YOSEMITE

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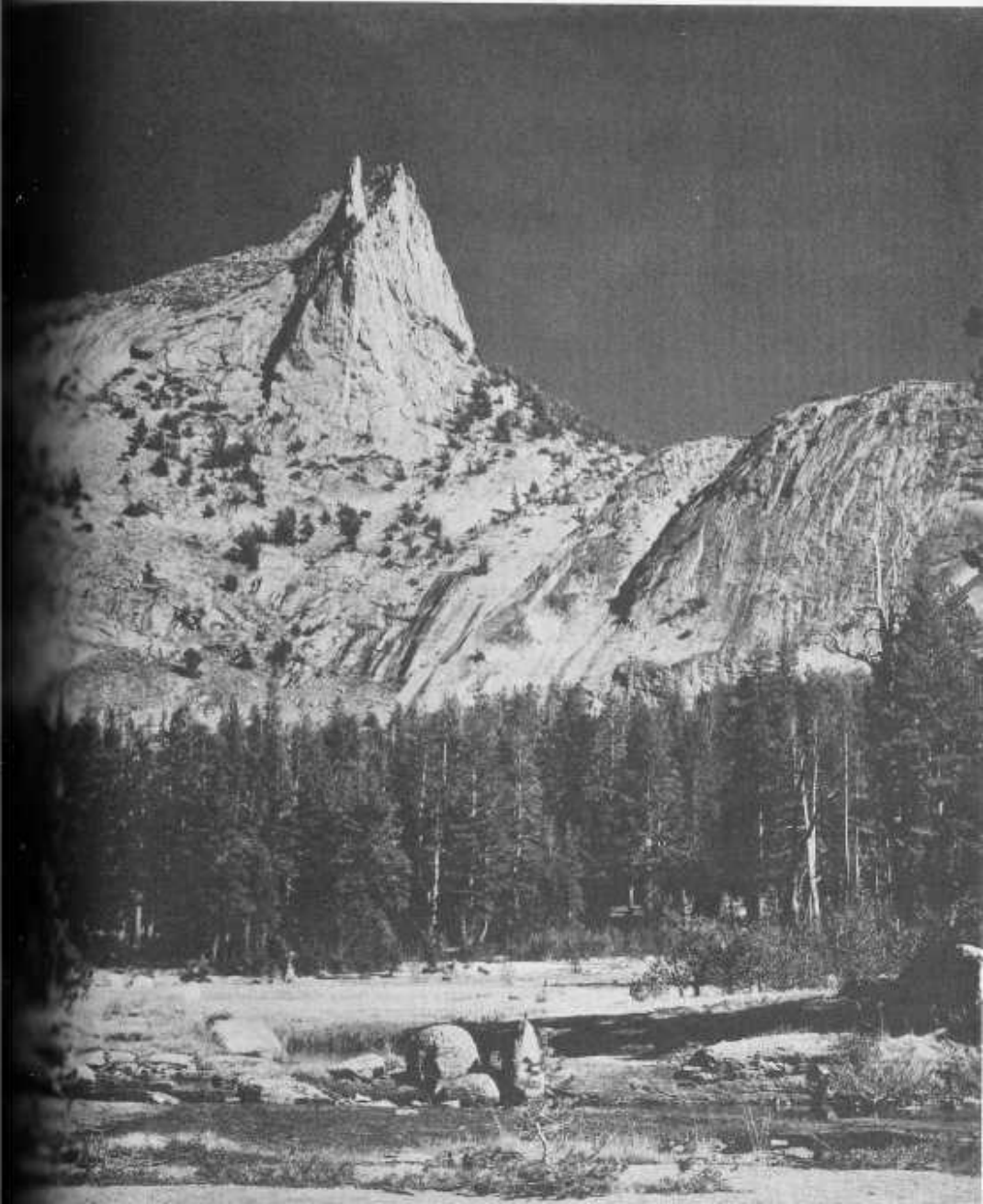

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COVER — Cathedral Peak — Courtesy of Vitagraph Corp.

yosemite
NATURE NOTES

Since 1922, the monthly publication of the National Park Service and the Yosemite Natural History Association in Yosemite National Park.

