Only a literary genius can paint a picture with words. Those of us with less skill must convey ideas by supplementing words. Textbooks, though good, must be supplemented, interpreted, and demonstrated if the inoculation of information from them "takes". Orally administered, smallpox vaccine is ineffective, but a high percentage of success is obtained when an expert applies the vaccine through the skin. The textbook, then, may be compared to the vaccine. If it is good and "administered" by an expert, a high percentage of "takes" results. It must be admitted, however, that some students are immune. It is the supplementation, emphasizing, and interpretation that I wish to deal with.

Teaching involves imparting information. Abstract facts can be taught by requiring the student to commit them to memory. Unless he has the background, the desire to learn, and confidence in the facts, he will derive no more meaning from them than memorizing car license numbers. Permanent and effective learning is best attained when the student has proper motivation, clearly presented information, and when he applied or checks the information personally so as to dispel his last lingering doubt.

We should have no trouble with proper motivation at Texas A. & M., as all meat courses are elective. The student presumably has the desire to learn about meat when he registers for a course. Our responsibility is to present the information accurately and clearly, and provide opportunity for its application. An ounce of experience is worth a ton of theory.

All our meat courses are divided into a theory section and a laboratory section. In theory we try to present information to assignments in texts and supplementary books outside class, and by interpreting, emphasizing, and supplementing assigned work at class meetings. Small sections allow effective discussion and exchange of ideas, but large ones require closely controlled discussions, if any, else a large percentage of the class loses interest. For large sections lectures supplemented by the blackboard, by charts, by color slides, by demonstrations, or by movies are most effective. At the completion of the introductory meat course this spring, I asked the students in two sections of about fifty each to rank those methods in order of effectiveness. Lecture plus demonstration ranked first with a score of 490, lecture plus color slides second with 331, lecture plus movies third with 258, while lecture plus blackboard and lecture plus charts tied with 209 for last place in effectiveness.

Demonstrations were given on cutting of beef, pork and lamb, and on slaughtering sheep. Once a year a meat cooking demonstration is given for us by the National Live Stock and Meat Board. Students are pleased with the clarity and chronology of demonstrations.
"A picture is worth a thousand words", says Edgar Dale in "Audio-Visual Methods of Teaching". We believe him, and have prepared 2" x 2" color pictures for use in a slide projector on slaughtering cattle, on cutting beef, and on slaughtering sheep. At Texas A. & M. we have a photographic and visual aids laboratory to prepare such materials. They insist that moving pictures are preferable to slides for presenting "how to do it" information. Since only one movie "curing pork country style", a USDA film, was used, the comparison of slides and movies may not be reliable.

As far as lectures supplemented by charts or blackboard are concerned, they will compare poorly with the other methods unless something fresh and acutely interesting is presented with the precision and animation of a top ranking actor. The average lecture may be listed among the cures for insomnia unless it is properly supplemented and illustrated.

The laboratory in all our courses is emphasized. Information from lectures and textbooks, when applied and proved by the student, is truly learned. Laboratory sections are strictly limited to sixteen students per instructor so that personal attention may be given.

In our introductory course, a laboratory schedule is prepared in advance and placed in the hands of each student. Seldom is there any deviation from the schedule. This course has a three-hour laboratory, and the usual section meets sixteen times.

The first meeting is devoted to orientation and familiarization with equipment and facilities plus sharpening knives and caring for equipment.

We have found that putting a fine, smooth, properly beveled edge on a knife is about the most difficult thing to teach beginners. In teaching this operation we employ models of properly sharpened knives, pictures showing how to do it, a microscope for examination of the edge, plus demonstration and individual guidance. It is difficult to impress a student with the importance of a sharp knife in the beginning, however, and frequently we have to review knife sharpening and maintaining of the edge after a few periods of slaughtering and cutting.

Slaughtering hogs and cutting and curing pork occupy the next six periods. We begin with hogs because we feel that less knife skill is required than with cattle. Students kill three times and cut and cure three times. New operations are always demonstrated a few steps at the time followed by having the students do the same steps. We slaughter, cut and cure in various ways a minimum of twelve hogs per sixteen students, and usually we handle sixteen hogs.

It must be emphasized that we are not attempting to develop great skill in our laboratory work, but we do demand passable skill. Emphasis is placed on the factors which contribute to the value of each animal killed, and students are required to record weights, yields, and prices. A record for each animal or carcass used in a laboratory is kept on blackboards mounted on the wall on the killing floor and in the cutting room. Prior estimation of weights, yields, and comparative values is encouraged.
Demonstration of a method is felt to be incomplete without the reasons for doing the job in that way. We continually insist that the students utilize laboratory material to best advantage for learning, and discourage the usual tendency to get through and get out.

