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THE NATIONAL FORESTS OF ARIZONA

Prepared by the Southwestern District of the Forest Service

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INTRODUCTION

Little does one realize as he speeds through portions of Arizona on a fast transcontinental train, or motors along a desert highway, that the far-away blue mountains are clothed with timber. Yet it is true that the mountains of Arizona contain the largest unbroken expanse of virgin western yellow pine timber in the United States. One vast forest extends from north of Williams, Ariz., in a southeasterly direction, for about 300 miles air line, almost to the Rio Grande in New Mexico. A large part of this timber is situated so far from railroads that it has not been possible to log it. Most of the national forests in Arizona have been located in this timber belt. The other forests cover timbered mountains that are detached from the main body of timber.

There are nine national forests in Arizona, covering an area of more than 12,000,000 acres and bearing a total stand of over 14,500,000,000 feet of saw timber and 11,500,000 cords of wood. They contain 73 per cent of the timber of the State, and under their present conservative management are supplying much of the present demand of the State for lumber, and will go a long way toward meeting the requirements of the future. Already a flourishing and well-established lumber industry uses these forests as a source of supply. The amount now annually cut can, however, be considerably increased before the productive capacity of the forests is reached.

The national forests are under the jurisdiction of the Forest Service, a bureau of the United States Department of Agriculture. All the resources of the national forests are for use. It is the policy of

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the Government in their administration to make them in perpetuity most useful to the greatest number of people. In accordance with this policy, the timber resources of the forests are handled as a crop under approved forestry practice, and it is proposed ultimately to cut about the same amount each year. Under such a system it is believed that the productive capacity of these forests can be largely increased, and that an annual timber supply, which will make possible the establishment of a permanent lumber industry, is assured to the State.

The cut of timber from the Arizona national forests in 1923 was 42,000,000 feet. Although there are some large operators, much of this timber was cut by men having small mills. As these forests are further developed the timber cut will no doubt increase until their productive capacity is reached, which is well over 100,000,000 feet of timber annually. It may therefore be expected that in the future

FIG. 1.—Western yellow pine—the important timber tree of Arizona

local material will take the place of much of the lumber that now enters Arizona from the Pacific coast.

The worst enemy of the forest is fire. Where fires burn, no forests can be produced, and although fires in the yellow pine forests of Arizona rarely kill mature trees, they damage them and burn up young trees which would otherwise form the new crop. Forestry is therefore impossible where forest fires are allowed to burn uncontrolled, and the first duty of the national forest administration is to protect the forest resources against fires.

About one-half of the fires on Arizona national forests in 1923 were the result of the carelessness of man. The rest were caused by lightning. Of those caused by man nearly two-thirds were due to campers and smokers. Much damage to the forests could, therefore, be prevented if persons who go into them would be more careful. The forest administration requests the cooperation of the public, both in preventing fires and in reporting them if they do occur.

A large grazing industry is dependent for range upon the national forests of Arizona. In fact, much of the summer range of the State is located upon these forests, to which the cattle naturally drift and the sheep are driven in the spring. About 290,000 cattle and 280,000 sheep find range on these mountainous areas. Although there are some very large stockmen using national forest range, the great majority of the grazing permittees are owners of small herds, and many of them have farms in connection with their stock business. The Forest Service encourages the use of the range by this class of stock raisers, and under the Government permit system they are given ample protection for their stock.

It has always been the fundamental policy of the Forest Service to put the national forests to their highest use, consistent with the primary purpose of their establishment, for timber production and

FIG. 2.—When ripe the timber on the national forests may be cut. Provision for future stands is made by leaving seed trees

watershed protection. That is why regulated grazing is allowed, why agricultural lands may be homesteaded, and why occupancy permits for many other uses are issued.

The grazing capacity of the various forest ranges has been established as a result of scientific study, and upon each range is allowed only so much stock as can use it without detriment to the growing timber and the range. Improvements, such as drift fences and water-development projects, have been constructed on many of these ranges in order that they may be fully utilized. Most of these have been built by the permittees themselves, although a few for which funds were available were financed in part by Government funds.

Several years ago the lands within the forests were classified and all those found suited to agriculture were listed as homesteads.

Upon such areas homesteaders were encouraged to settle. All these lands have been settled upon and no others are available.

Prospecting for minerals may be conducted on the national forests, and after the discovery of minerals mining claims may be located under the Federal mining laws just as on the public domain. There are no additional restrictions. In fact, the Forest Service encourages the development of the resources of the forests and gives preference to local, established industries in the disposition of products. Many of Arizona's mines are now dependent upon the forests for lumber, timber, and fuel.

In addition to their economic value, the national forests of Arizona constitute the watersheds of several important rivers in the Southwest that are extensively used for irrigation. The large Roosevelt Dam, which impounds enough water to irrigate over 200,000 acres of land, is located upon the Tonto National Forest, in which is also

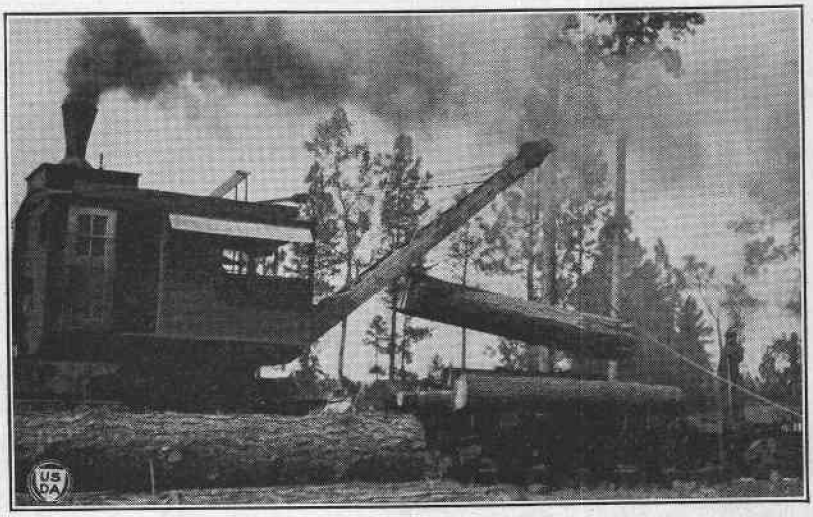


FIG. 3.—About 55,000,000 feet of timber is cut from Arizona's national forests each year

a part of the watershed whence this water comes. Forests hold back a great deal of the precipitation, feeding it out slowly through streams and springs. This tends to equalize the flow throughout the year. If these forests are destroyed, however, the snow and rain water runs off rapidly taking quantities of soil with it. Destructive floods and silting of reservoirs are usual results, and during dry seasons springs dry up. Under the Forest Service method of regulating the cutting of timber and the grazing, erosion is minimized, to the great advantage of the irrigated valleys.

