dergoing the test, that has suffered but very little, not having partaken of any food whatever for over a month.

I had a live Sceloporus consobrinus about my room here nearly two months, but one day it was missed, and ten days afterwards it was found in a dark corner. Nothing remained of it but the skin, enclosing a perfect skeleton and seven eggs. These latter had firm white shells, and were each of an elliptical form.

R. W. Shufeldt.

Fort Wingate, N. Mex., Aug. 12.

Color and other associations.

In the matter of color association with months, I have a relative who associates June and green, October and light crimson, December and blue.

I have strong color association with certain names; for example, —

Henry, Henrietta	= grass-green.
Sophia,	= dark green.
Louise,	= violet.
Charlotte,	= deep purple.
Alice,	= black and gold.
Francis,	= white and gold.
Emily,	= primrose-yellow.
Susan,	= pale blue.
Lucy,	= clear blue.
Anna,	= gold color.
Caroline,	= Naples-yellow.
Agnes,	= pearl gray.
Frances,	= pale fawn.
Lydia,	= a gay plaid, pink and green predominant.

Some of these, I suspect, are caused by the vowel in the name of the color and the proper name being the same. Lydia, perhaps, may wear the dress of the first owner of the name I ever saw. The others I cannot account for.

The months stand in a circle: December, January, and February grouped close together on the upper, or right hand; March and April curve around; May has a little more room; June, July, August, and September are wider apart; October and November correspond to March and April on the other side. The winter months are in the shade; the summer ones in a strong light.

F. M. Slack.

THE LICK OBSERVATORY.

To German parents in Lebanon county, Penn., in the year 1796, was born a son, who received the name James Lick. As a boy, he learned the piano-maker's trade in Philadelphia, where, in youth and early manhood, he led a varied life, engaging in divers occupations, from the making and selling of furniture and pianos, to the managing of a theatre. When about thirty-five years old, he went to South America, where he resided chiefly at Buenos Aires, acquiring property to the extent of about forty-five thousand dollars, with which sum, in 1847, he emigrated to the site of the present San Francisco, and invested it in real estate. In a quarter of a century he found himself worth a fortune nearly one hundred times as great, which, by the execution of a deed of trust, he placed under the control of a board of trustees, of which Mr. Richard S. Floyd is now the president.

Mr. Lick died at the age of eighty years. His chief scientific bequest was the sum of seven hundred thousand dollars, for the erection of a great observatory at a mountain elevation. He was anxious to secure the highest elevation consistent with ready accessibility; and Lake Tahoe, nearly eight thousand feet above sea-level, was about the first site which came prominently to his notice. The proposed locality was visited, investigated, and rejected; and the site of Mount Saint Helena, an eminence much nearer San Francisco, was visited by Mr. Lick in person. Early in 1875 Mr. Thomas E. Fraser suggested Mount Hamilton, in the county of Santa Clara, as a desirable site; and, on his recommendation, Mr. Lick decided upon this eminence for the permanent location of the great observatory. Mount Hamilton is situate in the Pacific coast-range, about fifty miles south-east of San Francisco, and thirteen miles in a direct line from San José, the nearest city. A telephone-line, and an excellent mountain road, now connect the two.

Mount Hamilton has a treble-pointed summit, about forty-five hundred feet high; and no mountain within a radius of one hundred miles approaches this elevation. The two extreme peaks of the general summit are nearly a mile distant from each other, in a north-east, south-west direction. The southernmost peak is bare of all woody growth, and its lines converge to form an angle slightly acute. Although about a hundred and twenty-five feet lower than the northern summit, this peak was chosen by the trustees for the location of the observatory, on the advice of Professor Newcomb and Mr. Burnham; as it presented the greater advantage in point of accessibility, configuration, and a minimum of obstruction to the view south, east, and west. The first work was to cut down this apex; and about forty-five thousand tons of rocks were removed, leaving an irregularly oval plateau, about four hundred and fifty feet in length, and with an extreme breadth of about two hundred and twenty-five feet. The lands about the mountain, which are set aside for observatory purposes, comprise a government reservation of about fifteen hundred acres, to which the trustees have added a hundred and sixty acres by purchase.

The first astronomer who visited the site of the projected observatory was Mr. Sherburne

W. Burnham, who in the autumn of 1879, on the recommendation of Professor Holden and Professor Newcomb, was invited by the Lick trustees to make a systematic study of the suitableness of the atmospheric conditions for observational research. In October he was joined by Professor Newcomb, who remained for a few days upon the summit, to advise with regard to the proper location of the buildings and instruments. Mr. Burnham devoted two months' time to the measurement of close double stars. During the period, Aug. 17 to Oct. 16 inclusive, he found, —

First-class nights, 42; medium nights, 7; cloudy and foggy nights, 11.

