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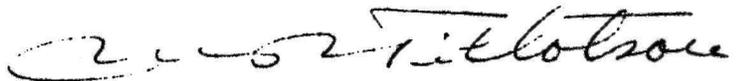
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With this issue, the Region Three Quarterly suspends publication. It will be merged with The Regional Review, published by Region One, in Richmond, Va. The Regional Review will expand its field of coverage so as to be representative of the four Regions of the National Park Service. It will include articles whose aim will be to appeal to all Service personnel, and to individuals and organizations outside the Service. It will take over the Region Three Quarterly mailing list.

Communications concerning The Regional Review should be addressed to The Regional Director, National Park Service, 811 Grace Securities Building, Richmond, Va.

We express our sincere appreciation to the many persons who have contributed articles, suggestions, and other helpful cooperation to the Region Three Quarterly. We know that such persons will give similar help to The Regional Review.



M. R. Tillotson,
Regional Director.

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M. R. Tillotson Regional Director

Leo A. McClatchy Editor

October, 1941

R E G I O N T H R E E

ARIZONA - ARKANSAS - NEW MEXICO - OKLAHOMA
TEXAS - UTAH - AND SOUTHERN PARTS
OF COLORADO AND NEVADA

FEATHERS AND FURS

By Daniel B. Beard,
Regional Biologist, Omaha.

One of the loneliest graves in all the world is located on the extreme southern tip of the Florida mainland within the boundaries of the proposed Everglades National Park. The place is known as Cape Sable, inaccessible except by boat. The gravestone faces the Gulf of Mexico. Behind it is a single cocopalms, bent and partially uprooted by a hurricane. In 1935 the grave was under at least 10 feet of water when the hurricane which wrought such havoc on the Florida Keys piled water onto the "cape of sands." Back of the cocopalms is a miniature jungle consisting of wild coffee bushes, strangler figs, gumbo limbo trees, wild morning glory vines, cabbage palms, cacti, and other growths. Beyond this is a mangrove swamp and, bordering it, a brackish lake.



AMERICAN EGRET

Thousands of white ibises fly over Cape Sable as they return from their feeding grounds in the nearby Everglades. Roseate spoonbills in their bright pink feathers wade along the borders of the lake and sometimes spend the night among the nearby mangroves. Along the calcareous beaches that border the gulf, many snowy egrets, little blue herons, and occasionally an American egret or two dodge up and back like plovers to catch whatever may be brought in by the waves. Enormous numbers of wood ibises come thumping in to roost each evening in some hurricane-swept black mangrove trees. Great white herons may be observed standing belly-deep in the blue-green waters of Florida Bay southeast of Cape Sable. All this and much more can be seen within a mile of that lonely grave.

The grave is that of Guy Bradley, a warden who was murdered during the heyday of the plume trade which flourished from the Carolinas to southern Texas. Money was to be made - big money - by killing egrets and other birds for their nuptial feathers. The "aigrettes" were used to decorate women's hats.

The warden was not a scientist. In Florida they would have called him a "cracker", just an average native with an average education - the

sort of a person who might run a chartered boat and know how to thread through the Ten Thousand Islands in order to reach tarpon-fishing water. He could have been making ten times his salary by killing birds because plume hunting went on with little pretense of concealment at that time. Instead, he tried to stop some hunters from ravaging a bird rookery, and his body was left in the wilderness of the southern Everglades. To me, the grave has always symbolized the constant struggle between the forces of conservation and those who would exploit wildlife to the bitter end for commercial purposes. Today's teeming bird life around Bradley's grave is proof that the forces of conservation won.

The laws that prohibited trade in wild-bird feathers contained some loopholes. You may have noticed lately that more feathers are being worn on women's hats. Usually they are dyed plumage from domestic birds, but that is not always the case. Past experience which almost ended in the extermination of certain birds showed that action was needed to head off this new "tendency." So, on February 6, 1941, the National Audubon Society negotiated a joint declaration of policy with the Feather Trade Industries, Inc. Members of the industry agreed to release at once their entire current inventories of plumages of bald eagles, golden eagles, egrets, birds of paradise, and herons, pending new laws. There were other provisions just as stringent. In 6 years other wild-bird plumage stocks will be disposed of in some manner. Praise is due all around to conservationists and civic-minded industrialists.

One of the most indicative things about the declaration of policy on feathers is that the industry itself cooperated. That is almost without precedent. Strange to relate, industries that have been dependent upon a perpetual supply of some wildlife species for their very existence have seldom favored conservation. They tend to go after all they can while they can, and make as much money as possible before the species become extinct. And unless something is done about it extinction is almost certain because when a wildlife species is exploited for commercial purposes - when feathers, hair, body, or bones become an article of commerce - that species is "on the skids."

It was not the trappers or fur houses that saved the beavers. Sturdy Mountain Men who penetrated the Rockies long before the first settlers arrived were searching for beaver pelts to be made into beaver hats and caps. Area after area was trapped dry by the skillful Mountain Men. Even in the Southwest, a good trapper could sometimes get more than sixty beaver pelts in a single day. The end seemed in sight when fashion decreed that hats of a different material should be worn. Thus the dandies of London and Paris unknowingly helped to save the beavers in the North American wilderness.

Some of the Mountain Men turned their talents towards scouting for the army, and others towards the bison slaughter that was gathering a full head of steam soon after the beaver trade died. As restless America moved westward after the War between the States, it took but a few years to kill most of the bison. Demand for hides, meat, and tongues was followed by a big market in bones. Many a prairie homesteader earned his first few dollars for subsistence and seed by picking up buffalo bones.

There are many other examples of commercial exploitation, some well known, some obscure. Fredric A. Lucas, in the annual report of the Smithsonian Institution (year ending June 30, 1889, pp. 609-49) said:

"In 1885 peccaries (wild pigs) were so abundant in the counties of Medina, Uvalde, and Zavala, Texas, that their well-worn trails were everywhere to be seen, while their favorite haunts could be readily picked out by the peculiar, musky odor characteristic of these little animals. Shortly after this date, hogskin goods being in favor, a price of 50 cents each was offered for peccary hides and by 1890 they were practically exterminated."

The peccaries are coming back now, in protected areas in Arizona, New Mexico, and Texas.

It matters little what species is involved in commercial exploitation; sooner or later unless some checks are enforced it will reach a point where natural reproduction cannot keep up with the take. It does not take a biologist to figure what the final result will be. The animals involved may be alligators, martens, otters, shadfish, shrimps, or little turtles with names of cities painted upon their backs. The general rule is equally applicable.

Alligator leather has always been in style. When handbags and luggage are made from it, then 'gator hunters take the tough hide from the back and sides, leaving the rest of the animal to rot. Sometimes



MARTEN

alligator-skin shoes are in vogue. Then the softer hide of the underparts is stripped and the rest is left for the buzzards. The results of this continual persecution for the market are plain to see throughout the entire South. The trade in baby alligators as souvenirs has also become a lucrative and destructive business. In a bulletin entitled "Reptiles and Amphibians of Texas", we find:

"At one time the range of the alligator included the whole eastern half of the state, but it is now principally confined to the extreme eastern and southeastern counties bordering Louisiana and the Gulf of Mexico. Old settlers claim that in former years this saurian was abundant all along the Brazos River, even to its sources."

When the Chinese market for sea lion trimmings fell off, and systematic hunting of rookeries stopped, the sea lion was saved from immediate extermination. A treaty between Great Britain, Russia, Japan, and the United States rescued the fur seals in the Pacific. Market hunters slaughtered prairie chickens, shorebirds, waterfowl, passenger pigeons, and other birds by carload lots to sell in big cities. Another example of the trade in wild-bird feathers is mentioned by David Condon in the January-February (1941) issue of "Yellowstone Nature Notes", when he quotes from an old report that "between 1853 and 1877 the Hudson's Bay Company sold a total of 17,671 swan skins." Swan's down was in style, and feathers made trimmings for women's wear. Much of the same thing happened with the grebes.

In 1933, 29,172 diamondback terrapins were sold for \$25,000, and 145,000 pounds of "sea turtles" were marketed for \$6,000 in Louisiana (Bull. No. 25: 1-258, Louisiana Department of Conservation, 1934). In the last half of the 19th century and later, the toll of loggerhead, green, and diamondback turtles was enormous off the Texas coast. According to data collected by James O. Stevenson, of the Aransas Waterfowl Refuge, Corpus Christi, Rockport, and other cities along the coast had canneries and shipped out both the meat and live turtles. Loggerhead and green turtles are now rare in Texas, as they are elsewhere along the Gulf of Mexico. The turtle business in Texas, Louisiana, and Key West in Florida has dwindled in spite of the catch noted in the first sentence of this paragraph.

One of the most significant developments in the last three decades is the concept of wildlife as a perpetual resource. Prior to that time there were two schools of thought. One was the ignorant "fallacy of abundance." The prairie farmer figured that he could always take his gun and pick off enough sharptails or prairie chickens for supper. The extermination of the passenger pigeon was a big jolt to that pleasant philosophy.

A woman who lives in a hillbilly shack in the shadow of Shenandoah National Park, Virginia, is an amusing, if not typical, case of this

school of thought. She was asked if she could remember any passenger pigeons. "Doves?" she replied, "Yup, used to be plenty of 'em around here. Pappy shot 'em and we young'uns caught 'em in big nets baited with corn. What we couldn't eat, we'd salt down or give to the hogs. Don't see 'em anymore - 'spect they must fly down t'other side of the mountain - they made them hogs right fat around early killin' time, too."

