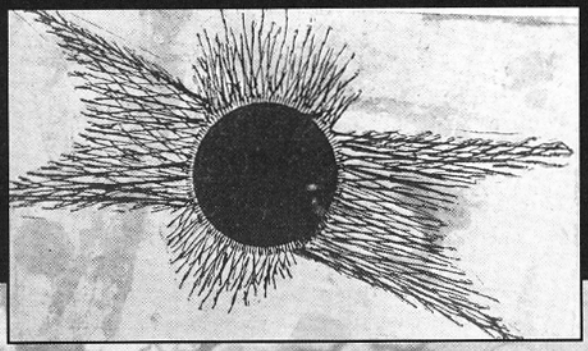
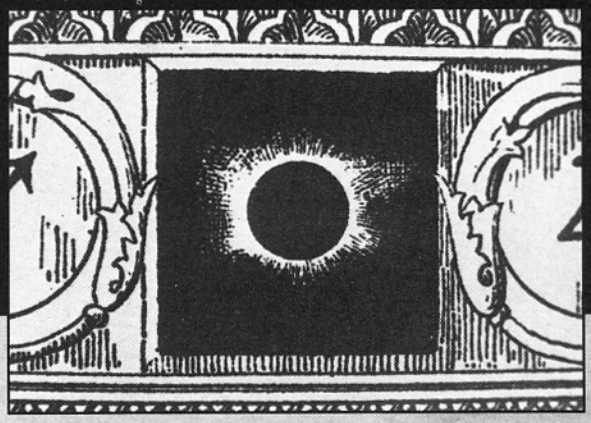
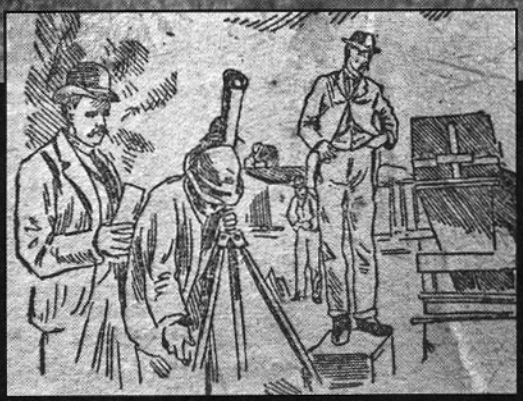
The Stars for All: A Centennial History of the Astronomical Society of the Pacific







Katherine Bracher
Whitman College

Foreword

For more than a hundred years the Astronomical Society of the Pacific has brought together scientists, educators, and everyone fascinated by the heavens. As the first national (and international) astronomical society in the U.S., the A.S.P. has led the way in fostering astronomical research and in sharing the excitement of astronomical ideas and discoveries with a wider public.

This special issue of our journal *Mercury* celebrates the Society's century of service to science and education. Written by astronomer, historian, and *Mercury* columnist Katherine Bracher, the story of our first 100 years should serve as an inspiration to the leaders and members of the A.S.P. as we prepare for the challenges and opportunities of the coming decade and century.

Never in our history has the promise of astronomical discovery been so bright and never has the need for science education for youngsters and the public been so strong. More than ever, we have our work cut out for us as we work to fulfill the vision of our founders as described in this issue — a vision which is as meaningful today as it was in 1889.

Andrew Fraknoi
Executive Officer

Thanks to Eastman Kodak Company

The printing and distribution of this special Centennial issue of *Mercury* were underwritten by the Scientific Imaging, Professional Photography Division of Eastman Kodak Company . The Society is most grateful to Kodak not only for the company's support of this issue, but also for its many contributions to the science — and art — of astronomical photography over the course of the 20th century.

On our Covers

FRONT COVER: The event which occasioned the founding of the A.S.P., recorded by hand and on film. *The large photograph shows the Cloverdale expedition set up to photograph the eclipse of January 1, 1889. Insets: at upper left is a drawing of the corona by C. Mason Kline; upper right shows a detail from the A.S.P. membership certificate which incorporates a drawing of the eclipse; at lower left is a drawing titled "Mr. Burckhalter Makes a Speech" and at lower right one entitled "Helping the Astronomer" from a contemporaneous newspaper account of the event. (Illustrations courtesy Shiloh Unruh, Lick Observatory historian)*

BACK COVER: Past and future. *The original seal of the Society (upper left), which is descibed in detail in the history, has been updated over the A.S.P.'s century to become the design at lower right. Optical instrumentation has also changed greatly over the same century, as illustrated by the 1889 drawing of the Lick 36" refractor (upper right) juxtaposed to the artist's concept of the Hubble Space Telescope, due to be launched in 1990. (Lick drawing courtesy of the Mary Lea Shane Archives of Lick Observatory and D. E. Osterbrock; Space Telescope illustration courtesy Perkin Elmer Corporation)*

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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.

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 schoolteacher, 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.)

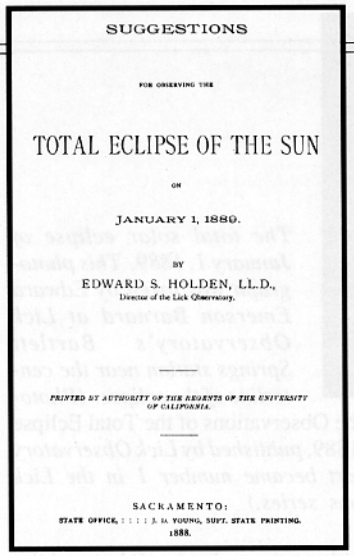
At the same time, astronomy has changed in the past century, in ways that would have been unimaginable in 1889. In the late nineteenth century, interest centered primarily on the planets in our solar system. There was speculation about life on Mars as a result of Schiaparelli's observations of "canals" 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-



SUGGESTIONS

FOR OBSERVING THE

TOTAL ECLIPSE OF THE SUN

ON

JANUARY 1, 1889.

BY

EDWARD S. HOLDEN, LL.D.,
Director of the Lick Observatory.

PRINTED BY AUTHORITY OF THE REGENTS OF THE UNIVERSITY OF CALIFORNIA.

SACRAMENTO:
STATE OFFICE, J. D. YOUNG, SUPT. STATE PRINTING.
1888.

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.)

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.

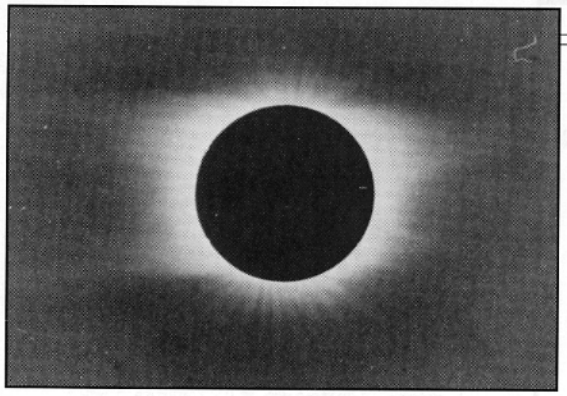
A total eclipse is a rare opportunity for scientists to gather data on the Sun's corona (outer atmosphere) and other solar phenomena, and for laymen to enjoy a spectacular celestial sight and, perhaps, to help astronomers by recording some useful scientific information. Accordingly, Holden published 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, 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. Burkhalter [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.)*

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.

Chapter 2:

A Society Is Born

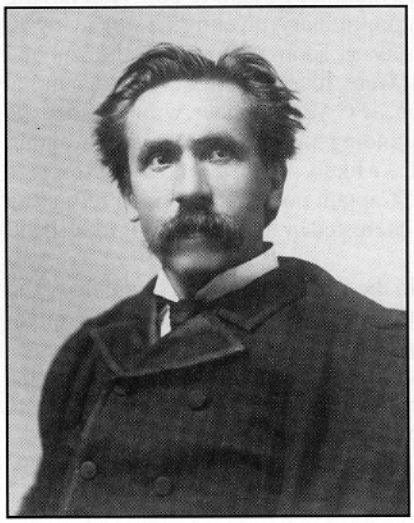
On February 7, the PCAPA held a dinner and meeting in its rooms in San Francisco. Holden and the other Lick astronomers were invited to attend, and after dinner Holden gave a talk in which he said: "No greater service has ever been rendered by photography to science than that recently performed by your Society." He then proposed the creation of an Astronomical Society of the Pacific, to provide a means for continuing this sort of cooperation between amateurs and the astronomers at Lick Observatory. There was great enthusiasm for this idea, and a total of forty men signed the Charter Membership Roll: the six staff members from Lick and thirty-four other interested persons, mostly PCAPA members, including fifteen who had been on the Cloverdale expedition.

The group drew up bylaws, and elected officers pro-tem to serve until the first annual meeting. Holden was chosen president; John Schaeberle and Burckhalter secretaries; and Eusebius J. Molera, a San Francisco civil engineer of Spanish background, treasurer. The bylaws set the dues at $5 per year, or $50 for life membership; as it turned out, these annual dues would not be raised for 62 years!

Holden, Burckhalter, and other eager members immediately set about recruiting more people and spreading the word about the new Society. A circular was distributed to all members of the California Academy of Sciences, the Technical Society, the Microscopical Society, the PCAPA, the Geographical Society of the Pacific, the San Diego Society of Natural History, and the California Historical Society. It was also sent to anyone who was known to have observed the eclipse, and to the teachers and administrators of all California colleges, normal schools, and high schools.

This circular, published together with the bylaws as No. 1 of the *Publications of the A.S.P.*, described the aims of the Society and the benefits of membership as follows:

> "The cordial cooperation of many amateur and professional astronomers in the very successful observations of the Solar Eclipse of January 1, 1889, has again brought forward the desirability of organizing an Astronomical Society of the Pacific, in order that this pleasant and close association may not be lost, either as a scientific or as a social force. You are respectfully invited to become a member of this organization, and to do your part toward making it useful in our community. The new Society is designed to be popular in the best sense of the word. We wish to count in our membership every person on the Pacific Coast who takes a genuine interest in Astronomy, whether he has made special studies in this direction or not, and we believe that every such person will get, and feel that he gets, a full return from the Society, either from its publications or from its meetings. You will observe that the seat of the Society (the place of deposit of its library, collections, etc.) is in San Francisco, where rooms can doubtless be found. Half of the meetings of the Society are to be held there (including the annual meeting). The other half are proposed to be held at the Lick Observatory, on certain Saturdays of the summer months when clear weather is to be expected... It would seem that, in this way, a vivid interest in our science can be created and main-



John M. Schaeberle in 1897. Schaeberle was a charter member of the A.S.P., one of its first secretaries, and a Lick staff astronomer. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

Eusebius J. Molera. A San Francisco civil engineer, Molera was also a charter member of the A.S.P. and the Society's first treasurer. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

tained, and that a Society possessing such exceptional advantages ought to grow and prosper, and be of real weight in the advancement and in the diffusion of knowledge. We should look forward to the establishment of an astronomical journal of high class, to the formation of a special astronomical library, and especially to the organization of such scientific work as requires cooperation and mutual assistance..."

The names of the forty charter members followed.

