

PLEASANT HOURS

A PAPER FOR OUR YOUNG FOLK.

THE LICK OBSERVATORY.



JAMES LICK.

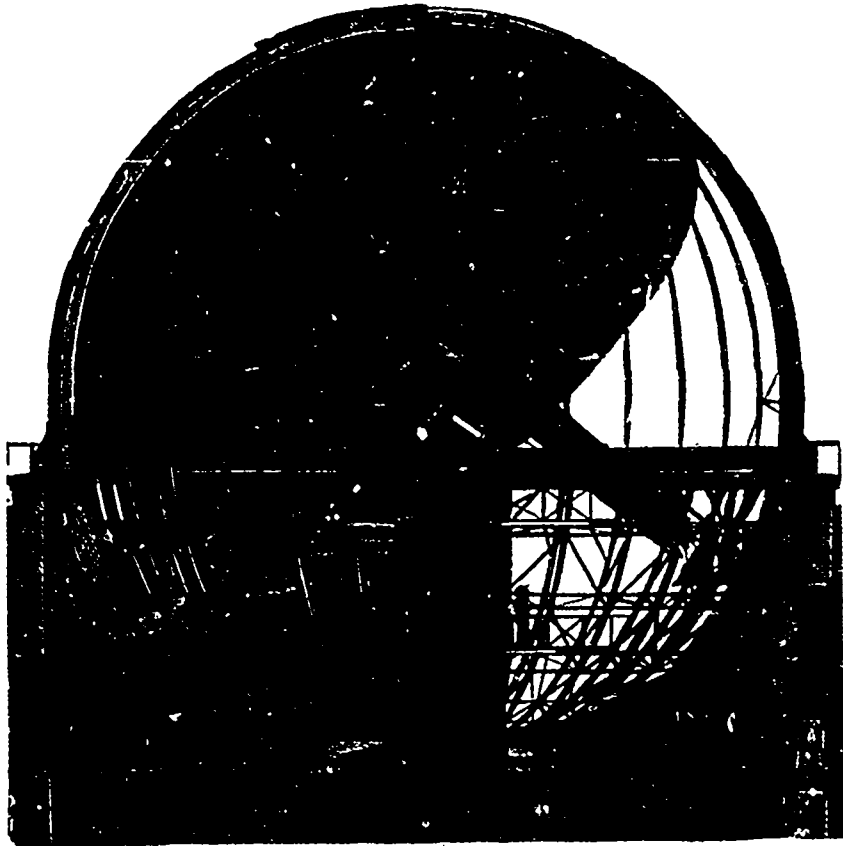
A person standing at the south end of San Francisco Bay, and looking almost due east, will observe a point of light of dazzling brilliancy on the top of what appears to be a small flat-topped knob, no larger apparently than a half-section of a billiard-ball. The

little knob is the summit of Mount Hamilton, and the bright point of light is the reflection of the sun from the north dome of the Lick Observatory, from fifteen to twenty miles off as the crow flies.

The donor, James Lick, was born at Fredericksburg, Lebanon County, Pennsylvania, August 25th, 1796. He began life as an organ and piano maker, first at Hanover, Pennsylvania, then at Baltimore, Maryland. In 1820 he started in business on his own account in Philadelphia, but soon after emigrated to Buenos Ayres, where for ten years he successfully prosecuted his trade. He subsequently moved to Valparaiso, and later to California, where he arrived with a moderate fortune in the latter part of 1847. He spent the remainder of his days in California, dying in San Francisco on October 1, 1876, leaving an estate worth nearly \$4,000,000. He was such an unlovable, eccentric, solitary, selfish, and avaricious character that, it may be fairly said, had it not been for one of the last acts of his life, he would have died "unwept, unhonoured, and unsung."

This one act was a contradiction of his whole life. A little more than two years before his death Mr. Lick conveyed all of his great fortune by trust-deed to a board of trustees, to be divided mainly among public charities, and for the erection of important public, industrial, scientific, and hygienic institutions. The trust-deed provided for the expenditure of \$700,000 for the construction and equipment of an astronomical observatory for the University of California. There is good reason to believe that he had nursed the idea for a good many years before he began to put it into practical shape. His ambition concerning it knew no bounds. He imposed the obligation in the trust-deed of erecting a powerful telescope, superior to and more powerful than any telescope yet made.