The other school of thought was that the presence of white man and wildlife in the same country was incompatible. In certain cases this has proved to be true. Packs of wolves and herds of domestic sheep cannot occupy the same range. In some instances, however, it is an erroneous concept and efforts are now being made to develop practical adjustments between agricultural uses of land and production of game, fur or other wildlife.

With all our progress in the past 300 years, the fur trade is still flourishing; but it has reached a critical state. I quote from an article by William J. Hamilton, entitled "Our Fur-bearers--a Vanishing Natural Resource", which appeared in the New York Zoological Society Bulletin (Vol. XLI, No. 3. May-June, 1938):

"One may weary of statistics, but they serve a purpose in establishing the immensity of the fur industry. Ashbrook (Fur Farming for Profit) has supplied the following data: About \$26,000,000 worth of furs imported and \$100,000,000 exported annually; \$121,000,000 worth used annually in the states (retail value of furs and trimmings used annually in the United States \$500,000,000); 20,000 concerns in the United States handling furs; 2,000 wholesale manufacturers of furs in New York with 8,000 workers; 160 fur-dressing and fur-dyeing concerns, with 5,500 workers, annual payroll \$8,400,000, dressing and dyeing 40,000,000 skins annually, exclusive of rabbits . . ."

These statistics mean just one thing to the conservationist: The fur industry is a huge commercial enterprise depending chiefly upon the continued availability of wildlife. Past examples of exploitation crowd into our thoughts and make us wonder. The U. S. Fish and Wildlife Service has warned that more animals of certain species are being taken in the wild than are being produced. Did we say something about "coming events cast their shadows before them?"

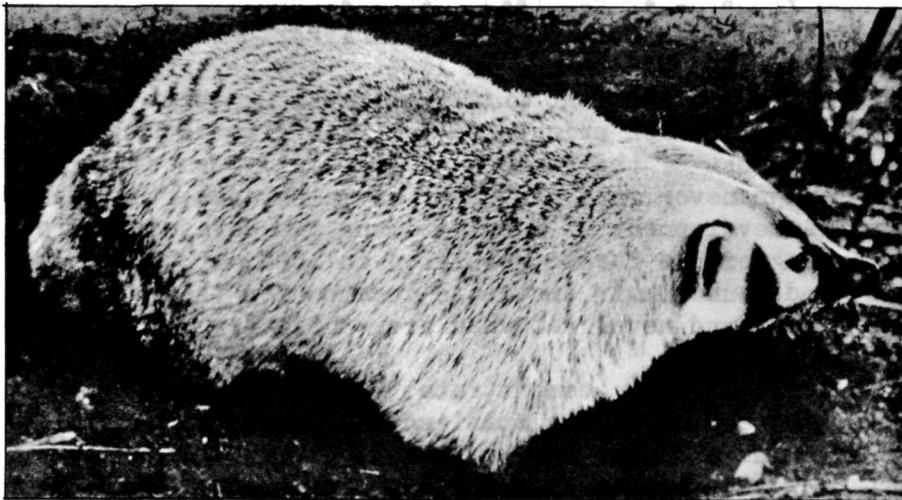
Otters were once abundant in several of the Southwestern states, but are now seriously endangered there and everywhere else in this country. In many places they are already gone. Martens, wolverines, fishers, and other fur-bearers that are still taken in the wild are in a precarious condition. Sea otters were almost exterminated long ago but are now being brought back by careful protection. Even badgers have come in for their share of abuse - badger hair brushes, you know.

For many years conservationists have been concerned, and efforts are now being made to save our fur resources and put them on a sustaining basis. That tried panacea of closed season has been invoked in many states. Research is being conducted. The so-called "stepchild" of conservation is at last getting a pretty, modern dress and a new hair-do.

Commerce now cooperates with conservation, in bird feathers. Mutual plans to conserve and use fish resources off California are doing away with the old cut throat "if-I-don't-get-them-the-next-guy-will" techniques. The taking of furs has not reached that happy state yet, but it must do so or perish. Fur farms will not supply enough. Careful management of wild fur animals, and increased fur farm production will bring the products to hitherto unknown popularity, according to present indications. It is happening today with the beaver.

One sobering thought should be recorded. This is quoted from Wildlife Leaflet 170, issued by the U. S. Fish and Wildlife Service in August, 1940, entitled, The Annual Fur Catch in the United States:

"The wars in Europe and Asia have greatly affected the American fur import and export business. With the shipping of furs practically, if not entirely, stopped, importations are bound to be curtailed for a long time. If the coming year should show a shortage of furs from foreign countries, the American market will be more and more dependent upon local production. Many persons formerly engaged in trapping in foreign countries had to abandon the pursuit when called into military service. If the demand for furs in the United States continues, then, unless protective measures prevent, a larger number of fur animals will be trapped to meet the demand. In view of the already precarious condition of many fur species, trapping must be limited and shorter seasons promulgated to maintain the supply. The conservation of fur animals, therefore, should be given as much consideration as that of any other natural resource."



BADGER

INDIANS DON'T STAY HOME

By Erik K. Reed,
Regional Archaeologist.

In the summer of 1540 Coronado found Indians from Pecos Pueblo, 200 miles to the east, visiting at the Zuni towns in westernmost New Mexico. Previously he had found, among the Pimans in southern Arizona, many people who had visited the Zunis to trade for turquoise. In 1598, soldiers of Onate, the founder of New Mexico, met Apaches in the plains east of the Pecos who were on their way to Taos pueblo to exchange bison products and salt for cotton blankets, maize, pottery, and turquoise.

Most interesting perhaps, of all the early historical references to trade and travel among the Indians is one in the history of northern explorations written in 1584 by Baltasar de Obregon, telling of a North Mexican Indian who had repeatedly visited the New Mexico pueblos taking parrot feathers north to trade. We know from archaeological finds, especially in Wupatki National Monument, Arizona; and in Pueblo Bonito in Chaco Canyon National Monument, New Mexico, that the prehistoric southwestern Indians centuries ago had macaws, which are native to Mexico. Modern Pueblo Indians are still anxious to have parrot feathers for their ceremonial regalia.

In the 17th and 18th centuries, there was travel between tribes, and occasionally whole groups moved considerable distances to live with some other nation. Movement of an entire tribe or group was usually caused by some important disturbance, and occurred particularly at the end of the 17th century in the troublous times of the Pueblo Rebellion and the subsequent Spanish reconquest of New Mexico, when many Rio Grande Pueblo Indians fled to the Navajo or the Hopi.

One such group never returned, and descendants still live in the Hopi country: the Tewa Pueblo of Hano on First Mesa, founded by Tano Indians who left the Rio Grande in 1696. Another group, Tiwas from the Bernalillo region who went to the Hopi country about the same time, were persuaded by Spanish priests in the 1740's to return and reoccupy Sandia Pueblo. Most of the Pueblos -- especially Jemez Indians -- who joined the Navajo never returned, but became Navajos; this was a major reason for the development of weaving among the Navajos. Previously, at the beginning of the Pueblo Rebellion in 1680, the Piro Indians of the Socorro and Mountainair districts accompanied the retreating Spaniards to El Paso, and never returned from their new pueblos there.

Archaeological finds demonstrate that trade and travel went on long before the coming of the Spaniards. Ornaments made of seashell are found in ruins all over the Southwest; turquoise and other stones for ornament were extensively distributed by trade, and a great deal

of exchanging evidently went on of even so general a thing as pottery. In areas as far east as Bandelier National Monument, and Pecos Pueblo, near Santa Fe; and sites near Gran Quivira National Monument southeast of Albuquerque, red pottery from the Zuni region is found. Pottery of late-prehistoric Hopi manufacture is common in Montezuma Castle and Tuzigoot National Monuments, on the Verde in central Arizona. Occasional items of Mexican origin are found. It is generally believed that most of this prehistoric trade took place gradually between neighboring groups, rather than by long journeys of professional traders such as there were in the Aztec region in southern Mexico. Successive bartering between adjacent tribes would eventually produce fairly wide distribution of desirable articles of various sorts.

Salt was an important and desirable commodity not everywhere obtainable. Fairly long journeys to procure it were made by various tribes up until recent years. The Pimans went to the Gulf of California; the Hopis to a salt mine in the Little Colorado gorge; the Zunis, Acomas, Navajos, and many western Apaches used the famous Zuni Salt Lake. Most of the Rio Grande Pueblos probably used the salines of the Estancia Valley, salt from which was sent to Mexico over the Chihuahua Trail by the Spaniards in the 17th century.

Today the same process goes on, modified by contemporary differences, in part accelerated by easier and faster travel. Men of Santo Domingo Pueblo, on the Rio Grande 30 miles southwest of Santa Fe, travel occasionally to Zuni and Gallup; even to Shiprock, and sometimes to Flagstaff or to Phoenix, to trade with the other Indians for things to sell in Santa Fe. Especially they visit such affairs as the Laguna fiesta, the Jicarilla Apache encampment, and the Navajo tribal fair, all in September; and, later in the fall, the great Zuni ceremonial of the Shalako, always primarily in order to trade, especially with visiting Navajos, for Navajo silverwork and blankets.

Pueblo pottery is almost as widely exchanged today as in prehistoric times, even aside from curio shops. Different pueblos sometimes imitate each other's styles, or a woman of one pueblo may go live in another but continue to make pottery in the tradition of her original home. Actual trading of pottery occurs, however, and occasionally an Acoma or San Ildefonso woman will have Hopi specimens among the small vessels she sells.