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VOL. XXXIX MAY 1960 NO. 5

THE SIERRA YELLOW LEGGED FROG

Carl L. Heller, Ranger-Naturalist

Frogs are interesting members of the class Amphibia. The phylogenetic classification places the Amphibians just above the fishes and below the reptiles. The name Amphibia means "double life" referring to the fact that many of them return to the water to lay their eggs and spend their larval life in the water for variable lengths of time, during which period their respiration is by means of gills and their food is vegetable matter. These larvae, the tadpoles, go through a striking metamorphosis in which the broad swimming tail is resorbed into the body, lungs develop, and the food habits change from vegetarian to carnivore as the larvae assume the form of adults and emerge from the water for a life upon the land.

Amphibians: Frogs, toads, and salamanders can be characterized best as those animals which have either a tuberculate, dry, and warty outer covering or one that is smooth and slimy. They share with the fish and reptiles the poikilothermal condition in that their body temperature fluctuates with the temperature of the environment rather than remaining constant as in the birds and mammals. Frogs are extremely alert in sight and hearing, especially in sight. Frogs see small objects at a distance of three or four feet. They will often let a fly or worm crawl immediately under their nose while staring with eager eyes far ahead. It has been proven by experiment that a frog does not give a motor response to sound alone, but that a sound stimulus intensifies the effect of an accompanying visual or other stimulus. It means for instance, that if a frog hears an insect before seeing it, he is put on the alert, so that when he sees it, his dash for it is more vigorous and effective than it would have been with the visual stimulus alone. (Dickerson-1920)

The Sierra yellow legged frog is

a member of such a class of animals and is found chiefly in the Yosemite region above 6500 feet along the borders of lakes and stream courses where the water flow is moderate or slow. Often active in the daytime, they may be found suning along shores or upon rocks in streams. When frightened, they plunge into the water and attempt to hide beneath the stones or sediment of stream bottom and remain there until the danger has passed. Observation of a frog in the Bridalveil Creek area produced a ten minute stay under water for one frog and the frog was still there when the writer gave up and walked on. This demonstrates the frog's ability to conserve oxygen and to obtain it through their moist thin skin.

The food of the frog consists of aquatic and terrestrial arthropods, particularly insects. This particular habit makes the frog beneficial to man in maintaining a balance in nature. The frog in turn being eaten by certain snakes, birds, mammals, and even fishes. As is true of many of our carnivorous animals, the frogs are somewhat canabalistic, that is they will devour their own kind if the opportunity presents itself. Although I knew this to be true, I was quite surprised at the extreme canabalistic tendencies of a yellow legged frog obtained from the Harden Lake area in June of 1959. A full grown frog was obtained along with two smaller ones for the valley museum display and placed in the same container for the trip back to the valley. Within the hour, the larger frog devoured the two smaller frogs as was born out by the extreme distention of its abdomen and the hind legs of one of the frogs protruding from the larger frog's mouth. This seemed unusual to me in that I have found no reference to such an act with frogs so recently removed from their habitat. This same tendency showed itself the following week with an attempt by the frog to devour a small Yosemite toad that occupied the same compartment or display case. This action followed the regular feeding of the frogs and toads their allotment of meal worm beetles and larva. A large stone was moved from one part of the case to another exposing the small toad. The small toad immediately attempted to move in the direction of the stone triggering a vigorous and effective lunge by the frog and only interference by the writer prevented the toad from being dessert for the frog. Perhaps the nervous alertness of a frog's eating habit accounts for this latter act. The movement of a small living object gives the visual stimulus and psychologically speaking brings to the frog the suggestion of something to eat. The mouth has the sense of touch highly developed, but the sense of taste is present only to a small degree. Long experience of the race has taught that only immediate and swift motor response will result in capture of the food — the miller or grasshopper may take wing, the slug disappear under a board, or the caterpillar roll into a ball and "play dead". Usually, the result of the immediate seizure of the moving object is satisfactory, since almost all small insects and worms are part of a toad's or frog's menu. But sometimes lack of examination of the object brings dire results. Such is the case when a large stag beetle is swallowed. Its huge pinching mandibles produce terrible effects at once in the frog's stomach. Fortunately, the frog has a wide, short esophagus, so that any disagreeable object can be disgorged immediately.