In January, 1881, the trustees contracted with Alvan Clark & Sons for the manufacture of "an achromatic astronomical object-glass of thirty-six inches clear aperture" (this being the largest the Clarks would venture to contract for), to be delivered November 1st, 1883. The price was fifty thousand dollars, of which amount twelve thousand dollars was paid when the contract was signed. The



NEW SYSTEM OF DOME, LICK OBSERVATORY.

flint-glass disk was successfully cast by Fell & Sons, Paris, France, early in 1882. Its companion, the crown-glass disk, was cast ready for shipment at the close of 1882, but the material was so brittle that it unfortunately cracked in packing.

The difficulties attending the casting of the crown disk have been extraordinary. No class of the dimensions required had ever been cast or attempted before the Lick Observatory contract was awarded to the Clarks. Thirty or more blocks were cast by the Fells before one was obtained that would be acceptable. The wrecks are arrayed along the walls of their factory as curiosities. The first block, as has been already stated, was broken in packing for shipment. Many contained irremediable flaws. Others were destroyed in annealing, and others again were damaged beyond repair in cooling.

At one time the prospects of the great telescope appeared hopeless. The elder Fell had retired from business, leaving his glass-works in charge of his sons. They made a great many castings and experiments in annealing, but without success. It took the Clarks a year to grind and polish the glass, after it reached their manufactory.

James Lick reserved for himself the selection of a suitable site for the observatory destined to bear his name.

The wisdom of his selection has since been abundantly demonstrated. Mount Hamilton is situated fifty miles south of San Francisco. Its summit is 4,285 feet above the sea. In due season a road was built, at a cost of \$75,000, twenty miles and a half in length. In the last two miles the road has to overcome a vertical rise of nearly two thousand feet, and ascends in a zig-zag course. At some points a dozen laps of its windings can be seen at one glance within the distance of half a

mile. Near the summit it winds twice around the peak.

A cosy cluster of white frame buildings nestle in the shadow of Observatory Peak, which protects it from the keen west wind. Few people have any conception of the difficulties which had to be overcome before the enterprise could have hoped of success. Everything—food, tools, building materials, and water—had to be carried to the top of the mountain from the valley.

Lick Observatory consists of a structure 287 feet in length, a transit house, meridian circle, a photo heliograph and heliostat, and a photograph house. The south dome contains the great telescope. This dome is the largest of any observatory in existence. Its great size presented many difficult problems for solution. The outcome has been the devising of a dome which is a seven-eighths sphere, resting and revolving on a tower 75 feet in circumference. The object of the seven-eighths sphere dome is manifold. In the first place, the friction in moving it will be a minimum. A hemisphere of the same diameter would rest on a tower having a circumference of 217 feet. The tower would need to be of enormous strength to carry the weight, and the friction in revolving the dome would offer a resistance over one hundred per cent. greater than the seven-eighths sphere.

The frame of the dome is of steel. The inside of the envelope of the upper hemisphere is of paper, and the outside of steel plates. The lower half of the sphere is a mere skeleton of the framework. Around it are two fixed galleries for observers, assistants, and students. The observer's chair is hung opposite the shutter, sliding on an arc nearly corresponding with that of the eye-piece of the telescope. The observer in the Lick dome is able to perform all his work free from intrusion or interruption, and is saved the fatigue and loss of time incurred in ascending and descending a ladder chair thirty feet or more in height. The dome weighs fifty tons. It rolls on an endless harnessed carriage. The sole and bed plates are perfectly protected from any variations of temperature, so that there is no trouble from expansion and contraction.

The view from Observatory Peak is magnificent in its range and varied beauty. The horizon in almost every direction is unobstructed. The Sierra Nevada, 130 miles to the east, comes out sharp and distinct at sunrise. The astronomer may be sure of at least 250 good nights in every year on Mount Hamilton, 150 of which are such as are rarely enjoyed at any of the Eastern observatories. The atmosphere is remarkably dry.

Strange to say, James Lick made no provision in the trust-deed or any other written instrument for the disposition of his remains; but some time during the last year of his life he expressed a wish to a friend that his body be buried on Mount Hamilton, within or adjacent to the observatory. In the base of the pier sustaining the great equatorial telescope, is constructed a vault in which the body of James Lick found its last resting-place. He was a solitary in life, and in death he also was isolated. But the observatory is his magnificent tomb and monument, as well as a precious instrument for the advancement of the most sublime of the sciences.

Mummery was originally an adaptation of the name of Mohammed, and, in its first form, was Mohammedy. During the Middle Ages so many strange tales were told of the doings of the Moslems that all the rites of the Mohammedan religion were classified as mummery.



LICK OBSERVATORY IN THE FIRST OCTOBER SNOW.



MOUNT HAMILTON—SITE OF LICK OBSERVATORY.