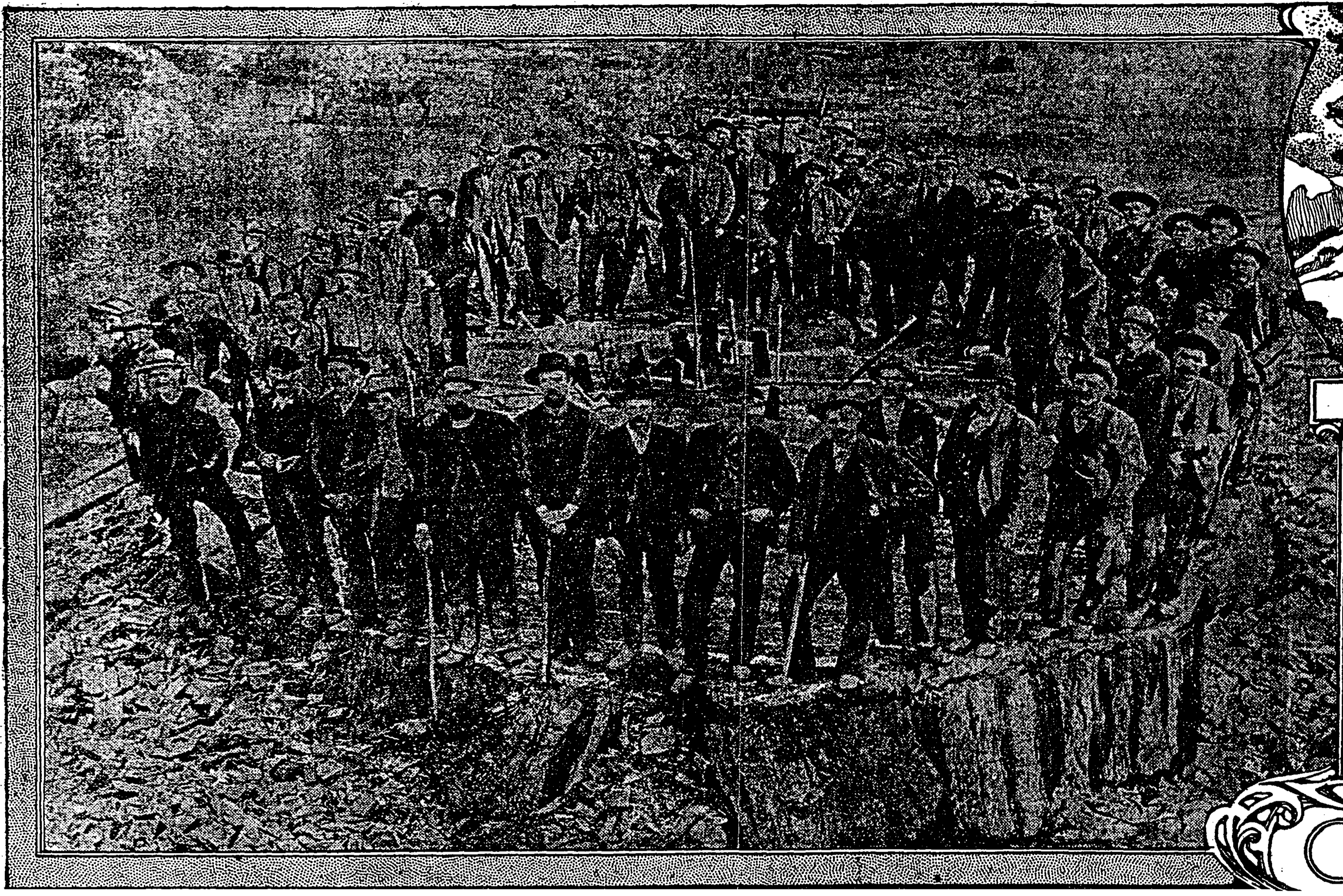
