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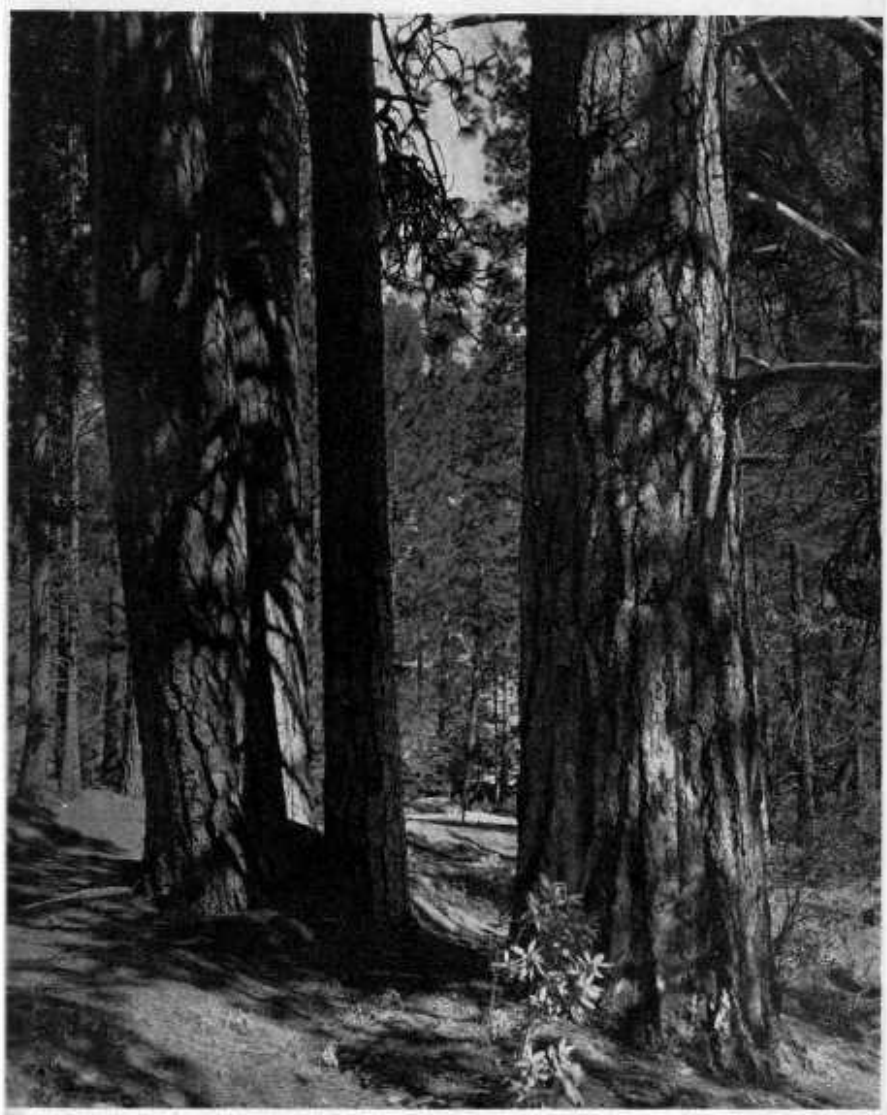
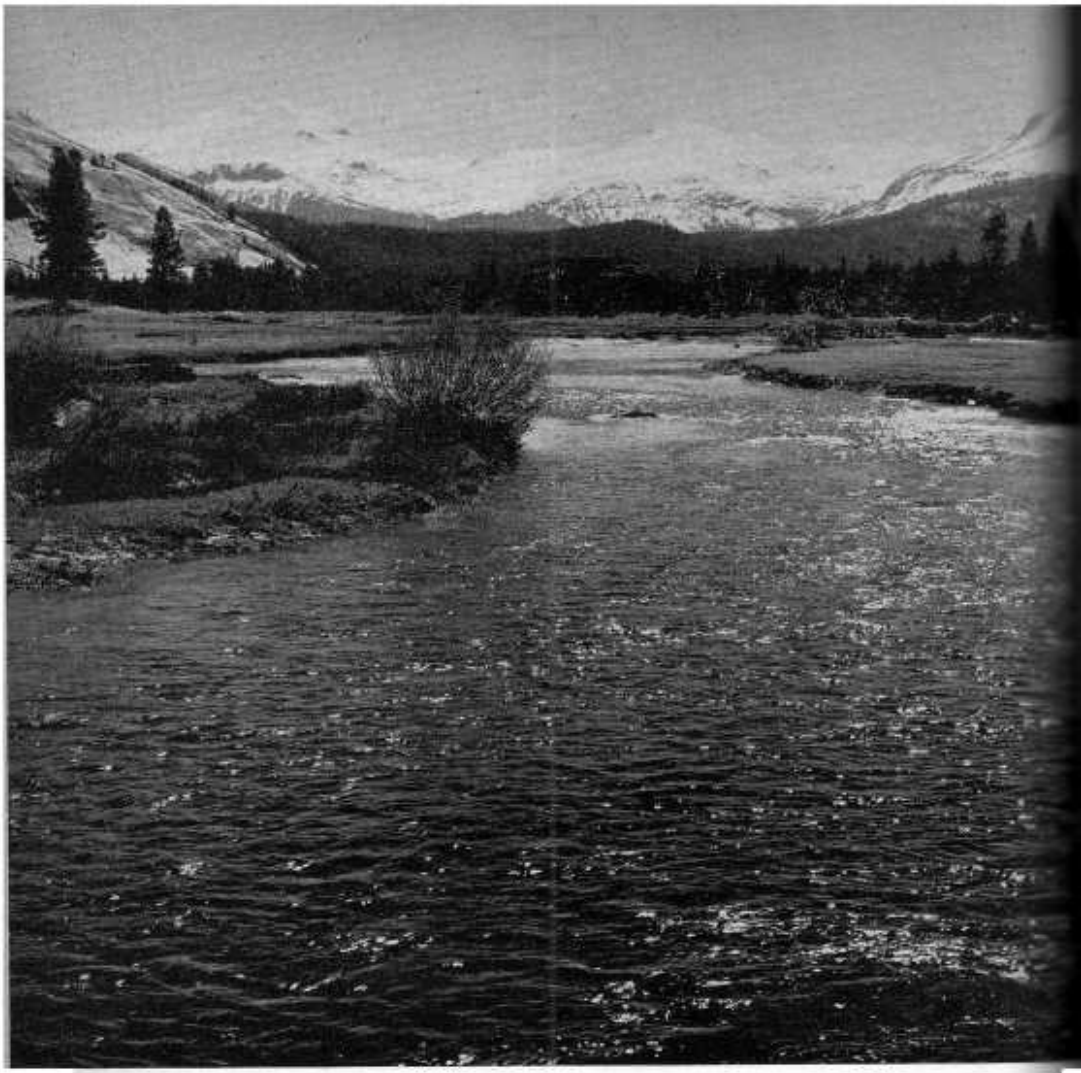


