

Chapter 1:

A Fateful Eclipse

On February 7, 1889, a diverse group of men gathered in a meeting room in downtown San Francisco. They included a high school science teacher who was also director of a civic observatory, a Spanish gentleman from Catalonia who was a civil engineer, a professional astronomer educated at West Point, a distinguished corporate lawyer, a railroad clerk who was an avid amateur photographer, an insurance broker, a homeopathic physician, a college professor, and more than thirty others. The outcome of the meeting was the creation of the Astronomical Society of the Pacific, whose aims — as admirable today as a hundred years ago — were set forth clearly in its very first bylaws: "...to advance the Science of Astronomy, and to diffuse information concerning it."

In the past century, the Society has grown from an initial forty members to over six thousand; its publications are read wherever astronomy is discussed; and its members inhabit all parts of the globe. From the beginning, the Society intended to serve the needs of both professional and amateur astronomers, as well as interested laypeople. Moreover, everyone, regardless of scientific background, would be admitted to the Society on an equal footing. The Society would devote its energies not only to furthering the research which is astronomy's primary mission, but also to making sure that the fruits of that research were widely and promptly shared with the public. Such a mission — quite unusual among scientific societies — probably helps account for the longevity and popularity the A.S.P. has enjoyed.


At the same time, astronomy has changed in the past century, in ways that would have been unimaginable in 1889. In the late nineteenth century, interest centered primarily on the planets in our solar system. There was speculation about life on Mars as a result of Schiaparelli's observations of "canals" on the red planet, and excitement caused by the discoveries of new faint satellites of Jupiter and Saturn. Stellar astronomers typically spent their time measuring the separations of double stars and obtaining accurate positions for stars in the sky; they were just beginning to analyze the light from stars to help deduce their chemical makeup.

No one (except perhaps Jules Verne) thought that space travel was really possible; no one believed that a 200-inch telescope could be built; no one had heard of pulsars or supernovae or quasars or black holes. And the discovery of the expansion of the universe lay decades in the future.

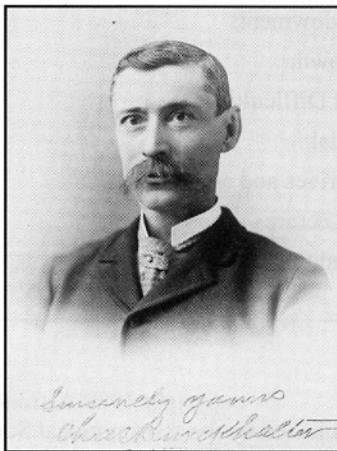
As the 20th century dawned and the headlong rush of astronomical discoveries began to expand humanity's horizons, the A.S.P. became one of the most important vehicles for keeping scientists, educators, journalists, and the public abreast of new developments. Through its journals, lecture series, and other information services, the Society has helped to share the excitement of modern astronomy and to create broad public support for further research.

How did such an organization come to be? Its immediate impetus, as we shall see, was a total eclipse of the Sun on January 1, 1889. But in fact it goes back farther, to the founding of Lick Observatory on Mount Hamilton, near San Jose, California, in the 1880's. James Lick, a wealthy (and eccentric) San Francisco businessman, had left a bequest to build an observatory as his memorial. He wanted it to be located in the middle of San Francisco, but was persuaded that it would be much more useful on top of a mountain, away from a center of population with its lights and smoke, and above some of the unsteadiness of the Earth's atmosphere that interferes with sharp views of the heavens.

In 1888, the just-completed observatory with its record-breaking telescope, boasting a superb lens 36 inches in diameter, was placed under the auspices of the University of California. Edward S. Holden — who would become the A.S.P.'s founder — was named as its first director. He chose four distinguished astronomers to complete the staff: John M. Schaeberle, Sherburne W. Burnham, Edward Emerson Barnard, and James E. Keeler. C.B. Hill, an amateur astrono-



Edward S. Holden in 1888. Holden was the founder of the Astronomical Society of the Pacific and the first director of Lick Observatory. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)



Charles Burckhalter in 1896. Burckhalter, an Oakland school-teacher, was one of the founding members of the A.S.P. and director of Chabot Observatory from 1887 to 1923. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

mer from Oakland, served as librarian and secretary for the observatory.

