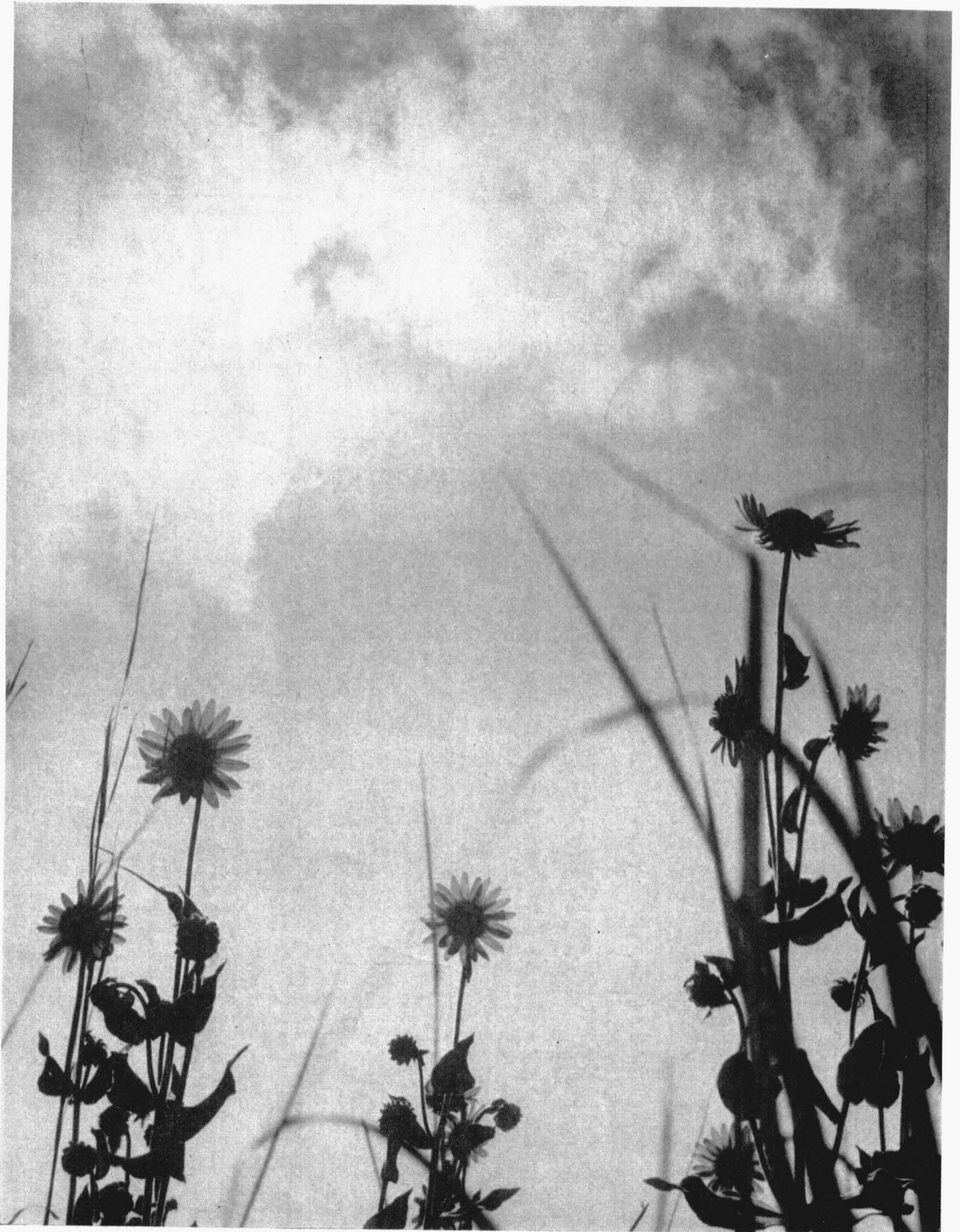


# TUCKER PRAIRIE





Lee Battaglia photos

A unique addition to the expanding research and education facilities of the University is the famous Tucker Prairie tract, 160 acres of unbroken land lying along Highway 40 in Callaway County, about 18 miles east of Columbia. It was dedicated as a research area of the University in formal ceremonies on September 13.