Within a week Holden had several hundred copies of this invitation addressed. He also had ordered a rubber stamp to be made to mark books donated to the new society. He himself gave a number of books to the library, and suggested to Burckhalter that he get a lockable bookcase in which to keep these and others they might receive.

Burckhalter was also busy. By February 16 he had A.S.P. letterhead stationery and envelopes. And he wrote Holden: "I can have a large number of members to join at next meeting. Will they be considered charter members? Many think they ought to be — not having a chance at the preliminary meeting. I am ready to 'boom' the society as soon as you give the signal." Other members were recruiting too. For example, James H. Johnson, a PCAPA member, wrote Holden the day after the founding meeting, suggesting Captain Charles Goodall as a likely prospect who should receive a circular: "The Captain possesses a 6 inch refracting telescope and is interested in Astronomy." (Goodall did join.)

Elsewhere in the United States the founding of the new Society was also noted. Burckhalter sent an account of the eclipse expedition to *The Sidereal Messenger*, a popular astronomy magazine published in Northfield, Minnesota; this appeared in the March issue, along with a separate note about the Society:

"The friendly relations which were established between the professional astronomers at Mount Hamilton and the amateur photographers and amateur astronomers of San Jose and coast on the occasion of the recent eclipse of the sun have almost spontaneously resulted in the formation of an astronomical association. Just prior to the eclipse a pamphlet of information relative to it was issued from the Lick Observatory and was widely read and followed by the many photographers and amateur astronomers, and the community of interests of last month led to friendly relations and intercourse. During the first week these culminated in the initiatory steps being taken toward the formation of the Astronomical Society of the Pacific Coast [sic], as first suggested in the field on January 1st."

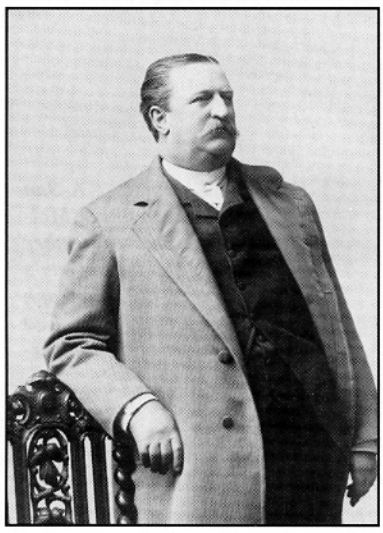
The editor showed his ignorance of the West by locating the Society in San Jose rather than San Francisco; but the note did bring the Society's existence to the attention of a wider circle of amateur and professional astronomers. A letter Holden wrote to *The Observatory* magazine in England had the same result.

Inquiries and requests for membership began coming in to Holden and Burckhalter. On March 1 Holden wrote to the secretary: "...I am sure the Society will grow naturally and easily." His optimism was justified when a request for life membership arrived from William Alvord, the president of the Bank of California. Holden replied to him: "I will, with the greatest pleasure, propose your name for life-membership in the new Astronomical Society, and I think it very kind of you to write me to this effect. You may be sure that the Society is going to be a success."

On March 30, 1889, the Society held its first regular meeting, in the rooms of the PCAPA. Fifteen new members were elected, including Alvord, Armin O. Leuschner (then a 21-year-old graduate student at the University of California, and later to become a noted astronomer), and Rosa O'Halloran (a San Francisco journalist and the first female member).

The members elected a Board of eleven directors: Alvord, William Boericke, Burckhalter, W. C. Gibbs, C. Mitchell Grant, Holden, Molera, William Pierson, Schaeberle, and Frank Soulé (professor at the Students' Observatory in Berkeley). Holden was confirmed as president, and three vice-presidents (in accordance with the bylaws) were also elected: Pierson, W. H. Lowden, and Soulé. Two secretaries (Schaeberle and Burckhalter) were chosen in order to have one at Lick and one in town; and Molera was confirmed as treasurer. A Finance Committee and a Publications Committee were also set up. These two committees have continued — in evolving form — to the present day.

At this meeting Holden delivered a long address on "The Work of an Astronomical Society" (which was soon published in the Society's journal). In it he re-



William Alvord. President of the Bank of California, Alvord was elected to membership in the A.S.P. during its first regular meeting on March 30, 1889. At that meeting, he was also elected to the Society's first Board of Directors. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

emphasized what he had written to Burckhalter a few weeks earlier: "The main point is that the non-professional members shall take an active interest in it, and I think that they will." He remarked upon the great diversity in backgrounds of the members, and hoped that "every class will find a sphere of action in our programme, a stimulus in our proceedings, and a support in our friendly organization." The professional astronomers would benefit by having to explain their work to a lay audience; the amateurs with telescopes would get suggestions as to how best to use their equipment for pleasure and useful results; the photographers would contribute their expertise; some members might have time and energy to devote to the computations necessary to reduce others' observations; and the learners would have ample opportunity to read, listen, and observe. Holden felt very strongly that "meetings should never consist of mere lectures, no matter how interesting. There should be discussion, questions, remarks, interchange of ideas, contact of active minds."

One of the first projects he envisioned for the Society was the creation of an astronomical library, which would be available to all members, and he suggested a list of basic books. The Society should also produce its own publications, which it would give to members and exchange with other astronomical institutions. These publications might include summaries of work at Lick Observatory, but also observations and papers from amateur members, and perhaps translations and reprintings of important papers in other journals. "We should be extremely careful to make our publications fully worthy of the society." He also remarked that "the observations and communications from the amateur members of the society should always constitute the greater part of the publication." But almost from the start this was rarely the case, and at the beginning the Lick astronomers contributed most of the articles. Holden himself wrote many of these, to the point where some of his enemies accused him of making the *Publications* a personal vehicle for self-promotion. But it seems more likely that he merely wanted to insure the success of the Society by keeping the *Publications* active.

Holden concluded his talk with several practical suggestions of projects for the amateur members: photography of the Sun, visual study of the Moon's surface, timing occultations of stars by the Moon, recording the eclipses of Jupiter's satellites, experiments on photography of the zodiacal light, the aurora, and the Milky Way, and the observation of variable stars. If some of these things are done, he said, then "we may look forward to a career of real usefulness not only to our members, but to the science of Astronomy."

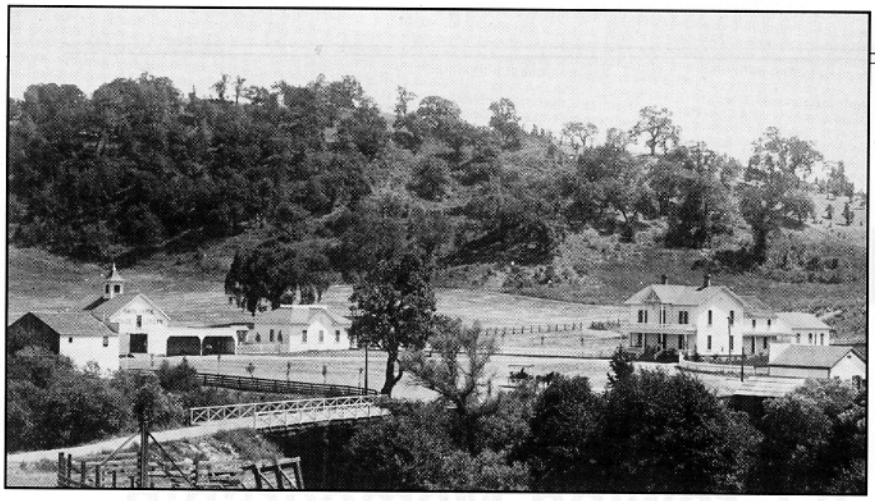
Chapter 3:

A Meeting at Lick and a Growing Membership

The next regularly scheduled meeting of the new Society was held on May 25, at Lick Observatory. A trip to Mount Hamilton in 1889 was no trivial task. Members had to take early morning trains to San Jose, where they were met by stage coaches. They were instructed that "the start from San Jose should be made very promptly at ten o'clock, in order to arrive at Smith Creek [a hotel and livery stable part way up the mountain] about half past one. Here, dinner can be had, and by starting promptly, the summit can be reached about four o'clock." (Today the same trip is made by automobile in two hours or so.)

Once the group arrived at Lick, the directors held a meeting in the library, and the Society meeting followed immediately. From seven until ten o'clock the telescopes were open to visitors; Society members could stay after the other visitors left, and observe other

An advertisement in Sunset *magazine July 1902 placed by the Hotel Vendome to attract visitors to Lick Observatory. (A.S.P. archives)*



Smith Creek Hotel near Mt. Hamilton around the turn of the century. This is where most — but not all — of the A.S.P. members who participated in the Society's first outing to Lick Observatory spent the night after their time at the telescopes. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

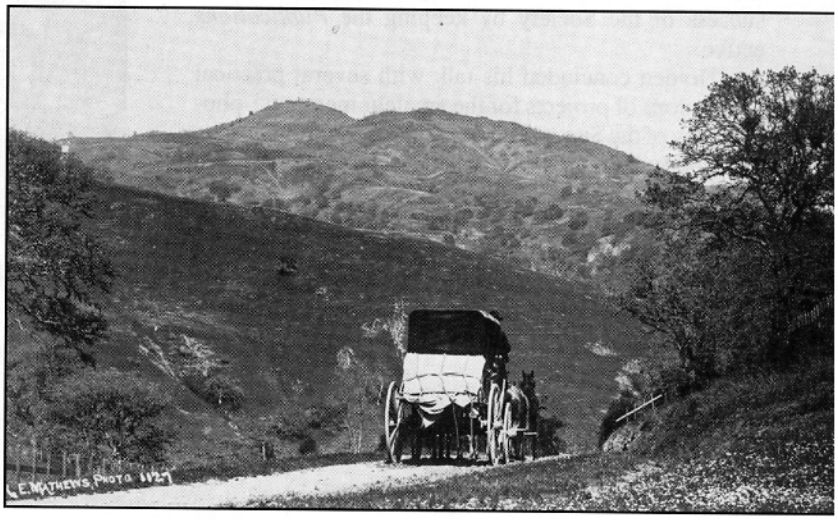
objects. Some members were invited to stay overnight in the residences of the astronomers; those who could not be so accommodated were asked to leave the mountain about 11:30 and return to Smith Creek, where rooms would be ready for them at the hotel. The total cost of the trip for each member (train, wagon, meals, hotel) was around $8.

About thirty-five members made the trip and attended the meeting. Ten new members were elected; Pierson presented a paper on the Sun's corona; objects such as Saturn, Uranus, and the Ring Nebula were observed with Lick's 36-inch refractor. Burckhalter later wrote a letter of thanks to Holden and had high praise from the members "for the Lick Observatory and the 'astronomical brigade of good fellows.' " Only one thing upset him: a few members who had not been invited to spend the night on the mountain stayed anyway. He commented to Holden that "these members showed bad taste in not going. They won't do it again!!! ...I shall not hesitate to tell would-be Observatory campers, that it isn't just the thing to turn the Observatory into a dormitory."

Burckhalter also commented on the continued support of many of the members. On May 27 he received a $100 check from William Alvord for two more life memberships, for his wife and his son. "He sends it 'thinking our young society may be in need of funds' etc." Alvord could well afford such generosity: he was president of the Bank of California, and a distinguished former mayor of San Francisco.