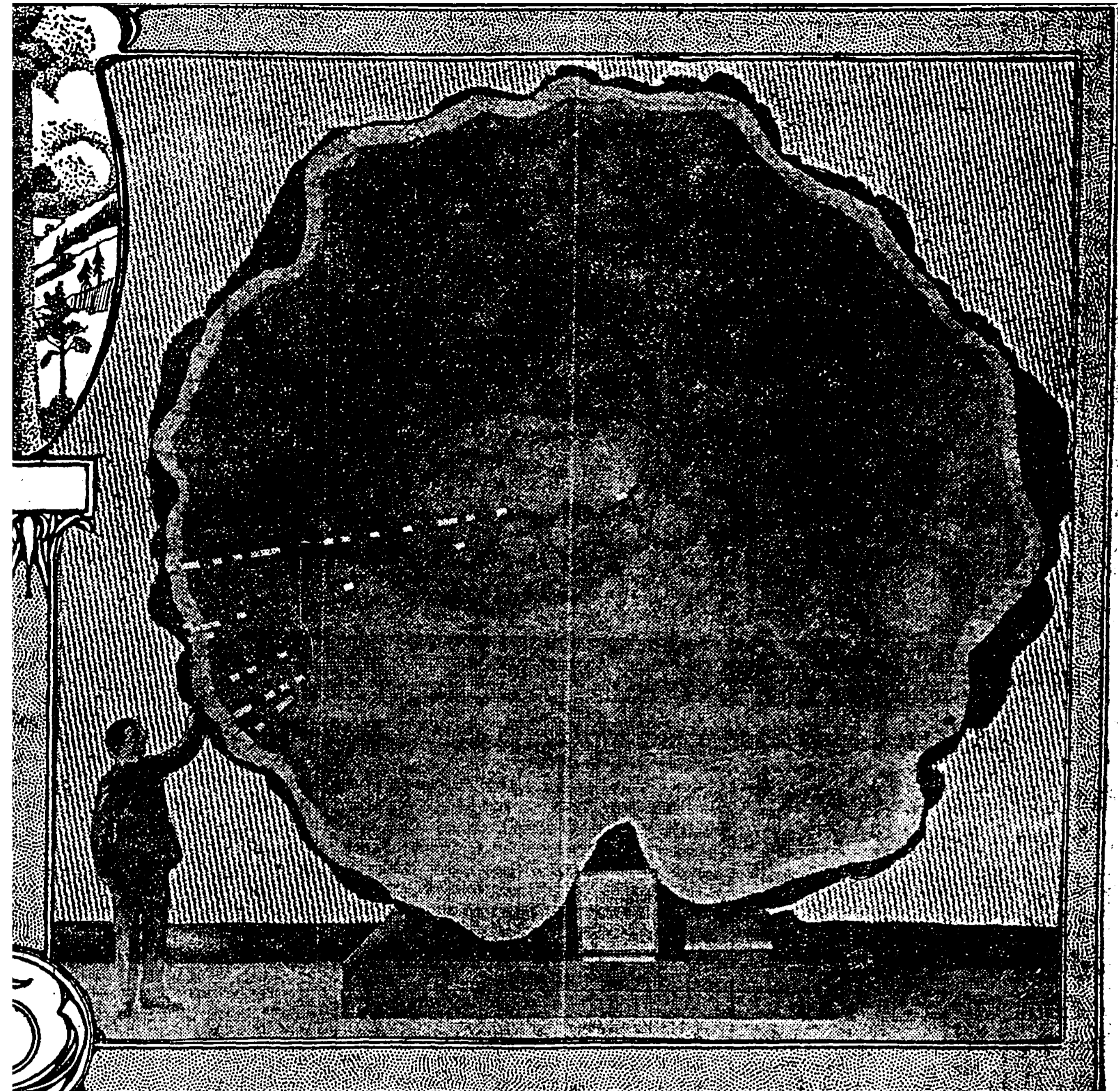