The Navajos do less traveling any distance outside their own reservation, but their domain in Arizona and New Mexico is a vast one, with ample space for intra-tribal travel. At least two or three Navajos, however, have visited, of all places, Australia. Many Navajos and Pueblos go away to school; a few do not stay home afterwards, but work as silversmiths or in other trades; and there is said to be a Navajo making and selling his silverwork on the Mohawk Trail near Deerfield, Massachusetts.

LESSONS IN BOTANY

By Dr. W. B. McDougall,
Regional Biologist.

(This is the second in a series of
LESSONS IN BOTANY, by Dr. McDougall.)



COMPOSITE BOUQUETS

The largest of all the families of flowering plants is called the composite family. In the entire world there are probably more than 15,000 different species of composites and, as a general rule, about one-fifth of all the flowering plants in any given locality belong to this family. They grow in all conceivable sorts of habitats from sea level to the tops of high mountains, and from dry deserts to swamps and lake margins. Since they are so numerous and so widely distributed it is important that we know something of them.

Some of the well known plants belonging to the composite family are the asters, goldenrods, thistles, ragweeds, dandelions, sunflowers, daisies, lettuce and sagebrush. The reason they are called composites is that the so-called flower, of a dandelion or an aster, for example, is, in reality, not a single flower but a bouquet of flowers; that is, it is composed of numerous flowers all clustered on one flower stem.

Let us examine the flower of a dandelion. If we take a dandelion "head" which is in full bloom, and pull off one of the yellow petal-like structures, we will have a single dandelion flower. At the lower end of this flower we will find a whitish body which is nearly cylindrical but pointed at the lower end. This is the ovary which will later develop into a one-seeded fruit. At the upper end of the ovary there is a short stalk, and attached to the end of this stalk are numerous white hairs. These hairs are collectively called the pappus, and they represent the calyx of the flower. In some members of the family the pappus consists of bristles, awns, scales, or teeth, and in some cases it is lacking entirely.

The yellow, strap-shaped portion of the dandelion flower is the corolla, and the five teeth at its end indicate that it consists of

five petals grown together. It will be noted that the lower end of this corolla is not flat but tubular, and through this tubular portion extends the style of the pistil with two stigmas at the upper end, each curled outward. The filaments of the five stamens are included within the tubular part of the corolla but the rather long anthers are united around the style just above this tubular part.

Thus we see that the little dandelion flower has all of the parts that we are familiar with in flowers, and that what we have commonly thought of as a dandelion flower consists of a large number of flowers all attached to the end of a stem which is much enlarged and expanded and is called a receptacle. Surrounding the cluster of flowers on the receptacle are numerous green bracts. These are modified leaves, and make up what is called the involucre.

All of the flowers in a dandelion "bouquet" are alike. If we examine a sunflower head, however, we find that the bouquet is made up of two kinds of flowers. Those around the margin of the bouquet have flat corollas and are similar to those of the dandelion, but those in the central portion of the bouquet have short, tubular corollas with no flat portion. These latter are called disk flowers, while the flowers with flat corollas are called ray flowers. In some sunflowers both the ray flowers and the disk flowers are yellow but in others the disk flowers are purple or brown and the ray flowers yellow so that there are two colors as well as two kinds of flowers in the little bouquet. In the asters this is almost always true, the disk flowers being yellow and the ray flowers usually either purple or white.

The advantage of having a large number of flowers clustered together on one receptacle is obvious. They can be small and still conspicuous enough to attract insects. Once an insect has been attracted it is likely to visit a number of flowers before leaving. In some kinds of composites the ray flowers do not produce any fruits, their function being merely to attract insects while the disk flowers produce the fruits.

In addition to the two groups of composites described above, that is, those that have both ray flowers and disk flowers and those that have only the ray type of flowers, there is a third group in which all of the flowers are disk flowers. This is true, for example, of the Joe Pye weed and the white snakeroot of the East, and of the rabbitbrush and the pincushion flowers of the West.

Although the composite family is the largest of all plant families, relatively few of its members are of value to man except for ornamental planting and cut flowers. Lettuce and, in some places, dandelion greens, are the only food plants from this family that are extensively used in the United States. On the other hand there is a large number

of pernicious weeds in the family.

The great size of the composite family and the large numbers of weeds in it indicate that it has been a remarkably successful family. This is all the more striking because it is believed that this is one of the youngest of plant families. Why has the family been so successful? Probably the most important reason is to be found in the very efficient means that have been developed for scattering the seeds. The composites produce one-seeded fruits. A sunflower "seed" or a dandelion "seed", for example, is a one-seeded fruit and in all cases, therefore, the entire fruits rather than the seeds alone are scattered.

Some composites, such as cockleburrs and beggar-ticks, produce fruits that readily cling to the hair of animals or the clothing of men and are thus widely scattered. The great majority of composites, however, depend upon wind as a fruit-scattering agent.

Referring again to the familiar dandelion we find a most remarkable adaptation for wind-scattering of fruits. If we examine a dandelion head while the flowers are still in bud we will find that the innermost bracts of the involucre are completely enclosed around the flower buds in a protective manner. When the flowers bloom these bracts bend at the middle, the tips being turned outward to permit the flowering head to expand. After the flowers have been pollinated by visiting insects they wither, and the bracts of the involucre close up again to protect the developing fruits.

While the fruits are developing, two important changes take place. First, the flower stalk, which was relatively short at blooming time begins to elongate, and the length to which it grows depends on the height of the surrounding vegetation. Such flower stalks have been known to become as much as 3 feet long when the dandelion plant was growing in a patch of tall weeds. In any case, this elongation of the stalk places the head in such a position that it is fully exposed to the wind. At the same time the little stalk at the tip of the ovary to which the pappus is attached elongates to such an extent that when the fruit is fully mature the pappus is at some distance from the fruit, and the fruit with the pappus forms a veritable parachute which may be carried for miles on a light breeze.

Finally when the fruits are ripe and ready to be scattered the involucre opens again and this time the bracts do not bend at the middle as they did when the flowers were in bloom. They bend at the base and become turned back entirely out of the way so that there is nothing to prevent the wind from picking up the little parachute-like fruits and scattering them far and wide.

LET'S SEE THE DESERT

By William L. Bowen,
Park Ranger,
Grand Canyon National Monument.

If your automobile balks in the desert, and an investigation reveals that the trouble is due to a break in the gasoline-feed line, look around for a Mesquite plant. Sometimes it's just a shrub; sometimes it's a small tree. In either case you are likely to find a gum exuding from the bark. The gum can be dissolved in a little water to make an excellent glue for emergency repairs to the gas line.

The Mesquite is one of the most valuable of desert plants. In addition to its utilization for firewood and fenceposts, it provides the material from which come many of the wooden buttons used on sports clothes. It has a highly nutritious bean which has long been one of the main sources of food for animals of the desert. Indian women have many ways of preparing the bean for food. There are recipes for bread, mush, and even for a drink reputed to be as refreshing as lemonade. And that gum which was used in making emergency glue - well, it can be used in making candy, too!

Such bits of practical information are provided by Park Rangers, in interpreting the natural phenomena to visitors in the national parks and monuments. Like the analysts who can "read between the lines", the Park Rangers are trained to look behind the surface, and to point out and explain the things that are not always apparent to casual observers. This interpretive service is free, and it has been organized to assist visitors in getting more enjoyment from the areas. So when you go to the national parks and monuments, join the Ranger parties.



The Ranger has only a few minutes to meet his party and to gauge the individual interests. Such things as bits of conversation, auto licenses, and clothes enable him to sort the group, and to make a quick mental assembly of those points of interest which are likely to make the most appeal in this particular case. This time we are going to see one of the Southwestern areas, and so - let's get along.

First there is Mr. Photographer. His battery of cameras testify that he wants to take some pictures. With him is Mrs. Housewife, that patient soul who has already spent much time waiting for John to get a picture. Often it will help when he shows the pictures to the folks back home if she knows what they are pictures of - he sometimes misses that "angle."

In the second car is Mr. Doctor, identified by the physician tag attached to the license plate. Later we learn that his wife was the former Miss Dietician.

In the third car are two middle-aged women. The first is a school-teacher - she wants all the available literature on the park for her class in geography. Her traveling companion, judging from the case, must be from the art department of the same school.

The man traveling with his little boy turns out to be a contractor who is going to be interested in stresses and strains and the relative merits of local building materials. His son meanwhile will have that natural curiosity of the young for any and all things that are new and comprehensible.

The array of musical instruments bear witness that the six boys traveling together are a dance orchestra absorbing a little scenery between bookings.

Here, then, is the group for whom we are going to interpret a section of this great Southwest which many people preconceive to be a land of sand dunes, heat, and wasteland with little or no vegetation.

The first plant we pass is the Thorn Apple, or Jimson Weed. This white, 6-inch, tubular blossom can be "sold" to Mr. Photographer; just the thing for a color shot. The Doctor will be interested to know that this plant belongs to the tobacco family, and contains the powerful drug, stramonium. Both the ancient and modern Indians of North and South America knew this drug. The group as a whole will see in this plant something as beautiful as the fragile, potted Easter Lily, and will respect it, not alone for its beauty, but for its hardness that life in the desert demands. While Mr. Photographer is getting his camera back in its case, there is time to point out to the contractor's little boy how a flower is made up; and that if you can recog-

nize petals, sepals, and stamens, you have made a start toward understanding botany.