Alvord's service to the A.S.P. included being on the Board of Directors from 1889-1894 and again in 1897, when he was elected the Society's eighth president. From the beginning he actively recruited new members. He urged that reports of the A.S.P. meetings should be given to the daily newspapers, and especially to the Evening Bulletin, for "it is from its readers we are more likely to gain new members, than from the readers of the morning press."

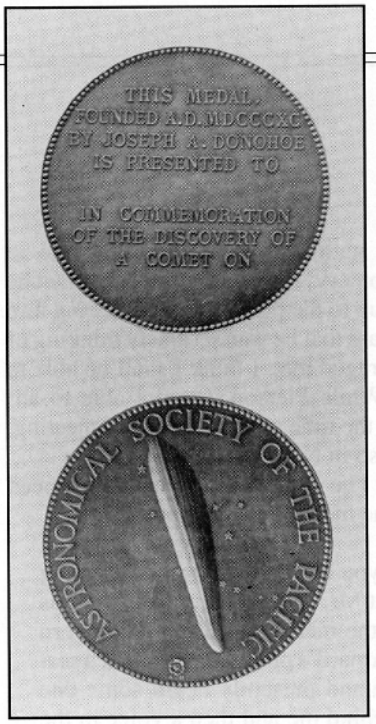
In that first year of the Society's life, Alvord wrote Holden that he had sent card circulars soliciting membership "to men who are easily able to subscribe for several Life Memberships and I hope good results will follow." He sent out over fifty of them, "sending them in stamped envelopes to the residences of those addressed. Sending to places of business is not a good plan, for they are likely to be thrown in the waste-basket without being read." (Human nature seems not to have changed much.) In late July the Society met again at Lick, and elected more new members for a total of 120, eighteen of whom were life members. The list included prominent San Francisco citizens such as Colonel Charles F. Crocker, Charles S. Cushing, Alexander Montgomery, D. O. Mills, Joseph A. Donohoe, and others. In geographical spread, the Society now reached Nevada and Mexico, as well as California. By the end of the year there were also members from Pennsylvania, New York, New Jersey, Massachusetts, Canada, England, and even Venezuela, bringing the membership to 178.



A stagecoach en route to Lick Observatory in the early days. While indistinct in this photograph, the Observatory is on the highest point on the horizon, the summit of Mt. Hamilton. Readers familiar with Lick Observatory today will note that the character of the mountain's foliage has changed dramatically during the last century; the slopes are now more densely forested. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

Chapter 4:

Medals and Endowments



The Donohoe Comet Medal. (Photograph from the January 25, 1890, Publications of the A.S.P.*)*

At the July 1889 meeting of the Society, President Holden announced the first of what was to become a number of medals and prizes awarded by the Society. Joseph A. Donohoe, a wealthy San Francisco businessman, had donated $500 to endow a bronze "Comet Medal", to be awarded to the discoverer of each new comet. The directors accepted his gift with thanks, named him a life member, and laid out a set of guidelines for the award of the medal. It was to be given to "the actual discoverer of any unexpected comet," who was expected to notify the director of Lick Observatory, giving the exact time of discovery, the comet's position and motion, and its appearance.

Donohoe was in Paris in the summer of 1889, and chose a design for the medal, which was illustrated in the *P.A.S.P.* By late September the dies were being made. The first medal was awarded in March of 1890 to W. R. Brooks of Geneva, New York. From then on several medals were generally given each year. Donohoe died in 1895, but the Comet Medal Fund supported 250 awards until 1950, by which time comet discoveries had become so frequent that the Donohoe Comet Medal had to be discontinued. (The 250 medals are now collectors' items, and many recipients or their families have written to the A.S.P. to say that the medal is a prized family possession.)

During the first year of the Society's existence, another member, William M. Pierson, was also busy behind the scenes on behalf of the A.S.P. Pierson was a prominent San Francisco attorney, who had drawn up the A.S.P. Articles of Incorporation, signed by the officers on August 28, 1889. One of Pierson's greatest services to the Society was to obtain a $2,500 gift from Alexander Montgomery, a San Francisco philanthropist.

In August 1889 Pierson wrote to Montgomery as follows:

> "My dear Mr. Montgomery,—
> I want to enlist your great public spirit in behalf of science. You have been most generous in the cause of Christianity: I ask your cooperation in the interest of scientific research. I have the honor to be the first Vice President of the Astronomical Society of the Pacific of which Professor E. S. Holden, Director of the Lick Observatory, is President. The Society is a most active and enthusiastic one. Many of its members, particularly its life members, are prominent and wealthy citizens... Mr. Joseph A. Donohoe has just founded a medal to be awarded by the Society for the first discovery of comets. Mr. C. F. Crocker has just equipped an expedition for the purpose of observing the solar eclipse in November next. Honorary stimulus of this kind is most important in scientific work.
>
> Out of the great goodness of your heart and your love of all true progress, let me be able to report to our September meeting that you will found a gold medal to be known as the "Montgomery medal" of the Society to be awarded to the author of the most valuable paper on an astronomical subject read before the Society during each year...
>
> I would very much like to confer with you on the subject. I know you have many calls on your purse but I believe that none outside of charity would be productive of greater results in a rapidly advancing science than this."

William M. Pierson. Attorney Pierson drew up the initial Articles of Incorporation for the Society in 1889. (Portrait from the A.S.P. archives.)

Pierson did meet with Montgomery, and wrote to Holden: "[Montgomery] told me that he feared that he was not educated up to the point — but on seeing him a second time he said that he was seriously thinking of it and quite encouraged me. I think I shall be able to accomplish it." While Pierson was not able to announce the gift by the time of the September meeting, he was able to do so in November.

On December 1 he wrote to Holden, who had been unable to attend the meeting the day before:

> "I telegraphed you last night about our meeting and the fact that Mr. Montgomery had given us the money for the medal... During the lantern exhibition of Barnard's photographs I took a seat in the audience and presently heard some one taking a seat behind me and then a voice in the dark 'Mr. Pierson, you can have that money for the Society' — at the same time handing me my letter to him. He added 'You think $2000 would be enough but you had better make it $2500. Send for the money as soon as you want it.' I, of course, thanked him and afterwards on announcing it to the meeting we all rose to give him our thanks. The announcement was a great surprise and elicited a good deal of enthusiasm."

Holden must have had somewhat mixed feelings on receiving this news. On the one hand, such a generous gift was a great asset for the youthful Society, but on the other, Holden had already made clear to colleagues his feeling that the Society was too new to begin awarding medals. He did not want to diminish the value of such an award by having it come from an organization nobody had ever heard of. He and Pierson had evidently discussed this, for the latter continued: "I think that Mr. Montgomery will allow us to use this gift in any way that we desire."

Pierson suggested using half the income for a medal and the rest "either for books or some other purpose." In any case, he felt that the Board should meet soon and discuss the possibilities: "Mr. Montgomery's health is not of the best and I deem it nice to obtain this fund as soon as possible."

At the December Board meeting, Holden worked hard to persuade them to his point of view. He was successful, and after much discussion the Board voted in favor of using the income for the "Alexander Montgomery Library" of the A.S.P. Holden wrote Pierson to thank him for his role in securing the gift; Pierson replied: "I am obliged to you for your kindness in considering my service in the matter but it is too trifling to merit it. I feel very much as Mr. Montgomery did when I endeavored to express my thanks for his gift. He simply said 'Now, my boy, don't strain yourself'."

Montgomery died in 1893, having seen the Montgomery Library grow considerably. Over the next decade it expanded to a total of 1,350 bound volumes, and almost as many unbound pamphlets and magazines. Unfortunately, the great San Francisco earthquake and fire of 1906 destroyed the Society's headquarters, all its records, and the entire library. (See Chapter 8.) The collection was gradually rebuilt, however, in the succeeding years.

In late April of 1889, Holden had written on behalf of the A.S.P. Diploma Committee to P. R. Calvert of Nashville, Tennessee (the brother-in-law of Lick astronomer E. E. Barnard), asking for designs and a sketch for a diploma (membership certificate). By July the committee had a design which they recommended to the Society at its September meeting. It was described as follows:

> ...the centre of the upper panel contains the Sun, the Moon and the Corona of January, 1889. To the left and right of this are the symbols of the eight major planets. The twelve medallions of the lower panel include the twelve Zodiacal signs, copied from the beautiful designs of Mr. Vedder. The right hand panels represent first, the great comet of 1858, and second, the configuration of the Constellation of Orion. The stars of this constellation may stand for the stellar universe; while they also remind us that the central star of the sword-handle is the nucleus of the grandest of all the nebulae. The drawing of the Muse of Astronomy — Urania — in the left-hand panel is copied from the antique statue of the Vatican. The national coat of arms in the upper left-hand panel

The A.S.P. membership certificate (or "diploma" as it was called in 1889) of Charles Burckhalter. (Courtesy of Carter Roberts and the East Bay Astronomical Society)

designates the country in which the Society has its seat, and to which the work of our members should bring increasing honor as time goes on.

The Society adopted this design, and five hundred copies were ordered to be printed. By mid-October they were ready, and were signed by President Holden and the two secretaries, Schaeberle and Burckhalter. The diploma continued to be issued over the next two decades to all new members. Today, very few copies of the original diploma remain in public and private archives, and a much smaller membership card has replaced them as the Society's membership has grown into the thousands.

Chapter 5:

Continuing Growth

By the time of the second annual meeting of the Society in March of 1890, President Holden could point with pride to the activities of the past year. In his address as retiring President, he noted that as of that date the Society had 192 members, distributed geographically "from London to Venezuela, from Mexico to British Columbia, and in the United States from Boston and New York to California." In addition, almost 100 observatories and libraries around the world were receiving the *Publications of the A.S.P.* These *Publications* had chiefly contained the work of Lick Observatory astronomers and students, but Holden still hoped to get papers from elsewhere, and especially from the amateur members.

The Society had benefitted from the gifts of Donohoe and Montgomery. Other members had made substantial contributions to astronomical research, such as Col. C. F. Crocker's expedition sent to South America to observe and measure a solar eclipse in December 1889. Holden urged the members to "help to place before the people of our State, directly and indirectly, the purposes for which observatories are founded and the problems which astronomy has now to consider... The members of the Society already exert a very wide personal influence to increase the general interest in astronomy, and this will grow from year to year."