The summer of 1881 marked great progress. The transit of Mercury in the latter part of that year was observed with the twelve-inch equatorial and the four-inch meridian transit instrument in their permanent quarters, Professor Holden and Mr. Burnham securing complete series of satisfactory contact-observations. During the period Oct. 20 to Nov. 9, Professor Holden found fourteen nights which were perfectly clear, with at least average conditions of vision; and one of them was exceptionally fine.[1]

In the summer of 1882 the results achieved on the mountain were even more important than during the year previous. The construc-

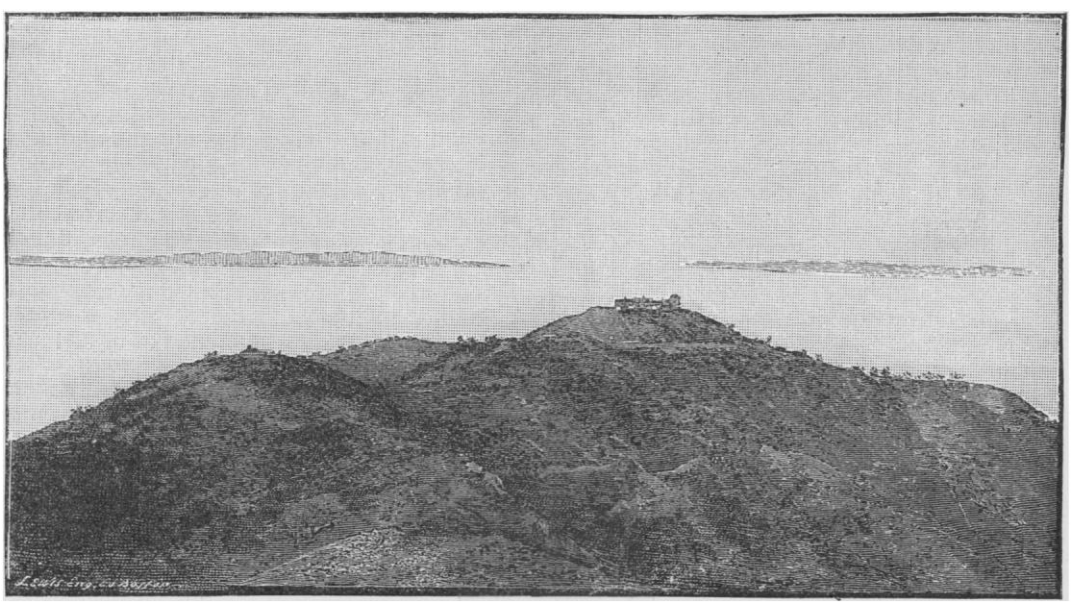

FIG. 1. — THE LICK OBSERVATORY. DISTANT VIEW FROM THE NORTH-EAST.

There was not in the whole time a single poor night when it was clear.

In the spring of 1880 Capt. Floyd spent several weeks in Washington, accompanied by Mr. Fraser, whom the trustees had appointed superintendent of construction of the observatory. There they were in daily consultation with Professor Newcomb, Professor Holden, and other astronomers, with regard to the plans of construction on the mountain, and the final instrumental equipment of the institution. Under their direction, the architect's plans for the main building were prepared at this time. and the work of construction was at once begun.

tion of the main building was rapidly carried forward, and the problem of water-supply for all future purposes was shown to be effectively solved. Springs of excellent water had been discovered about four hundred feet below the summit, and a reservoir large enough to hold eighty-five thousand gallons was built on the apex of the middle peak. A year later, the trustees took the additional precaution of providing a second reservoir of nearly seventy thousand gallons capacity, in which the rains are collected from the slate roofs on Observa-

[1] It is to be remembered that this was at the season of the year when the change from the summer to the rainy season was impending, and when the inequality of the temperature between the day and the night was something near the maximum.

tory peak, and stored for use at the houses and stables just below.