Jimson Weed lends itself to study since it is large enough that even Mr. Bandleader recalls his course in freshman botany. Mrs. Housewife can see the resemblance between this bloom and that of the tomato vine in her own garden. Nature does strange things when she places one of man's best foods and one of nature's most powerful drugs in the same plant family.

Moving on a little farther we stop in front of a plant perhaps 2 feet tall with pale yellow or cream-colored blossoms. It is Wild Tobacco, a cousin of the Jimson Weed. The Bandleader takes up the chant of the tobacco auctioneer, ending with "Sold to the First American." He is right. The two most common wild tobaccos in this region were used by the "First Americans." In many cases the ancient Indian used tobacco because he thought it enabled him to commune more easily with his tribal deities.

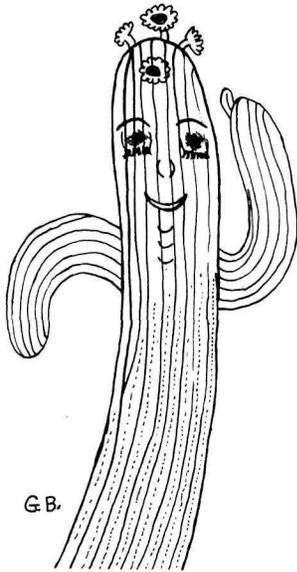
Next is the Mesquite. If this shrub were turned around, with the roots in the air, the tree would compare in height with an elm in a city park. On the desert, water is the limiting factor, and the scrubby Mesquite has an enormous root system to provide sufficient water for the small part above ground. A closer examination of the tree will give the group a first-hand understanding of why the early Vaquero developed chaps as part of his working clothes when riding the Southwestern ranges. Catsclaw and Mimosa are other shrubs that can be explained in conjunction with Mesquite, since they are all members of the same family. After one encounter with the thorns of either of these plants, people seldom ask why the common name of Catsclaw.

In many parts of the Southwest, where Mesquite grows on the richer bottomland, the hills farther back are covered with Creosote Bush. Mr. Doctor will be interested to know that the Indian boiled the leaves of the Creosote Bush to make a tea that was considered a remedy for coughs and chest colds. Later, after the discovery of America, the Indian used the plant against diseases brought by the white man; notably, syphilis. The yellow, waxy blossoms are interesting because of the tendency of the petals to turn on edge. The contractor's boy will probably tell you that they look like the pinwheels he shoots on the Fourth of July. The visitors will understand the common name, Creosote Bush, the first time they are caught in a shower on the desert, and smell the fresh, clean odor so characteristic of the plant.

Perhaps Miss Artist is interested in mosaic work. Some of the finest, ancient turquoise mosaics made by the Indians were glued together with a lac sometimes found on the Creosote Bush. This plant seems to grow in the driest of the dry places. A waxy covering over

the leaves prevents the strong desert sun from drawing the water from the plant tissues. Mr. Doctor can undoubtedly cite some similar case in which members of the human race have adapted themselves to a not-too-friendly environment.

The tourist associates Cactus with the Southwest, and some one of the plant's thousand-odd species is bound to show up on any trip through this region. Cacti vary in size from tiny little buttons to the giant of the family, the Saguaro. Together they make up one of the Southwest's most interesting and beautiful exhibits. The Saguaro, by its own fantastic shapes and upraised arms, usually puts the crowd in a good humor from the start. Anyone who has an ounce of that all-important trait, imagination, can find in a stand of Saguaros an individual portraying human emotions from sorrow to hilarious joy. If it is during the blooming season Mrs. Housewife or Miss Schoolteacher will surely see the resemblance between the tiny little flowers so ludicrously perched on top of this massive trunk, and some portly woman under a particularly small hat.



SAGUARO

In its range the Saguaro is one of the most useful of desert plants. Its fruits, in common with those of other cacti, are a staple food among the Indians living in the area. The fruit is gathered by using a long stick with a hook on the end. The ribs of the tree fit together something like the bellows of an accordion, and by expansion the plant is able to store much water which is gradually given back to growth, with a corresponding return to a slender figure, during dry spells. The long straight ribs of the dead plant are used for building purposes.

Prickly Pear is another member of the cactus family that will lend itself to wide interpretation. Here is a plant which arms for defense but does not forget beauty, for the blossoms are among the desert's masterpieces. The fruit, when peeled, is tasty and nutritious, whether raw or cooked. One can give Mrs. Housewife the recipe for "Tuna Preserves." Remove the small prickles by rolling the pear in sand; peel, remove seeds, cook by the open kettle method, adding sugar if desired, and the result is a deep red, tangy preserve. The Indians made syrup by continuing the boiling until nothing was left but the thick, sweet juice.

The members of the party who are not familiar with the Southwest may want to place other plants in the cactus family which do not belong

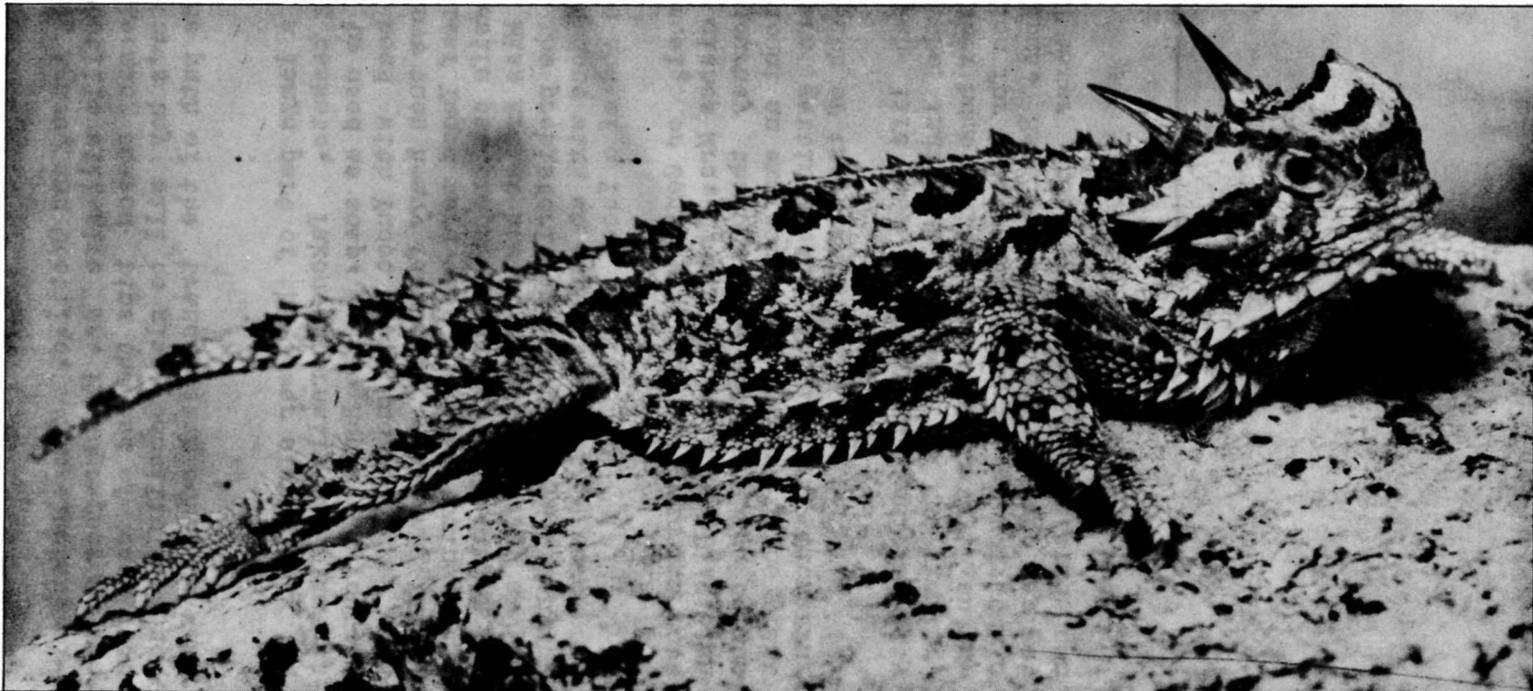
there. Among these are Yucca, Agave, and Ocotillo. The slender, almost leafless stems of the Ocotillo will give Mr. Photographer an interesting "shot" when the blooming season tips the end of each stem with scarlet. Mr. Contractor's boy will be glad Ocotillo does not grow in his community, as the path of the transgressor could be very thorny.

The Yucca, common over a large part of the lower elevations, is used by the Indians in making baskets. Taken internally the plant is a laxative. The roots can be used as soap. The Hopis say you can cure baldness by washing the head with Yucca root and rubbing with duck grease, because "ducks have such heavy feathers." The long fibers in the leaves of the Broad-leaf Yucca were used in making twine, and Mrs. Dietician and Mrs. Housewife can prepare a new dish by baking the seed pods in earth ovens. Miss Artist has no doubt marveled at the beautiful designs painted on the prehistoric Indian pottery. Many of the lines, as fine as though done with an expensive brush, were probably painted with the chewed end of a Yucca leaf.

Agave, also known as Mescal, or Century Plant, will add one more item to the long list of new dishes Mrs. Housewife and Mrs. Dietician have encountered on their journey through the desert. The common name, Century Plant, is no doubt an exaggeration; however, the plant does spend from 10 to 20 years getting ready for its one flowering flourish which ends in the death of the plant.

