

SAN CARLOS APACHE CATTLE STUDY IS BEING EXPANDED

One of the largest "large animal" research projects in the history of the world is 10 years old — and expanding.

That project is the cooperative study in which the San Carlos Apache Tribe, The University of Arizona and the U. S. Department of Agriculture combine in a performance testing program of the San Carlos herd of purebred Hereford beef cattle.

The idea for the project came in 1955, when Thomas S. Shiya, then general manager of San Carlos tribal affairs, approached Dr. C. B. Roubicek, head of the USDA Beef Cattle Breeding Research Center at Denver, and Dr. O. F. Pahnish of The University of Arizona.

The San Carlos purebred herd, explained Tom, is made up of more than 600 Hereford cows, serving as "seed stock" for high quality young bulls to serve the general tribal herd of 12,000 to 18,000 head, which roams some 1,640,000 acres of tribal lands in east central Arizona. Why not use that purebred herd for research purposes and also apply those research findings to the benefit of the tribe and all Apache-owned cattle?

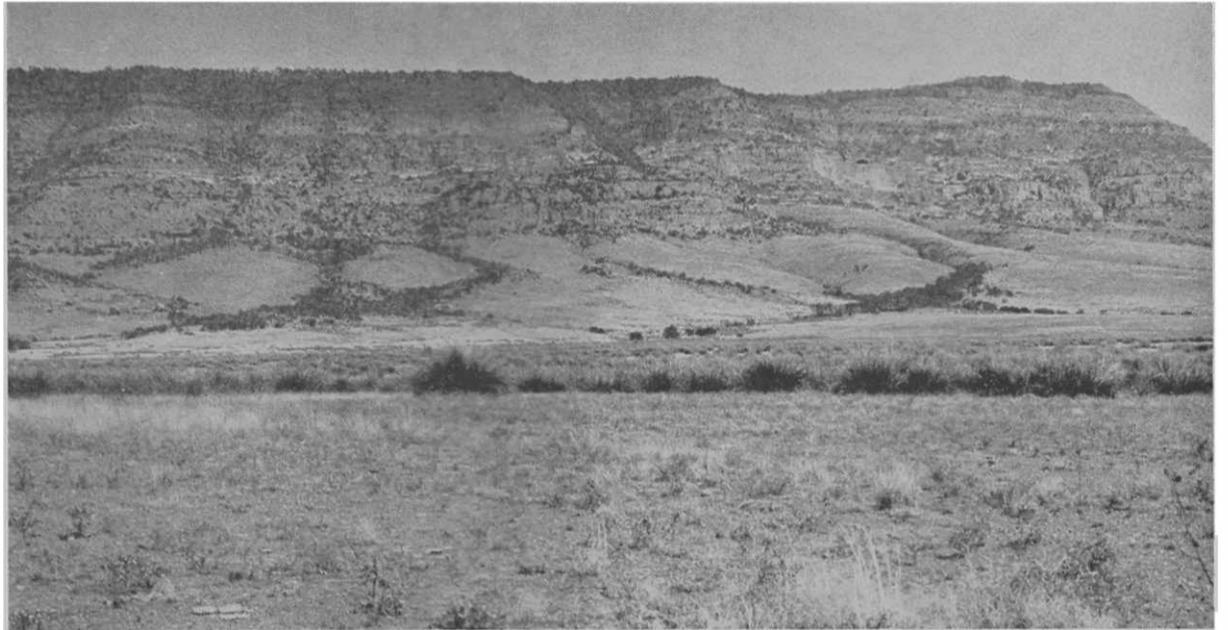
Indian Officials Approve

The idea was approved by George Stevens, manager of the tribal registered herd, and by Tom Dodge, superintendent of the San Carlos Agency.

Dr. Roubicek, at about this time, left the federal beef breeding research work at Denver and joined the Animal Science Department staff at The University of Arizona, in charge of livestock research work. He saw great promise in the San Carlos project and encouraged University of Arizona participation.

He and Shiya agreed on the details of starting a performance testing program, with the motive of increasing beef production, raising the currently inadequate calving rates, keeping adequate records, and using bulls which would throw a large calf crop of animals which had quick gaining ability and desirable conformation.

Tom and Carl talked it over: "You lead the way," said the tribal business manager to the animal scientist, "and we'll follow."



ARSENIC TUBS, 45 miles back from the highway, looks northward toward the Mogollon Rim. These bajadas are rich in early Indian artifacts — and also in rattlesnakes.



TYPICAL BUNCH OF young purebred Hereford bulls at Arsenic Tubs, brought in for the semi-annual inspection.