Students are required to clean the part of the laboratory they use. This is part of the teaching, as sanitation is best emphasized at that time. Bacterial counts are sometimes made to allow estimation of the effectiveness of the cleaning job.

Six periods are allotted to cattle--three for slaughtering and three for cutting. A minimum of twelve cattle are used per section. In cutting, wholesale cuts are prepared, and boneless cuts are made from the wholesale cuts where feasible.

Sheep are slaughtered once and cut once, always at the close of the semester. A minimum of one sheep per two students is used.

One laboratory period is reserved for a field trip to the Houston Packing Company, which is our nearest packing house of adequate size. Fortunately, the general superintendent there formerly taught meats at Texas A. & M., so he knows what the students need to see. This trip always comes in the latter part of the semester so that operations will not be entirely new, and so that the students will be properly impressed with the skill of professional workmen.

A pamphlet discussing the highlights of each department in the packing plant is given the student about a week prior to the trip, and discussed at one theory period. He takes that pamphlet along, thus focusing his attention on the important things to be seen.

Answers to a questionnaire covering the laboratory work revealed that all students approve the field trip. All want to own the knives and small equipment required, and most would like to handle more animals in laboratory. The majority feels that less than sixteen students per instructor would allow more effective learning.

In our advanced courses great emphasis is placed on the individual student. Here sections are small and courses are more flexible. Our aim is to prepare students to be locker plant managers and for other jobs in the meats field.

Operations in laboratory are intended to leave a student with a feeling of personal and individual accomplishment. In one course a student is required to select, slaughter, cut and cure a hog in any way he desires, as well as make the sausage and render the lard. He is encouraged to sell the products. Last semester we held a ham show among the students in that course, with the winner receiving one of the hams he produced as a prize. A report in detail is required on costs and profit or loss realized.

We have a small locker plant operated commercially for instructional purposes. Each student taking laboratory work in locker plant operation is required to select five patrons using our services. He must inventory their boxes and try to influence his patrons to use them most effectively for the individual and locker plant. This is down-to-earth
selling and catering and introduces the student to cold-blooded business. A report on each customer is required at the end of the semester.

A new sausage kitchen will be used to try to give students a more complete idea of meat operations. We feel that an operation utilizing such a large percentage of the meat produced in this country should be given appropriate emphasis in teaching meats. It is not our aim to produce finished sausage makers, but we hope to familiarize our men with the operation enough so that it will not be strange to them.

Finally, we attempt to find out how much we are putting across by quizzes in laboratory and theory. The major quizzes are announced, but daily quizzes are not. Results on these usually serve to deflate the ego of the instructor.

We hope to expand our meats curriculum. It is our aim to send out a graduate who will have a distinct advantage in almost any occupation in the field of meats.

In summarizing, effective learning involves motivation, access to information, and application.

Information is best presented by use of text books and reference books, demonstrations, color slides, moving pictures, charts, models, and blackboard illustrations.

Application is best accomplished by effective use of a meats laboratory with a minimum number of students per instructor.

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CHAIRMAN ANDERSON: Thank you, Mr. Butler.

The discussion leader on this paper is N. W. Hilston of the University of Wyoming. Mr. Hilston, please.

PROF. HILSTON: You have heard an excellent paper on teaching methods. Does anyone have a question on this paper?

PROF. J. W. COLE: There is one phase in meat instruction that has always troubled me and that is the best and fairest way of scoring laboratory work. I know a practical examination is good, such as a cutting demonstration, but it generally takes too long. You have to allow each student ten or fifteen minutes, and if you have sixty students, it takes too much time. What is the most practical way of grading laboratory work in courses in meats?

PROF. HILSTON: Do you have an answer for that, Prof. Butler?

PROF. BUTLER: Well, that is also one of our big problems. I must admit that personal opinion is the main basis that we use for scoring students in the laboratory. With only sixteen men, we can become fairly well acquainted with them. We score them on skill to some extent, but more on application, the way they try to learn the subject, and in addition we have practical quizzes covering what they have done, and a quiz for identification of the cuts that they produce during the semester.
This business of grading is, I believe, one of the greatest challenges in teaching meats. Personally, I like to teach, but I dislike to grade. I always ponder whether it is a fair grade or not when I give it to a student.