Here each plant and each life zone takes on an individuality which, when interpreted to the individual interest of the visitor, will send him back to his lusher home pasture with a sympathy, an understanding, and an admiration for those plants and those individuals which make the desert their home. Here are plants and men who can get more results from one drop of water than most modern civilization can get from a barrelful.

The horned toad is a harmless lizard and, like other lizards, he feeds on insects. The majority of lizards catch their prey by aggressive rushes, but this little fellow slips up quietly and, with a flash of the thick viscid tongue, draws the morsel into his mouth.



HORNED TOADS

By Harold J. Brodrick,
Assistant Chief Ranger,
Carlsbad Caverns National Park.

Probably no other living thing is more emblematic of the desert than the horned toad. He is at his best in the dry, sparsely vegetated sandy areas, where he prowls contentedly in the blazing sunlight, under conditions that are frequently almost unendurable by man. He is, after all, not a toad, but a reptile, and he has the appearance of some prehistoric creature in miniature. He is rather ferocious-looking at times, but he can't hurt you.

The horned toads are lizards of the genus *Phrynosoma*, or horned lizards, and they are found only in Mexico and in the western portions of the United States. The number of species generally recognized is seventeen, of which four are exclusively Mexican, while several others range only a short distance northward into the United States. They are distinct from all other genera of North American lizards. They have a wide and flattened toad-like body; a short tail and, in most species, sharp, conical horns upon the back of the head and the temples. The back is usually covered with numerous sharp-pointed and pyramid-like scales.

Though they are formidable looking, the horned toads are gentle, and rather spiritless. They seldom try to bite. Occasionally they will attempt the impossible - to cause injury by use of their horns. They are viviparous, producing usually from six to twelve living young. At birth the young are encased individually in a transparent envelope through which they soon break. They are active immediately, and are fully able to care for themselves. At this stage the horns are only rudimentary; they do not appear rough and spiny like those of the parent.

One of the most interesting traits is the method of preparation for the night. While the sun is still high and the heat shimmers from the sand, the little creature places his armored nose into the sand like a plow, scooping until a furrow is produced. Then flattening its body into the furrow, and using the spiny borders of its sides like shovels, it digs deeper into the sand. Using its head and sides alternately it casts the sand over its back until it is entirely covered. Sometimes it digs to 2 or 3 inches below the surface, or often the top of its head is level with the surface. When the warmth of the sun strikes the sand the next morning a movement appears on the smooth surface and, as in slow motion, the horns, head, body and tail appear, and the reptile is again at his daily foraging.

HANDS ACROSS THE BORDER

By Dr. Aubrey Neasham,
Regional Supervisor of Historic Sites.

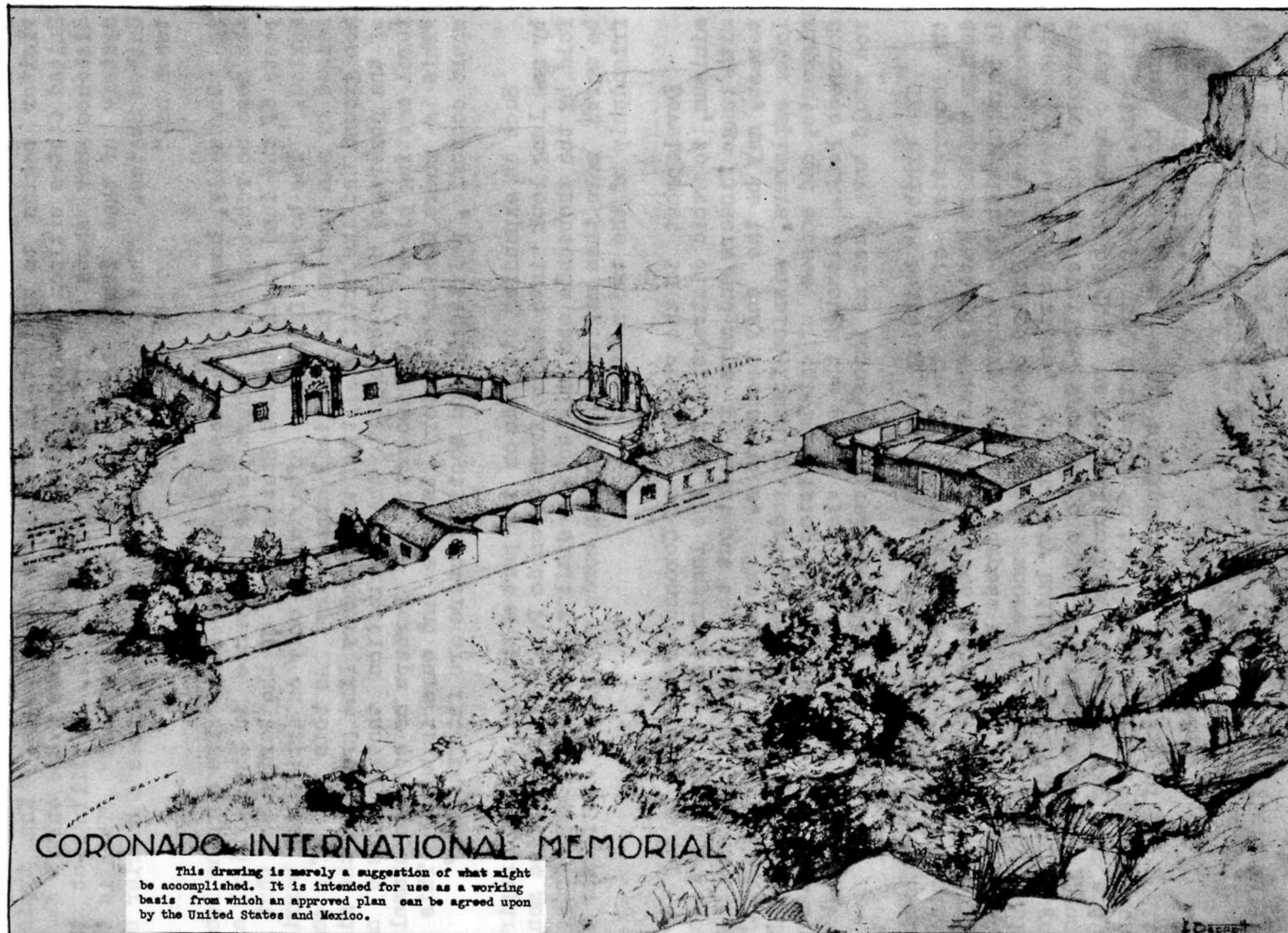
The proposed Coronado International Memorial, whose establishment on the Arizona-Mexico border, near Bisbee, Arizona, has been authorized by the American Congress, is intended to symbolize the good will, friendship, and understanding of the Americas. The recently enacted legislation authorizes the President to establish the area by proclamation, after Mexico has established or provided for establishment of a similar contiguous area. The Mexican Government has indicated that these steps will be taken shortly.

The idea behind the memorial is to emphasize that an **artificial** boundary line is not a barrier to the friendly intercourse of nations, but that, instead, it may be a focal point upon which common interests can be illustrated. The area would be dedicated to the story of the Arizona-Sonora border region, and, it is hoped, may point the way for similar undertakings, either in the Western Hemisphere or elsewhere.

Down where the Huachuca Mountains of Arizona reach the international boundary and where they end abruptly just across the line in Mexico, between the headwaters and valleys of the San Pedro and Santa Cruz rivers, it is proposed that the United States and Mexico each set aside 2,880 acres as the international memorial area. They are contiguous areas, and would be administered through the joint efforts of the National Park Services of the two nations.

The setting is superb. From Coronado Peak, which would be the site of an observation shelter on the United States side, a view into Mexico is had which classifies this area as one having superlative scenic qualities. To the south, east, and west great expanses of grasslands, trees, valleys, and mountains take on the form of a vast relief map. Distances are so great that cattle, river courses, and even roads and a railroad are lost to view in the broad reaches of the valleys below. In all, some 150 miles of border country are to be seen from this vantage point. The international boundary fence can be followed with the naked eye for about 50 miles. The smoke from the distant copper smelters of Douglas, Arizona, and Cananea, Sonora; and the mountains of Sonora to the southward, those of the Animas range of New Mexico to the eastward, and Baboquiviri Peak, west of Nogales, serve as landmarks on the outer horizons. The faint gridiron lines of the San Pedro Valley towns of Naco in Sonora and Arizona serve to remind one that the area is really inhabited.

The reaction upon individuals who partake of this scene is profound. After the first impacts of the view have been absorbed, the



APPROACH DRIVE

CORONADO INTERNATIONAL MEMORIAL

This drawing is merely a suggestion of what might be accomplished. It is intended for use as a working basis from which an approved plan can be agreed upon by the United States and Mexico.

visitor begins to project himself into the picture. The typical United States citizen becomes aware that the border fence only a short distance away shuts him off from a foreign land. Thrilling at the mystery of that land, his thoughts may at first be: "This is the United States. That is Mexico. That fence symbolizes a barrier between us."

Gradually, however, a change comes over him. The more he looks the more he realizes that there is no difference in the physical aspects of the land on the United States side of the border and that of Mexico. The border fence is, after all, only an artificial barrier raised by man because of political expediency. As this idea of a common ground and the artificiality of the boundary line grows in the mind of the observer, he is brought to the realization that here is a natural meeting place of the two nations. Perhaps he says to himself: "This is where Mexico's history is ours and ours is hers. This is where economic, political, and social factors are intertwined."