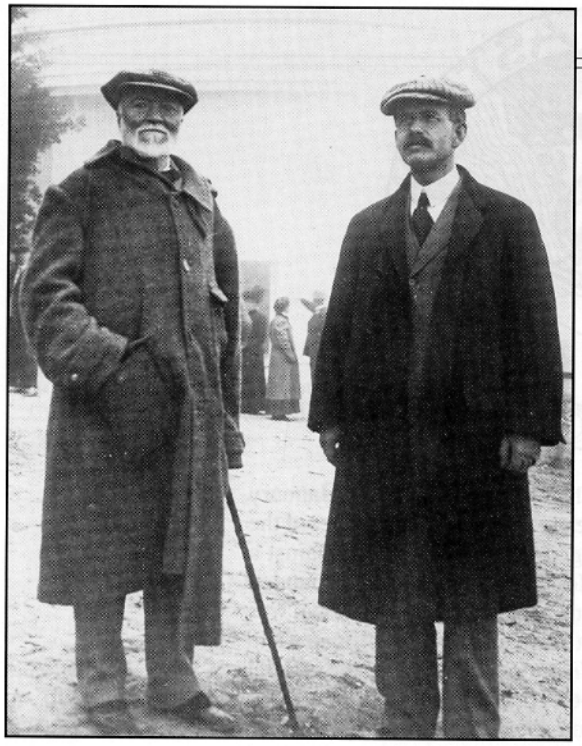
At the same meeting, the Society voted to solicit a design for a Society seal. During the ensuing year, W. Lewis Fraser, Art Editor of *Century Magazine,* supervised the design, and the seal was adopted on January 31, 1891. It showed the god Mercury (messenger of the heavens) with his winged feet and his staff, against a background of stars, Moon, and clouds and surrounded by a rim bearing the name of the Society. This seal was immediately added to the membership certificates and to the cover of the *Publications,* as well as to the official A.S.P. stationery and other printed materials. The same design was still in use on the *P.A.S.P.* in 1970, with the founding date below it; since then a slightly modernized and redrawn version has been used.

The original seal of the Astronomical Society of the Pacific. (A.S.P. archives.)

Holden felt that the presidency of the Society should pass to one of the amateur members, William Pierson, and he wrote to Treasurer Molera to that effect in October 1889. Molera's reply was quick and vehement: "I cannot grant your request, i.e. to aid you in nominating, canvasing [sic] or voting for any person for President of the Astl Sc, excepting Edward S. Holden. It is no use for you to argue with me, I am a Catalonian... Now I take an uncompromising stand: I will not aid you in any way, and will fight you in this matter tooth and nail. If you are reasonable and consent to serve the coming term, then I promise next year to let you have your own way." Holden evidently gave in, for he was re-elected at the 1890 annual meeting to a second term as president.

Molera, who was trained as a civil engineer, was a charter member of the A.S.P. and its first treasurer; but he resigned this position in June 1890, after some aspersions had been cast on his bookkeeping methods. These complaints may have been justified, if the following note (now in the Lick Observatory archives) from Molera to Holden about a bill is any indication: "Yes: I paid the bill, but it does not appear in my check book as I paid you cash when eating an oyster omelette at Govey's restaurant. It is marked on the bill. — I did not think that that excellent dish would take your memory off." Molera did, however, continue on the Board of Directors of the A.S.P. for over a decade, and served as a vice-president for four years, and as president in 1893.

In November 1890, another step towards broadening the Society was taken with the amending of the bylaws to permit the creation of local Sections. This option permitted groups of A.S.P. members living in the same area to work more closely together and to have regular meetings. A group of nearly 30 members in the Chicago area, organized by George Ellery Hale, formed the first such Section. Holden recognized the advantages of such close association of members, as well as the potential danger that a Section might become too in-



By 1893, the Society's membership of 493 included not only prominent astronomers like George Ellery Hale (right) but powerful figures from other walks of life such as his benefactor Andrew Carnegie (left). (Photograph courtesy of the Mount Wilson Institute.)

dependent. But he felt that if such groups were "tolerably large and likely to be active" they should succeed, and he commended the Chicago Section as "an admirable model."

One of Holden's main concerns at this time was the *Publications*, since these formed the sole contact with the Society for the 140 or so members not located close to San Francisco. "Their scope must be as wide as the interests of the individual members, and their quality should be of the highest...we should strive to be as simple as practicable, as rigorous as the subject demands, as lucid and clear as it is possible to be, and entirely fearless and fresh." He felt that the first two years of the *Publications* pointed the direction to go, and was pleased to have articles from authors not just at Lick, but from all over. His only disappointment was that the local newspapers had not picked up and reprinted any of these, and he speculated that perhaps "they need another dilution before they can be used in this most useful way."

F. R. Ziel in 1895. Ziel, who became the Society's treasurer in 1891, sent bill collectors after some members who fell behind in their dues. The Society no longer continues this practice. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

At the end of his second year as president, Holden again gave a retiring president's address (and this time he really did retire), pointing to the growth of the Society from 40 to 360 members in two years, with 26 states and 15 foreign countries represented. The next several years saw a steady increase in the Society's membership and activities. By 1893 there were 493 members (a high not exceeded till 1926). These included well-known astronomers such as G. W. Ritchey, and David Gill; rising young astronomers like W. W. Campbell and F. H. Seares; and wealthy lay members such as Charles F. Crocker, John Dolbeer, Andrew Carnegie, Mrs. Phoebe Hearst, Baron Albert von Rothschild, and members of the Spreckels family.

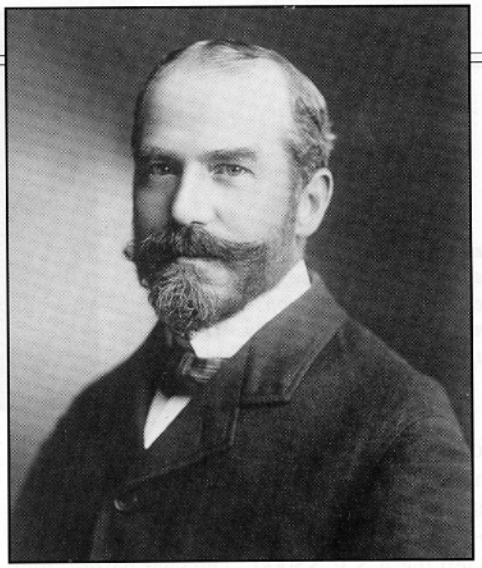
This large membership was achieved despite the fact that quite a few of the original founders dropped their membership after a few years. For example, the photographers of the PCAPA found, in many cases, that astronomy was not their first love; Archie Treat left the Society in 1891, and several others followed suit. F. R. Ziel, the new treasurer who succeeded Molera in 1891, set to work trying to collect back dues from some of the delinquent members, even sending bill collectors after some of them; this must have hastened the departure of those not deeply committed to the A.S.P.

Charles Burckhalter's enthusiasm for the growth of the Society continued unabated during its first several years. When Professor David Gill of South Africa and noted amateur John Tebbutt of New South Wales joined in March of 1890, Burckhalter wrote jubilantly to Holden: "Dr. Gill's praise is certainly something to be proud of, for he is none too liberal with it as a rule... This now gives us members on every continent. I am, however, becoming impatient at the indifference of Afghanistan and Upper Egypt." He returned periodically to this theme, which must have been a standing joke between him and Holden. In August of 1890 he wrote: "I see Brazil has come in out of the wet. This revives my hope of Afghanistan." In May of 1891, "Afghanistan is looming up! I note your last candidate — H. Barrymore Harrison, Jask, Persian Gulf." But in March of 1892, "We have members in 23 foreign countries... I am in the dumps now about Afghanistan. Do you know anyone there? I'll pay his first year's dues if you can get him." Despite this offer, and the addition of 61 new members during 1892, no resident of Afghanistan came forth. But the international character of the Society has continued throughout its history.

President Pierson, at the conclusion of the Society's third year, commented that "The Society has steadily advanced from its feeble beginning, and today finds itself a permanent, a practical and a prosperous organization." He went on to urge even more support from the members: "If each of us would introduce one new member during the coming year, the Society would be enabled to greatly extend its sphere of usefulness and its advantages to science and to ourselves."

As an amateur, Pierson wanted particularly to en-

courage the Society to instruct and aid the non-professional members. He wrote: "The difficulty...that I, as a novice, first encountered in astronomy was that, after understanding the general outlines of its descriptive department, I was at a loss where to begin or what to do in the way of observation." He proceeded to make some suggestions for other amateurs: choose a specific goal to pursue, and be sure to "make notes at once of what you observe, with all the details possible. Trust nothing to your memory... Remember that celestial phenomena occur but once, and you may happen to be the only person to have observed that one." Photography offered another way in which amateurs could make useful contributions. And with all this, he counseled patience: "Do not expect to discover a planet or a comet the second night you observe." This is still good advice today!



Malcolm McNeill in 1897. McNeill, a professor of astronomy at Lake Forest, wrote the popular-level "Planetary Phenomena" in the Publications of the A.S.P. *from the column's inception in 1894 until his death in 1923. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)*

Chapter 6:

Challenges and Difficulties

The year 1893 saw the creation of a second A.S.P. Section, in Mexico City. Much of the impetus for this probably came from Molera, who visited there early in the year. He was impressed with the facilities of the National Astronomical Observatory at Tacubaya, and praised the expertise of its seven staff members. He felt that Mexican members would benefit greatly by the frequent meetings which would ensue as a result of their organization into a Section, and also by the receipt of the *P.A.S.P.*, although they "are printed in a language foreign to their vernacular." He concluded that "The Mexican Section of our Society is ... in good hands, and its success is assured."

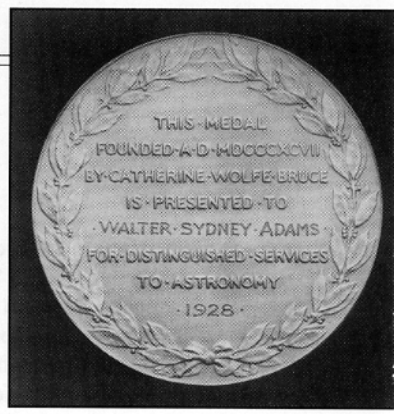
But despite his confidence, the existence of Sections seems to have been an idea that did not prove effective. By 1905 the *Publications* stopped listing the Chicago and Mexican Sections, as they had done up until that time, presumably because they were no longer active.

During the 1890's the *Publications* appeared bimonthly, as they continued to do until 1983, when they became monthly. In 1894 Holden added a "Planetary Phenomena" column, primarily for the benefit of the amateur members, which was written for thirty years by Malcolm McNeill. McNeill, a professor of astronomy and mathematics at Lake Forest, Illinois, had been writing such a column for *Popular Science News*, and Holden inquired if he would be interested in doing a similar one for the *P.A.S.P.* McNeill replied, "I shall be delighted to do so... I should think that something a little more extended, and not so absolutely elementary, might be better suited to the needs of anyone who takes enough interest in Astronomy to read the A.S.P. publications."

McNeill continued to write this column until his death in 1923; it was then produced by Carlos S. Mundt and Hamilton M. Jeffers, and replaced in 1928 by a more general column entitled "Aspect of the Heavens". This column then ran in every issue of the *P.A.S.P.* through 1960, with various authors, especially C. H. Cleminshaw of the Griffith Planetarium in Los Angeles. In 1961 it was replaced by a summary for the year, published in the small format of the A.S.P. *Leaflets* (which had begun in 1925), called "The Heavens in 1961". This continued to appear each year through 1971, when the *Leaflets* were discontinued and replaced by *Mercury* magazine. Today, A.S.P. members get their sky information from the *Sky Calendars* produced by the Abrams Planetarium in Michigan.