A TREE'S LIFE THROUGH THIRTEEN CENTURIES



Woodsmen standing on the base of the severed trunk of the tree



Diameter and Circumference of tree, shown in Comparison with a man's height, age of tree computed as 1341 years

By a Curious Device the Cross Section of a Redwood Records the World's History During Its Existence of 1,341 Years.

HERE are few of us who have not been introduced by geographers, newspapers, and books to the Big Trees of California. But the chances are that our acquaintance is rather cursory, extending little beyond the knowledge that among trees their dimensions are unequalled, and that they are the oldest living thing in either the animal or vegetable kingdom. Some of us with good memories may even be able to quote figures: There are the "Two Sentinels," for instance, famous giants of the Calaveras Grove, over 300 feet high, the larger 23 feet in diameter, and both many hundred years of age. Plain figures, however, are very unsatisfactory material out of which to reconstruct anything in the imagination. A tree 300 feet high! It means little to us until we get something for comparison—a man standing at its base, no bigger relatively than a lady bug on a rose bush—then we can gasp an appreciative, "Gee whizz! but that's a whopper!"

But what does it mean to have lived hundreds and hundreds of years? How is the imagination to reconstruct that vast stretch of time?

The Life Story of "Mark Twain."

George H. Sherwood, one of the assistant curators in the American Museum of Natural History on Central Park West has devised a graphic solution of this problem. He has told the life story of "Mark Twain," one of the California forest giants, a sixteen-foot cross section of which is on exhibition in the museum, by erecting on the circles which tell the tree's age little flags or labels showing contemporaneous events in the world's history.

One of "Mark Twain's" first contemporaries was Justinian, Emperor of the Roman Empire in the East; one of its last, Benjamin Harrison, President of the United States. It began life as a seedling while the Eastern Emperors in the years that followed the fall of Rome were struggling hard and doubtfully to withstand the waves of the barbarian inundation which constantly threatened to overwhelm Constantinople with the same awful calamities that had befallen the imperial city of the West; it came to an untimely death by violence in the days of the telegraph and telephone.

With these historic contrasts before us, we can begin to picture in our imagination the span of life that has been enjoyed by this hardy forest Methuselah.

The Big Tree has inherited its longevity. It belongs to a family, the Sequoia, which is not only noted for the long lives enjoyed by its individual members, but which can also put to blush all human genealogies—the Chinese not excepted. The Sequoia family can trace its sap, unmingled with the sap of any other tree family, back to preglacial days.

Before the glacial period the Sequoia family flourished widely in the temperate zones of three continents. There were many species, and Europe, Asia, and America had each its share.

This is the recommendation which Gifford Pinchot, United States Forester, gives the Big Tree branch of the Sequoia family: "The Big Trees are unique in the world—the grandest, the largest, the oldest, the most majestically graceful of trees—and if it were not enough to be all this, they are among the scarcest of known tree species, and have the extreme scientific value of being the best living representative of a former geologic age. It is a tree which has



The Fall of the Big Tree. It bore the name "Mark Twain."

come down to us through the vicissitudes of many centuries solely because of its superb qualifications. Its bark is often two feet thick and almost non-combustible. The oldest specimens felled are still sound at heart, and fungus is an enemy unknown to it. Yet with all these means of maintenance the Big Trees have apparently not increased their range since the glacial epoch. They have only just managed to hold their own on this little strip of country where the climate is locally favorable."

Selecting the Specimen.

For the purpose of procuring a specimen of this remarkable tree for the American Museum of Natural History, S. D. Dill was sent to California in the Summer of 1891. Through the courtesy and liberality of A. D. Moore, owner of one of the largest groves of Big Trees, and his son, (manager of the King's River Lumber Company.) Mr. Dill was permitted to select any tree that he desired. After diligent search he found a fine specimen growing at an altitude of 7,000 or 8,000 feet and bearing the name, "Mark Twain." Nearly all the large trees have been christened by hunters or tourists, and several are marked with marble tablets. Such names as "Bay State," "Sir Joseph Hooker," "Pride of the Forest," and "Grizzly Giant" are familiar.

"Mark Twain" was a tree of magnificent proportions, one of the most perfect trees in the grove, symmetrical, fully 300 feet tall, and entirely free of limbs for nearly 200 feet. Sixty-two feet in circumference, while at the ground it measured ninety feet. Mr. Moore took the contract of felling the tree and shipping to the museum a section suitable for exhibition.

We all know these "rings" or concentric circles, which are shown in a

cross section from any exogenous tree in which botanical division is included nearly all trees growing in temperate climates; how each ring of wood corresponds to a period of vegetable growth during the Spring and Summer, and how the lines of separation represent periods of interrupted growth during the Winter and Fall. Each ring marks off a year in a tree's growth, and every tree therefore carries within itself its autobiography.

With the patient courage of the scientist, Mr. Sherwood deciphered the sixteen-foot two-inch autobiography of "Mark Twain." In many places the records of neighboring years were less than a sixteenth of an inch apart.

In the outermost ring, which marks the last year of the tree's life, he inserted a pin upon which is mounted a black card bearing the date "1891." Patiently counting in toward the center of the tree ninety-one rings, he inserted another pin bearing the date "1800." Then as he made the next century of rings he set up another card, "1700," and so on back through the centuries. It was as though he were reversing the order of nature, putting the giant tree through a shrinking process which gradually reduced it to its sapling days. In the very innermost ring, the one that records its first year of life, he inserted a pin which bears the date "550 A. D."