Such an expanding attitude on the part of the individual, inspired by one long look into Mexico from Coronado Peak, if multiplied manyfold by the thousands who will have a similar experience, may, indeed, be worth more than millions spent in words or dollars to foster the friendship of the two nations.

Development in the vicinity of Coronado Peak will be kept to a minimum, to avoid distraction from the inspiration. A simple shelter, with range finders and maps to point out the areas of historical interest, may be the only necessities. The routes of Niza, Coronado, later explorers, mission-founding padres, marauding Indians, and immigrants, and scenes of cattle raising and mining, can be seen from Coronado Peak. Although the grand view is from the United States, Mexico would have just as important a role to play.

The exhibits building would be designed and constructed through the cooperation of both the United States and Mexico. A preliminary design which is entirely tentative suggests that it be Mexican style, in harmony with the country and the purpose of the memorial. The approach from the United States side, where there would be parking spaces, custodian quarters, and utility buildings, would be through a visitors' contact station. Crossing a patio, the visitor would approach first a memorial plaque; on the international line at the west end of the patio. This plaque, dedicated to the common story of the Arizona-Sonora border region, would be flanked by the flags of the United States and Mexico.

The entrance to the International Exhibits Building, according to these tentative plans, will lead into the lobby, where there will be

an information desk. The floor of this room will be of tile, and will incorporate a terrazo or mosaic map of the Sonora-Arizona region. Murals depicting the historical highlights of the region may be painted on the walls. The exhibits section will be one of the leading attractions. It will illustrate what the peoples of Mexico and the United States have in common, and it will include dioramas, historical documents and objects.

A suggestion has been made that the themes of the exhibits section be divided into three main parts - aboriginal, historical, and present day. The aboriginal section, having as its purpose the telling of the archeological and ethnological story of the Arizona-Sonora border region, would include exhibits to emphasize basic similarities, cultural relationships, and prehistoric trade. The historical section would depict the economic, social, and political aspects of the three main historical periods involved - the Spanish Period, 1536-1821; the Mexican Period, 1821-1853; and the Arizona-Sonora Region, 1853 to date. The present day exhibits could cover such subjects as products and industries, education, travel, transportation, and recreation. To prevent a static condition in these exhibits, it is proposed that they be given periodic rotation, thus insuring continued interest and appeal.

There could be a combination library-lecture room, and other rooms for research, preparation of exhibits, workshop, storage, and an administrative office.

Some 400 years ago, a Spanish explorer passed this way in his search for the fabled seven cities of Cibola. Little did he, Francisco de Coronado, dream that he would be the inspiration for a memorial to the efforts of himself and those who came after him in this colorful land of the Southwest. Little did he realize that one day two great nations of the New World would foster friendship and peace in his name, or that both nations would claim him as theirs. Could he but speak across the centuries, these might be his words: "Clasp hands across the border, those of you who have followed me. Illustrate to the world what you have in common. By your cooperative endeavor, it will be known that my journey was not in vain."



COUNTING TREE RINGS

Courtesy Laboratory
of Anthropology

TREES TELL TIME

By Dr. Gordon Baldwin,
Junior Park Archeologist,
Boulder Dam National Recreational Area.

There is frequently a lot of doubt concerning the age of some women - and maybe that's as it should be - but the element of uncertainty has been eliminated entirely in determining the age of certain species of trees. Facials, henna packs, eyebrow plucking, and 9-day diets are among the veils that screen femininity's time cycles, but the diaries of trees are recorded in rings that can be translated into years. You can "guess" that a certain woman is "past 40", and then regret that you were not more conservative - or diplomatic. There is no need of guessing about the age of trees, though. Tree-ring dating has become such an exact science that the ruins of early Indian dwellings can be dated by studying the annual rings found in the timbers taken from such ruins. And so, putting women aside for the moment, there can still be romance and adventure in the life of a scientist!

Tree rings are the material record of the growth of trees year by year. The study, however, encompasses a great deal more than that. It requires a fairly broad knowledge of such widely spaced fields as astronomy, meteorology, botany, geology, and archeology. The idea was conceived back in 1901 by Dr. A. E. Douglass, of the University of Arizona. Originally the study of tree rings began in an attempt to solve certain astronomical problems related to solar change, such as sun spots, and their indirect effects on the earth's weather. If sun spots affected our weather, either by producing more or less moisture, Dr. Douglass reasoned that there should be some evidence of this fact in living things. Since trees are the earth's oldest living occupants, he turned to them as a possible source of information.

Each year a tree puts on a ring around the exterior, just beneath the bark. The width of this ring is directly proportioned to the amount of rainfall during the preceding year, being wider if the supply of moisture is above the average, and narrower if it is not. Thus the rings not only tell us the age of the tree, but they record as well the abundance or the scantiness of rainfall, year by year. This is not true of all types of trees. In the Southwest, the studies have included pine, pinyon, and Douglas fir. Even in this section of the country, cottonwood and other trees growing in conditions of constant supply of moisture, such as along stream channels and in lowlands, have not proved satisfactory. These trees do not record variations in rainfall by ring growth.

The Southwestern United States is ideal for the study of tree ring growth because there are two rainy seasons each year. One comes in winter when slow rains soak the lowlands, and snow falls in the higher altitudes. Much of the moisture thus derived sinks into the ground where it is available to trees. The second rainy season comes during the height of summer when the country is drenched by local downpours lasting at the most, only a few hours. Most of the summer rain runs off, thus contributing very little to tree growth. It follows, then, that in times of abundant winter rainfall or snowfall, the trees will have access to more moisture stored in the ground, and will grow more rapidly, and that in times of scanty rainfall there will be comparatively little growth. Additional factors determine tree growth, such as the nature of the soil in which the tree is rooted, altitude, early and late frosts, ultra-violet radiation, and other elements. But these, for the moment, are not particularly important to our present field of interest.

Dating trees by annual rings in the Southwest is made possible because the rainfall is not the same from year to year; some years are considerably wetter than others. Looking at any series of rings, then, one will usually see a pattern of large, intermediate, and small rings -giving what Dr. Douglass has referred to as the "tree's fingerprint." If the moisture were constant year to year, each ring would be approximately as large as its predecessors, and we could do little more than tell the age of the tree. Since it is the winter rains and

snows which are largely responsible for the size of a tree's rings, and these winter storms generally prevail over rather large areas, it follows that all trees growing in similar environments in the same general region should register an abundance or a lack of moisture in the same way. On this basis rests one of the important angles of tree-ring dating, namely, the ability to match the record of one tree against that of another.

Suppose a tree springs up in a forest and is permitted to grow unmolested for 100 years. At the end of that time another seedling sprouts beside it and these two trees continue growing for another 100 years. At that time the older of the two trees, now 200 years' old, is cut for lumber. The younger tree continues growth for another century, when it, too, is felled. Now, in examining the stumps it will be found that the ring pattern of the first tree during the last century of its growth will "cross-date" that of the other. The century which the two trees had in common serves to tie the ring records together to form a single 300-year series although each tree was only 200 years' old when cut. We call this "building a tree-ring chronology." By applying this principle on a large scale, beginning with living trees and shingling back, as it were, with older and older material obtained from ruins, Dr. Douglass has built a tree-ring calendar which falls just short of 2,000 years; in fact it goes back to 11 A. D.

That is how tree rings enable us to date accurately many of the prehistoric cliff dwellings and pueblos throughout our Southwestern United States. Archeologists can take a small fragment of wood or even charcoal and, by comparing these large and small rings with the sequence of the 2,000-year chronology, can determine the exact year in which the beam was cut. Fortunately some of the timbers used as beams in roof and floor construction in ancient ruins can still be found.

Of course, perfectly sound specimens of timbers are desirable but even fragments or pieces of charred wood will often suffice as long as the ring structure is well preserved. It is little wonder, then, that the archeologist pays as much attention to scraps of wood or charcoal which he finds in ruins, as he does to pottery, basketry, stone implements, and textiles, for from this lowly material is derived information on that all-important factor, time.

WESTERN PATHFINDER

By Charles J. Smith,
Superintendent,
Grand Teton National Park.

U. S. Highway No. 66, the Will Rogers Highway, was surveyed in 1857 from the Rio Grande to the Colorado River, the state line of California. At that time there were wagon trails across the southern portion of the Territory of New Mexico, in what is now Arizona, but for the most part these roads were highways for the savage Apaches. Long stretches were without wood, grass or water, and it was necessary to swing far to the south and back again to reach California. About 75,000 Californians had petitioned the Congress to construct a wagon road directly across country over which supplies, mail and passengers could reach the state by a more direct and less dangerous route. In answer, the Congress in 1856 appropriated \$50,000 for the survey and construction of a wagon road along the 35th parallel from Fort Defiance, New Mexico, to the Colorado River.