Its acquisition by the University last year was made possible through a National Science Foundation grant and contributions from the University Alumni Achievement Fund, the Missouri Chapter of the Nature Conservancy, and a number of individuals.

The dedication ceremonies began with a morning program at the Student Union, where the participants were greeted by President Elmer Ellis of the University. The speaker was Dr. William J. Robbins, former dean of the Graduate School at the University and former director of the New York Botanical Garden, whose subject was "The Plains and the Prairies." Dr. Clair Kucera, associate professor of botany, who has been doing research at the tract, gave an illustrated talk on Tucker Prairie. Dr. W. Francis English, dean of the College of Arts and Science, presided.

At a luncheon meeting the address was given by Dr. Alan T. Waterman, physicist and director of the

National Science Foundation, who discussed "The Land From Our Fathers." (Excerpts from the dedication addresses begin on the following page). Dr. Frederick A. Middlebush, president-emeritus of the University, presided and introduced distinguished guests.

The group went to the Tucker Prairie tract in the afternoon for the formal presentation of the research area, which was made by Sidney Maestre of St. Louis. Accepting for the University was Randall R. Kitt, a member of the Board of Curators. Following the ceremonies, Dr. Kucera conducted a tour of the tract.

Individual donors were Mrs. J. Roy Tucker, Mr. and Mrs. Daniel P. Tucker, and Mr. and Mrs. James St. George Tucker, all of Fulton; William C. Tucker, Warrensburg; J. B. Arthur, Mexico; J. S. Lehmann, Sidney Maestre, Edward Mallinckrodt, Edgar M. Queeny, and Tom K. Smith, all of St. Louis, and R. B. Price, Columbia.

Tucker Prairie has never been broken by the plow. The native grasses are dominant with the bluestems being the most important. More than 150 plants of all kinds are present. In addition to historic and aesthetic values, the tract is significant for its research importance, with opportunity for basic studies in ecology, taxonomy, and other related fields.

## The Plains and the Prairies

By Dr. William J. Robbins

What a tale could be told if we knew the history of the plains and the prairies. Why did the three-toed horse, the mastadon and those other strange prehistoric animals known only from their fossil remains disappear? From where came the plants we now know and what preceeded them? Unfortunately, we have learned only fragments of the past of the plains and prairies.

According to Gleason, the prairie originated some 25 million years ago with uplift of the Rocky Mountains. As the mountains rose they intercepted the moisture-laden winds from the Pacific Ocean, and a region of low summer rainfall and still drier winters developed to the east of the mountains. Such a climate was unfavorable to tree growth; the forests gradually disappeared and were replaced by herbaceous plants, chiefly grasses. How long it took for the prairie to reach its final condition, no one knows, but it was slowly evolved and it was centuries old when the white man first saw it.

Spaniards in the 16th Century were the first white men to discover and explore the prairies in part; but they, bemused by dreams of riches in gold, silver, spices, and precious stones, probably never realized the true significance of this vast and fertile area.

The French, however, penetrating the prairies from Canada by way of the Great Lakes during the 17th Century early recognized the potential wealth of

middle North America. In fact, the name prairie, as you know, is French in origin and means an extensive meadow.

The young French Canadian, Louis Joliet, student, wanderer, explorer of the region of the Great Lakes and the Mississippi, reported, "At first, when we were told of these treeless lands I imagined it was a country ravaged by fire where the soil was so poor it could produce nothing. But we certainly observed the contrary, and no better soil can be found either for corn, for vines or for any other fruit whatever. . . . A settler would not spend there ten years in cutting down and burning the trees; on the very day of his arrival he could put his plow to the ground."

