate outcome can, however, be corrected by substantial additions to the clinical faculties of the university hospitals concerned.

The full-time departmental heads at Harvard—and I suspect elsewhere—face another dilemma. Suitability for this position is determined in part by the candidate's productivity as an investigator. In his new position he finds himself saddled with too many responsibilities of an administrative nature. His research career all but comes to an end. Ruefully, Professor William B. Castle at Harvard said: "We become professors of administrative medicine."

Residency Programme, Postgraduate Training, and Specialization

Limited as our individual capacities are and vast as medical knowledge has grown to be, specialization has become a necessity. Specialization, I maintain, should begin only after three years of training in general medicine or surgery. The current practice of retiring to the sheltered confines of the left auricle or the right knee-joint after completion of one year of internship results in a specialist not properly equipped to deal with the general body of medical knowledge. Such specialists do not make effective members of a teaching hospital staff.

A training period of three years in general medicine has other things to recommend it. The limitations of human ability are such that only a few people make outstanding discoveries. The incoming interns do not realize this fact. Exposed as they are in certain university clinics to the powerful influences of their teachers, most of whom are engaged in research work, the majority of the new graduates in many large centres want to take up investigative careers. As I interview Harvard Medical School applicants each year for internship appointments at the Massachusetts General Hospital, I find that not more than one in thirty wishes to go into medical practice. Many of them are doomed to frustration; and therefore I constantly preach to these young doctors what I sincerely believe—namely, that giving good medical care is the primary duty of every physician, of every hospital, and that all research and all teaching should be subsidiary to good patient care. I say to them: "If you can do some research, God bless you; if you can do some teaching, God bless you; if you can do neither, you should be proud that you are capable of providing good medical care."

A three-year period of training in general medicine provides adequate time for the realization of one's assets and limitations as a physician. At the end of this period those who want to enter the practice of internal medicine will have had adequate training and will be ready to undertake their chosen profession as able clinicians. Others will move on for further training in their chosen fields.

A three-year postgraduate training programme has another advantage. As an intern in the first year, the young doctor learns, as he has never learnt before, how to accept responsi-

bility, how to evaluate emergency situations carefully and accurately, yet with some speed. His practical learning soars. He acquires competence in basic hospital procedures. As an assistant resident, he is in a position to make use of his previous experiences, to reach more mature judgments, to bring to bear on his patients' problems a fair measure of critical evaluation. As a resident, with fewer immediate ward responsibilities, he is in a position to mobilize his experience, to augment his work of the previous two years with extensive reading. His judgment bears considerable weight in the handling of difficult and equivocal patient-problems. Thus he has acquired a foundation on which to build in any direction he chooses. He is now equipped for the practice of internal medicine.

One of the most illuminating experiences this house officer has had during his three years' stay is his training in a variety of hospital settings. Does the teaching hospital which is divided into autonomous separate firms, each manned by a permanent chief and with little inter-communication, provide the same varied training experience for the house officer? There can be no doubt that he acquires coherent knowledge under this system. Is this, however, sufficient justification for its perpetuation? Does it inhibit the growth of critical knowledge, promote hero-worship, and, at times, respect for authority rather than for ideas? Will it lead to frustration when in the light of later experience these gods, not too infrequently, turn out to be "tin-gods"? Again, I can only raise these questions. I cannot answer them. Some of my British colleagues, visiting the teaching hospitals in the United States, agree with me in preferring the system in which the many wards within the service are not autonomous isolated units, but instead are supervised by carefully selected senior clinicians who are attached to the wards for periods of only two to four months each year. The house officer therefore comes in contact with many physician-teachers with differing ideas.

We face still another problem in the training required for specialty board certification. There is no doubt that specialty boards have raised the standards of practice in America, yet they do impose severe burdens on the young doctor. In most instances board certification means prolonging his training period to four years or more. Often without such certification he cannot obtain an appointment even at the smaller non-teaching hospitals. This introduces an element of unwarranted pressure and great financial hardship on many competent young doctors who would make fine additions to hospital staffs, though not board-certified. Certainly in the academic field of medical education and research I see no need for specialty boards. It seems to me that a good medical education and three sound years of graduate training—plus a year or more in a basic medical science—equip a man for research in medicine if he has the other indispensable qualifications, which include interest, originality, and creativeness.

