

THE LIMITATIONS OF TEACHING

IN OUR MOST PRODUCTIVE clinical graduate programs, the interns and residents have been teachers of undergraduate students and of themselves. The profit accruing from this combined teaching learning process is evident by the degree of excellence achieved by the doctors produced by these programs. In recent years, the suggestion has been made that permanent faculty members be paid for recycling each quarter the introductory material which has proven such an excellent base for consolidation of the thoughts and ideas of the junior revolving staff. This means appointing clinical faculty primarily as teachers. This matter is of sufficient importance at the present time to warrant detailed consideration.

What are the teaching needs of a clinical service? Clinical departments need teachers to help in transferring to their students information present in books. They need, also, teachers who are going to present to the student a clear picture of what is not known about biological systems and who can inspire and lead the student to prepare himself to solve some of these puzzling and interesting problems.

On any clinical service, one finds a number of bright young residents who are very effective teachers of the current state of the art. They are capable doctors, completely trustworthy and loved by both patients *and* students. They are interested in what is known. They have nothing which they want to contribute to extend existing knowledge, and they have no stimulus to use scientific journals to communicate with their colleagues. As they teach their colleagues, they learn that each person has a personalized receiving system and an individualized processing system. They make the discovery that they can never predict the effect of any input into the nervous system of another man by any form of theoretical calculation. They have to listen to the playback from the system receiving the input to determine the degree of change produced. This information is of incalculable value in the practice of medicine.

When we allow these currently effective teachers to move into practice without a marked effort to hold them in the university, we are severely criticized by our students at both the undergraduate and graduate level. We are accused of killing off

teachers by the "publish or perish" attitude. We are told that we should reward good teaching by academic tenure, early promotion and good pay.

I have never believed that it is desirable to add a person to the permanent faculty because he is a good and effective teacher. Since this point of view is now strongly criticized by others, I will give my reasons for holding to this staid and supposedly outdated position.

When we add a man to our faculty, we make a lifelong commitment. If we select him primarily for his teaching ability, we have decided to use

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him as a teacher for the duration of his life. We have selected him not for his other attributes but for his teaching ability. The problem inherent in this basis of selection is in the fact that few teachers remain maximally effective as teachers over their full professional lifetime. Moreover there is no way to determine that any teacher actually achieves what is arbitrarily defined as good teaching. In the medical center we are dealing with a group of bright men interested in a successful professional career. They will learn a great deal no matter what the teachers do. Certainly we would be foolish to pay a teacher for what is going to happen without him.

The effectiveness of the teacher must be judged by the things which happen after the student and teacher part company. The immediate communication between student and teacher is usually of more benefit to the teacher than to the student.

The interchange causes the teacher to order his thoughts. The movement and rearrangement of material stored in his memory increases the chance for the stored knowledge to be transformed into usable, easily available knowledge and may even evoke an original thought. Usually the student forgets the material unless the contact causes him to undertake intellectual work he would not have done without the student-teacher interaction. This brings us to the hard fact that effective teaching is an interaction and can be prevented by the student, the teacher or both. A casual glance at this frame of reference will convince us that one man cannot be an effective teacher to all men. All men are differential receivers with personalized processing systems. In terms of enzymology, the teacher must change his student substrate into its activated form. Most of the ATP required for reaching the activated state must come from the student. Since students are undergoing continual change, all teachers who cannot continue to undergo equal change- will gradually become less effective. In practice, few teachers can survive competition from their bright youngsters for longer than ten years. Shall we employ a faculty to be effective teachers for ten years and dull old men for 30?

How can one identify the long-lived teachers and thus avoid the boredom present in many schools?

.. The teacher more interested in conveying attitudes will survive longer than the teacher interested in transmitting facts. Teaching young doctors how to acknowledge their mistakes and how to learn from them without wasting energy defending their errors is a good example. Learning how to learn easily from an error- has more general applicability than the transmission of any known fact.

... The teacher more concerned with what is not known about a subject will have a longer survival than one who makes the transmission of current knowledge his primary goal. The student is more likely to make moves on his own if he is exploring carefully the validity of the premises on which current practice is based than if he is learning what is the best current practice.

... The teacher at the bedside who gives a discourse on what he knows about the matter will come off second best to the teacher who identifies the problem presented by the patient and arranges material relevant to the problem in three phases: (a) what the student and other persons present know about the identified problem and what the teacher can add; (b) what is certainly available in the library and can be learned by having each member of the group collect some of the appropriate information, and (c) what is

likely not to be yet known about the problem but which could now be learned because of developments in science which have occurred since the problem was last intensively studied.

. The teacher who listens well will survive longer than the one who parrots the same record each time the button is pushed.

... The teacher who, as a matter of pride in his own ability, listens carefully to define areas for intellectual exploration when the resident says this patient is of little interest will have a longer survival.

... The teacher who gets up in the morning determined to learn something about biological or biosocial systems that he did not know yesterday will have to undergo continual change and, therefore, increases his chances of staying in touch with his students. It makes no difference how this drive expresses itself. It may be in the clinic or the laboratory. In years gone by, when there were few financial rewards for research, this quality was present in most people engaged in laboratory work. Therefore, a departmental chairman selecting a faculty member for a long teaching life chose one with research experience. Now that there are financial rewards for laboratory work, one has to be much more cautious in use of this criterion.

... The teacher who does not take himself too seriously and who is willing to be replaced by able youngsters when they pass him in any area will live a longer life as a teacher than the one who is destroyed by the fact that eventually he must become less important to the institution.