Ponderosa pines
—Ansel Adams



Lyell Fork of the Tuolumne River, Tuolumne Meadows. By Ansel Adams from "Yosemite and the Sierra Nevada." Reproduction by kind permission of Houghton Mifflin Co.

Cover Photo: Ponderosa pines. By Ansel Adams.

Yosemite Nature Notes

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HISTORY AND PRESENT STATUS OF GOLDEN TROUT IN YOSEMITE NATIONAL PARK

By Duane D. Jacobs, Assistant Chief Ranger

Of the several kinds of trout which have at one time or another been introduced in the waters of Yosemite National Park, none is more beautifully colored, remotely located, nor tempting to the fisherman than the golden trout. Because of its limited range this prized species *(Salmo aguabonita)* is much less known than other trout in the park, such as the rainbow *(Salmo gairdneri irideus)*, which is the only trout native to our waters and generally the best established throughout. The purpose of this article is to present the historical background of golden trout plantings in Yosemite and to show how they have affected the present distribution of this admired species.

Golden trout were first introduced in Yosemite National Park in 1919. This first plant was made in Adair Lake, elevation 10,000 feet. They became firmly established in the lake and its outlet stream, which is steep and rocky, with falls preventing other trout from migrating upwards. The stream fish population now exceeds that of the lake. No replants have ever been necessary.