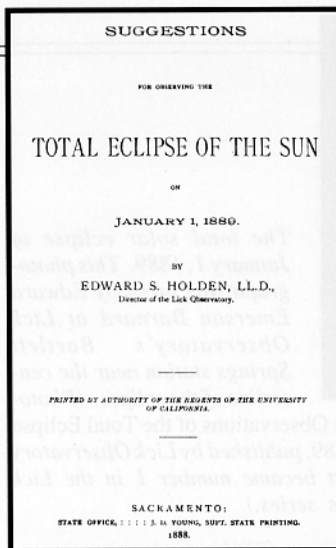
Holden himself was trained as an astronomer; he had studied at Washington University with William Chauvenet (author of a famous compendium on spherical astronomy), and in the 1870's worked at the U.S. Naval Observatory under America's foremost astronomer, Simon Newcomb. He had also taught at West Point, where he had studied, and the military atmosphere seems to have been congenial to his nature; he liked to give orders and did not hesitate to criticize his subordinates. (In time this caused enormous friction at Lick, and in 1897 Holden was forced to resign. But by then both the observatory and the A.S.P. had a solid place in American astronomy.)

Astronomical observation began at Lick in the summer of 1888. Each staff member had his own special research field, with Holden in charge of the overall program. Holden was eager to promote the observatory, and actively sought ways to make its existence better known to the world at large. The New Year's Day eclipse of 1889 provided him with a fine opportunity. This eclipse would take place around 1:45 p.m., and would be total for about two minutes as viewed from points along a path about ninety miles wide, north of San Francisco. The path crossed such northern California communities as Ukiah, Cloverdale, and Willows.

A total eclipse is a rare opportunity for scientists to gather data on the Sun's corona (outer atmosphere) and other solar phenomena, and for laymen to enjoy a spectacular celestial sight and, perhaps, to help astronomers by recording some useful scientific information. Accordingly, Holden published a widely-circulated pamphlet entitled "Suggestions for Observing the Total Eclipse of the Sun on January 1, 1889," in which he gave numerous suggestions for useful observations which amateurs might make.

Among those who read it was Charles Burckhalter, a school teacher in Oakland, across the Bay from San Francisco. Born in Ohio in 1849, Burckhalter had come to California in 1877, where he eked out a meager living in San Francisco as an insurance adjuster. He developed a great interest in astronomy, and spent his spare time in constant reading and study. By 1880 he had a 4 1/2 inch telescope, and by 1883 he had constructed his own observatory with a 10 1/2 inch reflector. He became so knowledgeable that in 1885 the city of Oakland hired him to teach geography and astronomy at the high school and to assist at the city's Chabot Observatory; he became director of Chabot in 1887, a position he held until his death in 1923. The idea of eclipse photography, which had not been done very much up to that time, appealed to him, and he conceived the idea of a *photographic* expedition to some point in the path of totality.

Burckhalter proposed this plan in October of 1888 to the members of the Pacific Coast Amateur Photographic Association (PCAPA). This organization,



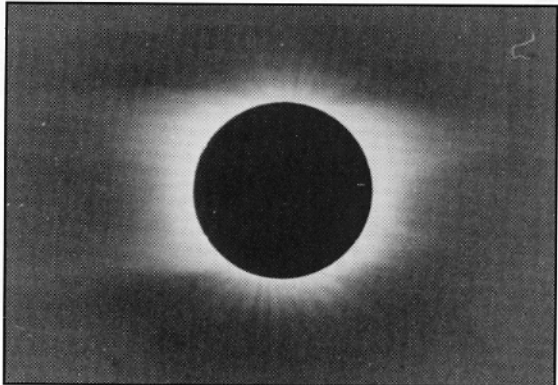
Title page of Holden's pamphlet on observing the January 1, 1889, solar eclipse. This pamphlet inspired Burckhalter to propose that the Pacific Coast Photographic Association organize a trip to photograph the eclipse. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

The path of the total eclipse of January 1, 1889, over northern California. Cloverdale, site of the PCAPA expedition's observing station, is marked by an arrow. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

founded in 1883 by Archie J. Treat and others, consisted of business and professional men with an interest in photography as a hobby. Burckhalter came to one of their meetings, lectured on "The Services of Photography to Astronomy," and discussed eclipse photography in particular. He must have been persuasive, for the photographers then elected him an honorary member, and about twenty-five of them volunteered for an eclipse expedition under his direction. They would take negatives using a wide variety of lenses and exposure times and donate the resulting pictures to Lick Observatory.

On December 26, Treat, by then president of the PCAPA, sent a memo of instructions to all members of the expedition. They were to catch the Tiburon ferry at 3:30 p.m. on December 31, and then proceed by train to Cloverdale, where hotel rooms had been reserved. A special round trip ticket fare of \$3.50 had been arranged for members. They were to carefully read the pamphlet which he enclosed (presumably Holden's), and were either to arrange to bring an assistant or plan to find one there. "It must be remembered that we will have no time during totality to do other than work mapped out for us by Mr. Burckhalter [sic] and whoever he may choose as his assistants. It is hoped that members will implicitly comply with their instructions [so] that scientific results may be obtained."

