

## SEQUOIA SURVEY—III: MISCELLANEOUS NOTES

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*The Age of the General Sherman Tree and Other Very Old Trees.* There has been rivalry as to the age of several very magnificent trees: The General Sherman in Sequoia National Park, the General Grant in the General Grant National Park, now part of Sequoia National Park, and the Boole Tree on a high ridge east of Converse Basin and north of Indian Basin.

In the trip in 1935 enough time was spent in the Sequoia National Park to make borings as follows in the General Sherman Tree by courtesy of Colonel John R. White, the Superintendent of the Park:

SP—2 —In middle of big burnt place on NE side; outer part watery and broken.

2A—1.5 feet left and below No. 2.

2B—NW side in white wood; worthless.

2C—N side, into bark; wood was not reached; bark fell to pieces and was not preserved.

2D—In black hole on SE side.

2E—NE side, as in 2 and 2A; about 15 feet above ground in big burnt place.

Thus, of the five borings that were obtained, Nos. 2 and 2E gave readable results. No. 2 was dated from 1430-1635, No. 2E from 1500-1730. The mean ring size was 0.81 mm; the records were very complacent. These are ring sizes which, in relation to the total size of the tree and the probable rate at which rings increase in size toward the center, supplied an estimate of the age of the tree of 3500 years plus or minus 500 years.

The writer became familiar with the sites of the General Sherman and the General Grant trees. The size of the General Grant was reported to be a little less than that of the General Sherman and neither of them has any ravine near which would carry water. The General Grant's size might make it a bit younger.

The ravine at the site of the Boole Tree is reported to be dry and very steep, and the tree is reported to be nearly the same in size as the General Sherman. It seems to belong to the same age group and, if reports are correct, it might be the oldest of the three.

*Sequoia Trees of Historic Interest.* The Centennial Stump at Enterprise (I: 52 and Plate 7B) is on the road a quarter mile west of the Enterprise Mill Site, near a brook. It was cut in 1874. My guide, Mr. Chas. A. Elster of Springville, worked on this very job as a youth. The tree was cut off some 30 feet up; then men with axes hollowed it out from the top. This left a high center at the present stump top (which made our 12-foot radial cut a very difficult one to extract). Vertical saw cuts were then made at intervals about the circuit and the intervening slabs were lowered and shipped to Philadelphia for exhibit. I visited this Enterprise Stump in 1918, 1925 and 1931; it is covered with initials and visiting cards.

The General Grant Park Centennial Tree was shown to me as the burnt remnant of a stump that carried that name.

The World's Fair Stump (1: 51 and Plate 6B) is in the Converse Hoist area, perhaps a hundred and fifty yards in a southerly direction from D-21 in the basin bottom. Stump D-21 has the number on it and a square cut across its top where my specimen had been sawed out (the square cut was made by Mr. N. E. Beckwith, a civil engineer from Los Altos, California). The World's Fair Stump is some 25 feet high and was impossible to climb in all my visits. I walked up hill and looked at its top with field glasses. It has grooves on top showing that its rings were counted by Huntington.

The Dance Hall Stump at Calaveras Grove (II: 53, 90) was, I suppose, the first sequoia to be cut down (1853). This was done by great auger holes coming in on opposite sides. The butt log was still lying near on my visit in 1924. The stump top was smoothed off, walls and roof were put on, and this structure used as a dance hall. In 1865 the rings were marked on a long strip of paper extended from center to outside, and

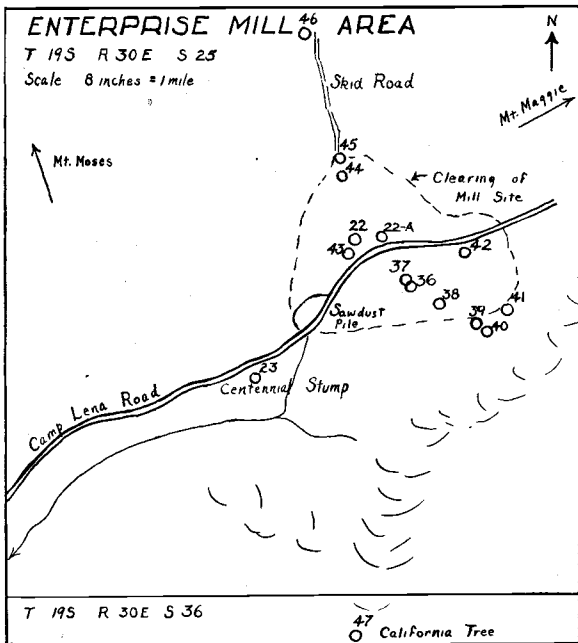
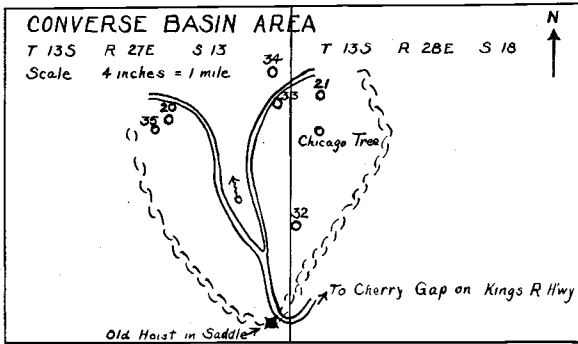
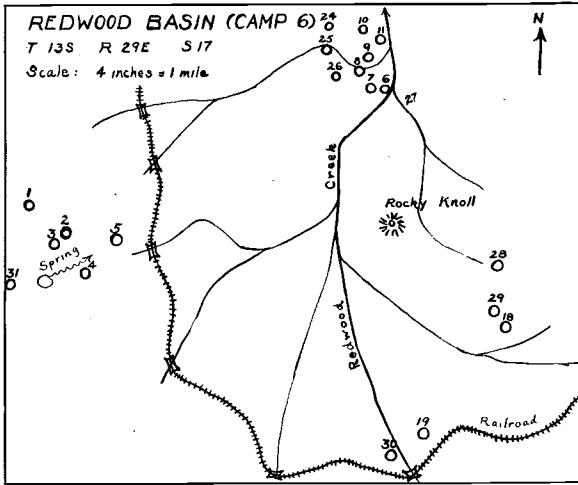
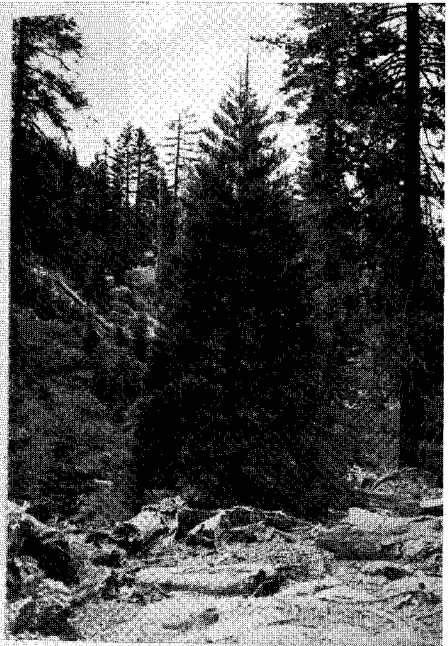