At the Time of Its Birth.

And so it was just a century, less one year, after Attila, the "Scourge of God," and his host of Huns had been forced to retreat across the Rhine after the battle of Chalons, a momentous conflict which decided that the Christian Germanic races, and not the pagan Scythic Huns, should inherit the dominions of the dying Roman Empire and control the destinies of Europe, that a little seed, scarcely one-fourth inch in length, forced its tiny sprout above the soil of the Sierras and sought

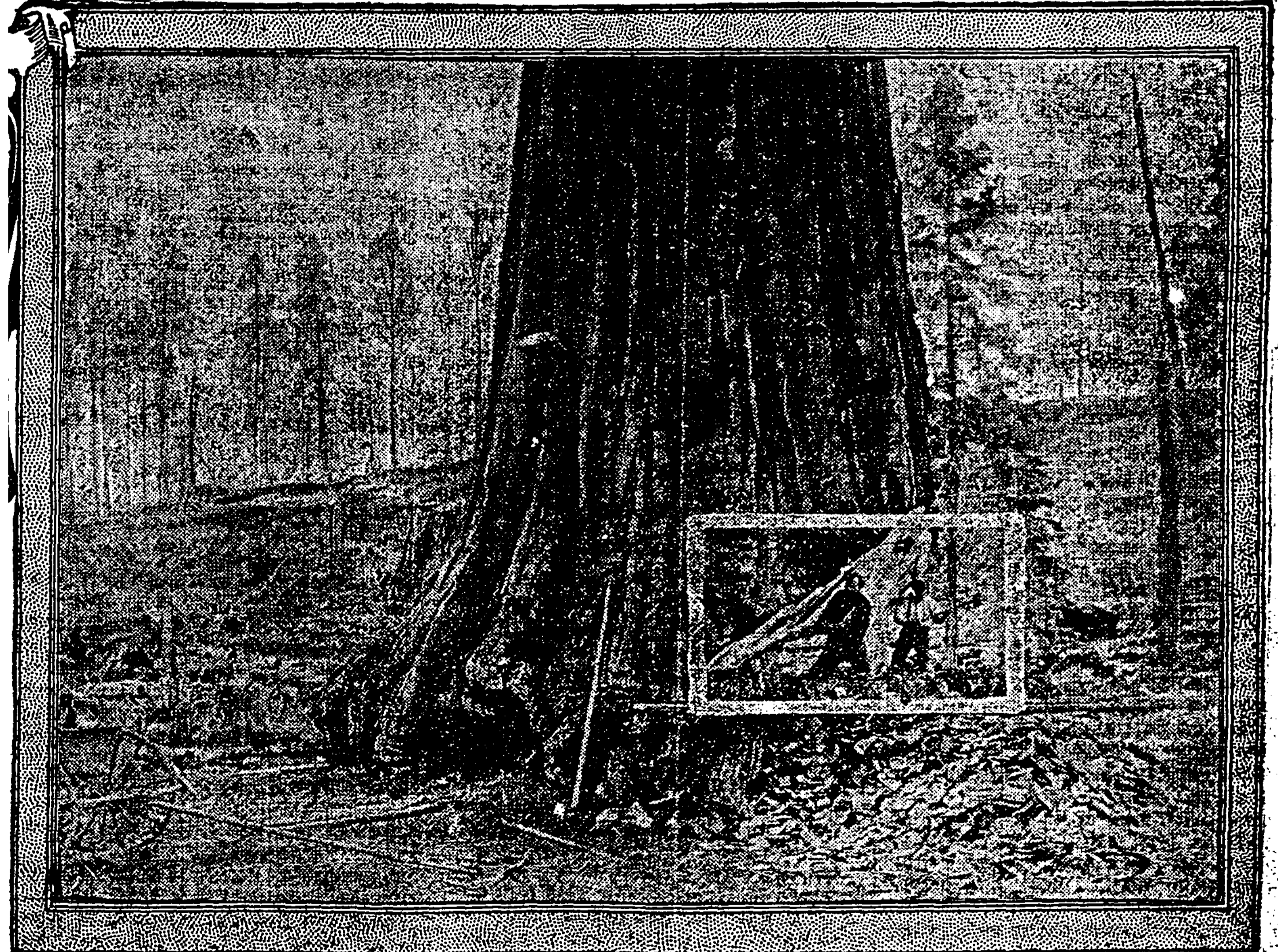
its inheritance as a member of the Big Tree family. While still a mere sapling, fighting with the surrounding forest undergrowth for light and air, Europe was overrun by the Goths, Vandals, and Franks, and a state of almost universal war prevailed.