The frogs with their thin moist skin may leave the water temporarily but depend upon the water for protection from enemies and against drying out. Unlike the toads, they lack the poison glands beneath the skin and do not carry an extra supply of water with them. The frogs are far more aquatic in habit than the toads and are very capable swimmers. The amphibians stand between the aquatic and terrestrial modes of existence among the vertebrates, and present a profitable field for investigations bearing on the evolution of land life.

Selected references: Robert C. Stebbins 1951, M. V. Walker 1945, Gayle Pickwell 1947, Tracy Storer 1925.

LOWER YOSEMITE FALLS

Ted R. McVey, Ranger-Naturalist

The bright blue sky comes down to touch the cliffs as if it were the very ceiling.

The canyon walls sparkle and shine and every detail stands out, redone by the afternoon shower.

Yosemite Falls seems filled with delight, exuberantly trying to match the beauty of the day.

The falls are ever changing;

Now floating gracefully in one long descent.

Then leaping gracefully, or perhaps as now, seemingly filled with wild abandon.

The mists plunging and billowing up and around as if doing some wild dance of delight.

OBSERVATIONS ON SOME MAMMALS OF THE YOSEMITE REGION

John D. Cunningham, Ranger-Naturalist

Observations made by the writer during the summer of 1958 and notes on file in the Yosemite Museum seem worthy of publication in order to bring our knowledge of the mammals of the Yosemite region to date. Knowledge of the mammals of this region has been summarized by Grinnell and Storer (1924), and Parker (1952). Nomenclature follows the latter authority. Unless otherwise noted all localities are within the boundaries of the Park in Mariposa and Tuolumne Counties.

Yosemite Mole, *Scapanus latimanus sericatus*: Several albino or partial albino moles have been collected in Yosemite Valley.

Mountain Water Shrew, *Sorex palustris navigator*: On June 7, 1925, a water shrew was discovered in the stomach of a brook trout (*Salvelinus fontinalis*) caught at Tamarack Creek.

San Bernardino Brown Bat, *Eptesicus fuscus bernardinus*: On February 26, 1932, one was discovered by A. E. Borell crawling across the highway at Arch Rock. Another was captured by G. P. Ashcroft after it collided with another bat and fell into the water in Yosemite Valley.

Sierra Black Bear, *Ursus americanus californiensis*: Near Glacier Point, on July 19, 1932, a bear was observed by E. F. Walker killing a fawn mule deer (*Odocoileus hemionus*).

California Ring-tailed Cat, *Bassariscus astutus raptor*: A female, with one embryo, captured at Cascade Creek on May 13, 1933, contained a white-footed mouse (*Peromyscus*) and a millipede in its stomach.

Sierra Pine Marten, *Martes americana sierrae*: Jones (1955) reports finding a marten dead on a road at an elevation of 4200 feet in a sagebrush habitat near Bishop, Inyo Co. Russell (1926) reports one at approximately the same elevation on the Vernal Falls trail near Happy Isles. In November 1949, a marten was observed inspecting a wood pile near the Fish Hatchery at Happy Isles (4100 feet). This represents a slightly lower altitude occurrence for the marten than that reported by Jones or Russell (*op. cit.*) but the habitat is normal. Happy Isles is cool and damp and represents the low altitude record for several species of animals.

The 1944 ski patrol sighted approximately two marten tracks per mile in heavy lodgepole pine (*Pinus contorta latifolia*) country near Badger Pass. They stated the marten were "definitely after the Douglas squirrels" (Sierra Chickaree). In August at Tuolumne Meadows a marten was observed capturing a white-crowned sparrow (*Zonotrichia leucophrys*) by H. Bryant.