Everyone Pitched In

"Actually," recalls Dr. Roubicek, "it wasn't a case of anybody following anybody — we all just pitched in and

went at the job together. The Department of the Interior, the tribal council of San Carlos, the U. S. Department of Agriculture with its pure-

(Continued on Next Page)



EVALUATING ANIMALS in the corral are, left to right, George Stevens, Dr. Quisenberry and R. T. Clark. The visual examination came after each animal was released from the squeeze.

San Carlos Project

(Continued from Previous Page)

bred bull stud up at Miles City, Montana, the Bureau of Land Management which laid out pastures, the Indians themselves who did a formidable job of fencing breeding pastures — all worked together in a tremendous harmony of cooperation.”

As for the results, The University of Arizona College of Agriculture would have a rich store of research data, an outdoor laboratory of vast scope, while the San Carlos Tribe would have access to the data, intended to improve the performance of their cattle.

First of all, there were 25 separate breeding pastures fenced, each pasture 650 to 700 acres. The BLM decided where the pastures would go (at Arsenic Tubs, headquarters for the herd manager) and the Apache Tribal Council did the fencing and provided water.

Obtain Miles City Bulls

Breaking precedent, the USDA Miles City Station made performance-tested bulls available for use in the San Carlos purebred herd. The first six Miles City bulls were purchased by the tribe in 1955 and used the spring of 1956. Cooperating at this point, in addition to those named

earlier, were J. Richard Quisenberry, superintendent of the federal station at Miles City, and the late R. T. Clark, who was then coordinator of beef cattle research at the Denver office for USDA.

Sires used on the purebred herd that spring of 1956 included the six from Miles City, some animals purchased from various registered herds, and a few bulls from San Carlos with performance records, for a total of 18.

University of Arizona participants, at the start, included Dr. O. F. Pahnish and Dr. Roubicek, although a considerable group of staff members and graduate students took part, in ensuing years, in the semi-annual survey of the herd.

The purebred sires were assigned 30 to 35 cows each, each sire and harem in its own breeding pasture. The pastures are used annually, May to mid-July, to include the calving season. For the rest of the year these pastures are rested to allow regrowth of forage.

Had Unique Advantages

Besides being one of the largest “large animal” (as contrasted to research with guinea pigs, hamsters, white mice or fowls) research projects in the world, the San Carlos project had unique assets of its own. First of all, there was no culling until animals were over two years of age, and no castrating. This allowed research on a “complete population,” instead of

a selected population from which certain animals had been culled.

Secondly, this experiment took place in a vast area where year-around grazing took place, a place where pasturage and pasturing could be judged without the interruptions of barn feeding, winter yarding, or supplemental feeding. The registered herd alone has 90,000 acres of rangeland, fenced off from other reservation lands. Excellent cooperation of tribal officials and individual Indians was continued under direction of Charles Rives, the new superintendent.

A Variety of Tests

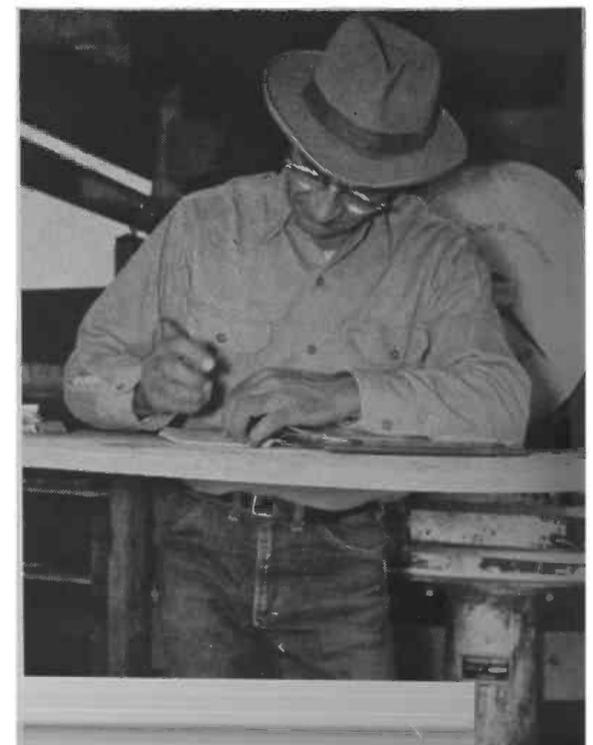
Each March and November the group of animal scientists from The University of Arizona would go to the reservation, take the winding mountain road back to Arsenic Tubs, and there for two or three days:

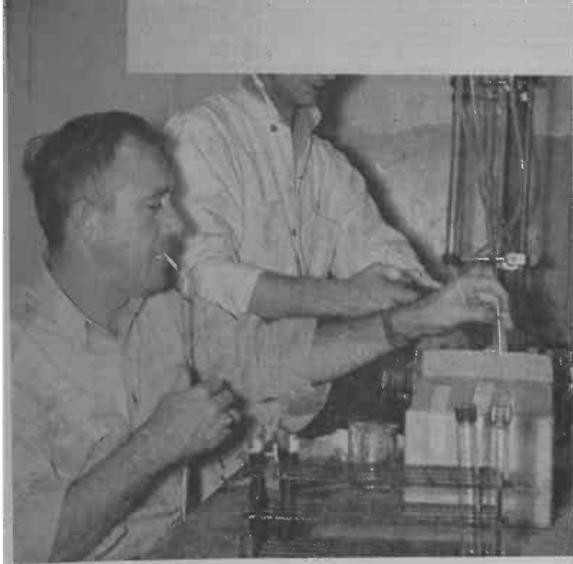
1. Take weights and visual grades of calves. After the first year that included yearlings, for a total of around 600 head.
2. Make a liver biopsy, to determine vitamin A storage (or lack of carotene).
3. Get blood samples for a wide range of tests — glucose, phosphorus, hemoglobin count, etc.
4. Obtain feces samples, in order to make a count of internal parasites.
5. Finally, as the animal is released from the squeeze, make a general grading as to appearance, conformation, type, etc.

Active over the years in this semi-annual examination of hundreds of young animals has been Albert Lane, University of Arizona Extension ani-

(Continued on Next Page)

DR. FLOYD PAHNISH takes the weights as animals walk onto the scale before approaching the squeeze, where blood, liver and feces samples are taken.





IN THE MAKESHIFT "laboratory" adjoining the corrals, Bill Hale and Dick Taylor work on blood samples.

San Carlos Project

(Continued from Previous Page)

mal husbandman. Taking the feces samples and later examining them in the laboratory at Tucson has been Dr. L. W. Dewhirst of The University of Arizona Department of Animal Pathology. Active, too, has been Dr. Raymond Reed, head of that department.

The work at Arsenic Tubs, in its beautiful mountain-framed wild surroundings, has been the exciting and colorful portion of the work. The cowboy meals prepared by Apache cooks, the living outdoors, the sweating and the freezing, the animal urgency of hundreds of Herefords milling in the corrals and being prodded into the chutes — all that has a certain zest. But the work which makes this all meaningful has been that which came later — the long hours of laboratory drudgery, sifting and evaluating the findings.

There were, in the Department of Animal Science alone, more than 10,000 laboratory analyses annually.

GETTING HIS number. The record keeping must be accurate if the data are to mean anything.



Additional are the parasite classifications and counts made by Dr. Dewhirst. The data are placed on IBM cards, quickly available.

Range is Studied, Too

A part of the project, yet not directly a part of it, has been the taking of grass samples by Bureau of Land Management workers. Various portions of the vast rangeland have been studied, grass species noted, poisonous plants observed and destroyed, seasonal evaluations made of range condition.

Now, a decade after the project began, it has widened to include studies in other states. With a U. S. Department of Agriculture grant and continued cooperation of University and Indian personnel, performance-tested Hereford sires from other states will be introduced to the San Carlos purebred cow herd. Production records of progeny will be obtained.

The sires themselves will be evaluated to learn if they perform as well at San Carlos as they did at home. Animals from the Agricultural Experiment Stations at Wyoming, New Mexico, Montana, Nevada, Utah and Colorado will enter the picture. Semen from these bulls will be used on commercial herds in Oregon, Wyoming and Hawaii.

After weaning, half of the bull calves from the San Carlos purebred herd will be placed on feedlot tests at Tucson, to see if there is similarity or disparity between gaining ability on the range and in the feedlot. The other half of this young bull crop will stay on the San Carlos range.

Heredity and Environment

Through switching of sires and semen between states, where feed conditions and climate have many differences, there will be opportunity to learn if a bull which has a good performance record under one set of conditions can do comparably well under other conditions.

Will the genetic factors which make beef cattle perform well on the cold mountainsides of Wyoming and Montana make these animals — or their progeny — perform equally well in the humid heat of Louisiana, or the bland climate and with the strange livestock diets of Hawaii?

Research is a road without an end, and those directing the San Carlos cattle project are already planning new variations to find new information. Dr. Roubicek foresees more stress on reproductive ability in sires and fertility in dams, because the size

(Continued on Next Page)

FILTRATING BLOOD SAMPLES. At San Carlos the air is brisk in the open air makeshift laboratory in March and November, so the flannel shirt and hunter's cap worn by Dr. Roubicek are not an affectation. All research samples are returned to Tucson for further evaluation and recording.