As Mr. Lick gave specific direction that the income from his endowment of the observatory should be made 'useful in promoting science,' his trustees wisely made thorough provision for observing the transit of Venus of 1882. A photoheliograph, for obtaining very accurate pictures of the sun, was added to the permanent equipment of the observatory, for the purpose of co-operating with the American transit-of-Venus commission. The president of the trustees invited Professor Todd to direct the observations on Mount Hamilton; and the excellence of the photographs obtained by the expedition is largely due to the wide experience of his photographer-in-chief, Mr. Lovell of Amherst. The work of the expedition has been fully described in *Science*, vol. i. p. 94; and the results obtained from these photographs have been incorporated with those secured under the immediate direction of the American commission. The period of residence of the party on the mountain (Nov. 21 to Dec. 21) included four nights totally cloudy, fourteen partly cloudy, six clear with good seeing, and seven clear with exceptionally fine conditions of vision. The solar eclipse of the 16th March, 1885, was also photographed at the observatory, under very favorable atmospheric conditions.

The illustration of the ground-plan of Observatory peak shows the exact location of all the buildings on the main plateau, and the arrangements of the rooms of the principal edifice. This is mostly a single story high; and like all the other buildings containing instruments, and the dwelling-house also, is fire-proof in construction. The interior finish of the main building is of superior quality throughout: the hall, about two hundred feet in length, with its floor and wainscot of marble, affords an excellent space for optical experiments. The diagram shows also the position at the extreme south end of the plateau, which will ultimately be occupied by the great telescope.

Among the principal instruments of the observatory is the Repsold meridian-circle. Its object-glasses are six-and-one-third inches in diameter, and were made by the Clarks. A house of unusual construction and proportions (at the left of the square tower in the centre of the 'near view,' fig. 3) has been built to shelter this instrument. The building is forty-three feet by forty-five, with an office-wing adjoining. It has double walls, the interior of wood, and the exterior of iron, with abundant space between for ready access to any part; and the arrangements for securing the same temperature within as without are perfect. The shutters closing the observing-slit are of a novel pattern, the device of Mr. Fraser. The interior of the observing-room is of California red-wood with a high finish. At the right, in the illustra-

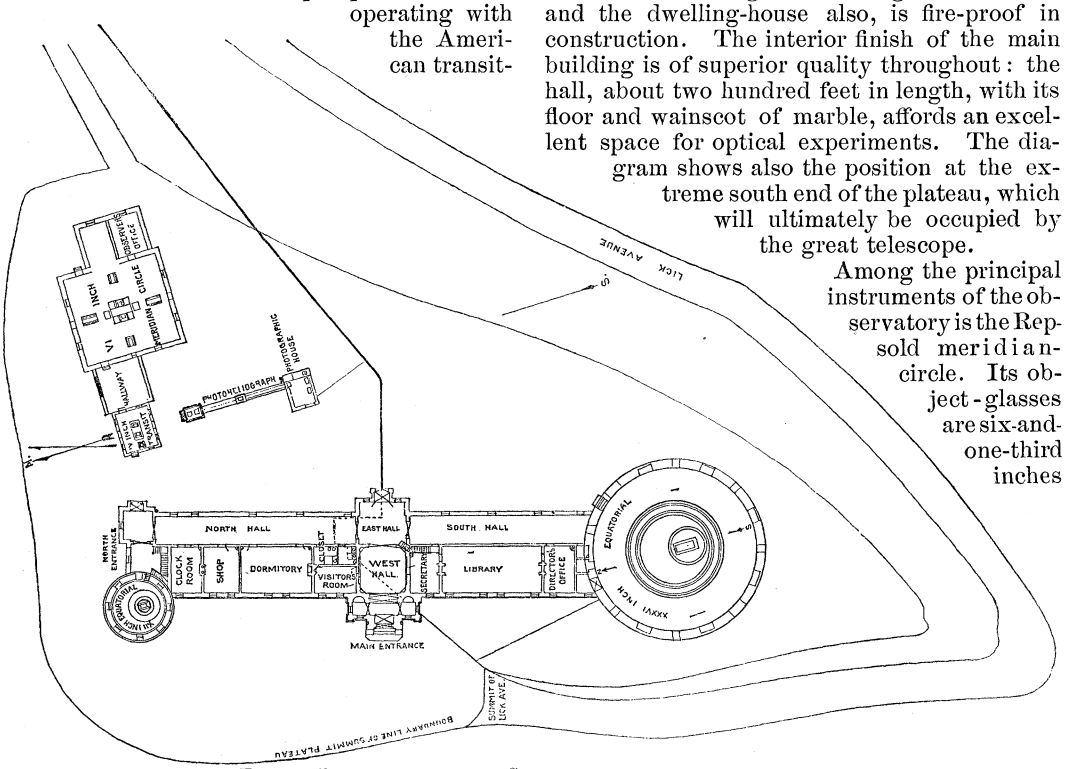

FIG. 2. — LICK OBSERVATORY. GROUND PLAN AND SUMMIT PLATEAU.

tion of this interior (fig. 4), is shown a covered carriage on rails, which serves the purpose of additional protection to the instrument when not in use.