In 1930, on the Four Mile Trail, a golden eagle (*Aquila chrysaetos*) killed a marten.

Notes made in 1937 near Swamp Lake state that the marten is "nocturnal to a degree in its feeding. A specimen was shot from a branch of a red fir fifty feet above the ground. It was in the act of stalking a chickaree which revealed its presence by repeated alarm notes. Beneath the tree from which the marten was shot was found the carcass of a chipmunk with the head severed, while an examination of the contents of the marten's stomach revealed the remains

of one chipmunk and the head of another, probably the head of the body found. Both chipmunks were *Eutamias quadrimaculatus*, Long-eared Chipmunk. Dipterous larvae were also found within the stomach, presenting the possibility of carrion eating."

Mountain Weasel, *Mustela frenata arvadensis*: On July 8, 1939, one was observed by V. C. Baysinger capturing a golden-mantled ground squirrel (*Citellus lateralis chrysodeirus*) at Glacier Point. On July 27, 1939, one was observed by H. Bryant catching a Belding ground squirrel (*Citellus b. beldingi*) at Tuolumne Meadows. Another was observed by H. Bryant at Tuolumne Meadows, on August 1, 1939, with a pocket gopher (*Thomomys m. monticola*). Near Sentinel Bridge on July 19, 1942, a weasel was observed by J. D. Webster carrying a meadow mouse (*Microtus*). Three young were observed at Sentinel Bridge on July 30, 1930, by B. A. Thaxter and two young were observed at Puppy Dome (Tuolumne Meadows) on August 6, 1941, by H. Bryant.

Gray Fox, *Urocyon cinereoargenteus*: On November 3, 1940, in Yosemite Valley, E. Wolfe observed a buck mule deer (*Odocoileus hemionus*) kill a fox. Three fox pups were taken from the base of a hollow tree at Ackerson Meadow in June 1933.

On July 27, 1958, the writer found a fox on Hwy. 395, 1 mile north of the northern June Lake Loop Road, Mono Co. (6900 feet). Vegetation for miles consists of sagebrush (*Artemisia tridentata*) with scattered yellow pine (*Pinus ponderosa*). With the exception of an occasional rock outcrop, the surrounding country is flat.

California Wildcat, *Lynx rufus californicus*: A full grown wildcat captured alive near Yosemite Falls lived in captivity 13 years before being killed.

Southern Sierra Marmot, *Marmota flaviventris sierrae*: Along the Tioga Road (Hwy. 120) marmots are frequently found. On July 10, 1940, a female with three young was observed by E. A. Payne at Vogelsang High Sierra Camp and on June 16, 1928, young were observed at Merced Lake by H. Bryant.

Sierra Ground Squirrel, *Citellus beecheyi sierrae*: On October 6, 1936, one was observed "as it effortlessly and without hesitation swam the Merced River" by C. A. Harwell. On July 13, 1940, one was observed by R. S. Miller killing a chipmunk (*Eutamias*) at Glacier Point.

Sierra Chickaree, *Tamiasciurus douglasi albolimbatus*: M. V. Hood discovered 242 fresh ponderosa pine (*Pinus ponderosa*) cones stacked at the base of a pine by these squirrels in August 1949. On May 28, 1941, young chickarees were observed near the Yosemite Museum. During the summer of 1931, C. Sharsmith observed a chickaree on Mt. Lyell at an elevation of 12,500 feet, about 1500 feet higher than the squirrel is usually found. Despite its arboreal predilections, the chickaree is not infrequently found in Yosemite Valley, where automobile traffic is heavy.

Sierra Flying Squirrel, *Glaucomys sabrinus lascivus*: An albino was collected in Yosemite Valley in 1927.

Yosemite Pocket Gopher, *Thomomys bottae awahnee*: A female was captured in a snap trap at Poison Meadow. No burrow could be discovered nearby.