... An effective teacher must be able to make demands on others. He cannot be paralyzed by his own inadequacies and failures. He must require excellence from his students at all times. Effort and good intentions are not enough. The student must be judged by his achievement and the student must learn the difference between success and failure.

... An effective teacher is a happy teacher. He counts his blessings even though he knows life is not perfect. He appreciates the frailties of man and his organizations but spends little of his energies bemoaning them. He will die for only certain things. Most of the time he will walk around obstructions and not bloody his nose unnecessarily.

... The most effective and long-lived teachers create an atmosphere in which intellectual achievement has honor. The teacher shares with his student the fun and satisfaction created by the intellectual achievement of the student. The returns to the student for his effort create enough pleasurable feelings for him to want to repeat the process. This is the way to develop a pattern of lifetime learning. The creation of the environment where learning has

honor and produces satisfactions is a more important function of the faculty than the creation of libraries, laboratories or classrooms.

... The most long-lived teachers are those who best understand the limitations of teaching. When the teacher works, he gains knowledge. When the student works, he gains knowledge. The crossover is very small. The teacher is useful because he creates the physical and intellectual setting where the student works and because he can tell the student whether or not his performance has achieved excellence. He can lead the student to look into areas he does not know about. He can identify books that are useful to read. He can point out that the student has examined only one side of a problem. He can lead the student to realize that he has accepted unproven assumption as proven facts. He can determine whether the student has prepared himself to read the books that will be useful to him. The teacher is most useful when the student is active. The more active the teacher, the less the learning opportunity for the student.

... The most effective teachers create a shadowy framework in which the student can climb. If the teacher fills in the skeleton in great detail, he will limit the learning by his own knowledge. If he makes the form recognizable, but leaves the final shape and details to the student, the student may produce a much better intellectual synthesis than the teacher. A teacher may be likened to an artist. A pedestrian artist may, produce an exact copy of a scene and most viewers will see approximately the same thing. The picture will not live because it will have little relevance to the changing patterns of life. A much less precise picture, suggesting a mother and child which leaves many details to the imagination, will come to life in as many interpretations as there are viewers. Some of these interpretations may be superior to the original concept of the artist. This impressionist quality of a teacher can be assayed. A skilled teacher never has any difficulty in teaching students together who are at widely different stages in the learning process. He gives some new facts to the beginners; he leads the intermediate group to incorporate the facts in a new framework; and he stimulates the advanced students to relate the new frame of reference to phenomena that they have puzzled about in the past. He leaves behind him an agreed-upon allocation of tasks where each person will have to try his hand at ordering and transmitting information because he will have the responsibility for teaching someone else.

... The most long-lived and effective teachers can tolerate ignorance. When a student is thoughtfully exploring an area new to him, he cannot be

penalized if he is ignorant of yet unexplored areas. The man who must know every fact, who is destroyed if he must admit ignorance, is at the mercy of everyone who asks him a question. Too much memory work makes original thinking impossible. Memory is the accumulation of facts; thinking is the manipulation of facts. Many facts are best left in books. The best clinician' conducts thinking ward rounds, not memory ward rounds.

...The goal of teaching is to create independence. To achieve this aim, the long-lived teacher assumes two roles. In the administrative role, he is the leader and maintains the discipline which permits the learning situation to develop. In the learning situation there is no administrative hierarchy. The leader is the one who can best manipulate the relevant facts and procedures to solve the problem. The student will cautiously test the teacher to see if he can tolerate intellectual freedom. If he can, the goal of education may be met.

The teacher who survives a long time knows his limitations and is careful not to be destructive. He knows that young people mature and grow. These young people will accomplish many things without a teacher. They often give the teacher the credit because they are not experts in the learning process, and a teacher they like happens to be standing by. The non-participating role of the teacher is shown clearly if, years later, student and teacher discuss the matter. The student can remember clearly every detail of the great moment when a new period of personal or intellectual growth started. The teacher is completely blank. Certainly he had no inkling at the time that, a major event was occurring and he had no way to fix the event in his mind. I know of no thoughtful teacher or leader of the young who has not been embarrassed by the credit given him for words and acts which have completely passed from his memory. The teacher can take one thing to his credit: he did not stop the development.

I have said enough about the complexity of the problem, and I have stated my belief that selecting faculty for teaching ability will only make your institution dull. Well-then what?

Teaching should be the price of admission to the club and not something to be paid for over the period in which you belong to the faculty. If one is neither a good teacher nor wishes to become one, he should not be given a place on the faculty of a medical school. The school should appoint faculty for their excellence in research, their skill in patient care, their ability to write and communicate, their capacity for leadership and administration.

Everyone should do some teaching, and this should be for love and not for pay. There should

be adequate money in the budget to pay a portion of the faculty each year for giving more time to teaching than is required for admission to the club. Assignment to the teaching budget should be on a yearly basis, and each faculty member should know that the time will come when he will be replaced by a younger man. The teaching budget should pay for time over and beyond that contributed by the average faculty member, but each man so supported should know that, over his lifetime, he cannot expect major support from the teaching budget. Departments who add staff solely because of their teaching ability, expecting to support them as teachers over their active life, create very

dull shops. An occasional man will break the mold. When that happens, enjoy him but do not build your house on this unlikely-to-be found rock. The best intern and residency programs will incorporate the interns and residents in the teaching program. The faculty will watch these young men teach and will reward them appropriately for teaching during their years as junior faculty members.