It is estimated that Arizona's national forests are each year visited by over 400,000 persons, who find in these cool mountain forests rest and health, to say nothing of hunting and fishing. The Forest Service encourages the use of the national forests for recreation. Campers may use them freely without burdensome restrictions. They are requested only to leave clean camps and to be certain that forest fires are not started. Those who desire more permanent camps may secure permits at reasonable rates for locations upon which to

build summer homes. Municipalities and associations of various kinds are encouraged to establish community camp grounds.

To make these forests more accessible and to develop their resources, transportation and communication facilities are being built up as rapidly as possible. Approximately 1,500 miles of telephone lines have been constructed, and road and trail work is being rapidly extended into these mountain regions. The annual receipts from the Arizona forests are nearly $500,000, of which 25 per cent, or about $125,000, is turned into the county funds for roads and schools. In addition, 10 per cent, or $50,000, is annually used for the construction of roads and trails upon the forests. With the steadily increasing receipts, the funds which accrue directly to the benefit of the State will correspondingly increase from year to year.

The Forest Service maintains the Fort Valley Experiment Station, 9 miles northwest of Flagstaff. This station studies problems of forestry and silviculture, and the putting of its results into practice on the national forests is making the forests more useful as sources of a continuous timber supply. The station has had a very great influence upon forest practice in the southwest and has already overcome some of the most difficult obstacles which confronted Government foresters in the regeneration of the timber stands of the Arizona forests.

Near Tucson, Ariz., the Santa Rita Reserve of some 50,000 acres of semidesert grazing land is used as a grazing experiment station. Here many of the range problems forest officers meet in handling grazing on the Arizona national forests are studied under actual working range conditions. Over 1,200 head of high-grade range cattle are used on the reserve, the herd being under close observation by the forest officers in charge of the work at all times during the year, the stock being handled by the owners according to a cooperative schedule.

The national forests of Arizona are under the supervision of the district forester at Albuquerque, N. Mex., with the exception of the Kaibab Forest, which, because of its location north of the Grand Canyon, has been placed under the supervision of the district forester at Ogden, Utah. Each forest is administered by a forest supervisor, under whom a number of rangers are employed. The supervisors, whose offices are in towns conveniently located in relation to their forests, are glad to give detailed information concerning their respective forests.

THE APACHE NATIONAL FOREST

(In Apache and Greenlee Counties)

Off the beaten path, in the White Mountains of Arizona, stretching along the New Mexico line from Springerville to Clifton, lies the Apache National Forest. For the most part it is high mountain country with mountain meadows, rugged peaks, and deep canyons. The forest lies in the country over which the Apache Indians at one time roamed, and from them it takes its name. It covers a gross area of 1,226,420 acres and is administered from Springerville, Ariz., a small town on the transcontinental National Old Trails Highway, about 100 miles southeast of the Santa Fe Railroad at Holbrook, Ariz.

The timber resources of the Apache, which have practically not been touched by the ax, are estimated to consist of 2,400,000,000 board feet of saw timber, of which 75 per cent is western yellow pine. The remainder is made up mostly of Douglas fir, white fir, and spruce. In addition, the south end of the forest has extensive stands of piñon and juniper which contain 300,000 cords of wood. Most of the saw timber is now inaccessible because of its distance from the railroad. For this reason, the present annual cut of about 1 million feet is confined to the timber needed for local consumption by small communities and ranches on or near the forest. In future years, the Apache Forest may be expected to occupy an important place in the timber production of the State.

Within this forest there are a few flat, treeless areas suitable for the growing of crops. Such lands have been listed in 215 tracts, which have been settled upon by homesteaders. Of the lands which

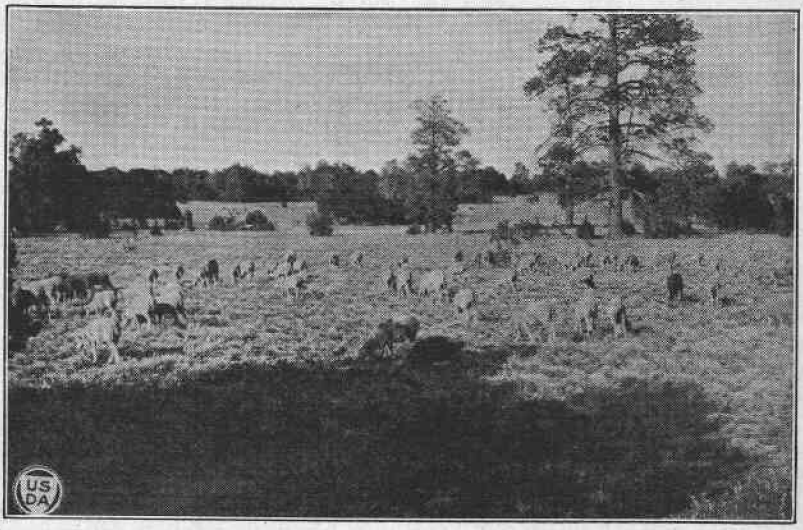


FIG. 4.—About 300,000 sheep find range on the national forests of Arizona

have been retained in public ownership, none are considered to have sufficient value for agriculture to warrant alienating them as homesteads.