In 1920, plants of golden were made in Fletcher and Townsley Lakes. They have been and are at present doing well in Townsley Lake, and the strain is believed pure. Fletcher Lake was replanted in 1936 and has some golden in it, but they are in competition with eastern brook trout and seem to be disappearing.

During the late twenties and early thirties, several other plants were made in lakes and streams which already contained other species. These plants all failed to establish themselves, disappearing completely in a few years. The Lyell Fork of the Tuolumne River was one of these waters; it was planted twice with large numbers of golden without noticeable result. The principal competing species was eastern brook.

Reymann Lake, elevation 10,000 feet, was stocked with golden trout during this period. These did well until old enough to spawn, when they left the lake via the outlet which drains into Nelson Lake, a distance of roughly one mile. In the summer of 1936 the writer checked these lakes twice, and at that time there were no golden left in Reymann Lake, the place of original plant, but some were found in the stream and in Nelson Lake. One 17-inch golden was caught with hook and line in the small stream between the lakes. Several golden about 12

inches in length were found dead along the shores of Nelson Lake, which was well stocked with eastern brook at that time. The remaining golden later migrated further downstream from Nelson Lake into Echo Creek and crossed with resident rainbow of this stream. The hybrid species is to be found in Echo Creek at the present time. The golden have vanished completely from both of the above lakes.

Mary Lake, elevation 9,600 feet, and an unnamed lake near Dorothy Lake, elevation about 9,500 feet, were planted in 1930 with golden trout. These lakes are in the extreme northern area of the park, and present reports indicate that golden may be fairly well established in both, with natural reproduction supporting them.

In 1936, 98,000 golden trout were planted in six lakes in widely separated areas of the Tuolumne Meadows region, ranging in elevation from about 7,000 to 10,400 feet. Three of these lakes were devoid of fish at the time golden were introduced, and three contained some rainbow. All were typical Sierran glacial cirque lakes with live outlet streams, but insufficient inlets for spawning purposes. These six lakes were planted by and under the supervision of the writer, who checked the plants during the ensuing 6 years for results, which briefly follow:

A. Lakes already containing trout at time of planting

1. Fletcher Lake, elevation 10,300 feet. Contained some golden and probably eastern brook. Still has some golden, but these seem to be disappearing.

2. Vogelsang Lake, elevation 10,400 feet. Contained a few rainbow. Some golden still present, having reproduced successfully in the outlet of the lake. Has been replanted since with rainbow, which predominate.

3. Table Lake, elevation 7,000 feet. Contained rainbow. No results ever recorded from plant. No reports of golden being caught. Complete failure.

B. Lakes devoid of fish at time of planting

1. Mattie Lake, elevation 9,400 feet. Golden did remarkably well first 2 years, attaining growth of about 10 inches. Spawned the third year, leaving lake by outlet stream, which empties into Tuolumne River gorge by steep bluffs and falls. One or two very large golden were reported as being seen in this lake as late as 1947. Natural reproduction never occurred within the lake and the original plant was considered a complete failure as far as getting golden established in this lake.

2. Virginia Lake, elevation 9,200 feet. An exact duplication of the results shown for Mattie Lake was also observed in this lake. These fish, spawning in their third year, left the lake by the outlet, which drains into the Tuolumne River via Return Creek, and for all practical purposes were lost. No reproduction occurred in the lake.

3. Unnamed lake, elevation 9,000 feet. Here again the golden thrived very well the first 2 years on the abundant feed present. Spawning the third year, they, too, left the lake via the outlet, which at the time (early July) was already rapidly drying up, the water so shallow in places as being insufficient to completely cover the fish. We picked up with our hands about a dozen 10- to 11-inch golden from the rapidly diminishing pools. They were full of spawn. No further evidence of fish,

except for an occasional report of single large trout being seen in the lake, was noted. No reproduction occurred in the lake and this plant must also be recorded as a complete failure.

Location and Present Status of Golden Trout

1. Adair Lake and Gray Peak Fork

Location: Headwaters of Merced River. Stocked in 1919.

Present status: Pure strain of golden. Successfully established since 1919, no replants. Stream population exceeds that of lake. Fishing pressure light due to difficult accessibility.

2. Townsley Lake

Location: Headwaters of Merced River near those of Tuolumne River. Stocked in 1920.