The brothers-in-law Radisson and Grosseilliers wrote, "Ye world could not discover such inticing countrys to live in. Europeans fight for a rock in the sea against one another, or for a sterile land and horrid country. Contrarywise those kingdoms, the prairies, are plentiful of all things. . . . What laborinth of pleasure should millions of people have, instead that millions complain of misery and poverty."

Allouez, writing of the Illinois Indians, said "They live on Indian corn and other fruits of the earth which they cultivate . . . on the prairies. They eat 14 kinds of roots; they gather from trees and plants 42 different kinds of fruits all of which are excellent, they hunt

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## The Land From Our Fathers

By Dr. Alan T. Waterman

The National Science Foundation is glad to have had a part in preserving for research purposes one of the few remaining tracts of natural prairie land. At the same time, one cannot escape the thought of how strange this occasion today would have seemed to the men and women who made their way across these plains less than a hundred years ago. How could they possibly have imagined that in so short a time the magnificent prairies that unrolled before them in every direction would have succumbed to cities, farms, and roadways?

It is particularly fitting that the universities, which have so long stood as guardians of our intellectual and political freedom, should lead the way in conserving and protecting those natural resources which we have used with such prodigal waste.

Such resources are important to us not only for economic and aesthetic reasons but also because we are beginning to see that environment is an essential part of the study of life. We owe to the biologists and to that emerging class of specialists known as "ecologists" a debt of gratitude for teaching us that plants and animals alike can best be understood in their native habitat.

The idea of studying an organism in its natural environment seems too eminently logical to be novel, but the biologists tell us that it does, in fact, represent a trend away from the recent idea of isolating a given biological entity from its fellows. It is quite apparent, for example, that a cell studied in complete isolation is quite a different thing from a cell observed in the blood stream or as part of living tissue.

There will be little disagreement as to the necessity of devoting increasing study to all types of plants and organisms within their natural environment. The real problem is how to conserve such natural environment in the face of the steady and uncontrolled growth of urbanization and mechanization. For it is now obvious that the survival of natural environments cannot be left to chance but must be the subject of organized effort, supported, where necessary, by local and Federal government. The universities have a crucial role to play in three important respects: first, in establishing, by a sound body of basic research, those fundamental principles which should be observed; secondly, by encouraging and training young biologists in sufficient numbers to become ecologists; and thirdly, by supporting and influencing the de-



velopment of policies, both at the local and national levels, which will insure effective land utilization and preserve irreplaceable natural resources.

Our ideas on conservation have until recent years been largely on an intuitive or an aesthetic basis. Conservation measures usually develop around a particular resource which interested a special group. They have therefore had the earmark of special pleading, and we have neglected to look at the overall problem from a scientific point of view.

Science can aid these efforts by furnishing us an estimate of the extent of our resources and the best methods of making them continuously available. It can also give us a realistic picture of man's place in nature. Is he, for example, an exception to the principle that no organism has ever been known to increase and spread its kind without encountering limitations? Man has clearly made himself a dominant

species. In some respects he is unique, in that he has been able to break through the barriers of climate and distance—or so we think in our finite view of the universe! A most challenging scientific question today is how much longer man can continue to intensify the pressures on his environment.

To govern his course wisely, he needs much basic knowledge, not now available, about living organisms, both plant and animal, and about their physical environment. I am glad to be able to say that in the National Science Foundation our earth sciences and environmental biology programs are currently supporting a considerable number of research projects that are devoted to acquiring fundamental data of this kind.