A large livestock industry has been developed upon the Apache Forest, and all of the available range is now used under Government permits. It supports a total of 34,000 cattle and 34,000 sheep, which are owned by 184 permittees, most of whom live on or near the forest. Much of this stock spends only its summer on the high, cool mountain ranges of the Apache Forest, and is driven to the lower-lying country to the north and south for the winter. In addition, 263 settlers on the forest are allowed to graze nearly 3,000 head of work and milk stock on the forest free of charge.

Besides its purely commercial value, this forest is of immense importance because of its location on the headwaters of many of the streams ultimately running into the Roosevelt Reservoir, which supplies irrigation water and power for the Salt River Valley. Upon such an area, therefore, conservative lumbering should be practiced

and grazing must be regulated. This is assured under national forest administration.

In order to make mountain areas like the Apache Forest more accessible to travelers, and in order that fires may be more easily reached, the Forest Service is developing lines of communication. In accordance with this policy, 209 miles of telephone lines, 84 miles of roads, and 160 miles of trails have been constructed on this forest. A road from Clifton to Springerville, running through the heart of the finest mountain scenery on the Apache Forest, is now being built by the Forest Service in cooperation with Apache and Greenlee Counties. This project, which will be completed before the end of 1924, will allow travel between northern and southern transcontinental routes. Several other roads, which connect with the transcontinental system, are now being built into the forest from the north. The completion of these roads will do much to make the forest more popular for camping, fishing, and hunting. Even then, however, many portions will still be far enough in the "backwoods" to delight those who desire to get away from the main routes of travel. Within the Apache National Forest there are several hundred miles of trout waters. As the State has recently established a fish hatchery within this forest, excellent trout fishing is now assured during the summer months.

THE COCONINO NATIONAL FOREST

(In Coconino and Yavapai Counties)

The most accessible and at present the most valuable of any of Arizona's national forests is the Coconino, lying on the Colorado Plateau on both sides of the Santa Fe Railway. It is a large, comparatively flat area, at an elevation of approximately 7,000 feet, cut, however, toward the south end by several deep canyons. North of the Santa Fe Railway, rising abruptly from this plateau to an elevation of 12,600 feet, are the San Francisco Peaks, the highest in Arizona. The Coconino National Forest contains a gross area of 1,909,278 acres and is administered from Flagstaff, which is located within its boundaries. The forest takes its name from the Hopi word *Kohonino*, which was the name at one time applied to the Havasupai Tribe of Indians of Cataract Canyon.

Originally, the Colorado Plateau contained the finest body of western yellow pine timber in the Southwest. Because of its accessibility from the Santa Fe Railway, however, much of this timber has been cut by large mills at Flagstaff, Cliffs, and Williams, Ariz. The forest still has nearly 4,000,000,000 feet of mature yellow pine, a part of which is now under contract for cutting by the three large mills in this region. This forest now supplies a large part of the lumber produced in Arizona, and under the Forest Service policy of conservative cutting, it will supply the lumber industry for a long period of years. At the present time, the annual cut of timber from this forest is about 35,000,000 board feet. There are on the forest also about 1,500,000 cords of piñon and juniper, portions of which are now being cut for posts and firewood.

A comprehensive plan for handling the timber resources has been completed for the saw-timber type on the forest. According

to this, the forest is capable of supplying 40 million feet of saw timber annually. Cutting will proceed at such a rate that by the time the virgin timber is removed, it will be possible to start cutting on the new growth. Under this system the forest will produce successive crops of timber which will provide approximately the same cut each year for a permanent lumber industry.

The excellent summer ranges of the Coconino National Forest have long been well known among the stockmen of the Southwest. They are, therefore, fully stocked with about 43,000 cattle and 75,000 sheep. Most of this stock leaves the forest during the winter, at which time it is grazed in the surrounding semidesert country at lower elevations.

A large part of the Coconino National Forest, especially the north end, has little or no living water upon it. Springs are scarce and