Sierra Lemming Mouse, *Phenacomys intermedius celsus*: On August 2, 1939, a female with four embryos was collected at Lower McCabe Lake by J. Huss.

Yosemite Meadow Mouse, *Microtus*

Easter Sunrise Services at Mirror Lake, Yosemite National Park.

National Parks represent opportunities for worship through which one comes to understand more fully certain of the attributes of nature and its Creator. They are not objects to be worshipped, but they are shrines at which we may worship.

JOHN C. MERRIAM

montanus yosemite: A female containing 6 embryos, 13mm. in length, was collected at Swamp Lake on July 11, 1938.

Yellow-haired Porcupine, *Erethizon dorsatum epixanthum*: (Storer 1940) notes the paucity of published records of the porcupine as a highway casualty. In the Yosemite region, porcupines are frequently found on highways.

Yosemite Pika, *Ochotona princeps muiri*: A pika was discovered in the stomach of a rattlesnake (*Crotalus viridis*) captured in Tenaya Canyon on July 18, 1931.

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Conservation Quotes

There is one thing better even than the City Beautiful, and that is the Country Beautiful . . . The places of scenic beauty do not increase, but, on the contrary, are in danger of being reduced in number and diminished in quality, and the danger is always increasing with the accumulation of wealth, owing to the desire of private persons to appropriate these places. There is no better service we can render to the masses of the people than to set about and preserve for them wide spaces of fine scenery for their delight . . . we are heirs of those who have gone before, and charged with the duty we owe to those who come after, and there is no duty which seems clearer than that of handing on to them undiminished facilities for the enjoyment of some of the best gifts that the Creator has bestowed upon his children.

—James Bryce

THE INFLUENCE OF JOINTING AT ILLILOUETTE FALLS

Franklin C. Potter, Ranger-Naturalist

The top of Illilouette Falls, where the water begins its plunge, represents a distinct departure from the pattern of most waterfalls. Instead of dropping in the direction of the flow of the creek, the water falls at an angle of approximately 90° to the course of the creek.

The explanation for this change in direction becomes apparent when the falls are viewed from the overlook on the trail from Glacier Point. In the rocks of this area there are two sets of almost vertical master joints. One set is parallel to Panorama Cliffs which were formed by weathering and erosion along one of the joints in this set. (The back side of Half Dome is essentially parallel and apparently is bounded by another joint in this set). The second set of master joints is roughly parallel to the course of Illilouette Creek immediately above the falls; the joints of these two sets of master joints intersect at angles of approximately 135° and 45°.

Weathering and erosion at and near the cliff over which Illilouette Creek falls have produced a series of small rock steps which descend to the westward. So instead of dropping in the direction the creek has been following, the water falls in the direction of this newer, lower drop to the westward thereby initiating the falls at an angle of approximately 90° to the course of the creek.

The length of time that the falls has had this arrangement is a matter of speculation. It has been long enough for pot-holes to be eroded in the rock immediately above the main falls, but such features can be rapidly eroded in the rock bed of an active stream. The cliff down which the water spills probably was produced, at least in part, by the gouging action of the Upper Merced Valley Glacier gouging into the side of the ridge which the Glacier Point trail traverses.

Extensive jointing exists in the area of the falls. Continued weathering with resultant loosening and falling of blocks of rocks will continue especially near the top of the falls. Such action will result in material alteration of the direction of at least the upper part of the falls in the decades and centuries to come.

POISON OAK

Howard H. Cofer, Ranger-Naturalist

The mention of poison oak evokes thoughts of dread in most people whether or not they have actually had direct experience with it. Many unsuspecting persons have been attracted by the glossy, deep green foliage — tinted crimson in autumn — and the dense clusters of greenish-white flowers, much to their regret later.