Another and related problem that falls within the

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*At the presentation ceremony, from left: Robert Doerr, president, Missouri Nature Conservancy Association; Randall R. Kitt, member of the Board of Curators; Daniel Pratt Tucker, Fulton; Sidney Maestre, St. Louis; Dr. William J. Robbins, one of the dedication speakers; President Ellis, who presided at the presentation program; Mrs. Daniel Pratt Tucker and Mrs. James Roy Tucker, Fulton; Mrs. William C. Tucker, Warrensburg; Mrs. T. D. Anderson, Fulton, sister of Mrs. J. R. Tucker; Daniel Tucker, son of Mr. and Mrs. D. P. Tucker; and William C. Tucker, Warrensburg.*

University Photo Service



## The Plains and the Prairies from page 4

the roebuck, the bison, the turkey, the wildcat, a species of tiger, and other animals. They reckon up 22 kinds of these and some 40 kinds of game and birds."

These reports and others like them as well as population pressures in Europe and on the eastern seaboard of North America, induced in the 19th Century, rapid settlement of the prairies and the great plains. This is not the time to review the course of settlement of the plains and the prairies. Others have told again and again in history and in story the fabulous rapidity with which it occurred, the hardships endured by settlers who, accustomed to living in clearings in well watered woodland, had to adapt themselves to a country deficient in trees, water and even stones.

It is almost inconceivable now that less than 150 years ago the prairies were considered to be areas which would never be occupied by white men. John Bradbury, writing of his travels in the interior of America in the years 1809, 1810 and 1811 said . . . "the question whether the prairie can or cannot be peopled by civilized man has often been agitated. Accustomed as they are to a profusion of timber . . . they are not aware of the small quantity of that article that may be dispensed with. The belief in America is that the prairie cannot be inhabited by whites. My own opinion is that it can be cultivated and that in the process of time it will not only be peopled and cultivated but that it will be one of the most beautiful countries in the world." How right John Bradbury was. Even when settlement was well under way the attitudes toward life on the prairie were not all favorable by any means. This may be illustrated by a sample of doggerel published originally in *Spirit of the Times*, New York City, and written with reference to the Illinois prairie:

Flat as a pancake, rich as grease,  
Where gnats are full as big as toads  
And 'skeeters are as big as geese,  
O, lonesome, windy, grassy place,  
Where buffaloes and snakes prevail—  
The first with dreadful looking face,  
The last with dreadful sounding tail—  
I'd rather live on Camel's Rump  
And be a Yankee-doodle beggar  
Than where they never see a stump  
And shake to death of fever-or-agur.

Others have described the changes which transformed the prairies into farms, ranches, villages and cities. Never in the history of the world did so great an area of fertile land, sparsely occupied by men, become available for settlement. Hunger, which had stalked their ancestors for centuries, was eliminated for those fortunate people who established themselves on the prairies by the abundance which eventually came from their cultivation.

Now the University of Missouri is proposing to preserve a bit of native prairie. Why? For what reason? I suggest that it is preserved first, because it will remind us of the past; of fur traders in fringed buckskin, mountain men, Jim Bridger, pioneers and their long rifles, Daniel Boone and the Callows, Independence and St. Louis, Johnny Appleseed, Lewis and Clark, the 49ers, pony express, families in prairie schooners, skin tepees, war bonnets, Comanches, Sioux, Blackfeet and Apaches, Crazy Horse, Sitting Bull, Geronimo, Custer and the Little Big Horn, the



*Dr. William J. Robbins, former dean of the Graduate School at the University, and President Ellis as they arrive at Tucker Prairie.*

overland stage, herds of buffalo, hide hunters, bones, at a dollar a ton, railroad to the Pacific, John Deere's sod-breaking plow, sod houses, boundless cold, blizzards from the northwest making a gray white fury in which a man might be lost going from barn to house, tornadoes, grasshoppers, drought, loneliness which drove many a housewife mad, air burning like a blast furnace, an emerald green sea spangled with golden cow-slips, with scarlet lilies, lavender pasque flowers, birds-foot violets and shooting stars. All of this and much more will pass before our mind's eye as we see this piece of virgin prairie.