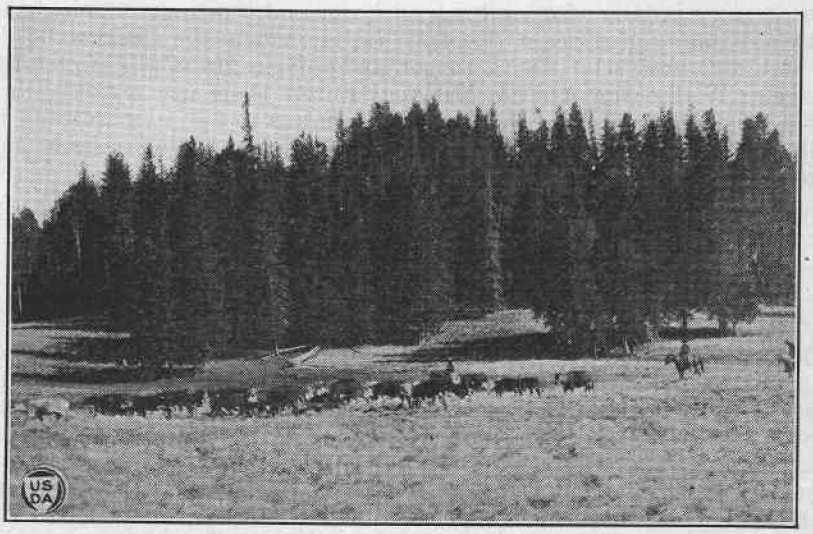
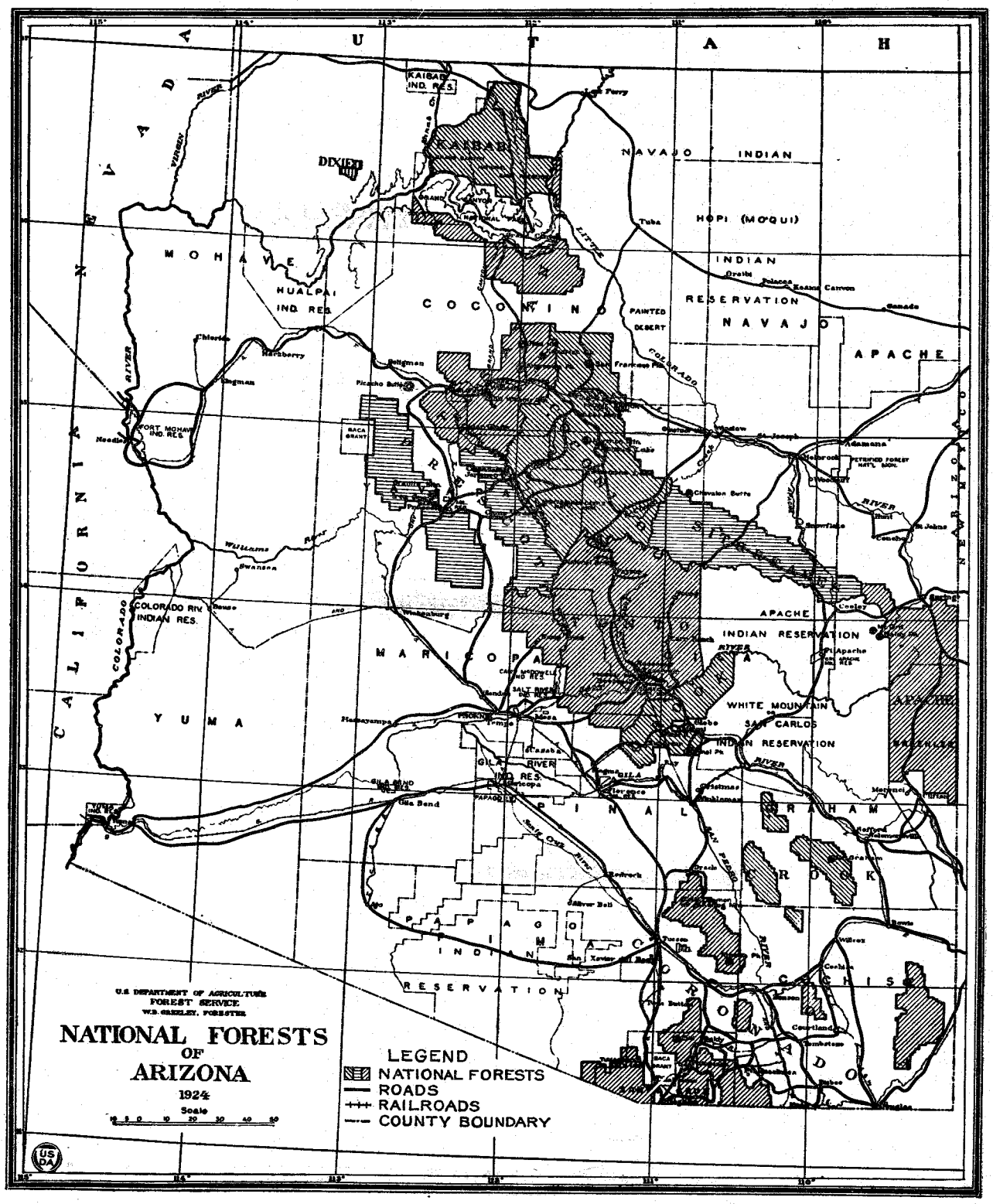


FIG. 5.—The national forests of Arizona provide range for 310,000 cattle

streams are unknown. In order to use the range to its full capacity, it became necessary to store flood waters. Many stockmen have spent large sums of money in water-development projects, which are protected under Government permit. To some extent, also, the Government has cooperated with these men in the building of drift fences and other range improvements.

As on the other Arizona national forests, homesteaders have already secured all the lands which would make desirable farm units. These lie in 334 tracts widely scattered throughout the forest.

Many people from the surrounding semidesert regions are finding Flagstaff and vicinity, with its cool summer climate and its stately pines, a most delightful place to visit in summer. Some have built summer homes; others camp in the forest, or stay at the little mountain resorts. Although the scarcity of water on the Colorado Plateau makes many places undesirable, fortunately two lakes south



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of Flagstaff provide excellent opportunities for recreational development. One of these, Mormon Lake, located about 30 miles south of Flagstaff, is the largest natural body of water in the State. It offers good bass fishing, and there are many camping places along its shoreline of over 12 miles.

There are many other wonders which attract tourists to this region during the summer months. The San Francisco Peaks offer opportunities for mountain climbing to heights from which the greater part of Arizona and portions of several other States may be seen. Then there are the cliff dwellings in the Walnut Canyon National Monument, 9 miles east of Flagstaff, and the wonderful Montezuma Castle and Well about 60 miles south. The Painted Desert, just northeast of the forest, presents those distant views of green, gold, crimson, and purple found only in the Southwest.

Roads and trails have been constructed primarily to protect this forest against fire, but they are available also to the traveler seeking recreation in the cool mountains. The Coconino National Forest has the largest fire hazard of any forest in the Southwest. It ordinarily has one-third of all the forest fires occurring in the national forests of the State. Lightning is responsible for many of them, as there are often in June severe electrical storms which are accompanied by little or no rain. Records show, however, that 40 per cent of all the fires occur through carelessness of man. To aid in the protection of this forest, lookout towers and a complete telephone system covering 222 miles have been established. The construction of roads and trails is also being continued each year.

THE CORONADO NATIONAL FOREST

(In Cochise, Pima, Pinal, and Santa Cruz Counties in Arizona, and Hidalgo County in New Mexico)

The Coronado National Forest lies in nine divisions, and is composed of mountain ranges which for the most part rise abruptly from the southern Arizona desert. The most important mountains in the forest are the Santa Catalinas, the Santa Ritas, the Huachucas, the Tumacacoris, the Dragoons, and the Chiricahuas. There are two small divisions containing 129,152 acres in the extreme southwestern part of New Mexico. The gross area of the entire forest, which is administered from headquarters at Tucson, is 1,486,980 acres. The forest is named for Don Francisco Vasquez Coronado, the Spanish explorer who in 1540 crossed southern Arizona in his march from Mexico in his search for the Seven Cities of Cibola, which had been reported to him as having large stores of gold.