At the centre of the 'near view' (fig. 3), is shown the permanent dwelling for the director of the observatory and his colleagues. It is built of brick, just below the observatory plateau, and faces the north-east, with a frontage of fifty feet. It contains thirty rooms, and extends toward the mountain to a depth of sixty feet; and a short bridge from the third story of the house lands on the summit plateau, near the entrance to the meridian-circle room.

It will be seen that the observatory is already in a position, so far as the outfit of the establishment is concerned, to proceed at once with astronomical research. In addition to the instruments already mentioned, its equipment consists of a four-inch transit-instrument by Fauth; a four-inch comet-seeker by Clark; a measuring-engine by Stackpole, reading either rectangular or polar co-ordinates; five clocks by Dent, Frodsham, Hohwü, and Howard, and four chronometers by Negus; a system of electric connections involving all the observing and clock rooms; a six and one-third inch equatorial telescope; a two-inch Repsold vertical circle; a workshop, with a complete outfit of lathes and tools; and an astronomical library containing a choice selection of works of an exclusively technical character. This latter has already necessitated an expense of about five thousand dollars.

Popular interest in the observatory now centres chiefly in the remaining work of the trustees, which is threefold, — the making of the object-glass of the great telescope; the construction of the mounting or mechanical portions of this instrument; and the building of the enormous dome, which will be required to cover the telescope, and permit its most unconstrained use. Upon the construction of the dome and the mounting, the future usefulness of the great telescope will very largely depend.

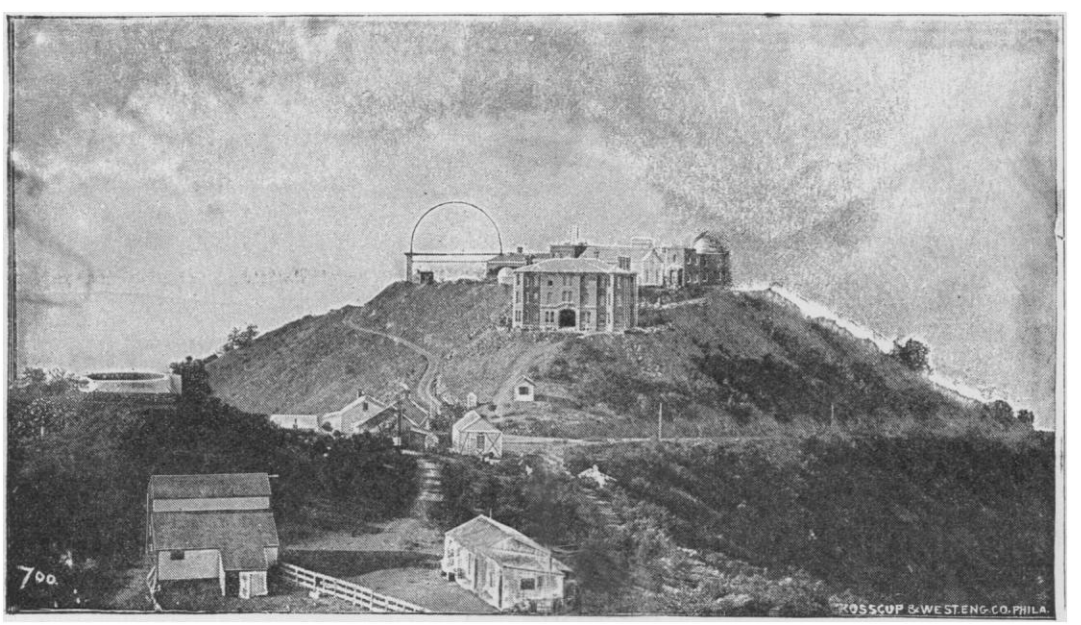

FIG. 3. — THE LICK OBSERVATORY. NEAR VIEW FROM THE NORTH-EAST.