Second, such pieces of land preserved not only here in Missouri, but in Kansas, Iowa, Nebraska, Minnesota and Wisconsin, help us reconstruct with some degree of clearness and certainty a picture of the prairie which once was—an almost endless rolling grassland—now nearly completely blotted out by the hand of man. These bits of virgin prairie can serve as points of reference and tell us whether what man has done and is doing to the land is good or bad, whether we are exhausting and even destroying a heritage, or treating it as capital to yield a steady income for the indefinite future.

Third, the Tucker Prairie will be an outdoor laboratory where the interrelations between plants, animals and their environment can be observed and

studied. The life in a prairie is complex. As Weaver has so well put it, "So many species can exist together only by sharing the soil at different levels, by obtaining light at different heights, by making maximum demands for water and soil nutrients at different seasons of the year, by fitting into niches unoccupied by other species and by profiting by the incidental benefits afforded by the community of which they are a part."

The Tucker Prairie will furnish means for the study of this complexity, an opportunity to learn how it came about and how it continues to exist. It will inspire students to apply themselves to the understanding of the relation of organisms to themselves and to their environment. Perhaps the lessons learned may have some significance for man's attempts to understand himself, his relations to other living things and to the physical world in which he lives.

The history of the vegetation of the plains and prairies, though still imperfectly known, is a history of repeated migrations of diverse plants arriving from various habitats, persisting for various periods of time, retreating and perhaps ever disappearing under the pressure of environmental changes or the appearance of competitors which made the position of the original inhabitants untenable. Old species extended their dominion for a time, new species were evolved, species of various origins intermingled, isolated relics of early migrations persisted here and there.

Students of the development and decay of civilizations, of the migrations of peoples, of the types of men best adapted to rural or to urban life, or to northern, temperate or tropical climates, might find

in the history of vegetation and the interrelations, in a plant community, lessons of value. Much has been learned of the structure, physiology and inheritance of man from a study of plants. Robert Hooke first observed cells in a bit of cork, Strassburger first observed chromosomes in the lily, Mendel made his basic studies in genetics on the pea plant, we have learned much about the use of sugar in the human body by studying its use by the yeast plant, at least three vitamins important for us were discovered because they were also needed for the growth and well-being of simple plants. We have become convinced in the last generation or so that the fundamental and basic life processes in plants—even the simple and primitive ones—are much the same as those which go on in the human body and that we can learn much about ourselves and the way our bodies work from an investigation of plants. Life, so infinite in the variety of its manifestations, is fundamentally the same wherever it is evidenced. Who knows but that a study of behavior in plant communities may not tell us much about the behavior of man in his associations and in his communities.

We are indebted to devoted, and able investigators for what we know of the vegetation of the plains and the prairies—J. E. Weaver, H. A. Gleason, A. Hayden, B. Shimem, E. N. Transeau, J. H. Shaffner and many others. I have no doubt but that the availability of the Tucker Prairie will inspire students here at the University of Missouri to add new knowledge and to solve some of the problems which the plains and the prairies still present to us.

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province of the university is the training of young scientists in the fields that are important to wild-life management and conservation practices. We hear a great deal these days about the shortages of physicists and engineers because these fields are so directly related to national defense. One of the problems is to persuade able students to resist the lure of high-paying jobs long enough to complete their graduate training. Although the situation in the biological fields is less acute, nevertheless there is sufficient demand from state and local agricultural and conservation programs for young biologists that many of them are diverted from the years of broad graduate training that are essential for the able ecologist. There must be a conscientious effort to encourage students with aptitudes in biology to stick with their graduate training in order that they may eventually contribute to this relatively new and highly important field.

I come now to the third aspect of university relationships to conservation practices: namely, the shaping of national policy. Here the role of the universities is one of leadership and influence upon public opinion, together with such positive action as circumstances may dictate. We have an excellent ex-

ample at hand in the University of Missouri's efforts to persuade the State Highway Commission to redirect the road which threatens to cut off part of the Tucker Prairie tract. One cannot expect agencies whose responsibilities lie in other fields, to be fully aware of the importance of preserving scientific and aesthetic values, particularly when these appear to conflict with other objectives directed toward the public welfare or convenience. Rather it is the universities which must be the guardians of these special values and to teach by precept and a continuing program of public education, the importance of preserving values not always apparent to the uninitiated.