The Coronado National Forest has no extensive saw-timber stand and can never become the source of supply for a large lumber industry. Much of it is exceedingly rough country with the good saw-timber stands high up in inaccessible country. At lower elevations, however, there are heavy stands of oak, together with considerable piñon and juniper. These are of much value in supplying the ranches in the surrounding treeless areas with firewood and fence posts. A few small mills in the more accessible saw-timber stands will always supply at least a portion of the local demand.

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The Coronado National Forest is estimated to contain 290,000,000 board feet of saw timber and 3,748,000 cords of wood. The cut of saw timber and other forest products in 1923 was 685,000 feet.

The Coronado National Forest, however, assumes great significance as the watershed of the surrounding valleys, in many of which it is important to maintain the supply of underground waters. Under the Forest Service administration these watersheds are protected, the flow of the short, rapid mountain streams is regulated, and the supply of underground water is maintained.

The forest also supports a cattle industry of 41,000 head, owned by 241 permittees, most of whom are local men. In addition, about 400 small ranchers graze over 2,000 head of work and milk stock on the forests free of charge. The forest has been divided into range allotments, many of which have been fenced, and the stock is so handled that the entire range is utilized but not overgrazed.

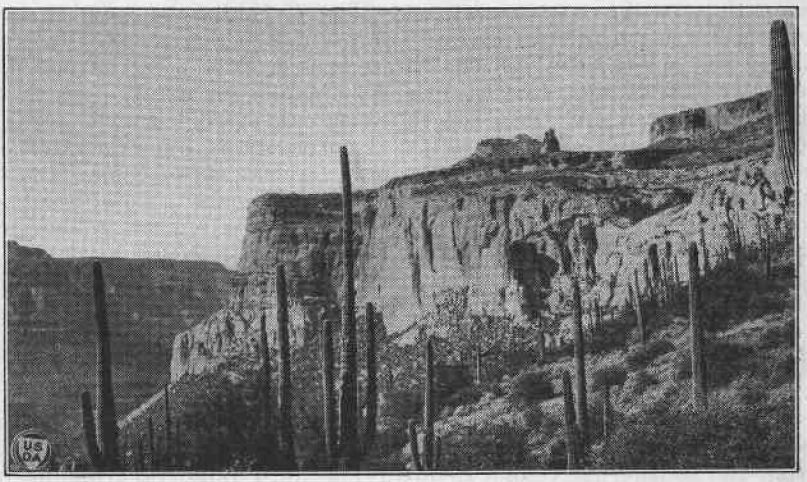

FIG. 6.—The giant cactus is found at the lower edge of some of the southern Arizona forests. Here are some of the important watersheds which must be protected against erosion

There are in these mountains numerous small flat areas which could either be irrigated or upon which dry farming could be practiced. Those which were not homesteaded before the creation of the forest have now been settled upon by 294 persons who secured title to a total area of 40,290 acres. No additional lands are now available for agricultural settlement.

The Coronado National Forest has a large fire hazard during the long dry period in the spring. It has been difficult, because of the inaccessibility of the country, to handle the many fires that have occurred. To overcome this difficulty the Forest Service has been developing means of detection and communication. Lookout towers and telephone lines have been constructed in order that fires may be readily located, and a comprehensive system of roads and trails is being built.

The opening up of lines of communication is also making the Coronado National Forest accessible to the summer visitors who

wish to escape the heat of the surrounding semidesert areas. These persons are being encouraged to make the fullest use of the forest for recreation purposes. A good road constructed some years ago to the top of the Santa Catalinas has put this beautiful mountain country at the very door of Tucson, whose citizens, as well as those of several other towns, are using it in greater numbers each year. Other localities, such as Cave Creek in the Chiricahua Mountains, Madera Canyon in the Santa Ritas, and Cochise Stronghold in the Dragoons, where excellent summer-home sites and camping places are available, are being more widely used each year by residents of the valley towns.

Several of the divisions of the forest offer limited deer hunting in the fall. The Santa Catalina and Huachuca divisions, however, have been set aside as game preserves upon which no hunting of any kind is allowed.

THE CROOK NATIONAL FOREST

(In Gila, Graham, Maricopa, and Pinal Counties.)

The Crook National Forest contains 912,161 gross acres, and is administered from headquarters at Safford on the Gila River. The forest lies in five divisions, four of which rise abruptly from the southern Arizona desert and are in the Graham, Galiuro, and Santa Theresa Mountains. The other division consists of the mountainous country north and west of Globe. The forest is named after Gen. George Crook, who was in charge of the United States Army in its operations against the Arizona Indians from 1871 to 1875.

Large portions of the forest are made up of precipitous mountain country, quite difficult of access from the flat areas below. Most of the saw timber is found on the Mount Graham division. There, high up in the mountains, is one of the heaviest stands of western yellow pine and Douglas fir in the entire Southwest. Its area, of course, is small, and it is difficult and expensive to get the timber. Several small mills, however, cut timber for use in the surrounding valleys. The remainder of the forest contains little saw timber, but there are large areas of woodland which supply most of the fuel wood for the surrounding settlements. The total stand of timber is estimated at 376,000,000 feet of saw timber and 450,000 cords of wood. The total cut of forest products from the Crook National Forest was 1,085,000 board feet in 1923. The timber business, though small, gives employment to a considerable number of men. This is shown by the fact that in 1923, 313 separate sales were made. Most of these were for cordwood.

The forest supports a livestock industry consisting of about 25,000 cattle and 3,000 sheep, which are permitted to 150 persons. In addition, 170 ranchers and settlers graze their work and milk stock, consisting of over 1,000 head, free of charge. For the most part the stock grazed on the forest is the property of men who own small ranches and carry on this business in connection with them. These men are encouraged to handle their stock efficiently and to improve the ranges, and at the same time they are protected in their undertakings through their national-forest permits.

Because of the ruggedness of the Crook National Forest, only 6,436 acres of agricultural land have been alienated under the forest homestead act. These lands lie in 120 tracts, which contain all of the agricultural lands that were in Government ownership at the time of the creation of the forest.

