our inability to transpose our thoughts from technical to common language with complete facility. In Range Management, for example, browse, shrub, brush, and coppice refer to woody plants with edible leaves, twigs, and shoots. To the British, the word coppice will most likely be understood to refer to a thicket of small trees which is used periodically as fuel. The American livestockman seems to prefer the all-inclusive term, "brush." Similarly in range management literature litter, mulch, residue, and debris all refer to dead plant material on the soil surface with the manner of deposition being qualified as natural or artificial. Cereals investigators use both residue and mulch to describe stubble left on the surface after a crop is harvested. Debris is generally thought of as rubbish. Hence, the manner of presentation of subject matter depends upon the group we wish to reach. To fellow scientists it is important to express ourselves exactly in the language which conveys our ideas and research results accurately. To an infinitely larger group, namely the public, it is mandatory that our findings be presented in a common language, in an interesting form and in an enthusiastic manner.

We Americans live in a favored nation, in a country filled to overflowing with the results of applied basic research. We touch a switch and we have available an abundance of electric power, manufactured from the energy of some distant river. We mow and stack improved alfalfa and grass from irrigated meadows, graze our animals on fine pastures and fatten them on hybrid cereals. The bread we eat comes from high quality wheat developed in the laboratories of the plant breeders. Although these scientific wonders are relatively new, they have become commonplace because of their abundance and wide use.

Advances in the agricultural sciences have come mainly from basic research carried on at our educational institutions and governmental agencies. Such research agencies are supported largely by taxes. The American public is interested not only in enjoying the fruits of research, but also in hearing the story of how the results came about.

The man or woman who did the work is the one who can best tell about it. So, Mr. Scientist, please tell us about your research in everyday words, in our own language.—John J. Sturm, Student, University of Wyoming, Laramie. (Supt. North Montana Branch Station, Havre.)

Is Science Enough?

RANGE management is daily moving further into the realm of science; research findings are providing sound, accurate information as a basis for adminis-

trative decisions and ranch operation. The increasing value of our research program is being proven in its application. Gratifying as this technical progress is, another
important phase of the field has been neglected to the extent that it detracts from the worth of our scientific information. Too often, we have not recognized the need for selling range management. If the technical side of the field is to contribute to the objective of wise range land use on a nation-wide basis, new discoveries must be brought home to the people who use and manage the range resource.

Ranchers, land use planners, and public land administrators need working information that can be applied to the problems at hand. Learned dissertations on the ecology of a cemetery are doubtless worthwhile and fine in their place, but they have little appeal to the man who is faced with the problems of supporting a family or planning a range management program that will result in full use, but not damage to the resource. Many of our ablest researchers have recognized this need, and have slanted their research programs and reporting toward it, with the encouragement and assistance of the American Society of Range Management and the Journal. This trend must be continued if we are to derive full benefit from range management research.

Techniques for selling range management, like techniques of any other kind of salesmanship, are limited only by the imagination of the salesman. Qualified technicians and experienced ranchmen need not limit their writing to technical and semi-technical journals, or to government bulletins. Their contributions to popular style periodicals have already improved the accuracy and usefulness of the range information in that area. Other popular selling methods in recent years have included show-me trips and a wide variety of contests.

Extension work by the states in cooperation with the Federal government is an important and effective means of getting information into the hands of those who can use it. The extension program now under way in Texas is an example of what can be done, using the tools developed over the years in other fields of agricultural extension. Each of the range state agricultural colleges could materially increase the value of their extension work by adding a range management section to their extension service.

Range land administrators have not always seen the need for selling as well as administering. The value of selling in this sphere of range work is twofold: first, it can make the administrative job easier by showing the scientific reasons for administrative actions, and convincing stockmen of the need for these actions; and second, it can result in the passing along of information which will be of value to the ranch operator in handling his own land to the best advantage.

Most of our selling efforts to date have naturally centered around the easiest commodity to sell: range improvement. A successfully reseeded pasture, or a range cleared of noxious shrubs is an effective sales talk in itself. The area in which most of our problems lie, and the one which is hardest to face in developing an educational program is that of management planning. Often, changes in a range management plan are slow to show tangible results, a fact which makes selling difficult. Nevertheless, that one field seems as important today as any in range management education.

Selling range management is not like "selling ice boxes to Eskimos." Any sincere range technician or rancher who knows from experience what he is talking about, and who will talk about it in the language of the range country will find that he can do a satisfying job. American stockmen follow a calling that is filled with treasured traditions, but that does not mean that they are not ever alert for developments that will help them do a
better job for themselves and their land. Anyone who earnestly wants to further the practice of sound range management has a receptive audience waiting for him.

—Raymond M. Housely, Jr., Student, School of Forestry and Range Management, Colorado Agricultural and Mechanical College, Fort Collins.

What Should the Goal of Range Education Be?

RANGE management is a youngster among college curricula. Data secured from schools offering degrees in range management indicate that but two schools offered a bachelor's degree in range management prior to 1930. Although instruction in this field was begun earlier than this, it is perhaps safe to say that the development of range education has occurred in the last forty years, with the major expansion having occurred within the last twenty-five years.

The major problems surrounding the development of a curriculum are associated with the many related fields of science which concern the range manager. It is difficult to see how one can be an effective range administrator without some reasonable knowledge of animal husbandry, agronomy, both soils and field crops, agricultural economics, public administration, and forestry, to name but a few of the more obvious. Some knowledge of few of these could properly be omitted from a course of training for a rancher. Yet, each of these has a sufficiently large body of information to occupy a full curriculum. How then can we hope to supply sufficient training in the field of range management and at the same time include the essential training from these related fields to make the range graduate an effective land administrator or ranch manager?

A further complication arises from the fact that the needs of the student for knowledge in these related fields vary considerably with the employment position of the individual. What will be essential information to one individual may be but helpful subsidiary information to another. Stated briefly, those responsible for developing a course of range instruction have little time, an almost unlimited amount of information, and no precise knowledge of the individual needs after graduation of the students for whom the range curriculum is being devised.

One solution is to elaborate the number of courses required so that an individual receives training in all the possibly useful areas of knowledge. This obviously can extend the required number of courses beyond that which can possibly be covered in the time available to the college student. Moreover, it is likely to develop into the elaboration of trivia and the emphasis upon operational details rather than upon fundamental and basic information.

Given the two alternatives of familiarizing the student with the details of the day to day operation of a particular job and providing a considerable and broad background in the problems involved and their significance from the standpoint of human relations, the latter seems to me imminently to be the better. An illustration may serve to clarify this point of view. One could obviously spend a good deal of time in elaborating the actual commensurate property requirements of the Forest Service from area to area. No doubt such information might be useful and helpful to the student, particularly should he later find himself working as a district ranger. However, would understanding not be better reached by pointing out that the commensurability problem is but one phase of more basic