Even the rapid advance of scientific agriculture cannot offset the threat to our food supply resulting from planless inroads upon the fertile farm and grasslands of the nation. We cannot sit back complacently and wait for legislation to check these trends. Legislators at local and national levels alike respond to the will of their constituents; and unless there is an informed body of public opinion that calls for effective planning and intelligent conservation, the heedless despoliation of the land will continue unchecked.

Preserving the productivity and beauty of our



natural resources as well as their potentialities as research laboratories is clearly a problem that cuts across state boundaries and affects all of our people. Indeed, we are beginning to see that conservation in its broadest sense knows neither natural nor man-made boundaries, and that what is being done in the far reaches of the earth may ultimately affect or influence the rest of the world.

It is noteworthy that Great Britain, under far greater pressure for productive land than we are, has not only set aside numerous natural areas but has inaugurated a program of systematic ecological study in many of them.

In our own country, a number of Federal departments and agencies are actively seeking to conserve our remaining natural resources and to repair, as best they can, some of the damage wrought by years of ruthless exploitation and unthinking development. The number and range of their activities testify to the size of the problem: the Conservation, Research, Forest and Soil Conservation Services of the Department of Agriculture; the Smithsonian Institution; the Fish and Wild Life Service of the Department of the Interior; and the National Park Service—to name a few of the outstanding ones.

The National Science Foundation has a multiple role. Through our basic research grants we are able to support sound ecological research in a number of fields; our fellowship programs open the way for biologists with ecological interests to acquire the advanced training necessary in this field; and we hope we are able to exert a constructive influence in the shaping of national policy as it relates to conservation and other protective measures.

More recently, as the Foundation's annual budget has increased in size, we have been able to turn our attention to the need for large-scale facilities in all the fields of science. The needs in the physical sciences for such large-scale facilities as electronic computers, nuclear accelerators, and optical and radio telescopes have attracted the most attention, but the needs of the biologists are important, too. In fact, there are many who feel that the next great advances in science are likely to occur in the biological fields. The biologists in general tend to require less costly and massive tools than the physical scientists, but such important facilities as biological field stations, controlled-environment laboratories, primate laboratories, and biological research vessels are needed and should be provided on a scale commensurate with the need. Similarly, there is a very real need in certain areas for adequate buildings in which to house and protect important collections of specimens. We in the Foundation are glad that wise lawmakers in Washington made the National Science Foundation Act a law of such breadth and flexibility that its funds can be extended to meet such unusual needs of science as the acquisition of the Tucker Prairie tract.

We extend our compliments and congratulations to Professor Kucera and to those of his colleagues



*Dr. Alan T. Waterman, director,  
National Science Foundation.*

whose vision and foresight were responsible for the preservation of Tucker Prairie and its commitment to the University of Missouri for safekeeping. How much wiser it is to conserve these great natural resources as they are than to attempt to recreate them when they are gone!

Nevertheless, we cannot undo what has already been done. We should, therefore, seriously consider the wisdom of restoring a considerable portion of land to native cover. Experts tell me that within a given area, 20 per cent would probably not be excessive when one takes into account such purely economic considerations as present marginal cropland, overproduction of certain staples, and the relatively less satisfactory expedient of subsidies and soil bank. If the land presently being used for these purposes were restored to native cover, soil formation would proceed, wastage by erosion would be checked, and water, wild life, recreation and aesthetic values would be substantially conserved.

Obviously, I cannot myself speak with authority in this field, but the merits of such a plan seem obvious. I hope that the University of Missouri and other land-grant institutions in our great western states will weigh this and other plans as they exert a role of positive leadership in seeking for ways in which to arrest the erosive processes that threaten the land,