Roads, trails, and telephone lines are being developed on the Crook National Forest both to aid the administration and protection of the forest and to allow the public to visit it more conveniently. There are hundreds of beautiful camping places in these mountains, and already Mount Graham, although difficult of access, has become a favorite summer recreation ground for residents of the adjacent Gila Valley. The Pinals, where road work is progressing, are also visited each year by an increasing number of persons from the mining towns of Globe and Miami.

The Mount Graham division of the forest has been set aside as a game preserve where hunting is prohibited. On the remainder of the forest, however, there is fair deer shooting in the fall of the year.

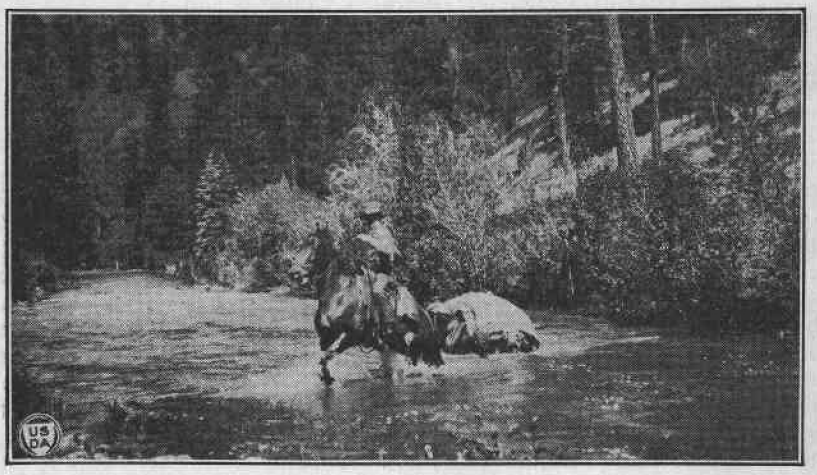

FIG. 7.—The mountain streams afford good trout fishing

THE KAIBAB NATIONAL FOREST

(In Coconino County)

Just north of the Grand Canyon, in a country little known as yet, lies the Kaibab National Forest, with a gross area of 770,900 acres, administered from the town of Kanab, Utah. The forest takes its name from the Kaibab Plateau upon which it is located. This plateau in turn is named after a small division of the Piute Indians who roamed there, and it is said to mean "on the mountain."

Although the Kaibab National Forest is estimated to contain 1,102,000,000 board feet of saw timber and 533,000 cords of fuel wood, there is practically no cutting at the present time because of the inaccessibility of the timber. On the south, the Grand Canyon of the Colorado prevents access, and the closest railroad to the north is 185 miles from the timber. Over 80 per cent of the saw timber consists of a heavy stand of western yellow pine, which, from a logging and

lumbering standpoint, offers as few engineering difficulties as any similar belt of timber west of the Rocky Mountains. As railroad construction is extended toward the forest, the Kaibab is destined to become one of the important lumber-producing forests of the West.

Before the forest was created the range now within it had been badly overgrazed and its carrying capacity is, therefore, low. At present only about 5,600 cattle and 3,500 sheep are grazed on this area. This is less than one-third of the stock which the ranges formerly carried. Owing to the increasing numbers of deer on this forest, which includes the Grand Canyon National Game Preserve, the numbers of domestic animals have been constantly reduced in order to prevent a possible scarcity of feed for the game, the needs of the game being considered as superior to those of domestic animals. These reductions will be continued as far as possible without depriving local settlers who are dependent upon the range of a reasonable amount of grazing for their stock.

The Kaibab National Forest is beginning to claim much popular attention as a sight-seeing and recreational region for the reason that it lies on the road to the Grand Canyon National Park from the north. The canyon itself, with a border varying in width from 1 to 5 miles from the rim of the plateau top, is in the National Park, and here are the great scenic attractions of the region, the lookout points from which spectacular views may be had out over the canyon. Less spectacular, yet no less interesting, are the scenes which are in store for the traveler as he passes through the forest. Its stately pines, alternating with grassy parks, in contrast with the surrounding desert and its animal life, attract immediate attention.

Chief interest lies in the large number of mule deer which range on this plateau, giving it its popular name of "Buckskin Mountains." It is estimated that there are over 25,000 mule deer on the forest, and they are seen in considerable numbers by everyone who passes through this region. Sometimes at dusk they may be seen by the hundreds at certain favorite places.

Mountain lions have found this area a paradise, and the region has been famous for lion hunting. Several hunters, employed especially for this kind of hunting, have greatly reduced the numbers of these animals in recent years, but the beasts are still far from extinct in this locality.

Owing to the isolation of the region it has become the home, and indeed the only home, of the Kaibab white-tailed squirrel, a gray squirrel with a white tail and tufted ears, which is locally quite common, although entirely unknown elsewhere.

The whole forest is a Federal game sanctuary and no shooting is allowed at any season. As it lies like a oasis in the desert, the normal drift of deer out of this region is prevented, and under protection their number has increased to such an extent that they have become a problem in game management. In order to check the excessive increase of deer, therefore, it may become necessary to issue a limited number of licenses for hunting them on designated areas.

While the Kaibab National Forest offers these attractions, it has one great drawback as a recreation area. It is practically without water. The main highway strikes the chief watering

places, yet even some of the "lakes" along this road become mere pools of warm, unpleasant water in midsummer. Experienced campers may, however, take interesting pack trips into this forest in spring and fall, when water is available.

THE PRESCOTT NATIONAL FOREST

(In Yavapai County)

Lying in two divisions east and west of the town of Prescott (named in honor of the great historian), from which it takes its name, is the Prescott National Forest. It contains a total gross area of 1,365,169 acres and its headquarters is in Prescott.