By 1894 the Society was having financial difficulties, in company with the rest of the nation. In April Burckhalter wrote to Holden: "There is an absolute famine of news except that business is growing visibly worse — and that is not news. It will have a bad effect upon the A.S.P. It will make the collecting of dues difficult and new members hard to get, but like other sufferers I live in hopes of better times." The cash balance in the Society's general fund was $378.39; membership dropped from 482 to 433 during the year; the *Publications* were a costly expense (though in that year they received second class mailing privileges).

The Board of Directors approved a proposal to use the Life Membership Fund (which had until then been invested and only the interest used for current expenses). In 1896 the treasurer was authorized to draw up to $300 from this fund if needed. However, problems continued, so that by 1900 the cash balance was $35.09, and membership was down to 291. In 1902 things became so bad that individual members had to come to the rescue. Alvord gave $100 toward current expenses, and Pierson offered to bear the Society's deficit for the year. (At the end of 1902 the cash balance was an astronomical $2.28.) But finances continued in



The Bruce Medal. Endowed in 1894 by Catherine Wolfe Bruce, it has become one of the most prestigious awards for contributions to astronomy. (Photographs from the A.S.P. archives.)

a precarious state for some years yet, and, as we shall see, financial straits would be a recurrent problem for the Society through its history.

Two bequests helped somewhat. In 1904 Alvord died, and left the A.S.P. $5000. The year before, John Dolbeer, a member who had done very well in the lumber business, also willed $5000 to the Society. These bequests were invested, and the income from these helped keep the A.S.P. afloat.

The original bylaws had called for six meetings of the Society per year: three in San Francisco and three at Lick. By 1895 the Lick meetings were becoming fewer, and in some years (for example, 1897 and 1901) there were no meetings there, due to lack of a quorum. The difficulties of the journey up the mountain deterred many members from going. In 1903 the bylaws were changed to specify three meetings in San Francisco and two at Lick; but already this was out of date with current practice, and Lick meetings occurred only sporadically. In 1909 the bylaws were again amended, to an August meeting at Lick and four San Francisco meetings each year. Though Lick meetings were only held in 1911 and 1917 during the next decade, the policy of at least four meetings in San Francisco or nearby continued in force through the 1920's.

At these gatherings some business typically was transacted, such as the election of new members, and then one or more papers were read to the assembled group. Frequently these were illustrated with lantern slides; they usually dealt with some aspect of astronomy being pursued by the professional members. Often these papers were later published in the *P.A.S.P.*, and served to show the fields of active interest — for example, the planet Mars, comets, or some new observing techniques. Occasionally a member would describe a recent trip to a foreign observatory. Presumably discussion followed these talks, as did socializing.

But, more and more, the business of the Society would be conducted through the mails and through the *Publications*. Today, with members scattered in 50 states and over 70 other countries, we take it for granted that only a small fraction of the Society's members can attend any meeting and that the Society's work must be conducted through the postal systems and the electronic mail networks that now connect the research institutions and astronomy enthusiasts of the world.

Chapter 7:

The Bruce Medal

A major event for the A.S.P. occurred in 1897, when Miss Catherine Wolfe Bruce of New York City endowed a gold medal, to be awarded to "that astronomer whose work has most deserved it." Miss Bruce had inherited a fortune from her immigrant father, and was a generous philanthropist to many causes, including astronomy. She previously had made gifts to Holden for Lick Observatory, as well as to other astronomers, such as E. C. Pickering of Harvard and Max Wolf of Germany.

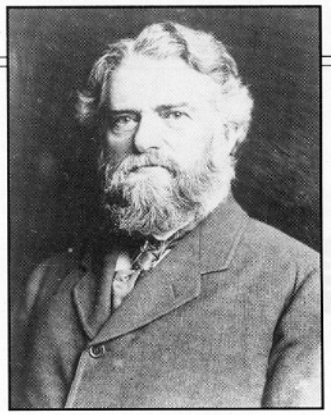
Holden solicited her interest in establishing an A.S.P. medal, which she agreed to do, on the conditions that it should not be restricted to American astronomers, and should be given "for distinguished services to astronomy only when a suitable candidate can be found." The A.S.P. Board of Directors was to select the recipient from a list of one to three nominees presented by the directors of each of six observatories, three American and three foreign. (At first these were Lick, Harvard, Yerkes, Paris, Greenwich, and Berlin).

In announcing this gift to the members, Holden wrote: "...not only will the Bruce Medal tend to the advancement of Astronomy, and enable the Astronomical Society of the Pacific to adequately recognize scientific work of the highest class (and these are Miss Bruce's only desires), but it will forever connect the name of the founder with the progressive advances of Astronomy... The time will soon come when the Bruce Medal will be one of the most highly prized recognitions of original and useful service to Astronomical Science."

The first Bruce Medal was awarded in 1898 to the dean of American astronomers (and Edward Holden's mentor) Simon Newcomb. Since then it has been given a total of eighty-two times (as of 1989), and has indeed long been regarded as one of the highest honors in the field of astronomy. Miss Bruce died in 1900, and the *P.A.S.P.* noted her passing by quoting from her

obituary in the *Astrophysical Journal:* "Miss Bruce has...endeared herself to men of science at home and abroad, aiding as perhaps no other has done the progress of research. Recognizing no national boundaries, giving assistance where it was most needed, and seeking no fame for herself, Miss Bruce may well be regarded as one of the most sympathetic and generous patrons astronomy has ever known... Astronomers in almost every country of the civilized world...will sincerely mourn her loss."

Miss Bruce would be pleased with the success and prestige of her Medal. The recipients have been truly international (45 from the United States and 37 from foreign institutions such as the observatories of Leiden, Berlin, Paris, Stockholm, Greenwich, and the Cape (in South Africa), as well as Moscow's Sternberg Astronomical Institute, and many others). The list of Bruce Medalists could be used to summarize the achievements of twentieth century astronomy: Harlow Shapley and his work on our location in the Milky Way Galaxy; George E. Hale on the mechanisms of the Sun's activity; Arthur S. Eddington's and S. Chandrasekhar's contributions to our understanding of stellar structure; Henry Norris Russell on stellar evolution; Edwin P. Hubble on the distances to galaxies; Walter Baade's delineation of two populations of stars; Grote Reber's and I. S. Shklovsky's pioneering work in radio astronomy; Allan Sandage on the large-scale structure of the universe; Jan H. Oort and Bart J. Bok on the structure of the Milky Way; Riccardo Giacconi on x-ray astronomy; Fred Whipple for the theory of comets; and all those others whose work has been fundamental in shaping our present view of the cosmos.



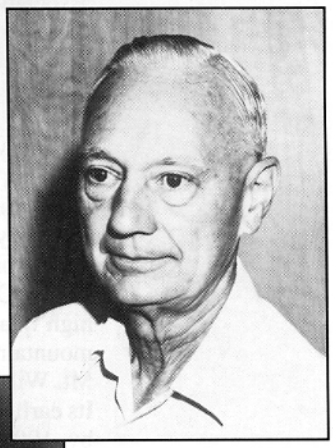
Simon Newcomb, who was awarded the Society's first Bruce Medal in 1898. (Photograph courtesy of Yerkes Observatory.)

The A.S.P. Board has taken care over the years to preserve the international balance of the nominating observatories and of the Medalists. Substitutions can be made in the list of nominating institutions (no more than one change per year), as long as three are foreign and three American; but they now include universities and institutes of theoretical astrophysics as well as observatories. The Board currently rotates one new institution onto the panel every few years, to insure a broad spectrum of representation by the astronomical community. (For more on the Bruce Medal and a complete list of medalists, see the article by Joseph Tenn in the "For Further Reading" section.)

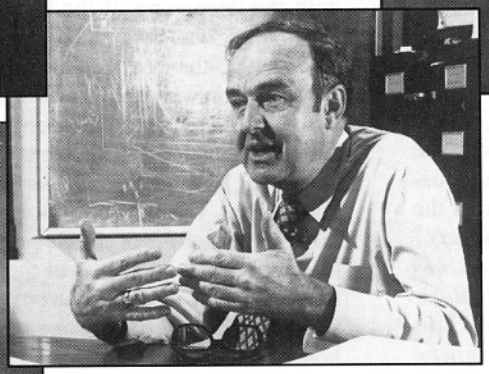
A montage of Bruce Medal winners

Harlow Shapley (photograph by Frank Hogg, coursesy of Helen Sawyer Hogg and Owen Gingerich)

Jan Oort (AS.P. archives)

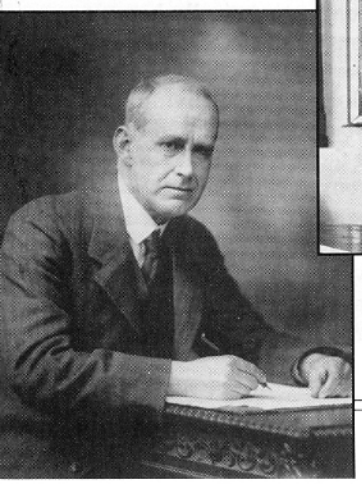


Grote Reber (A.S.P. archives)



Allan Sandage (courtesy Hale Observatories)

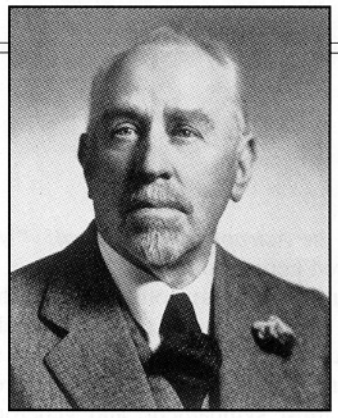
Henry Norris Russell (photograph courtesy Yerkes Observatory)



Arthur Stanley Eddington (A.S.P. archives)

Chapter 8:

Membership Drives and an Earthquake



Charles S. Cushing. Cushing was an attorney who was a staunch supporter of the A.S.P. He joined the Society in July of 1889, served on its Board of Directors for 45 continuous years, and was its president for two terms. (Photograph from the April 1946 issue of the Publications of the A.S.P.*)*

In 1897 Holden resigned as Director of Lick Observatory, as well as from the A.S.P. Board, on which he had served since the founding of the Society. His departure was the climax of a long period of difficulty in getting along with his staff members on the mountain, most of whom did not respect him as a scientist and found him arrogant and overbearing. Complaints to the University of California Board of Regents eventually forced his resignation; he left for the East Coast, where he was presently hired as librarian at West Point, a position he held until his death in 1941. (For more on Holden's life and contentious career, see the article by Donald Osterbrock in the "For Further Reading" section.)

With Holden's departure, the almost exclusive association of the A.S.P. with Lick Observatory began to lessen, and the Society's focus became broader. In 1899 the *P.A.S.P.* began a column of "General Notes," to cover astronomical work done elsewhere than at Lick. In 1905 the column "Notices from the Lick Observatory" became "Notes from Pacific Coast Observatories," primarily due to the founding and rapid growth in importance of the Mount Wilson Solar Observatory near Pasadena in southern California.

George Ellery Hale, formerly director of the Yerkes Observatory in Wisconsin, had recognized the high quality of the sky conditions on Pacific Coast mountain tops, and had founded the observatory on Mt. Wilson in 1904 as part of the Carnegie Institute. Its earliest instruments were two solar telescopes, but by 1908 Hale also had a large (60-inch) mirror mounted for stellar use.