PROF. HILSTON: Is there any other question?

PROF. D. L. MACKINTOSH: I would like to comment on two items that were mentioned: One is that of new blood. I think all of us who can be classified as old -- though none of us are old -- welcome new blood for two reasons. The first reason is that we need help because we cannot do it alone; the other is that new blood is always stimulating and every new man that we get contributes a few ideas.

It is not a case of the young man being converted to old methods. I think the young man more frequently contributes more with new thoughts than he does anything else possibly, as far as teaching is concerned. Everyone has new ideas.

The other question is with reference to the suspicious student. I always consider the suspicious student as an asset to the class, because he helps keep the instructor on his toes.

PROF. HILSTON: Thank you, Mr. Mackintosh. Maybe Ken Warner would like to defend that film of his.

MR. KEN WARNER: You know, my worry now is that I am going to use a blackboard when I talk.

PROF. HILSTON: Are there any other comments on the paper?

I would like to ask Mr. Butler a question. You mentioned that you do not use the laboratory for over sixteen students. What would be your preference in the number of students in the laboratory?

PROF. BUTLER: Well, I would prefer one, as far as effective teaching is concerned, but I think in order for the college to utilize our services to the best advantage and not be unfair to the students, that twelve is about the number I would like to see in the laboratory section. Twelve students with knives can do a lot of damage before you get around to seeing them.

PROF. HILSTON: Are there any further questions?

PROF. V. K. JOHNSON: I just wondered if a one-day field trip to the packing house is adequate. I think the idea of making the field trip at the end of the semester has its definite advantages in that the student knows more about what he sees when he goes there, but it is my experience that if you make a field trip at the beginning of the semester, it makes your teaching easier and more effective the rest of the semester.

PROF. HILSTON: That is, you would rather take your field trip to the packing house the first of the semester rather than the last?

PROF. JOHNSON: It seems to me the students understand a whole lot more about what is happening to the meat and so forth if you take it in such a manner. That is just another angle to throw on it.
PROF. HILSTON: Is there any further discussion on the subject of whether students should go the first or the last of the semester to the packing house?

PROF. PIERCE: I would like to ask Mr. Butler what type of a sales force he uses to dispose of all of the carcasses he slaughters. Some of us are not quite so fortunate in having an outlet such as he evidently has, and are limited in the number of animals which we can slaughter. I know in my particular case, if I can dispose of five hog carcasses through the period of a quarter for each section, I feel I have done quite well. He slaughters no less than twelve per each section of sixteen.

PROF. BUTLER: We slaughter about a thousand head of livestock a year, but we are fortunate in having a system that will take everything we want to sell at a price. We must sell it to them at the lowest bid they get from any packing house, for a comparable piece of meat. That makes it unprofitable in a lot of cases, but at least we are never worried about having anything spoil or get old. Then we do sell a good deal of the meat we produce to our locker plant. We have 220 boxes there.

PROF. MACKINTOSH: I would like to have your reaction, Mr. Butler, to the utilization of mechanical equipment in replacing hand labor in the classroom.

PROF. BUTLER: Thank you, Mr. Mackintosh. We have pretty modern slaughtering facilities in our meat laboratory, and I certainly want to defend those facilities. We think that if a student learns the operations necessary to slaughter hogs, for instance, and if we can run a few more hogs through in the time that we have and get him introduced to all the operations in slaughtering hogs, that if he has any initiative at all, he will be able to adapt the equipment that he has to the job. Now, we do tell him about certain aids that might not be evident on the face of it in slaughtering hogs. For instance, one of Roy Snyder's favorite stunts is to tell them how to carry a hog "back up," and drive a hog with a rope on his front foot, and a lot of things like that, but I certainly want to defend the use of modern equipment and facilities.

Farm slaughtering has decreased in importance a great deal in Texas, I know it has all over the country, and we no longer call our introductory course "Farm Meats." We call it simply "Meats," and we have a little different objective in view in teaching students. We hope to place a good many of them in the meat industry. While we do cover farm slaughtering operations, we do not emphasize it as much as we did formerly.

PROF. HILSTON: Thank you. I believe our time has expired, so will turn the meeting back to the Chairman.

CHAIRMAN ANDERSON: Thank you, Mr. Hilston.

The next paper is by our good friend, Professor Kunkle, of Ohio State University, on the subject "Required Meat Courses for Students Majoring in Food Technology, Animal Husbandry and Hotel-Restaurant Management." Mr. Kunkle.

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