For this important job the War Department chose Lieutenant Edward F. Beale, a man of western experience and a former comrade of Kit Carson, as leader of the expedition. He was no tenderfoot. Throughout the pages of western history his name illuminates the story of pioneer deeds. What first turned the eyes of this Southern lad towards the West is not known, but he was in San Diego in 1846 with the United States Navy, back in the time of strife with Mexico for the possession of California. Lieutenant W. H. Emory, who was with the advance guard of the Army of the West led by General Kearny, advancing from Fort Leavenworth, Missouri, to San Diego in 1846, wrote this dramatic story:

"Dec. 5, 1846. Against all advice General Kearny attacked the Mexican force, some thirty-five miles from San Diego, and our soldiers were in sore straits. Lt. Edward F. Beale with thirty-five marines came into camp with dispatches for Kearny from Stockton at San Diego. Kit Carson was with our command, having been ordered by Kearny to surrender the dispatches he was carrying to Washington to another messenger and return to California as a guide for the Army of the West. This, Carson very reluctantly did, and by so doing deprived himself of the opportunity to visit his family, again reach civilization and reap the reward in Washington for the long dangerous service he had given to his government in the far west.

"Dec. 7, 1846. Today dawned on the most tattered, ill fed detachment ever mustered under U. S. colors. Unless the three volunteers, Lt. Beale, Kit Carson and an Indian servant reach San Diego and Stockton sends help we are finished."

San Diego was reached. The three who volunteered to go for aid, separated in order to increase their chances of getting through. Beale

was the second man to stagger into Stockton's quarters. His shoes and canteen had been discarded so that he could move more quietly through three lines of sentries. He had covered 30 miles of cactus-studded desert without foot covering, and arrived suffering from a raging fever. Months later he and Carson with eight soldiers rode horseback to Washington, where Beale delivered dispatches to the Navy Department, and Carson delivered letters to President Polk. For many days Kit thought his companion would die on the long trail, and it was necessary to lift him on and off his horse. But Kit Carson gave Beale the best care possible in the circumstances, killing wild game from which to make broth, and in every way looking after his helpless friend. They reached Washington and Beale went to bed to recover. Carson went to say goodby to his comrade and before he started back for the West expressed the opinion that Beale would never leave his sick room.

Just 10 years later Lieutenant Beale, no longer a Navy man, walked into a corral in San Antonio, Texas, to inspect a number of camels which had been assigned to him for use in survey and construction of a wagon road across the very country over which he and Kit had struggled a decade before. These camels had recently arrived from their homeland in Persia and Arabia: There were thirty-three of them, brought over on the U.S.S. Supply, at the order of Secretary of War Jefferson Davis. The ship was commanded by Lieutenant D. D. Porter, later an admiral in the United States Navy. The prospective road builder selected twenty-seven of these foreign creatures, and with their native drivers journeyed north to Fort Defiance which was the outpost between hostile Indians and civilization. Here he met his military escort and the adventure was begun. As one reads his diary, faithfully kept throughout the journey, it is easy to detect his strong sense of responsibility and his determination to carve not only a path to the Pacific but also a lasting name for himself.

He knew that Navajo wars were being periodically waged across the territory through which his route was to lead, and he had a first-hand knowledge of the country. Other more or less official excursions had been made previously. Captain Sitgreaves had left Zuni in 1852, followed the Zuni River to where it emptied into the Little Colorado, and eventually arrived at the Gulf of Lower California. In 1853, Lieutenant J. C. Ives and Lieutenant Whipple, under the direction of the War Department, left Fort Smith, Arkansas, and followed more or less closely the 35th parallel to California. And then Xavier Aubrey worked eastward from California to Zuni, and faintly marked a trail over which the Atlantic and Pacific Railway was built 30 years later. Beale knew all there was to know about these former trips over his assigned pathway. He knew that some of these parties almost perished with thirst or starvation; that the Apaches attacked Aubrey's men and came close to wiping them out.

Let us go back 80 years and travel with Beale over part of this

journey through a region filled with hostile Indians who fought Mexicans and Americans on week days, and fought each other on Sundays.

"June 25, 1857. Left San Antonio, Texas, with herd of camel."

"August 12, 1857. Albuquerque. Started my train on, it being necessary to get the men out of town as soon as possible as the Spanish 'fandangos' and other pleasures have rendered them rather troublesome. It was necessary to boot several of them this morning, especially my Turks and Greeks, keepers of the camels. They were as drunk as any Christian in the train. To my delight the express arrived last night with my orders and a package from eastern friends."

The Lieutenant divided his box of cakes and other goodies with companions but was too gallant to say that the postage cost him \$16. This fact has been gleaned from his private account book which he kept throughout the journey. They went on and spent some time at "a little Indian village (Covero) and it was pleasant to get back into our big boots and greasy buckskins once more. They were home to us."

Here was an adventurous bunch of hardy young men setting out on a dangerous trek across the wildest part of the country. They were burdened with a herd of unacclimated camels and handlers. The horses and mules hated the vile smelling beasts. The mule skimmers despised the under-estimated Turks and Greeks who had come overseas with their charges. All of them, singly and combined, hated and feared the wild Indians they expected to encounter along the way. And yet, in this Indian village they forgot their cares and entered into the feasting and dancing that did homage to an Indian God.

While they waited in this little valley for the soldiers who were to come from Fort Defiance to meet them, they made seines of gunny sacks and caught plenty of fish in the little stream to feed their party. Beside the lava wall which runs for hundreds of miles through that part of the Southwest, they pastured their animals, wrestled, ran foot races, made sketches of the vicinity, and had a good time in general while their leader fretted at the delay and entered daily notes in his journal. He wrote: "We are all very anxious to be on our way as our real work is to begin. Whatever fortune is before us we are impatient to meet it and have done with all suspense in regard to it. I trust to be in California within sixty days after we get started."

Finally they reached Fort Defiance and were met by the drum and bugle corps, and what was probably more welcome, an ambulance carrying huge blocks of ice and the "cup of cheer." The Lieutenant refers to it as "red eye." While they rested at this frontier post the young officer again indulged in apprehensions: "This morning, everything being in readiness, we take our leave of our kind and hospitable friends and start upon our journey into the wilderness. No one, who

has not commanded an expedition of this kind where everything ahead is dim and uncertain and unknown, except the dangers, can imagine the anxiety with which I set out upon this journey. Not only am I responsible for the lives and welfare of my men, but my reputation and the highest wrought expectations of my friends - and the still more highly wrought expectations of my envious enemies - all these dependent upon the next sixty days' good or evil fortune. Today commences it. Let us see what I shall say in this journal, if I live to say anything, on the day of my return."

In this diary, often written by the light of the moon or by the camp fire, he spoke of the climate, the beautiful red sandstone cliffs, the rose and blue sky at sunset, "like the soft drapery of a Southern belle's dance gown"; of the rain and the chilly nights, of the excellent esprit de corps of his men, and the creditable performance of his camels. He even recalled lines from his favorite poets. Once he undertook to chase a bear, and the mule he was riding went out from under him and left the dashing nimrod sitting on a cactus. He was camp-bound for several days following this adventure.

The caravan now headed for Zuni, probably to obtain some of the corn and wheat which had just been harvested by the thrifty and friendly Indians. Lieutenant Beale admired the skill of the Indian women in carrying huge jars of water on their heads, but the sight of the men knitting rather provoked him. "Imagine Hiawatha at such undignified work!" was his terse comment. Here, too, they bought 200 head of sheep to be driven along the way with them and killed when other meat was not available. Altogether the animals in the caravan numbered approximately 400 - horses, mules, sheep and camels - and it was quite a problem to find camping sites with water and grass for this large herd.

"August 30. We spent the morning in arranging a trade with the Indians for corn. The men were all day and until midnight shelling it."

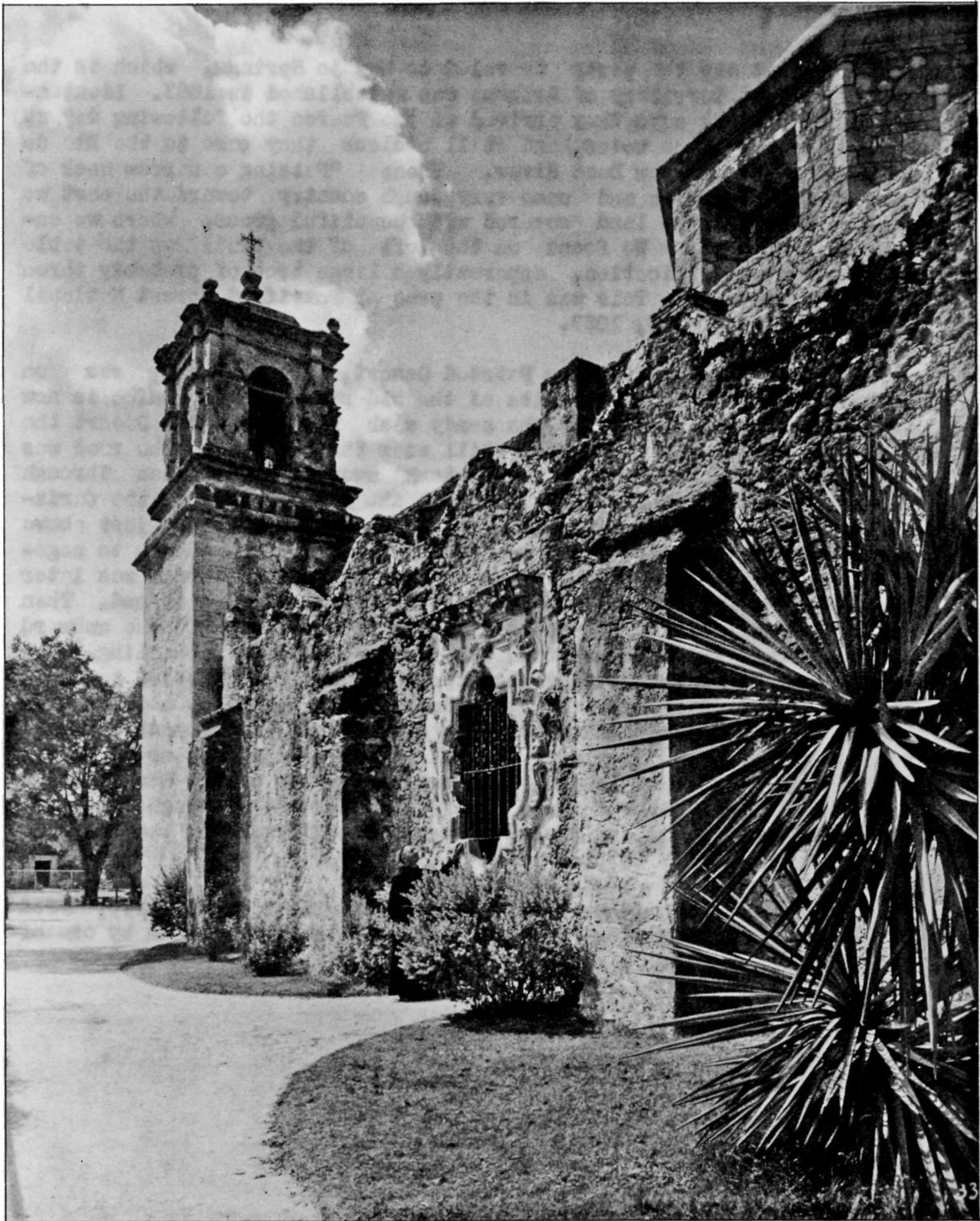
They loaded the corn on the camels, and left the next morning at 11 o'clock and "encamped on good grass without water. The high rolling prairie, over which we traveled today has good wood, cedar and pine, and plenty of it everywhere."