Hale, a member of the A.S.P. since 1890, joined the Society's Board of Directors in 1905, "with the understanding, necessarily, that it will be rarely possible for him to attend the meetings on account of the distance between Mount Wilson and San Francisco." Hale served on the Board for twelve years, and was also a frequent contributor of articles to the *Publications* on the work being done at Mount Wilson. This included his own important discovery of the magnetic fields in sunspots, made in 1908.

During the period of financial difficulties described earlier, a letter went out in 1903 to all members of the Society concerning the necessity of increasing the membership of the A.S.P.: "For some years membership has remained stationary, if it has not actually retrograded; while at the same time there has been a great increase in the population of our State. There are doubtless many who would be glad to join if we could place ourselves in touch with them... This letter is addressed to you because we know that you can assist us in increasing our membership..." The letter was signed by three important leaders of the Society: attorney Charles S. Cushing, Charles Burckhalter, and Armin O. Leuschner of the Students' Observatory at the University of California at Berkeley.

Charles Cushing was a staunch supporter of the A.S.P. who had joined the Society in July 1889, only five months after its founding. He served continuously on the Board of Directors for 45 years (longer than anyone else) and twice held the office of President. Despite his persuasive letter of 1903, however, A.S.P. membership did not increase, but continued to drop very slowly from 260 members in 1903 to 200 in 1915.

Accordingly, in 1916 plans were made for another membership drive, and late in that year some 700 copies of a letter soliciting members were sent out to prospective members, describing the goals, history, and activities of the Society. This effort seems to have had a little more success, as membership jumped to 350 in 1919. The increase continued during the prosperous 1920's, passing a thousand in 1931; but a decline set in after that with the deepening of the Great Depression, and the 1,000 mark was not reached again until 1957.

In 1905 the Board created the title of A.S.P. Patron for "a person who renders distinguished services to the Society." Any Patrons would automatically become Life Members. Seven Patrons were elected: Holden, Donohoe, Montgomery, Miss Bruce, Dolbeer, Alvord, and Pierson. Of these, only Holden was still living at the time. The Patrons of the Society are still listed on the title page of each volume of the *P.A.S.P.* The Society has continued to elect Patrons occasionally over the years; by 1989 thirty-five individuals had received this honor, including Cushing and Hale. The most recently selected Patron is Harold Weaver, a long-time officer and Finance Committee Chair for the A.S.P., of whom we will learn more in later chapters.

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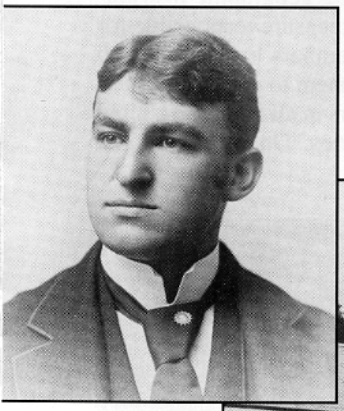
For a Society already struggling with money problems, April 18, 1906 brought a most unwelcome event. Early that morning a massive earthquake struck the San Francisco area, toppling buildings, cracking foundations, and breaking gas and water mains. Fires spread and could not be extinguished due to a lack of water. Over the next few days, the entire business district and large parts of the residential areas of the city burned to the ground, including the California Academy of Sciences Building where the A.S.P. then had its rooms.

The Society lost its entire library, collected over the years by gifts and with the help of the Montgomery fund. It also lost many of the records of its first years, all its *P.A.S.P.* files, and the April 1906 issue of the journal, which was about to be mailed.

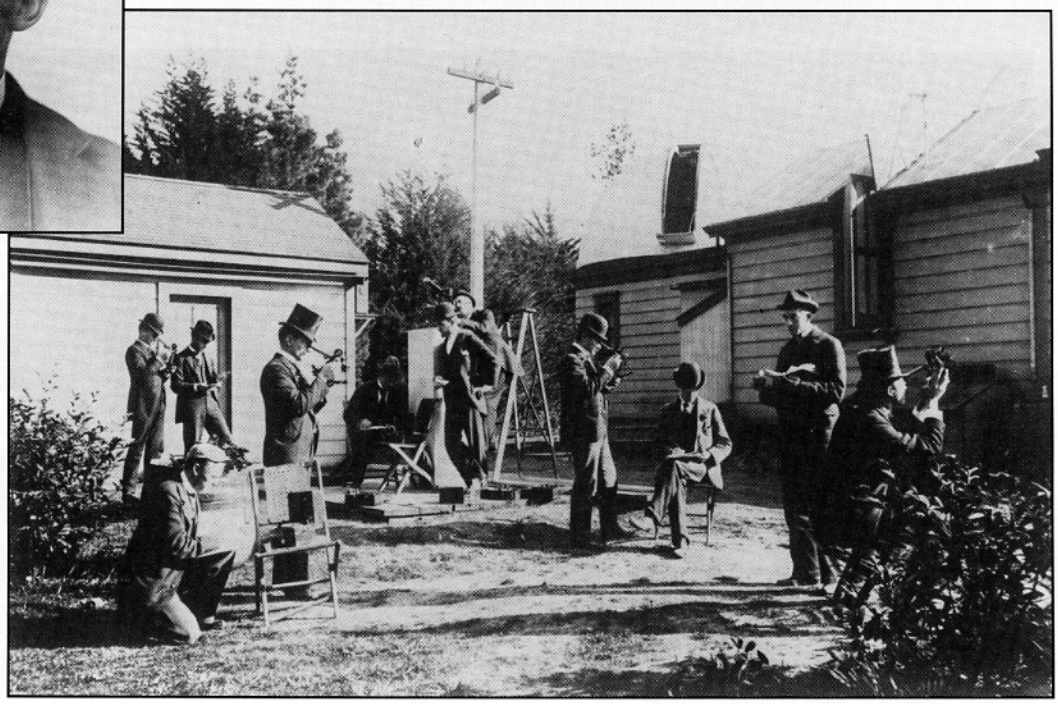
Undaunted, the Society immediately set about recovery. The April issue, of which one advance copy survived, was immediately reprinted in Los Angeles and distributed. In the June issue, President Leuschner addressed a statement to the members: "The first regular meeting of the Society since the California earthquake of April 18th, and the subsequent conflagration in San Francisco, was held on the evening of June 9th. By courtesy of the president of the University of California, the members of the society were welcomed to a temporary home in the Students' Observatory at Berkeley."

After describing the A.S.P.'s losses, Leuschner wrote: "The insurance of $2500, which the society carried on its belongings, in the Academy of Sciences Building, will suffice only for a partial restoration of its property... Nevertheless, the president and the directors are confident that an appeal to be issued to the leading astronomical observatories and societies as well as to authors, will soon give the society a new and valuable library... The present number 108 [of the *P.A.S.P.*] has been unavoidably delayed, but from now on the *Publications* will continue to appear as though nothing had happened."

The Finance Committee reported that the Society's permanent funds were safe, and that a new $500 bequest had just been received. Leuschner also expressed gratitude for the loyal members around the world. He concluded: "The society has lost none of its enthusiasm and will continue to disseminate the results of research in the oldest and noblest of sciences, through lectures and publications, with ever increasing vigor and let it be hoped, effectiveness." For the next several years the Society continued to meet at and operate out of the Students' Observatory, until it obtained new downtown San Francisco headquarters in the Phelan Building in 1909.



Armin O. Leuschner as a young man. Leuschner joined the A.S.P. as a student at the first meeting, and later served the Society as a Director and as President. He was President at the time of the devastating earthquake and fire in 1906. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)



Students' Observatory on the campus of the University of California at Berkeley in 1890. It became the temporary home of the A.S.P. after the earthquake and fire destroyed the Society's San Francisco headquarters in 1906. Students' Observatory was later renamed Leuschner Observatory. (Photograph by O. V. Lange reproduced courtesy of the Bancroft Library, University of California at Berkeley.)

Chapter 9:

Meetings and Lectures

One of the most significant developments for the Society in the second decade of the twentieth century concerned its relations with other societies. In 1912 the Board announced plans for the A.S.P. to affiliate with the Pacific Association of Scientific Societies and the following year the Society held a joint meeting with this association, which in 1914 merged into the Pacific Division of the American Association for the Advancement of Science (A.A.A.S.). The A.S.P. continues as an active affiliate of the A.A.A.S. to this day, with representation on the Astronomy and Education Section Committees.

In August of 1915 the A.S.P. met jointly with the American Astronomical Society in Berkeley for one session of the A.A.S.'s meeting. (Founded nine years after the A.S.P., the A.A.S. is an exclusively professional society, with most of its members in the United States.) At the same time, the A.A.A.S. was meeting in San Francisco, attracted by the Panama-Pacific International Exposition being held there to celebrate the rebuilding of the city after the 1906 earthquake and fire.

At this joint meeting the twelfth Bruce Medal was presented to William W. Campbell. This marked the first time that the honoree had been able to receive the medal in person, earlier recipients having lived too far away. Campbell was a distinguished Lick astronomer, who was three times elected A.S.P. President and also served for eight years as president of the University of California.

The joint meetings of the A.S.P. with the A.A.A.S. Pacific Division and with the A.A.S. set a precedent which was followed for many years. The Society continued to have several meetings a year by itself, for the transaction of business and the reading of papers by members. But in addition, joint meetings with the Pacific Division were held in 1916 at San Diego, in 1917 at Stanford, and in 1919 at Pasadena (there was no 1918 meeting due to the war). The year 1920 saw the first of these joint meetings to be held outside of California, in Seattl. This was later followed by joint meetings in Portland, Reno, Eugene, Salt Lake City, and Denver. A.S.P. attendance at these meetings was typically about 40 people.

Over the years the number of separate A.S.P. meetings gradually dwindled; by 1938 there was an annual business meeting in January, a meeting for scientific papers in February, and a joint meeting with the Pacific Division in the summer, the latter attended by about 50 people. By the 1950's this had further shrunk to one annual meeting for business and one summer scientific meeting.

Today, the Society only convenes once a year, holding the business meeting in conjunction with the summer meeting. The far-flung geographic distribution of its members is in large measure responsible for this. As long as most of the members lived in the San Francisco area it was easy for them to gather together, but now the A.S.P. has members in all 50 of the United States and over 70 other countries. On the other hand,

Participants in the first joint Astronomical Society of the Pacific and American Astronomical Society meeting in 1915. Seated cross-legged in the center (wearing glasses and in a lighter suit) is Heber D. Curtis; behind him is W.W. Campbell. To Campbell's left is George Ellery Hale; Armin O. Leuschner is seated to Hale's left. (Photograph from the A.S.P. archives.)

Society meetings have grown in size and complexity, with over 900 people attending the 1987 meeting in Pomona, California, and 850 at the 1989 Centennial Meeting in Berkeley.

