Special Communication

The Sorcerer's Apprentice

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Things are in the saddle and riding Mankind.
—Ralph Waldo Emerson

The frenzied but exciting situation in which medicine finds itself today reminds one of Goethe's familiar ballad, "The Sorcerer's Apprentice."[1] When the magician's back was turned the apprentice commanded the battered broomstick lying in the corner to do his bidding without realizing what might be in store for him.

> Don a pair of legs now
> Bear the pail at once.
> Toil until with water clear, ye
> Fill the bath to overflowing.[1]

The broom flew into action and soon there was pandemonium.

> See, 'tis off—'tis at the river
> In the stream the bucket flashes.
> Again, again and quicker!
> The floor is in a swim
> And every stoop and bickle
> Is running o'er the brim.[1]

The anxious apprentice could not remember how to command the broom to resume its place, so he called frantically for his master. Such is our position today! Our combined research, teaching, and service activities are "running o'er the brim." We, perhaps, do not see as clearly as the apprentice our role in initiating the events which have led to the problems that we presently face. What are the ways in which academic medicine (and departments of medicine in particular) must respond to the changing health needs of society? Our responsibilities in research and education are clearly defined, but what is the medical school's proper role in the delivery of medical services? Since this question is the subject of considerable controversy, I shall emphasize ways in which academic institutions can responsibly discharge obligations in the area of patient care *without* jeopardizing traditional academic pursuits. First, let us reflect on our role in bringing about the problems we face today.

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The thesis of Hudson's [2] recent essay on "Action and Reaction in Medical Research" is that the Medicare Act can be causally linked to Fleming's discovery of penicillin. He linked these apparently disparate events to highlight a phenomenon that is rarely appreciated—the negative effects of medical discovery. With apologies to Newton, he puts the matter this way: "For each action in medical discovery, there is an equal and opposite social reaction."

In 1900 pneumonia was the major killer. Nevertheless, it was often referred to as "the old man's friend" because it spared so many patients months of hopeless illness. Today pneumonia is a poor sixth among the causes of death and we can no longer conceive of practicing medicine without antibiotics. The very success of penicillin, however, has created new problems for society. The economic burden of an increasing population of elderly citizens has radically affected the role of government in our lives. As Hudson [2] points out, in 1948 Truman backed away from health insurance legislation because of widespread sentiment against further socialization of medicine. Two decades later the Medicare bill breezed through Congress. Indeed, the passage of Medicare indicates that more has changed than the public attitude toward big government! The American people have come to consider health a natural right.

What produced this remarkable change in attitude? Certainly most important have been the phenomenal advances resulting from medical research. People have come to believe that physicians can learn to do almost anything.

Obviously Hudson's thesis is a calculated oversimplification employed to make a cogent point—but as medical schools face the question of their community responsibilities, they must realize that our successes in medical research, like the sorcerers' apprentice, have started the broom of social pressures in its frantic activity.

Most of us were happy to stimulate public confidence in the scientific potential, and we gratefully accepted the increasing amounts of money made available. Good results came of this as we all know, but this only strengthened public opinion that more money would produce greater benefits and would directly lead to superior medical care for everyone. Thus, we have, in the minds of society, assumed a responsibility for the practical application as well as the discovery of new knowledge.

It is not surprising, therefore, that we are presently a little dazzled by our responsibilities. We feel like the apprentice when he beseeched:

> Deeper and deeper grows the water
> On the stairs and in the hall,
> Rushing in with roar and clatter
> Lord and master hear me call! [1]

In answer to the apprentice's call, you will remember the magician returned and commanded:

> Broom, avaunt Thee!
> Only answer,
> When for mine own ends I want thee,
> I, the Master necromancer! [1]

Our benevolent magician will only come, I am certain, in the form of effective medical statesmanship in relation to the three traditional activities of our profession: research, education, and service. About each of these I would like to comment for just a moment.[3-5]

First, what must we do to insure the orderly growth of research? Research has had a tremendous impact in vitalizing our medical schools and in stimulating the imagination and curiosity of students. Yet in many faculties an imbalance has arisen between research and teaching—not because of too much support for research, but because of a failure to recognize that research and education are inseparable. Medical education suffers when faculty support is too heavily dependent on research accomplishment. More support for *both* activities is urgently needed in view of the current shortage of medical personnel of all types; and a much larger proportion of the funds should be for *general* rather than restricted support.

By this I do not mean to imply that the highly successful grant-in-aid mechanism should not be continued, but I do contend that it is no longer appropriate as the dominant source of support for what should be a well-integrated research and education function. The individual grant support structure with its employment of talented personnel for study sections and frequent site visits has mushroomed to a degree that, added to the many other extramural activities, it now constitutes a serious drain on faculty time. And faculty time is a very precious element which we must jealously protect.

What are the needs in relation to faculty development? A first-class clinical department should have a sophisticated research program of high quality but it must have balance. As Vannevar Bush pointed out, the problems in any research endeavor must be relevant. Clinical investigation certainly has relevance

in a clinical department, and at various levels it should be playing a growing—not a lessening—role. If we emphasize the laboratory too heavily and fail to maintain balance in the various aspects of research, teaching, and medical care, we may one day find that our faculties are like zoo keepers who know all about monkeys in cages but nothing about monkeys in their natural habitat.

Already the growing complexity of both research and clinical practice is forcing us to concentrate more and more of our individual effort on either one or the other. This point was discussed in eloquent fashion by Dr. Carl Moore [6] in his 1964 presidential address:

> We have held too long to the vision that the only desirable member of a clinical department is so broad in his capabilities—a modern version of the Renaissance man—that he is a polished physician, a stirring teacher, and an investigator of great distinction. Within any department the responsibilities for patient care, teaching, and research must be without question kept in balance, but the time has come for the equilibrium to be provided by the department as a whole, rather than insist that it be provided within each individual.