The contract for the object-glass — amounting to about one-half the cost of the entire telescope — was placed with the Messrs. Clark nearly five years ago. Two years later they received from the glass-maker, Mr. Feil of Paris, a disk of flint-glass of the required perfection, and thirty-eight inches in diameter. This glass has already stood in their workshop at Cambridgeport nearly three years, and it is inexpedient for them to attempt to work it to the proper curvatures until its companion disk of crown-glass is secured: in fact, these curvatures cannot be definitely

decided upon until both disks have been carefully tested. The difficulties which the glass-maker has to encounter in obtaining so large a disk of crown-glass have been found to be much greater than with the flint, and fifteen or twenty moulds are said to have been ruined in the attempt to get them into the required disk-form. It is hoped that the glass-maker will succeed in accomplishing his task during the present season; and, in that event, the great telescope can readily be completed in 1887. Mr. Lick's trustees will then transfer the establishment to the University of California, and the observatory will subsequently

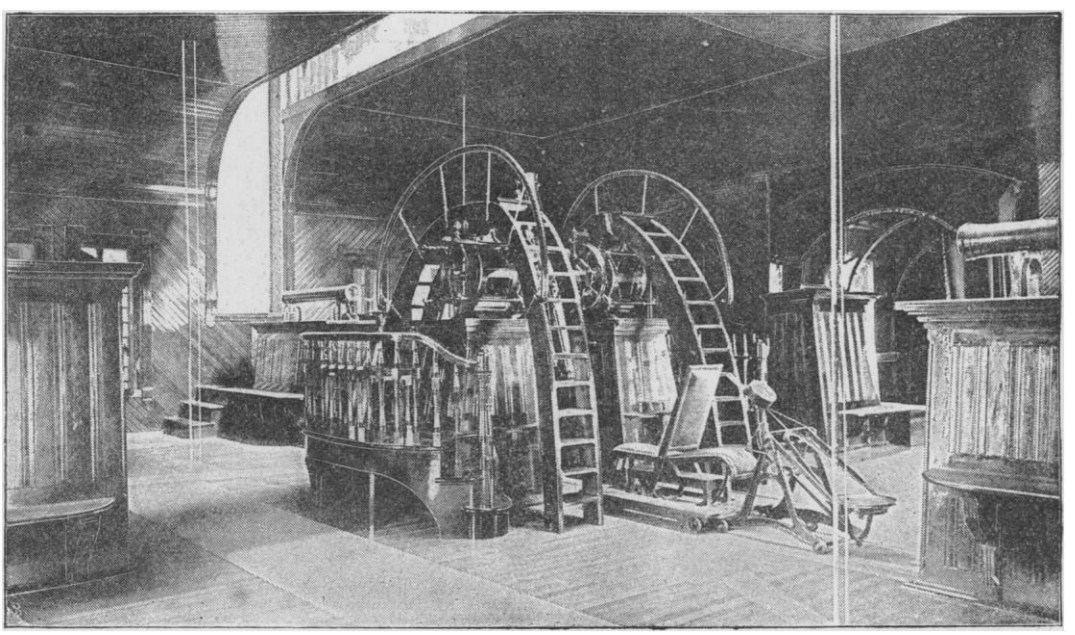

Fig. 4. — The Lick observatory. Interior of the meridian-circle house.

be conducted under the control of the regents of that institution.

An inquiry often made, and a very natural and proper one, relates to the prospective capabilities of this enormous instrument, when mounted in so favorable an atmosphere, and directed to the moon. Every astronomer who has observed the heavenly bodies from Mount Hamilton knows that the extraordinary steadiness of the atmosphere enables him to regularly employ eye-pieces on his telescope which magnify two or three times as much as those he habitually uses for the same kinds of work at home. It is thus not unreasonable to expect that a few nights in the course of each observing-year may be found when the maximum magnifying-power — about thirty-five hundred diameters — may be advantageously employed on the great telescope. The theoretical distance of the moon would then become about sixty miles, but the corresponding ideal conditions of perfect vision can never be attained. Making due allowance for the unavoidable effects of the earth's atmosphere and other unfavorable conditions, the observer might expect to see the moon much the same as he would without the telescope if it were only a hundred miles away. If, at the same time, the moon happened to be at its least distance from the eye of the observer, — about 220,000 miles, — and if the object on the moon were suitably illumined by the sun's light, it is possible that details of its nature might be satisfactorily made out, even although they were no larger than some of the larger edifices on the earth.

THE GROWTH OF THE FRENCH ACADEMY. 1635–1885.

It is interesting to trace the influences by which the French institute, *l'Institut de France*, as we know it in these days, has been developed from the French academy, *l'Académie*