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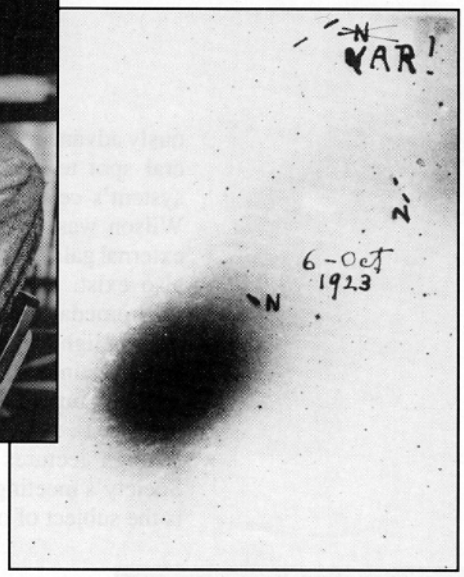
In 1916 the A.S.P. received a welcome gift, which no doubt aided in the increase in membership which began around that time. Adolfo Stahl, a member from San Francisco, gave the Society $1,000 to fund a series of public lectures on astronomy. These were to be given by Lick astronomers W. W. Campbell, Robert Aitken, and Heber Curtis, and were to be free of charge to all. A news release noted that "Mr. Stahl's generosity was prompted by his desire that the people of San Francisco and vicinity should have the benefit of free astronomical instruction by astronomers who are contributing to our knowledge of the heavens."

Lecture topics included the solar system, comets, the Moon, solar eclipses, and nebulae. The lectures were such a success that Stahl funded a second series for 1917-1918, including talks about the Sun and about the new 100-inch telescope at Mount Wilson, then the largest telescope in the world. In 1918 he provided means to publish the twelve Stahl lectures as a book. A thousand copies were printed, and the proceeds from their sale went to the A.S.P. This was the only book the Society published until the A.S.P. *Conference Series* began in 1988.

The Stahl lectures inaugurated a program of public talks sponsored by the A.S.P. which continued for a number of years, as funds permitted. In 1920 an anonymous donor gave $1,000 towards a 1920-1921 series, and the next year three donors each gave $1,000. These lecture series were presented in San Francisco nearly every year throughout the 1920's and drew large crowds. In 1924, for example, 1,200 people listened to Robert G. Aitken discussing the planet Mars, a subject of controversy in the first part of the twentieth century, since some astronomers had suggested that evidence of intelligent life could be seen on its surface. 1924 was a time when Mars came unusually close to Earth and public interest in the red planet was at a peak.

W. W. Campbell. A reknowned astronomer, distinguished educator, and vigorous member of the A.S.P., Campbell gave one of the first public lectures in the Stahl series in 1916. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)



Edwin Hubble and the photographic plate on which he discovered a variable star ("VAR!") whose characteristics allowed him to estimate the distance to the Andromeda galaxy. (Hubble photograph by James Stokley, author of the first A.S.P. Leaflet *and a winner of the A.S.P. Klumpke-Roberts award for contributions to public understanding of astronomy.)*

In 1929 a series of eleven lectures in southern California was co-sponsored by the A.S.P. and the Mount Wilson Observatory, and these were also well received and continued in 1930. In 1931 Henry Hyde of the A.S.P. and the East Bay Astronomical Society gave a series of radio lectures — then a new medium for the propagation of astronomical knowledge, but one which the Society has continued to use effectively. Σ The A.S.P. even had its own weekly radio program during two later periods.

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In 1924 the Society observed its 35th anniversary. Only three of the original founders were still on the membership rolls: Molera, F. R. Ziel (an insurance broker and amateur astronomer who had been A.S.P. Secretary-Treasurer), and astronomer John M. Schaeberle. (Schaeberle, the last surviving member of the original Lick Observatory staff, died later that year.) Astronomy had changed extensively during the Society's first 35 years. In the 1890's and early 1900's telescopes concentrated on observations of the Sun, Moon, and planets, mapping their surface features, looking for satellites, and refining knowledge of their orbits. Stellar observations were very limited. But in the 'teens attention turned increasingly to the stars — not just their numbers, brightness, and locations, but also their physical natures as revealed by their spectra. Much of this work was done at West Coast observatories such as Lick and Mount Wilson and reported in the pages of the *P.A.S.P.*

The large-scale structure of the universe was also being probed in a systematic way. In 1918 Harlow Shapley, working at Mount Wilson, proposed a model for our Galaxy which was much larger than any previ-

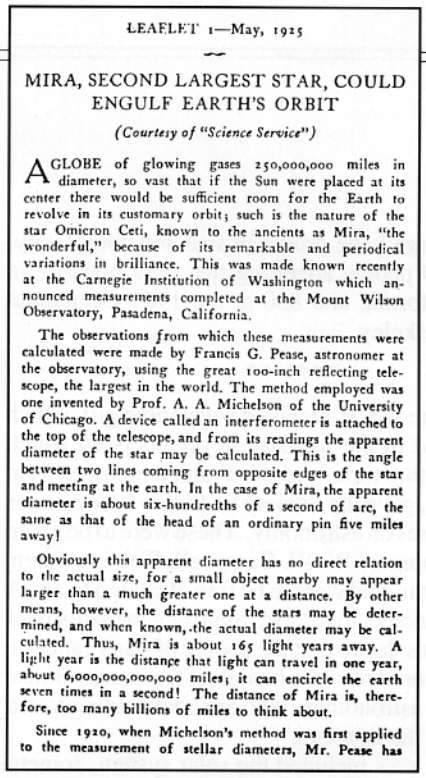
ously advanced, and which located the Sun in a peripheral spot tens of thousands of light years from the system's center. By 1924, Edwin Hubble at Mount Wilson was beginning his demonstrations that other external galactic systems comparable to our Milky Way also exist. His studies of the variable stars in the Andromeda Nebula (M31) showed that it was nearly a million light years away (later revised to two million), and contained billions of stars similar to our Sun and others in our neighborhood. Nonscientist members of the A.S.P. stayed informed about these discoveries through lectures like the Stahl series, through the Society's meetings, and through a new medium which is the subject of our next chapter.

Chapter 10:

The *Leaflets* and the Library

In 1925 the Society began one of its most successful ventures, aimed at its lay members. The president in that year, Bernard Benfield, a San Francisco engineer, conceived the idea of a series of small (vest-pocket sized) leaflets, written by professional astronomers, discussing astronomical topics in a nontechnical way. The first of these appeared in May 1925, funded by Benfield, and was a review of the variable star Mira by James Stokley; the second, by Robert Aitken, was on Mars. (Stokley, the author of the first A.S.P. *Leaflet,* was then a young science writer working for Science Service. Sixty years later, after a long career as reporter, author, and planetarium director, he would win the A.S.P.'s Klumpke-Roberts Award for his contributions to popularizing astronomy.)

The *Leaflets* were so popular that within a year or so they were appearing almost every other month, and then monthly in 1933. In 1937 they expanded from four pages to eight. The articles, often by noted astronomers, paved the way for modern astronomy magazines such as *Sky & Telescope* and *Mercury*. Astronomy was changing rapidly and the *Leaflets* brought news of many of the important new theories and discoveries to amateurs and laypeople around the world. Edwin Hubble described observations of redshifts in the spectra of galaxies in Leaflet No. 23, in 1929; Milton Humason discussed redshifts and the expanding universe theory in 1931, and again in 1936. Robert Trumpler wrote about the ubiquity of dust in the Milky Way (a discovery he had made in 1930) in *Leaflets* in 1931 and 1932.



LEAFLET 1—May, 1925

MIRA, SECOND LARGEST STAR, COULD ENGULF EARTH'S ORBIT

(Courtesy of "Science Service")

A GLOBE of glowing gases 250,000,000 miles in diameter, so vast that if the Sun were placed at its center there would be sufficient room for the Earth to revolve in its customary orbit; such is the nature of the star Omicron Ceti, known to the ancients as Mira, "the wonderful," because of its remarkable and periodical variations in brilliance. This was made known recently at the Carnegie Institution of Washington which announced measurements completed at the Mount Wilson Observatory, Pasadena, California.

The observations from which these measurements were calculated were made by Francis G. Pease, astronomer at the observatory, using the great 100-inch reflecting telescope, the largest in the world. The method employed was one invented by Prof. A. A. Michelson of the University of Chicago. A device called an interferometer is attached to the top of the telescope, and from its readings the apparent diameter of the star may be calculated. This is the angle between two lines coming from opposite edges of the star and meeting at the earth. In the case of Mira, the apparent diameter is about six-hundredths of a second of arc, the same as that of the head of an ordinary pin five miles away!

Obviously this apparent diameter has no direct relation to the actual size, for a small object nearby may appear larger than a much greater one at a distance. By other means, however, the distance of the stars may be determined, and when known, the actual diameter may be calculated. Thus, Mira is about 165 light years away. A light year is the distance that light can travel in one year, about 6,000,000,000,000 miles; it can encircle the earth seven times in a second! The distance of Mira is, therefore, too many billions of miles to think about.

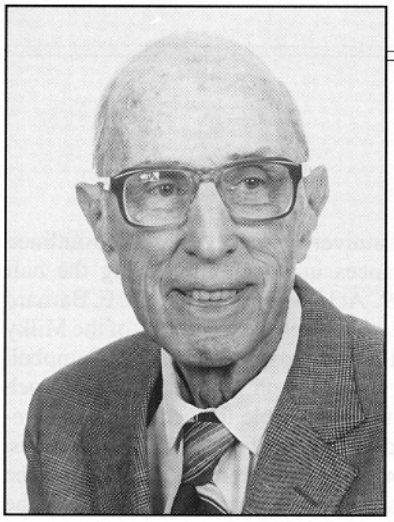
Since 1920, when Michelson's method was first applied to the measurement of stellar diameters, Mr. Pease has

The first page of the first A.S.P. Leaflet, *written by James Stokley.*

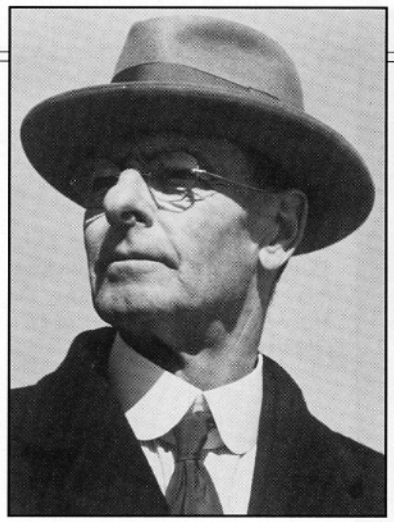
Other *Leaflets* dealt with such wide-ranging topics as comets, supernovae, astronomy and radar (1943), and the planet Pluto (discovered in 1930). Under the editorship of Benfield and A.S.P. Secretary Charles H. Adams, and later of Alfred H. Joy and then Gibson Reaves, the A.S.P. *Leaflets* continued to appear through December 1971, when they were replaced by the Society's new magazine *Mercury*. The final *Leaflet* was No. 510, entitled "Astronomers Look at Lightning," by Leon E. Salanave, who would become the Society's first executive officer.