Present status: Apparently maintaining themselves despite moderate fishing. Strain believed pure. No replants.

3. Fletcher Lake

Location: Headwaters of Merced River near those of Tuolumne River. Stocked in 1920. Replanted in 1936.

Present status: Golden apparently disappearing, eastern brook in competition. Fishing pressure moderately heavy.

4. Vogelsang Lake

Location: Headwaters of Merced River. Stocked in 1930, 1936, and 1938.

Present status: Some reproduction. Lake also contains rainbow. Fishing pressure moderate to heavy.

5. Mary Lake

Location: Headwaters of Tuolumne River in northern portion of park. Stocked in 1930.

Present status: Reports indicate golden are succesfully reproducing here, and are established in the outlet stream, Tilden Creek. No late official knowledge is available. Fishing pressure light due to remote location.

6. Unnamed lake near Dorothy Lake

Location: Headwaters of Tuolumne River in northern section of park. Stocked in 1930.

Present status: Reports indicate successful establishment of golden in this lake, but as in the case of Mary

Lake, no recent official reports are available. Fishing pressure light due to remote location.

Management Problems, Present and Future

We do not feel that any special management problems exist concerning the golden trout in Yosemite National Park. The present limit of 10 fish per day and 20 per week on all species is believed sufficiently low for the protection of the golden. Should the few waters containing a pure strain appear in danger of extermination through heavy fishing pressure, the most practical approach would seem to be a closure of fishing in these waters until they had replenished their numbers naturally.

While the existing golden trout waters are considered a definite asset to the park's trout population, our past experiences with this fish do not encourage further attempts in establishing such waters in Yosemite, due to the following reasons:

1. Golden trout are highly migratory upon reaching spawning age and are usually lost in the intermittent outlets.

2. They do not compete well with existing species already established in most park waters.

3. Very few of our streams or lakes are suitable for establishment of golden, as already shown through former plants.

SOME OBSERVATIONS ON SHOWY FLOWERS AND DECIDUOUS PLANT REPRODUCTION IN YOSEMITE VALLEY

By Emil F. Ernst, Park Forester

Time and time again we receive comments on the lack of showy flowers and deciduous brush and tree reproduction on the floor of Yosemite Valley. The advancing years show a continued decline in the numbers of such plants. There is, in marked contrast, no lack of reproduction in coniferous species or the noxious or unwanted flowering plants.

One naturally asks, "Why is this?"

Perhaps the answer can be obtained in some observations that have been made in more than 20 years of residence in the valley. In that time the writer has been directly involved in one way or another with four different enclosed areas.

Maintenance of the first of these fenced areas was taken over in the spring of 1938 following a previously unknown period of maintenance by another person. For the following 11

years deer were kept out of this enclosure and each summer saw an abundant concentration of showy native flowers. Practically no care other than a little watering and protection from grazing animals appears to have been sufficient to maintain this dense natural garden. Within the enclosure it was necessary occasionally to pull up many seedlings of California black oak *(Quercus kelloggii)*, otherwise there would have been a thick stand of these deciduous trees.

The second enclosed area was the community "victory" garden used by local residents for growing truck garden produce. Within this area showy flowers were able to maintain their status wherever they did not actually interfere with the gardening operations. Native species of flowers have appeared in the garden which were not present on the ground just outside of the protecting fence.

The third enclosure was, and still is, well known for the marvelous display of evening primrose *(Oenothera hookeri)* when in season in the valley. Prior to fencing and the introduction of a few parent plants the site which is now densely populated with the evening primrose was barren.

The fourth protected plot with which the writer became well acquainted contained a great number of seedlings of California black oak, occurring in considerable density. Areas outside of this enclosure, though under the same ecological conditions as those within, fail to reveal any similar reproduction. The scarcity of oak reproduction in Yosemite Valley is a fact often commented upon by observant interested visitors.