When our tree had reached its fifteenth year and attained a circumference of twelve inches, one of those big events happened which have had an influence on the progress of civilization. This is the way that Mr. Sherwood tells of the event on a pin-card inserted in the fifteenth ring from the center of the tree: "Silk worms introduced from China into Europe."

At the Age of Fifty.

When the tree completed its fiftieth year it had attained a diameter of twenty-one inches, and during the next century it added twenty-eight inches more. And so our tree was already a huge forester when we come to the next pin-card—"732, Battle of Tours." This was just five years after the conquest of Spain. The Saracens, crossing the Pyrenees, established themselves upon the plains of Gaul. This advance of the Moslem hosts beyond the northern wall of Spain was viewed with the greatest alarm by all Christendom. As Draper pictures it, the Crescent, lying in a vast semi-circle upon the northern shore of Africa and the curving coast of Asia, with one horn touching the Bosphorus and the other the Straits of Gibraltar, seemed about to round to the full and overspread all Europe. The Franks and their allies met the Moslems upon the plains of Tours, dealt them a crushing blow and forced them to retreat behind the Pyrenees.

The climatic conditions in California during the year 800 and the year preceding must have been very favorable for the growth of our tree, which had already attained the size of a large and venerable elm. Its growth during these



Woodsmen at work at the base of the tree

two years, indicated by the large rings, was phenomenal.

This year, 800, was also notable for the crowning of Charlemagne, a monarch who, in addition to being a great warrior, established a school at his court, inviting thither the few learned men of his time, and laying "the foundation of all that is noble and beautiful and useful in the history of the Middle Ages."

During this century occurred also the effort of King Alfred to establish schools in England. The hardy Norsemen began their bold voyages in quest of treasure and adventure, colonized Iceland in 874, discovered Greenland, (981,) and, pushing farther westward, probably sailed down along the eastern shore of America.

The year that saw our tree getting on toward the shady end of its sixth century also saw the beginning of the Crusades. These great military expeditions against the Moslems, begun in 1096 and continuing for almost 200 years, brought the various European peoples into intercourse, which resulted in exchange of ideas and helped prepare the popular mind for the discoveries which were soon to follow.

The first half of the thirteenth cen-

tury saw the founding of the universities. First, the University of Paris, (1200,) which became the centre of theology; a few years later were founded the University of Bologna, famous for law, and the University of Padua, which attracted the greatest students in medicine. In England, Oxford University was founded in 1249.

The fifteenth century brought those marvelous discoveries which were of so much importance in the advancement of civilization, and which contributed to the growth of science. Printing with wooden block type was introduced by John Gutenberg in 1438, and his invention was followed in 1450 with the use of metal type, making the general dissemination of knowledge possible.

Our tree was getting well on toward its thousandth birthday when Columbus discovered America. And in this grizzled old age it was contemporary with much that sounds ancient to us moderns. The pin-cards thus tell the story: "1543, Copernicus publishes his system of astronomy;" "1609, Kepler announces his laws of planetary motion;" "1685, Newton discovers laws of gravitation;" "1775, American Revolution;" "1815, Battle of Waterloo,"

and the last and most recent pin-card in the historical series, "1866, First successful Atlantic cable laid."

Had man left our Big Tree undisturbed on its Sierra hillside, what further great men and events in the world's history might it be a contemporary of?

"I never saw a Big Tree," writes John Muir, "that had died a natural death; barring accidents, they seem to be immortal, being exempt from all the diseases that afflict and kill other trees. Unless destroyed by man, they live on indefinitely—until burned, smashed by lightning, or cast down by storms, or by the giving way of the ground on which they stand. A colossal, scarred monument in the King's River forest is burned half through, and I spent a day in making an estimate of its age, clearing away the charred surface with an axe and carefully counting the annual rings with the aid of a pocket lens. The wood rings in the section I laid bare were so involved and contorted in some places that I was not able to determine its age exactly, but I counted over 4,000 rings, which showed that this tree was in its prime, swaying in the Sierra winds, when Christ walked the earth."