On September 1, they arrived at Jacob's Well. Here the camels objected to going down the steep narrow trail to water. Since there was only the one trail, and the cliffs around the waterhole were quite steep, the Arabs did without water until the next camping place was reached the following evening. Here, at Jacob's Lake, wild ducks were killed and roasted, but the large herd of antelope grazing near by was not disturbed.

The next day the party traveled to Navajo Springs, which is the spot where the Territory of Arizona was established in 1863. Lieutenant Beale's diary says they arrived at the Puerco the following day at 8 a.m. but found no water, and at 11 o'clock they came to the Rio de la Xara which is now Dead River. Then: "Passing a narrow neck of land toward the Xara and some very rough country toward the east we reached a high table land covered with beautiful grass, where we encamped. No wood. We found on the left of the trail on the table land, a huge petrification, apparently a large tree of probably three feet in diameter." This was in the present Petrified Forest National Monument, September 3, 1857.

Dropping down into the Painted Desert, the next camp was on Lithodendron Creek near the site of the old stage station which is now in ruins. Leading down to the sandy wash in the Painted Desert the deep ruts of the old stage road still scar the hillside. The road was used until 1883 when the railroad took over transportation through northern Arizona. Beale continued down the Lithodendron, or the Carizozo, as it is called, and swinging west crossed the Puerco just above old Horsehead Crossing. There was too much mud for the camels to negotiate so they crossed back again and camped where Holbrook was later founded. The only trouble Beale had with the camels was in mud. Then their ungainly hind feet would skid apart and rupture the awkward beasts. Once the skin was torn the injury was long in healing. You may be sure that he hastened to have the hind feet hobbled together and get them back on dry land when he saw them beginning to slip. On and on they traveled, measuring every mile with an instrument attached to a wagon wheel. They were compelled to make a detour at Canyon Diablo north almost to Leupp. The route led south of the San Francisco peaks through Walnut Canyon, continuing westward "through a wilderness of forest, plain and desert, occupied 48 days, when the Colorado River was reached on October 18th."

Ever the showman, our Pathfinder, as a climax to the trip, entered the Pueblo de Los Angeles riding in state in a buggy drawn by one of his favorite camels.



THE ROSE WINDOW - SAN JOSE MISSION

SAN JOSE MISSION NATIONAL HISTORIC SITE

The recently established San Jose Mission National Historic Site, in San Antonio, Texas, is the first area west of the Mississippi River to be designated a national historic site, and it is the first National Park Service unit in Texas. It is regarded as one of the finest Spanish missions in North America.

Originally named Mission San Jose y San Miguel de Aguayo, it was established on February 23, 1720, by Captain Juan Valdez, at the instigation of Father Antonio Margil. This was in accordance with the custom of having frontier missions founded by military authorities, acting with the cooperation of religious officials. The early buildings were constructed between 1720 and 1731, and included a chapel, granary, kitchen, administrative offices, cells for the friars, and quarters for the Indian neophytes. The mission was flourishing, by 1762, when it owned 200 head of cattle, and had an annual harvest of 1,000 bushels of maize.

The chapel which now stands in a state of partial preservation was not one of the earlier buildings but was erected between 1768 and 1781. The facade and baptistry window (Rose Window) are believed to be the work of the Spanish artist, Pedro Huizar.

The mission was ordered secularized in 1813, and was taken over by the Diocesan priests about 1827. After the American annexation of Texas, in 1845, the Benedictine Fathers of the Archabbey of Saint Vincent, in Latrobe, Pennsylvania, took charge of the mission and established a friary and seminary there in 1859. These were abandoned 8 years later, and the Diocesan Clergy again took charge. In 1925 the Redemptorist Fathers of San Antonio were appointed for the work. Finally, in September, 1931, after an absence of more than 100 years, the Franciscan Fathers returned to San Jose and built their present friary. The church was rededicated for religious services in 1937.

This group of old structures was established as the San Jose Mission National Historic Site; on May 8, 1941, under an agreement between the United States Department of the Interior, the Texas State Parks Board, and the Archbishop of San Antonio. The mission will continue its usual function as a religious institution.

ODDITIES

Engineers "lifted the face" of a rock cliff in Zion National Park, Utah, and then tunneled a mile-long highway through the cliff, when there seemed no practicable way of getting around the canyon wall. There are turnouts in the tunnel from where views of the canyon can be had through six windows. The cliff is so steep that the windows first had to be drilled, and the tunnel then completed between those points.

There are sixty-five named mountains in Rocky Mountain National Park, Colorado, that reach altitudes above 10,000 feet; twenty-seven of them are between 12,000 and 13,000 feet high. Long's Peak, the highest, reaches 14,255 feet. Summer visitors who live at the base of these great mountains are 8,000 feet, or more than a mile and a half, above sea level.

The Grand Canyon, a mile deep, is the world's greatest example of erosion: The surface around the rim is rising, perhaps a few inches a century, and the down cutting of the canyon by the Colorado River is just about keeping pace with the elevation. The canyon is probably getting deeper, but the level of the river bed is not becoming lower. Some believe that the river was never any higher than it is today.

Relics of an aboriginal people who vanished long before the coming of Columbus, make Mesa Verde National Park, Colorado, a veritable land of magic. Cliff dwellings, some in cave locations occupied centuries earlier by the Basket Makers, first agricultural Indians of the Southwest, are the major attraction. The earliest of the cliff-dweller homes dates back nearly 900 years, to 1066 A. D.

One of the first plants operated for the smelting of gold and silver in what is now part of the United States, is believed to have been located in the Tumacacori National Monument, 18 miles north of the Mexican border, and 50 miles south of Tucson, Arizona. Tumacacori Mission was founded in about 1700. The date of the smelter's operation is not known. The remains of the plant are in the mission grounds.

NATIONAL PARK SERVICE AREAS IN REGION III



- 1. Region III Headquarters
- 2. Bandelier National Monument
- 3. Chaco Canyon National Monument
- 4. El Morro National Monument
- 5. Gran Quivira National Monument
- 6. Carlsbad Caverns National Park
- 7. White Sands National Monument
- 8. Gila Cliff Dwellings National Monument
- 9. Chiricahua National Monument
- 10. Tumacacori National Monument
- 11. Saguaro National Monument
- 12. Casa Grande National Monument
- 13. Organ Pipe Cactus National Monument
- 14. Tonto National Monument
- 15. Petrified Forest National Monument
- 16. Montezuma Castle National Monument
- 17. Tuzigoot National Monument
- 18. Walnut Canyon National Monument
- 19. Sunset Crater National Monument
- 20. Wupatki National Monument
- 21. Grand Canyon National Park
- 22. Grand Canyon National Monument

- 23. Pipe Spring National Monument
- 24. Boulder Dam National Recreational Area
- 25. Lehman Caves National Monument
- 26. Zion National Park
- 27. Cedar Breaks National Monument
- 28. Bryce Canyon National Park
- 29. Timpanogos Cave National Monument
- 30. Capitol Reef National Monument
- 31. Rainbow Bridge National Monument
- 32. Navajo National Monument
- 33. Canyon de Chelly National Monument
- 34. Natural Bridges National Monument

- 35. Hovenweep National Monument
- 36. Yucca House National Monument
- 37. Mesa Verde National Park
- 38. Aztec Ruins National Monument
- 39. Arches National Monument
- 40. Colorado National Monument
- 41. Black Canyon of the Gunnison National Monument
- 42. Wheeler National Monument
- 43. Great Sand Dunes National Monument
- 44. Capulin Mountain National Monument
- 45. Platt National Park
- 46. Hot Springs National Park