Poison oak (*Rhus diversiloba*) is not a true oak, but is closely related to poison ivy (*Rhus toxicodendron*). Both are members of the sumac family. Poison oak is one of the most widely distributed shrubs of California and is often abundant in certain localities. It extends northward into Washington, eastward into Arizona, and southward into Lower California. In Yosemite it is rarely found above 4500 feet elevation, although it may extend up to 5000 feet. Poison oak is a deciduous shrub with alternate leaves and flowers which are quite small. The leaves are typically trifoliate, usually two to six inches long; leaflets are variously toothed, lobed, or rarely entire. The flowers occur with the leaves, usually in May in Yosemite. The flesh of the whitish drupe-type fruit, one-fourth inch in diameter, which appears later, is marked with brown fibers.

The growth form of poison oak varies with the nature of the soil and other environmental conditions. Where the soil is shallow and there is no support for its weak stems, it may creep along producing a ground cover of plants a few inches to several inches in height. In other situations it may be a shrub two to eight feet high or a vine climbing thirty feet or more upon some support by means of adventitious rootlets. The plant has considerable capacity to regenerate itself after it has been cut off at the base.

Very few visitors to Yosemite are ever exposed to poison oak since it does not occur out in the Valley area frequented by most people. Some has been found at Rocky Point. It is more commonly noted in the El Portal to Arch Rock area and around Hetch Hetchy. An abundance of it grows along the trail on the north side of the reservoir there. Associated with poison oak in the El Portal region is the squaw bush (*Rhus trilobata*). Many visitors to Yosemite confuse poison oak and squaw bush. Hale (Y.N.N. Feb. '39) describes a rather simple method of eliminating this confusion. "Both plants have trifoliolate leaves with one leaflet terminal and the other two lateral and opposite each other. The terminal leaflet of poison oak has a petiole while in the squaw bush there is no such stalk-like structure supporting the terminal leaflet, and the blade extends to the base of the lateral leaflets."

Squaw bush is far from being poisonous and the long, pliable stems were used by the Indians in basket weaving, and their red berries were used to make a drink resembling pink lemonade. According to Haskin (*Wildflowers of the Pacific Coast*) many of the Indians are nearly immune to the poison oak and use it

made of its stems in basket making. A stain is made from the fresh juice. Some of the Indians used the juice to burn out the roots of warts, and as a treatment for ringworms and rattlesnake poison.

Some authorities refer to poison oak as *toxicodendron*. This name comes from the Greek and means poison tree. The Greek word, toxicon, meaning bow (of the bow and arrow) now means poison, because arrow poisons were among the first poisons used by man. Poison oak secretes a nonvolatile oil which is highly poisonous to some people. One must come in contact with the oily substance to be affected. This may occur directly from the plant or indirectly by touching articles, such as clothing, which have previously come in contact with the plants. There is some evidence that smoke may carry the oil particles. The result of exposure to the poison depends on the physical nature of the individual. Some persons are rather immune while others react extensively even to the slightest exposure. The reaction involves a reddening of the skin with itching, and usually swelling and blistering. A severe case of poisoning can be a serious thing. There is some danger of fatality in a susceptible person if the mouth and throat become affected.

The poisonous properties of poison oak are probably due to a glucoside found in the oils of the plant since this is true of the related poison ivy. Potassium permanganate decomposes glucosides and therefore a 2 to 3% solution mixed with a little sodium carbonate may be used as a wash. It is important to keep this solution out of the eyes. A calamine lotion tends to be soothing to irritated tissues and antihistamines are sometimes prescribed to reduce swelling. Some people have received partial protection by applying a film of laundry soap or strong solution of baking soda to expsed parts of the body before going into areas where they are apt to come into contact with poison oak. Washing thoroughly with strong soap and/or baking soda solution as soon after exposure as possible is very important.

Flowers of poison oak are very fragant and produce an abundance of nectar. The honey produced from this nectar contains no poison and is said to be of excellent quality. The foliage is not poisonous to livestock and furnishes good browse for deer. Birds and small mammals eat the berries with impunity.