The Prescott National Forest is primarily a watershed-protection forest which contains very little saw timber. There is, however, an immense area of piñon, juniper, and oak woodland which is of consedirable importance as a local fuel supply. At one time there was

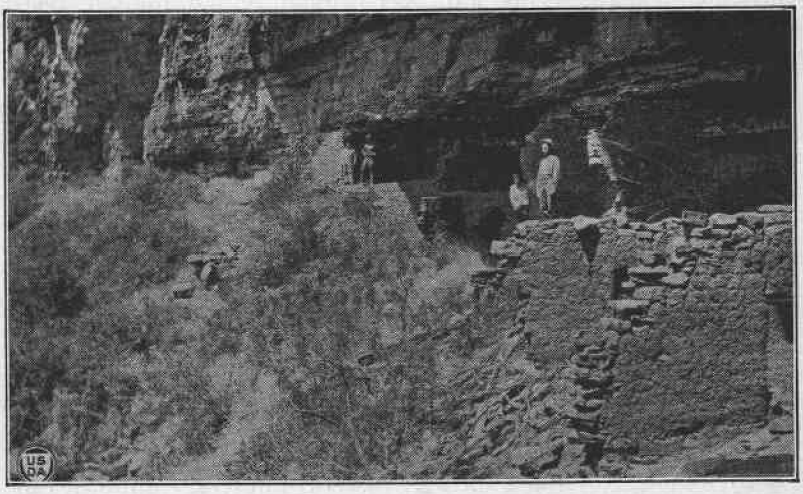

FIG. 8.—Cliff dwellings as well as other wonders abound on the Arizona forests

more timber, but much of it was cut for mining purposes before the creation of the forest. The cut-over areas now contain excellent stands of young timber which will later produce lumber. The present stand of merchantable timber is estimated at 180,000,000 feet of saw timber and over 2,000,000 cords of fuel wood. Its timber-sale business provides timber entirely for local consumption and during 1923 amounted to 1,523,000 feet.

Most of the forest is upon the watershed of the Verde River, the waters of which are used to irrigate large areas of farm land. It is important, therefore, that this watershed be protected, in order that floods may be minimized and the streamflow regulated. Under Forest Service administration protection is assured.

The Prescott National Forest supports a well-developed livestock industry. Upon its ranges graze annually about 52,000 cattle and 49,000 sheep, which are owned by 199 permittees. Many of the sheep which graze on the northern forests of the State during the

summer months find winter range on the Prescott Forest. In addition, settlers are given free range for about 1,600 work and milk stock. The grazing of livestock is so regulated that the ranges are not overgrazed and the watershed is not damaged.

What few agricultural lands remained on this forest at the time of its establishment have now been alienated in 110 tracts, which contain 8,847 acres. Although the agricultural possibilities are small, large portions of the Prescott Forest contain minerals. Many mining claims have, therefore, been located, and there are a number of paying mines. The famous United Verde Copper Mine is near the Verde division of the Prescott Forest.

Although the Prescott National Forest does not present the number of attractions that are found on some of the forests in the higher mountains, it does have many alluring spots for recreationists. It is used during the hot summer months by the residents of the valley towns surrounding it. Residents of Phoenix maintain a large colony of summer residents at Iron Springs, 7 miles from Prescott, located in a fine stand of yellow pine. Mingus Mountain, not far from Jerome, offers a cool retreat among the pines, and Groom Creek is much enjoyed by Prescott people. Both are easily reached over good roads.

As in the other national forests, the Forest Service is developing means of transportation. Probably the project of most interest to the public will be the Phoenix-Prescott road, in the construction of which the Forest Service is cooperating with the State. This road will extend for miles through cool forested areas.

THE SITGREAVES NATIONAL FOREST

(In Apache, Navajo, and Coconino Counties)

Stretching for nearly 100 miles along the north side of the Mogollon Rim and containing 881,102 gross acres, lies the Sitgreaves National Forest. It is named for Capt. L. Sitgreaves, United States Topographical Engineers, who headed a scientific expedition through this country in the early fifties. The supervisor's headquarters is at Holbrook, on the Atchison, Topeka & Santa Fe Railway.

The Sitgreaves is one of the most heavily timbered national forests in Arizona. It contains more than 4,000,000,000 feet of saw timber, nearly all of which is western yellow pine, and 1,000,000 cords of piñon and juniper. Only small amounts of this timber, the greater part of which is from 40 to 60 miles from the nearest railroad have been cut. It was too far back for profitable logging. Several years ago, however, a large operation started on the east end of the Sitgreaves Forest and on the adjoining Indian reservation. The annual cut of this forest is still only about 7,000,000 board feet, although in the not distant future it should increase.

The saw-timber resources on this forest are being handled under a management plan which provides for a cut of timber of approximately 35,000,000 feet anually. This is estimated to be the annual growth on the forest. This annual cut will supply a large lumbering operation on a permanent basis.

It is believed that within a few years a turpentine industry will be established on a large scale in the Southwest. To anticipate this demand the Forest Service has already taken stock of the turpentine

resources of this forest and is prepared to make sales under such conservative methods as will maintain the continued productivity of the forest.

Like other southwestern forests, practically the entire range on the Sitgreaves is used to support a stock industry. This consists of 7,000 cattle and 40,000 sheep. A great deal of this stock uses the forest only in the summer, seeking in winter the lower desert ranges. In addition, however, many head of work and milk animals are grazed free of charge by the settlers.

Scattered among the yellow pine areas are frequent level openings upon which crops can be raised. Where these were large enough to make feasible farm units, they were settled upon under the forest homestead act, and in this way 43,903 acres have been alienated. The 390 settlers who now cultivate these lands have practically all the available agricultural lands in the forest.

Because of its heavy timber stands and its comparatively flat topography, the Sitgreaves National Forest is bound to become an important factor in the lumber industry of the Southwest. It lacks the scenic attractions of some of the more rugged mountain forests, but for this very reason it is of high value as a timber-producing forest.

The west end of the forest, however, is cut by a number of deep, precipitous canyons, which render use and even travel difficult. It forms a natural wilderness 50 or 60 miles from the railroad and has been considered, therefore, an excellent place into which to introduce elk. Accordingly, some years ago a small herd of elk was sent there from Wyoming. These animals have been protected against hunting and have increased rapidly, until their number is now estimated at 500. If they continue to increase, it is not unlikely that a limited amount of elk hunting will be allowed in this region within a few years.