The enthusiastic group of photographers descended on Cloverdale, the chosen observing site, at about 8 p.m. on New Year's Eve, "a hungry horde clamoring for rooms and something for the inner man," as Treat later described it. With some difficulty the town's hotel managed to accommodate everyone. After dinner, Burckhalter presided at a meeting to brief the observers on their tasks. But the session lacked the dignity and seriousness of many scientific meetings, and Treat wrote that "in illustrating the phenomenon of an eclipse the learned Professor was so unscientific as



The total solar eclipse of January 1, 1889. This photograph was taken by Edward Emerson Barnard at Lick Observatory's Bartlett Springs station near the centerline of the eclipse. (Photograph from Reports on the Observations of the Total Eclipse of the Sun of January 1, 1889, published by Lick Observatory in that year. The report became number 1 in the Lick Observatory Contributions series.)

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to represent the approaching moon by a soft hat and the obscured sun by a soup plate." The gathering eventually degenerated into an impromptu entertainment of musical selections and dramatic readings. The exuberant photographers, no doubt aided by New Year's Eve libations, then roamed the hotel in high spirits, taking pictures of "a picturesque teamster from the mountains" and terrifying chambermaids and other guests by throwing flash powder into the open fireplaces.

The next day, however, everything was business, the skies were clear, and all went smoothly. The twenty-four photographers set up in the area set aside for them, and followed the instructions laid down by Burckhalter. Each man had his own program to carry out, and had an assistant to record information on the time, the exposure duration, and so forth. Some sixty-five people participated, including several ladies who sketched the Sun's corona — our star's faint outer atmosphere that could

only be seen in those days during eclipses. Following lunch the expedition members caught the 3:30 train and were back in San Francisco that night.

Holden was greatly pleased with the success of the endeavor. On January 3 he wrote to Burckhalter:

"My dear Mr. Burckhalter:—

I have seen the splendid reports from your parties, in the newspapers of yesterday which arrived here today, and I take the first opportunity to congratulate you and all the members of the expedition on the splendid success you have achieved. Your plan was so capitally conceived that success was sure if the day was fair — but that could not be commanded. Please give my heartiest congratulations to all."

On January 19 he wrote Burckhalter again: "When your report for the Amateur Photographers' Association with all your mass of material is received we shall have a quantity and quality of observations for discussion which has not been available at any former eclipse." And to the editor of *The Observatory*, a British periodical, he wrote on January 21: "Certainly the zeal of the members of the Association is sure to result in some definite knowledge."

Soon, Holden would attempt to harness this zeal, and the Astronomical Society of the Pacific would be the result.

The Forty Original Members of the A.S.P.

Edward E. Barnard, Lick Observatory
William Boericke, San Francisco
* Charles Burckhalter, Oakland
S. W. Burnham, Lick Observatory
W. A. Dewey, San Francisco
* W. C. Gibbs, San Francisco
Chase Gitchell, San Francisco
* C. L. Goddard, San Francisco
Ed. Gray, San Francisco
C. P. Grimwood, Fruitvale
C. B. Hill, Lick Observatory
Edward S. Holden, Lick Observatory
C. Webb Howard, San Francisco
William Irelan, San Francisco
J. R. Jarboe, San Francisco
P. R. Jarboe, San Francisco
* James H. Johnson, San Francisco
James E. Keeler, Lick Observatory
* O. V. Lange, San Francisco
John LeConte, Berkeley
* W. H. Lowden, San Francisco
* F. H. McConnell, San Francisco

Eusebius J. Molera, San Francisco
William Norris, San Francisco
* S. C. Partridge, San Francisco
* S. C. Passavant, San Francisco
T. Guy Phelps, Belmont
William M. Pierson, San Francisco
* Alfred P. Redington, San Francisco
* George W. Reed, San Francisco
* V. J. A. Rey, San Francisco
Arthur Rodgers, San Francisco
* E. W. Runyon, San Francisco
John M. Schaeberle, Lick Observatory
I. Stringham, Berkeley
Frank Soulé, Berkeley
* George Tasheira, San Francisco
* Archie J. Treat, San Francisco
* W. B. Tyler, San Francisco
Fedor R. Ziel, San Francisco

* These people participated in the Cloverdale eclipse expedition.