A really gifted clinician-teacher contributes as much as the investigator does to the educational environment and the two should have equal opportunity for academic advancement.

Now, let us look at medical education. More than ever, the role of the physician calls for increasing scientific sophistication and continuing intellectual vigor. His need for continuing development is just as great as that of the productive research scientist. How do we adjust our educational programs to the current revolution in scientific medicine? How do we anticipate what the patterns of practice should be ten years hence and then develop the means for producing the required manpower?

One of the greatest needs is a more flexible pattern of education. Although many medical schools, including my own, have introduced large blocks of elective time in the curriculum, it seems unrealistic to perpetuate a rigid system of required courses for all students. The diversity of roles which physicians must play in research, education, and practice demands equally diverse opportunities for educational experience. This means stronger ties between medical schools and parent universities with more joint educational programs in such fields as engineering and sociology. Leaf [7] and his colleagues have recently pointed out that medical education has done little to adjust to the far-reaching social and economic changes of our day. The public believes that medicine is the magician who will cure humanity of its ills. "Medicine must evolve new patterns, deepen its roots in science, and broaden its scope of service to society." [7] To achieve this type of evolution, medicine must redesign in a far-reaching way its educational process.

Finally, let us turn our attention to the most difficult and controversial problem—the proper role of the medical school in providing medical care. Scientific medicine and research can make invaluable contributions to all facets of medical care. There are now exciting opportunities for physicians to advance biomedical knowledge and at the same time develop more effective ways of applying this knowledge to the delivery of medical service. However, as we endeavor to meet these responsibilities, we face real dangers.

In expressing his views on the interaction between the university and society, Flexner [8] distinguished between "what Universities do not now touch, and what they have no business to touch."

> As the world has changed, new faculties have been needed, new subjects from time to time have been created, but even in the most modern University, a clear case must be made out (for expansion) and the case as I see it must rest on the inherent and intellectual value of the proposed faculty or the proposed subject. *Practical importance is not a sufficient title to academic recognition.* If that is the best that can be said, it is an excellent reason for exclusion.[8]

How then, Flexner asks, can he urge that Universities maintain contact with the actual world and at the same time continue to be *irresponsible* with respect to practical affairs. Are the two attitudes incompatible? Can the universities really take an objective position in reference to social, political and economic phenomena? Can they study these phenomena without wanting to tell legislatures, municipal authorities and chambers of commerce what they ought to do at any particular moment about some particular thing. I think they must and can. It is a question of ideals and organization. For experimental purposes, they may without sacrifice of intellectual integrity, make suggestions and watch results. But this is different from running a city government, or a political party, involving as such responsibilities do, compromises of principle that are fatal to fearless thinking. The analogy—is not complete—but it is suggestive. The Professor of Medicine needs patients just as a social scientist needs his environment—but the Professor of Medicine is primarily a student of problems and a trainer of men. He has not the slightest obligation to look after as many sick people as he can. On the contrary, the moment he regards his task as that of caring for more and more of the sick,

he will cease to discharge his duty to the university—his duty to study problems, to keep abreast of literature, to make his own contributions to service, to train men who can carry on.[8]

These words of Flexner are very wise and they are directly applicable to the dilemma in which we find ourselves. If we are to apply what unique talents and qualifications we have to the problem of improving medical care, we must do so without neglecting our basic responsibilities as educators.

By creating models for the study of medical service we must not only strive to improve the quality and economics of the medical care system, but we must also learn how best to train the physician and other members of the health team who will make it work.

What institutional arrangements can be devised to support such programs without weakening the other educational activities of the medical school? One possible answer is suggested by a development that occurred in my own university in the early 1940's.

Asked by the government to sponsor an applied physics laboratory, the president and trustees had to decide how to relate this potentially mammoth undertaking to the rest of the university. They finally settled on an administratively autonomous division of the university, physically separated from the main campus, financed entirely by outside funds, and responsible to the president and trustees only in matters of general policy.

This seemingly tenuous arrangement proved to be highly satisfactory for all concerned. Not only did the Johns Hopkins Applied Physics Laboratory, or APL as it is called, thrive to the point that it now has a larger operating budget than that of all the rest of the university put together, but its staff of expert physicists has made many important contributions to the space program. The university sponsorship of APL obviously played a significant role in determining the caliber and dedication of its staff. Conversely, the talented staff of APL is now participating in joint research and educational projects with the university faculty, such as the biomedical engineering program in our department of medicine. The point I would like to make is, that had the president and trustees decided to place the APL in the physics department, that department would soon have been overwhelmed by the APL's mission, and the whole financial structure and very character of the university would have been radically changed.

Perhaps what we now need is an applied laboratory for research and development in medical care, organized as a special university division, functionally related to existing departments, but administratively and financially separated from the rest of the university.

Such a model laboratory could be fully responsible for the medical care of a clearly defined and limited population. In such a model unit one could utilize the unique talents of the university and medical school for innovation and experimentation. Thus, the university could discharge its responsibility to society in a time of need, and still be sufficiently *irresponsible,* in Flexner's sense, to preserve its freedom as an institution of higher learning.

I have confidence that the magician is in the wings and that eventually wise decisions will be made and imaginative solutions found. It is an exciting period in the development of medicine. If you are discouraged by the magnitude of our task, I would only remind you of John Gardner's remark when asked what he thought of his new position as Secretary of Health, Education and Welfare. He replied: "I have never seen so many exciting opportunities disguised as seemingly insoluble problems."

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