It is hoped the visitor to Yosemite will not have his stay marred by an unhappy encounter with this attractive but deceptively obnoxious plant. Possibly the account given here will aid in its identification, or at least visitors will have a knowledge about the areas of its greatest occurrence. Also, an effort is made to keep a specimen growing in the wildflower garden to the rear of the museum. Of course, this plant will have a name tag.

The term "National Park" ought to be like the word "sterling" is to silver. It ought to indicate outstanding merit.

—Louis C. Cramton

IRON BACTERIA

David Essel, Ranger Naturalist

Crossing many Yosemite streams one is able to see rust-colored boulders, and in quieter waters, masses of a flocculent, brownish substance. This fascinating little speck of life is still the subject of much controversy among the biologists.

Midway between the bacteria (Schizomycetes) and the true molds (Hyphomycetes), are these members of the filamentous bacteria (Trichomycetes). Several members of this group are the "iron bacteria" (*Crenothrix polyspora, Lepothrix ochracea,* and *Spirophyllum ferrugineum*). These are especially characterized by deposits of iron oxide in the sheath surrounding the bacteria, or sometimes in the protoplasm itself.

Some scientists have attributed great significance to the presence of this iron. They assert that the vast beds of iron ore may have been deposited by the growth of innumerable quantities of these bacteria, living, then dying and leaving tiny bits of iron oxide behind as their bodies decayed. Others contest this theory; however one botanist has found that iron is built up chemosynthetically by the protoplasm of *Spirophyllum ferrugineum* from ferrous carbonate. He found this constituted a real and necessary source of energy as he was unable to grow the organism in an iron-free medium nor induce it to utilize salts of other metals.

While still under investigation, these bactetria are known to be responsible for much of the iron stain on stream boulders. Home owners are apt to be a little irritated at these organisms, which sometimes grow in the conduits of public water supplies, often resulting in stoppage of the pipes. Detached portions of these unpleasant looking masses, appearing in one's drinking glass, gives rise to consternation on the part of the thirsty one. They are not injurious, however, and except for aesthetic considerations, are all right to drink. Indeed, Fern Spring, one of the delightfully refreshing spots in Yosemite Valley, has several masses of these bacteria growing therein, with no impairment of taste or appetite. The only difference is that it is natural, growing where we expect it to grow. Perhaps that which is natural to man intuitively places him at ease with his surroundings, graciously accepting the natural world with unconscious gratitude.

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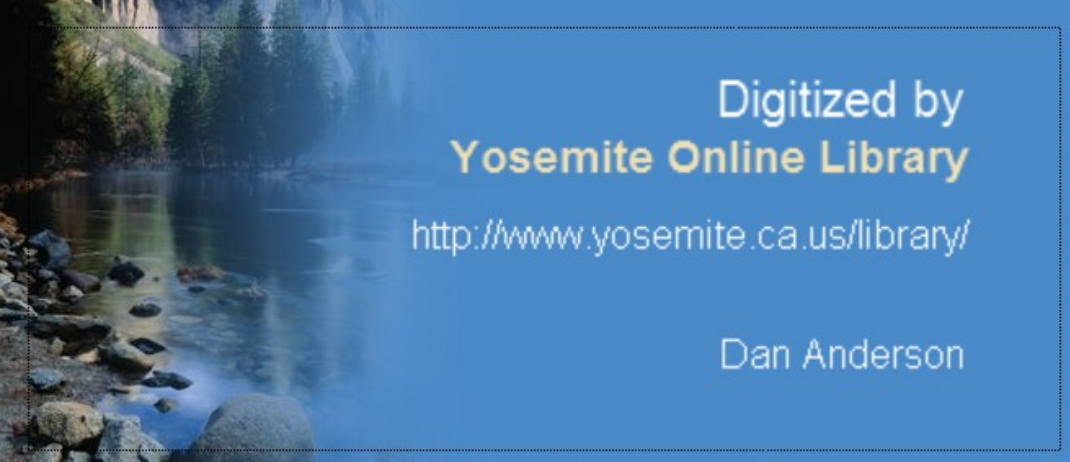

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