The only showy flowers able to maintain or improve their status are those plants which are unpalatable to grazing animals. The only animals

Photo by Pillsbury, courtesy of Mrs. Mary C. Tresidder

Dense stand of evening primrose in Yosemite Valley as it formerly occurred, 1916.

permitted to graze in Yosemite Valley are the deer. The smaller animals that are seed or vegetation eaters apparently have not been sufficient in number or voracious enough to materially affect the aforementioned enclosed areas in producing noticeable stands of showy flowers or deciduous brush and tree species. Those plants which the grazing animals do not seem to relish include a number of pests such as the bull thistle, the Klamath weed, the tumbleweed, and the puncture vine. All of these noxious plants have been able to expand in their areas of occurrence and in density during the same period that the more desirable showy flowers and deciduous woody species have been waging a losing fight.

BALLS OF FIRE

By Douglass H. Hubbard, Associate Park Naturalist

"Great Balls of Fire!" might well have been the expression of the afternoon on September 26 this year, when lightning struck an incense-cedar tree directly behind the Yosemite Museum at 4:20 p.m., causing some rather unusual phenomena.

Two others of the museum staff and I were in the post office nearby when there occurred a blinding flash of lightning, followed almost instantly by a heavy clap of thunder directly overhead, from a storm which had been moving down the valley for about half an hour. We returned to the museum, about one block from the post office, not yet realizing where the lightning had struck. A group of excited people was clustered on the back porch and under the incense-cedar some 15 feet north of the porch. The tree had been split for about one third the way down from the top. One man was holding a dead bird which closer examination showed to be a band-tailed pigeon, partially devoid of feathers.

The visitors had different stories to tell. One couple had just walked out of the museum at the time the lightning struck, and looked back in time to see a cloud of feathers floating downward from the cedar. Upon returning to the base of the tree they had no difficulty in locating the pigeon, which apparently had been sitting on one of the upper branches. Indications from the cleanly "plucked" areas were that the electricity had entered the bird's head and traveled downward, removing all of the feathers from the neck, breast, left side of the abdomen, and left leg. At the time we reached the base of the tree the smell of burned feathers was still in the air and singed feathers could be seen on the back of the pigeon's wings. Visitors in the History Room claimed they saw electricity running in and onto the ventilating fan, while others in the museum said that the floor fairly glowed with the heavy charge. One elderly lady stated that she had the sensation of numbness in her legs. Mr. Aretas Chamberlain, the museum janitor, was talking to this lady in the lobby at the time of the strike and he described something similar to a ball of fire running between them, from the rear of the building out the front door and in the direction of the Administration Building. That a portion of it reached there was evidenced by the fact that sparks jumped from the radiators and came out through the intercommunication system, causing local excitement.

Mr. Hubbard and lightning-killed pigeon.

Only the pigeon appears to have suffered extensive damage, but residents who in the past have stated that lightning never strikes on the floor of Yosemite Valley because of the higher walls surrounding it have had to revise their thoughts!

A SAMPLING OF THE ALGAL FLORA OF YOSEMITE

By Sol A. Karlin, Ranger Naturalist

Little study has been made as yet of the cryptogams, or non-flowering plants, of Yosemite. Among these primitive groups of the plant kingdom the ferns and their allies are to be investigated by a member of the Yosemite naturalist staff as a basis for a special issue of *Yosemite Nature Notes* sometime in the future. Other groups such as the algae, fungi, lichens, mosses, and liverworts also require attention.

This author (2)* in 1950 made an attempt at sampling the mosses and liverworts of the region. Carl Sharsmith (3, 4) has reported on the cause of the red snow in the high country. It is hoped that the present contribution on the algae of the region will help awaken the curiosity of others with regard to the less conspicuous organisms to be found in Yosemite National Park.

The reader may ask, "Why study the pond-scums anyway?" Let's stop a moment and consider what would happen if all plant life were suddenly to disappear. The food chain would be broken and soon all animal life would perish. Algae are "simple" plants. They hold a keystone position in the balance of nature in aquatic environments. The protozoans (microscopic one-celled animals) devour a portion of the pond-scums. The protozoans in turn become the prey of the small crustaceans such as the waterfleas; the crustaceans in turn serve as food for small fish. And, in this manner, the food chain goes on indefinitely.

The main reason why the algae are so important to aquatic habitats is that they have the ability to make their own food from the raw materials about them. The food-making process is dependent upon the pigments contained within the protoplasm, or "living stuff," of the algal cell. These pigments enable the plant cell to capture the sun's energy for the food-making process, called photosynthesis.