American Medical Association

Now, in approaching the end of my talk, I come to the difficult task of assessing the role of organized medicine in the growth of American medical education.

The American Medical Association, which regulates ethics and standards of the practice of medicine, is composed of practising physicians who, understandably, resent superimposed restrictions and impersonal remote supervision. The physician, by his nature and training, deals with people on an individualistic and personalized basis. He is in no mood to function at the command of a bureaucrat. In his setting he tends to be conservative, suspicious of encroachments by city, state, and federal agencies on his independence and freedom of action. It is not for me to decide that his attitude is good or bad, but I think we will all agree that many aspects of it are understandable.

In the United States to-day we face a real problem in the financing of our medical schools. Teachers are woefully underpaid, and schools are understaffed. Income from endowment can no longer carry the full cost. The demand

for doctors increases with the expanding population. It is in the public interest to train better doctors and more doctors, all of which is expensive. Where are the schools to get this money? Inevitably, of course, the schools are turning to the Federal Government for assistance. The American Medical Association, worried that the man who pays the piper will call the tune, has vigorously opposed efforts of the schools to achieve favourable legislation for financial assistance. The cry of socialized medicine can be heard over the battlefield, and I must confess that at times I am very confused as to what this term means. I gather that to the leaders of medical opinion in the American Medical Association, socialized medicine means the direction or undue influencing of the practice of medicine by a government body—notably a federal agency. How much of this alarm is derived from the inherent resistance of the American Medical Association to any new suggestion of change in medical practice I cannot say. As I said before, this would be understandable, but I think it is not necessarily realistic.

Proper legislation, with proper safeguards to protect the autonomy of the medical schools, could hardly be called encroachment of government influence over the domain of the private practice of medicine. Certainly federal grants for medical research have not demonstrated this predicted omnivorous tendency. In fact, they have become increasingly more liberal, often imposing fewer restrictions than many of our private granting agencies. Perhaps this is not an analogous "pilot-experiment" for federal support of medical education. The practitioner fears that if government interest extended beyond the financing of medical research the practice of medicine would be increasingly controlled and regulated by federal bureaucracy. It is my firm belief, however, that proper legislation can ensure financial support for medical schools without jeopardizing their independence of action in the teaching of students. Doctors themselves are beginning to contribute financially to the support of medical schools in larger numbers, but their contributions constitute only a trickle where a river of assistance is needed. I hope that the younger generation of doctors, working vigorously to express themselves within the American Medical Association, will ultimately help to siphon off the element of entrenched, unyielding reaction, to the extent that it exists. In this way the profession's view about the critical needs of the medical schools may be gradually broadened.

As I come to the end of my discussion, I wish to state that American medical education is basically sound. Problems are inherent in any human endeavour, yet man lives by problems. My attitude towards them is best summed up in the following quotation from Goethe: "Man is born not to solve the problems of the universe, but to find out where the problem begins, and then to restrain himself within the limits of the comprehensible."

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The first four issues of the *New Scientist*, a weekly magazine for those interested in the progress of science, have now appeared. Edited by Mr. PERCY CUDLIPP, formerly editor of the *Daily Herald*, it aims to tell its readers, in clear language, about scientific discoveries and their industrial, commercial, and social implications. In appearance the *New Scientist* is a 60-68-page magazine of similar format to week-end reviews such as the *Spectator* and *Economist*. Besides expository and reviewing articles by well-known scientists and scientific journalists, the magazine also includes shorter comments, a news section, book reviews, correspondence, an American newsletter, a guide to careers in science, and a section of short annotations called "It Seems to Me." A useful feature is the potted biographies of the principal contributors. The *New Scientist* is published on Thursdays and costs 1s. an issue.