Because of its large timber values, special efforts have been made to protect this forest against fires. It has an excellent lookout system entirely connected by telephone lines. Fires are usually located by triangulation soon after they start. The network of roads and trails already built gives quick access to every portion of the forest and allows the rangers to reach fires before they become large. The Promontory Butte lookout tower on this forest is 110 feet high and is the highest tower in the Southwest.

THE TONTO NATIONAL FOREST

(In Gila, Maricopa, Pinal, and Yavapai Counties)

The Tonto National Forest, named for the Tonto Apache Indians, a branch of the Apache Nation, contains a gross area of 2,154,255 acres and is the largest in Arizona. It is administered from Phoenix.

The Tonto Forest was established largely for the purpose of protecting the watershed of the Roosevelt Reservoir, which furnishes water for irrigation for the great Salt River Valley. Much of its area is covered only with brush, but overgrazing and uncontrolled fires would destroy this, and serious damage to the Salt River Valley would result. The Forest Service administration protects this vast

watershed through conservative management of the grazing and other resources. Thus the effects of erosion are minimized and silting of the reservoir is retarded.

There is, however, a considerable body of timber on the Mazatzal and Sierra Ancha Mountains and under the Mogollon Rim within this forest, where 593,000,000 feet of western yellow pine and Douglas fir saw timber are found. In addition, it is estimated that 1,087,000 cords of piñon, juniper, and oak wood are located on the Tonto National Forest. Because the stands of saw timber are scattered, no large timber operations can ever be established on this forest. The very fact that there is so little timber in this country, however, makes the existing stands more valuable for local consumption, and several small mills have already been established. These mills cut during the past year 185,000 feet of timber from the forest.

A large cattle industry uses the Tonto Forest, and about 67,000 cattle and 19,000 sheep were grazed during 1923 by about 200 permittees.

As on the other Arizona national forests, the agricultural lands have all been settled upon. Three hundred and twenty-five tracts have been listed under the forest homestead act.

Within this forest is the famous Roosevelt Reservoir, reached by good roads from Phoenix and Globe. This lake is about 30 miles long and offers excellent bass fishing. Near it and accessible by automobile are the Tonto cliff dwellings, relics of an ancient and extinct civilization. Because of the exceedingly mild winter climate these wonders can most comfortably be visited during the winter months. In the north portion of the Tonto Forest lies the Arizona Natural Bridge, a high limestone arch spanning Tonto Creek, a little mountain stream. A good road connects it with the Phoenix-Globe Highway at Roosevelt.

Although the Tonto Forest does not have the attractions of the high forested mountains, yet its rugged semidesert scenery appeals to many, and its streams, in places shaded by walnut groves, offer beautiful camping places. Its importance lies not in its beauty, however, nor in the timber stand, but in the large influence which this area has on the prosperity of the Salt River Valley with its population of nearly 100,000 persons. It is doubtful whether this valley could remain prosperous without adequate protection of the watershed from which its irrigation water comes.

THE TUSAYAN NATIONAL FOREST

(In Coconino and Yavapai Counties)

The Tusayan National Forest, with headquarters at Williams, lies in the western part of the Colorado Plateau. It consists of two divisions, one surrounding the town of Williams and the other adjoining the Grand Canyon National Park. Its gross area is 1,494,438 acres. Its name is derived from the Hopi Indian province of Tusayan, which was described by the chroniclers of the Coronado expedition of 1540–1542 as existing in northern Arizona.

Because of its accessibility and its fine timber stand of western yellow pine, lumbering has been going on for many years. The forest still has 770,000,000 board feet of timber and 1,045,000 cords

of piñon and juniper cordwood. It supports one large sawmill, one small mill, and a number of cordwood operations which together cut from the forest during 1923 a total of 14,366,000 board feet of timber and other forest products.

A detailed plan of timber management has been made for the Tusayan National Forest. Under it the extensive cut-over areas within this forest, many of them logged off before the forest was created, are being so handled and protected that new stands of timber will grow. Even though much of the forest is to-day without merchantable timber stands, it will in the future become a large factor in the lumber industry of Arizona. The carrying out of the plan will also help to stabilize lumber operations in this region. The plan also provides for the systematic handling of the large cordwood operations which are being conducted on a sustained-yield basis.

Within the forest there is excellent summer and winter range, which, because of its accessibility, has been fully stocked for many years. It now supports 18,000 cattle and 59,000 sheep. Approximately 50 per cent of the cattle graze on the forest yearlong, but practically all the sheep go to lower desert ranges during the winter. In addition, a large number of work and milk animals is grazed free upon the forest by settlers.

Very little settlement on the agricultural lands within the Tusayan Forest occurred before its establishment as a national forest. The greater part has since been taken up under the homestead law. About 359 tracts have been alienated under this act. All of the agricultural land has now been listed and opened to entry, and there are no more homesteads left. Several good-sized farming communities, which aid materially in the protection of the forest against fire, have become established. Notable are those near Red Lake, in Pitman Valley, and in Spring Valley, as well as the Garland Prairie and Government Prairie communities.

The greater part of this forest is comparatively flat. The roads, however, especially into the more remote portions of the forest are generally poor. This condition is being remedied as fast as funds permit and in accordance with a comprehensive road-building program. In order to protect the valuable timber stand of the Tusayan National Forest from fire, these roads are badly needed. At the same time roads will provide the public with means of access to the heavily timbered regions.

The Forest Service maintains a complete telephone system of 95 miles, which makes it possible to report forest fires soon after they are discovered. Lightning causes most of the fires, but careless persons are still responsible for nearly one-third of them.

There are pretty spots for summer homes in many parts of the Tusayan Forest, but because of the scarcity of water and the absence of running streams, it does not present to the seeker of recreation as many attractions as do some of the other forests of the Southwest. One finds here, however, a wonderful summer climate and many restful places among the stately pines.

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July 2, 1924

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