The scientific grouping of the algae depends upon two features, namely, (a) the kinds of pigments present, and (b) the methods of reproduction. In the random sampling for Yosemite described herein, members of four classes of algae were discovered. These are: (I) The blue-green algae (Myxophyceae or Cyanophyceae), (II) the red algae (Rhodophyceae), (III) the diatoms (Bacillariaceae), and (IV) the green algae (Chlorophyceae). The diagnoses and determinations were made by using the author's own reference (1), and G. M. Smith's standard work (5) on the freshwater algae of the United States.

Samples of the algae were taken during the first two weeks of August this year. In all cases the material was preserved in a weak formalin solution, and later examined microscopically within several days of collection. The sketches which appear in this article were made from typical material found in the various temporary microscope slide mounts. Vials of the preserved material have been deposited in the Yosemite Museum for future reference.

In the following annotated list the numbers correspond to those of the sketched figures appearing in the illustrated plate. Numbers in parentheses, such as (440x), indicate power of magnification.

*Numbers refer to references listed at end of article.

Class I. Blue-green Algae

1. *Oscillatoria limosa* Ag. (440x). This specimen was found mixed in with *Zygnema* (No. 8) filaments from Yosemite Creek near the Tioga Road.

2. *Phormidium autumnale* (Ag.) Gom. (440x). This sample was taken from the Merced River near Camp 19. It formed dark green to rust-brown mats both near the sandy shore and on granite boulders. 2a, shows the thin sheath about the trichome; 2b, the peculiar apical cells.

Class II. Red Algae

3. *Lemanea annulata* Kutz. (?) variety. Our specimens were growing in the splash water on granite boulders in Yosemite Creek near the Tioga Road. 3a, habit of plant (4x); 3b, detail of apical end of filament (440x); 3c, lower power view of a single filament (22x). Fruiting bodies are borne internally. The structure of the thallus is very complicated.

4. *Batrachospermum moniliforme* Roth. Our specimens were collected in the rapids of the Merced River attached to boulders in midstream. 4a, habit (4x); 4b, simplified diagram to show the method of branching at the swollen nodes (100x); 4c, detail of one lateral branch showing sex organs and fruiting body (440x).

Class III. Diatoms

5. *Tabellaria flocculosa* (Roth) Kutz. (440x). Our specimens were taken along with *Zygnema* filaments at Yosemite Creek. The zigzag chains are held together by colorless adhesive surfaces.

Class IV. Green Algae

6. *Cosmarium punctulatum* (Nordst.) Borgesen (440x). From specimens taken in a pothole filled with standing water along Cascade Creek near Gentry.

7. *Rhizoclonium crispum* Kutz. (440x). This bright green alga was taken from the Merced River near Camp 19. It grew in long streamers attached to any convenient place.

8. *Zygnema peliosporum* Wittr. (?) variety. This is the most widespread alga in the park. It was taken from the Merced River, Yosemite Creek, and the Dana Fork of the Tuolumne River. 8a, vegetative cells with stellate chloroplasts (440x); 8b, resting spores (440x).

9. *Mougeotia scalaris* Hass. (440x). This specimen was intermingled with the *Zygnema* samples of Yosemite Creek. 9a, view of broad surface of the chloroplast; 9b, view of chloroplast turned at right angles to view of 9a.

10. *Microspora amoena* (Kutz.) Rab. (440x). Our material was taken from Fern Spring where it was the dominant filamentous alga. 10a, vegetative cells; 10b, the remains of adjoining cells.

11. *Scenedesmus obliquus* (Turp.) Kutz. (440x). Taken from the same pothole as specimen No. 6.

12. *Vaucheria hamata* (Vauch.) DC. (440x). Collected from the banks of Fern Spring where it grew in fine velvety patches resembling mosses in an early stage of development. It was only after a long search of the material that a fruiting body was found.