Cultivating Our Garden

By Arthur H. Beattie

EDITOR'S NOTE: This is second portion of the talk given by Dr. Beattie before the members of Gamma Sigma Delta, honorary society for agriculture. Dr. Beattie is professor of Romance Languages and Director of The University of Arizona's Honors Program.

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If cultivating our garden means improving the physical environment in which we live, it also means improving the social and the moral environment. To combat poverty, to fight ignorance and superstition, to work for the creation of a healthier world, are all ways of cultivating our garden.

There are no distant peoples in the world today, and no problems that do not touch us. We must be concerned with our own neighborhood and our own town, and we must do what we can to make them centers of healthy activity. But we must recognize that the racial problems of New York or of Selma, Alabama, vitally affect us and that we cannot hold ourselves aloof from famine in India, disease in Ghana, squalor in the slums of Rio, or tyranny in Budapest.

We Each Can Do Something

It is rare that you and I as private citizens can do very much individually to improve the lot of even our closest neighbors, not to mention those who live in distant lands. Yet here this evening are agriculturists who have contributed to increasing the food supply and improving the economy of peoples of the Near and Middle East, of Mexico, and of Brazil. They have made major contributions to the cultivating of this garden of ours which is the entire world.

But each of us in his own way, in his professional work as teacher or researcher, and in his day by day dealings with others, can practice the cultivating of our garden which consists in making life a little more pleasant, or a little more readily bearable, for those about us. It does not take a Dr. Seagrave or an Albert Schweitzer to achieve this, for quite small gestures of helpfulness or encouragement, simple expressions of fellowship or sympathy, unpremeditated demonstrations of human trust, an attitude of respect toward our fellow men, are significant steps toward the broader goal.

If cultivating our garden involves a concern for protecting and embellishing our physical environment, and an effort to improve the lot of mankind by an understanding attitude and a sympathetic cooperation with others, its major element is, in my opinion, an unceasing devotion to our own intellectual and spiritual growth.

We remain incomplete human beings if we ever allow our thirst for knowledge and understanding to be appeased, and if we permit any of our intellectual and esthetic capacities to be uncultivated. There is a verse from Proverbs which I like to quote in discussing our Honors Program. It is the injunction, "Now wisdom is the principal thing; therefore get wisdom; but with all thy getting, get understanding." This seems to me to suggest what should be the aim of the intellectual life.

As some of you well know from experience, we seek in our Honors Program to broaden the intellectual and artistic capacities of freshmen and sophomore students admitted to it. In the conversations with participants

which take place during Honors interviews, and through the Frontiers of Knowledge discussions, we encourage both depth and breadth in their studies and their extracurricular activities. My own field of specialization is in language and literature, but I should feel even more inadequately equipped than I now do for life in the complex world of today if I had not managed to acquire at least a nodding acquaintance with several of the natural, physical, and social sciences.

We cannot be universal scholars like those happy men of the Renaissance (we might choose Leonardo da Vinci, Francis Bacon, and Francois Rabelais as examples) who were experts in virtually every field of knowledge of their day. We must, if we are to be scholars, become specialists in a quite restricted branch of an already narrow discipline. But this narrowness must be counter-balanced, if we are not to lose our humanity, by a great breadth of less profound knowledge.

We do encounter people who lack intellectual curiosity and seek to shut out from their experience everything that does not contribute directly and immediately to their professional objective. We have admitted to the Honors Program an occasional student so narrowly committed to his vocational objective as a mechanical engineer, a veterinary surgeon, or a professional musician that he has resolutely resisted efforts to encourage him to gain a broad view of knowledge in the sciences, the humanities, and the arts in general. The student in the humanities who will not make an effort to acquaint himself with scientific thinking and with new scientific discoveries, or the student in an applied science curriculum who thinks it a total waste of time to enrich his inner life through litera-

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of the calf crop is one index of beef cattle profit.

Supplemental feeding has a useful place in Arizona desert grassland ranges, and such feeding might well be introduced as a new feature in this work. Separate pastures for the yearling heifers, to give them a good nutritional start, may be tried.

Effect of Sparse Vitamin A

The work of semen testing and use

of breeding pastures has already shown great improvement in the calving rate. Increased attention will be given to vitamin A deficiencies. San Carlos ranges have had their fourth straight year of drought, and the shortage of green forage and available carotene is beginning to hurt, noticeable in poorer calving rates and lack of vigor in the calves.

"We're noticing from our laboratory tests of blood and liver tissue that there is a tremendous 'year effect'

which indicates how the animal's general well being is affected by adverse range conditions," says Dr. Roubicek.

An interesting supplement — adverse conditions, whether they are extremes of cold, or heat, poor quality of forage or scarcity of feed — seem to affect the females much less than the males.