Fig. 2. The Boole Tree. Diameter 35 feet at base.

Fig. 1. Maps showing the locations of 41 of the numbered trees from which radial specimens were taken for our collections. No. 5 (Camp 6) is about 220 yards WSW of the section center; no. 32 (Converse) is about 100 yards N of the section-center latitude; no. 47 (Enterprise) is about 200 yards E of the section-center longitude. Reproduced from surveys in October, 1937, by the U. S. Forest Service, to whom most cordial thanks are given.



Photos by A. E. Douglass.

Fig. 3. The General Grant Tree.

Fig. 4. A young sequoia, near D-35, photographed in 1919.

Fig. 5. The Dance Hall at Calaveras Grove (left) and the butt log showing auger holes by which the Dance Hall Tree was cut in A. D. 1853.

Fig. 6. World's Fair Stump. This tree was cut for exhibit in the Chicago Exposition of 1893.

I have a tracing made from that by Marsdon Manson, well-known engineer. The ring system is complacent and showed some 1244 rings in the 13 ft. 1 inch of the tracing.

*Taper Study.* This was made on E-7, a windfall tree at Enterprise Mill, blown down in 1901 (date checked by C. A. Elster):

Section	Apx. Height, feet	Diameter feet	Remarks
1	0	15	
2	20	11	Bark 4-16 inches
3	40	10 $\frac{1}{3}$	Lower side crushed; bark 6-10 inches
4	60	10 $\frac{1}{2}$	No branches; bark 3 inches thick
5	80	9 $\frac{1}{2}$	Clear, no branches
6	100	9 $\frac{1}{3}$	No branches
7	120	9.2	Two 8-inch branches
8	140	9 $\frac{1}{3}$	Two or three 12-inch branches
9	160	9 $\frac{1}{2}$	Four or five big branches
10	180	7	
11	200	9	Three or four branches
12	220	8	Three big branch nodes
13	240	6 $\frac{1}{2}$	Three branch nodes; one 3-foot branch
14	255	2 $\frac{1}{2}$	(Estimate); six or eight branches
15	261		Top; upper six feet was long dead

*Fallen Trees and Duration of Parts.* Some special studies have been made of fallen trees. In earlier days it was hoped to extend our ring sequences into greater antiquity by the use of fallen trees which in some way had been preserved for centuries. We found no gain whatever in rings near Flagstaff, recorded as "burnt centers." Among the big sequoias (I: 50-51), the rings of D-20 showed that this tree was blown down about six years before lumbering in that area. D-17, west of Camp 7, was cut from a fallen log. The outer thousand years were unreadable.

In the Calaveras Grove the fallen trees offered the only possibility of getting long sequences in that locality (II: 19-21). In the case of CV-3, allowing about 100 years for the sapwood growth, the tree probably fell about 125 years before my study of it, and in that time the bark had been lost and all of the sapwood and most of the central part of the tree. The part most resistant to decay is the outer half-radius of the heartwood; that alone remained (II: 20 and Plate 2).

The persistence of the sapwood on a fallen tree was determined from CV-4, whose date of falling was easily learned from the rings as 1864. This date was verified by tradition. The sapwood had decayed almost completely and fallen away. Thus the time in which that took place was 60 years. These durations of bark and sapwood are probably below the average because this is the farthest north of the sequoia groves and has heavier rainfall than the more southerly groves, but it shows that the duration of the wood is not indefinite.

*Uniformity Problems.* Circuit uniformity near the base of the tree is good if it is above the great bulges. In the early years of lumbering the cutting was often done rather high in the tree and the V-cuts from those stumps escape this deformity. But even in later years the top of a stump, and therefore the V-cut, is commonly above the bulge at the base of the tree.

Vertical uniformity was tested on E-7 above mentioned (see II: 26 and Plate 4A). Borings in this tree about every twenty feet of elevation above the roots showed that the heartwood rings were almost perfectly uniform up to within about thirty feet of the top of a 265-foot tree. The sapwood rings, however, show very bad distortion with little identification in the known sequoia series. This was due, apparently, to the fact that the tree had been blown down in 1901 without entirely losing root and bark connections with the ground. Through that connection, one side of the tree was nourished and the bark and some of the branches remained alive until 1915, fourteen years after the tree was blown down.