REFERENCES

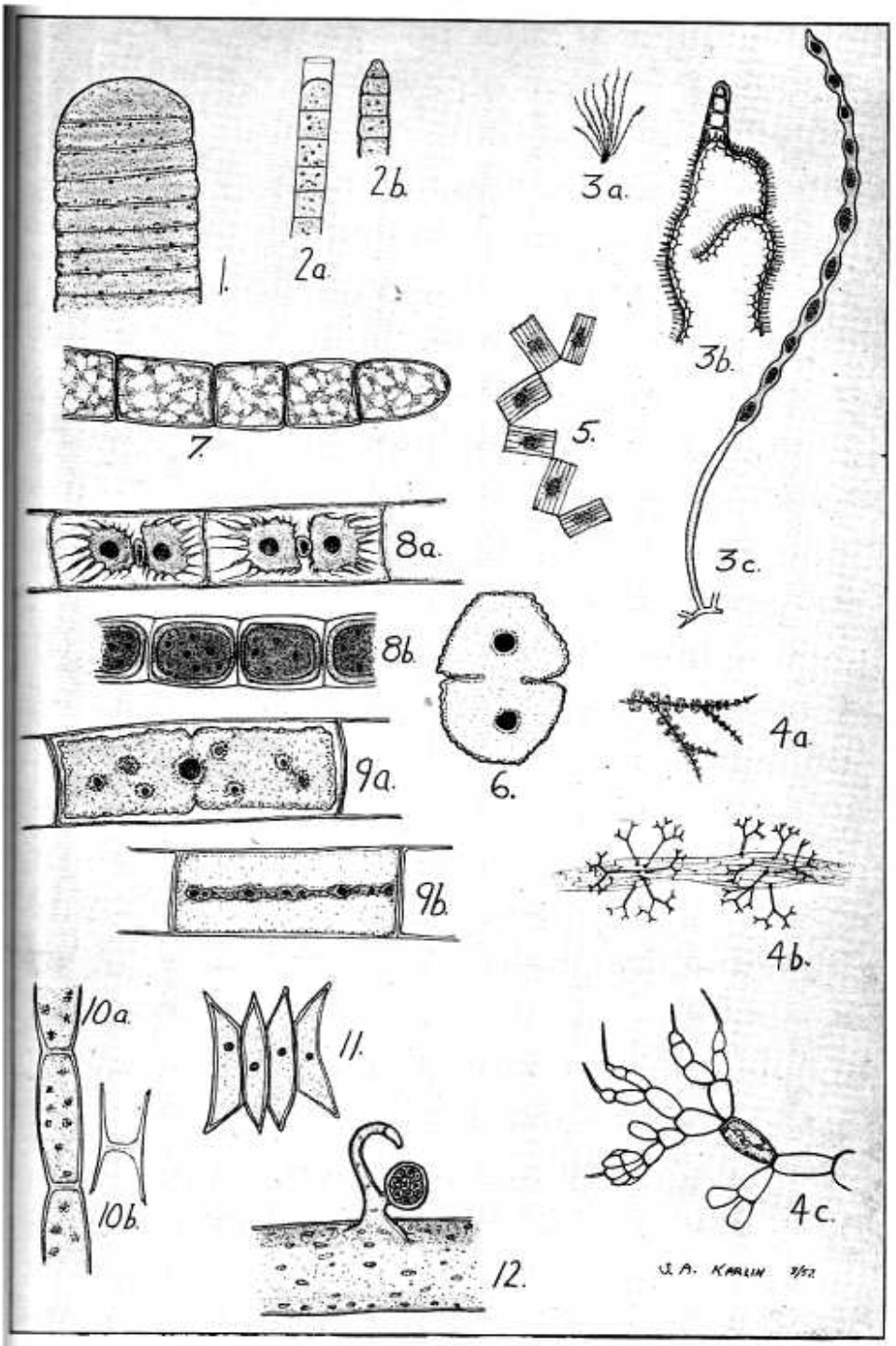
1. Karlin, S. A.
1949. Preliminary survey of the filamentous algae of southern California. Master's thesis. Univ. of California at Los Angeles.

2. Karlin, S. A.
1950. Notes on bryophytes seen along Yosemite trails. *Yosemite Nature Notes*, 29(12):118-119.

3. Sharsmith, C. W.
1935. Red snow at Tioga Pass. *Yosemite Nature Notes*, 14(8):63.

4. Sharsmith, C.W.
1941. Observations on red snow. *Yosemite Nature Notes*, 20(2):9-10.

5. Smith, G. M.
1933. The fresh-water algae of the United States. McGraw-Hill Book Company, Inc., New York and London.



Microscopic views of some algae of Yosemite