Benfield's assistant in producing the *Leaflets* was Charles H. Adams, who served as secretary of the A.S.P. for a quarter of a century — from 1925-1950. Adams was born in 1868 near San Francisco, the son of a successful lumber and timber businessman. But while Charles was a student at the University of California, his father's business met with a series of disasters (fires, shipwrecks), and Charles left school to help salvage matters. The family's debts were finally settled, and Charles became an insurance broker and executive secretary to the Merchants' Exchange Association, a post he held until 1940. At some point he acquired a small telescope, with which he enjoyed looking at the sky. In 1919 he wrote a letter to Campbell at Lick, asking for some information about stellar parallaxes; Campbell replied and invited him to join the A.S.P. Adams did so, and soon was actively recruiting members (in 1923 he enlisted about forty new ones).

Adams served on the Board from 1923-1948, and was appointed secretary-treasurer in 1925, a position he continued to hold until he retired for health reasons. During much of his tenure the A.S.P.'s business was transacted at his kitchen table, and the records were kept in his home. His interest in astronomy had a strong influence on his son Ansel, who would become one of



James Stokley in 1983, the year he was awarded the Society's Klumpke-Roberts award. (A.S.P. archives.)



Charles H. Adams. Adams was a most vigorous and dedicated member of the A.S.P., serving as its secretary for a quarter of a century. (Photograph by his son Ansel, courtesy of the Ansel Adams Publishing Rights Trust, all rights reserved.)

the great photographers of the twentieth century. When Charles died in 1951, Ansel and other family members requested that memorial gifts be made to the A.S.P., and the Charles H. Adams Fund was set up, to help support the Society's various publications.

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Another concern of the Society in the 1920's was its library. The collection had been rebuilt after the destruction of the 1906 fire; by 1911 it contained about 300 bound volumes and 3,000 periodicals and miscellaneous items. It was housed in the A.S.P. rooms in the Phelan Building in San Francisco; but it was getting very little use, and by 1916 the Directors were wondering how to make the library more useful. In 1917 they voted to move it to the Sutro Branch of the California State Library, in the hopes that it would be more accessible. By 1920 the collection had nearly doubled in size, to 635 bound volumes and 6000 others, all indexed and shelved in the Sutro Branch. In 1924 it was moved again, to the San Francisco Public Library.

By 1927 the Society was in a quandary: it could not afford to rent quarters for the collection, which continued to grow as many observatories sent their publications in exchange for the *P.A.S.P.* In 1929 the library was moved to the Students' Observatory at the University of California in Berkeley. Eventually, the A.S.P.'s collection was merged with the University's, and by today the normal culling process at the University has apparently led to the discarding of most of the A.S.P.'s books.

With the purchase of the Society's own building in 1988, a new effort is being made to build up the library as the A.S.P. begins its second century. A number of members have already donated books and older magazines to the Society's collection and other such contributions are being sought from members, other libraries, and book collectors.

Chapter 11:

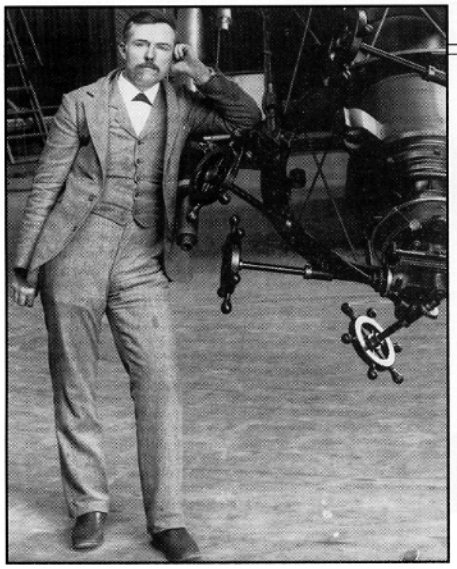
Anniversaries

The *P.A.S.P.* for February 1929 marked the fortieth anniversary of the founding of the Society. Robert Aitken wrote to the six surviving founders asking for their recollections of the event, and three responded with letters which were published in that issue. James H. Johnson had been secretary of the PCAPA in 1889; he wrote: "From a modest band of novices led by a few earnest astronomers [the A.S.P.] has evolved into an institution commanding international esteem... And the good work still goes on under capable hands." He also had high praise for Holden at the founding meeting: "I still remember his inspiring zeal... His ideals were high yet practical... Much wise counsel did he give us, and the meeting closed with faith and mighty resolve."

Alfred P. Redington, another charter member, wrote that "In the forty years that have elapsed since that memorable evening it has been a satisfaction to note the growth and progress the Society has attained throughout the world, and the Certificate of Charter Membership, issued to the writer over the signatures of Dr. Holden and Professor Schaeberle, is regarded by him as one of his most valued possessions."

Ten years later, at the annual meeting in 1939, Aitken gave an address on the fiftieth anniver-

Robert G. Aitken at the micrometer eyepiece of the Lick 36-inch refractor. Aitken was one of the most distinguished and active Society members; he served twice as President, held several other offices and was on the Board of Directors, and was awarded the Bruce Medal in 1926 for his work on double stars — much of which was done with this instrument. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)



Edward E. Barnard in 1893 at the 36-inch telescope at Lick Observatory. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

sary of the A.S.P. He described the 1889 eclipse and the formation of the Society, paid tribute to James H. Johnson, by then the only surviving charter member (Johnson died in 1946), and outlined the Society's activities from the Bruce and Comet Medals to the Montgomery library gift, the *P.A.S.P.*, and the *Leaflets*. He emphasized the importance of amateurs and of public education in astronomy. A salute to the three long-term secretaries — Ziel, Richardson, and Adams — concluded the talk. He might well have saluted his own service to the Society, the importance of which could not be overestimated.

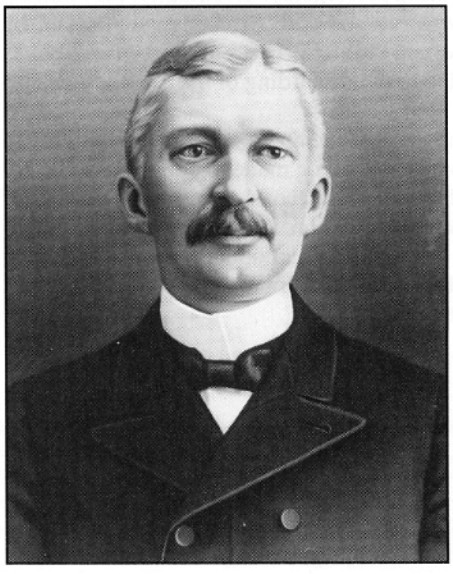
Indeed, Robert Aitken was one of the pillars of the A.S.P. for 57 years. Born in the gold rush country of California in 1864, he received his A.B. and A.M. degrees from Williams College in Massachusetts. From 1891-1895 he taught mathematics at the College of the Pacific, and then joined the staff of Lick Observatory as an assistant. For ten years he served there as assistant astronomer, then as astronomer from 1907-1935, associate director 1923-1930, and director 1930-1935. He retired July 1, 1935, but spent the night of June 30 at the 36-inch telescope, observing double stars as usual.

Aitken's research on double stars earned him the Society's Bruce Medal in 1926, and resulted in the publication (in 1932) of a catalogue of 17,000 double stars, giving the results of years of observations and the statistics of their orbits. This catalogue is still a major reference for astronomers. Aitken had joined the A.S.P. in 1894, and was on the Board several times between 1898 and 1951. He was president in 1898 and 1915, Lick secretary of the Society from 1902-1914 (when that position was abolished), and vice-president nine times. For fifty years he was on the Publications Committee, and he edited the *P.A.S.P.* for most of that time. He wrote numerous *Leaflets* and popular articles for the *P.A.S.P.*, and was famed for his lectures to the public. For all these services the Board elected him a Patron of the Society in 1943. Aitken's son and grandson still live in Northern California, and they were able to attend the Centennial Banquet of the Society, where they heard astronomer Frank Edmondson announce that he had named an asteroid after Robert Aitken in memory of his services to astronomy and the A.S.P.

In his fiftieth anniversary talk, Aitken also outlined some of the advances in astronomy during the half century since 1889. At Lick Observatory, E. E. Barnard had cultivated the wide-angle photography of the Milky Way and its great star clouds. Also at Lick, Campbell had developed a spectrograph for use on the 36-inch telescope, which made possible the accurate measurement of the speeds of stars towards or away from us. These observations had provided information on the rotation of our galactic system and had revealed the existence of hundreds of previously unknown binary stars. In addition, as Aitken wrote, they had also "provided a wealth of data for the solution of astrophysical problems, relating to the luminosity, mass, and other properties of stars."

James Keeler's photographs at Lick in the 1890's had showed structural detail in some of the spiral nebulae, and had demonstrated that large numbers of these intriguing objects existed. Keeler predicted that this would be very important in theories of cosmology. Edwin Hubble followed up on this work, showing by 1939 that there were thousands of these galaxies, far outside our Milky Way, and all apparently rushing away from us at great speeds. Aitken pointed to the growth of other western observatories besides Lick (Mount Wilson, Lowell in Arizona, the Dominion Astrophysical Observatory at Victoria (B.C.), the Steward Observatory at the University of Arizona, and the 200-inch telescope then under construction at Mount Palomar) as evidence of the superiority of the Pacific region for astronomical observation. Aitken could proudly point to the fact that in most of these institutions and discoveries, A.S.P. members had played a significant role.

James Keeler, noted astronomer, founding member of the A.S.P., and the Society's President in 1900. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)



Chapter 12:

Financial Aid

Throughout its existence a plaintive theme running through the Society's activities has been a scarcity of money. We have already seen the financial problems of the late 1890's and early 1900's. In 1916-1917 the cash balance was again below $200, but a massive membership drive helped bring it back up. In 1921 there was concern about the printing costs for the *Publications*, and new revenue (that is, new members) was again needed. There was still no change in the $5 annual dues, however, except to raise the student dues from $2.50 to $3.00 in 1929.

In 1932 the Society ran a $100 deficit, but recovered in 1933 through collecting delinquent dues and cutting down public lectures. In 1935 there was a loss of about $2,000 in the operating accounts; this was partly an accounting matter, but also partly from stock losses. A bequest from Arthur L. Black of $2,775 in 1936 was set up as a special fund, the interest from which could be used for ongoing expenses. But in 1949 the same refrain was heard from the Board: a need to reduce costs or add members.

One financial palliative taken by the Board in 1950 was to institute page charges for technical material in the *P.A.S.P.* This meant that the author of a technical article (or his/her institution) would be billed a certain amount for each printed page. Such page charges are common in astronomy and physics, and in the other smaller sciences as well; they help to cover the costs of producing technical journals which have a fairly small circulation and no advertising, and thus prevent subscription costs from becoming unreasonably high.

The institution of page charges must be seen in the context of the broader changes that were affecting both the field of astronomy and the Society. By the 1950's, changes in the practice and instrumentation of astronomy led the *P.A.S.P.* to become an increasingly professional journal. Although it still carried columns like "Aspects of the Heavens" and "General Notes" (which included information about amateur astronomy groups), more and more of its articles were accessible only to professional astronomers. The rapid advances in astronomy after World War II resulted in a growing flood of technical papers.

Radio astronomy had blossomed from the advances in military technology needed for the development of radar equipment. In the postwar decade, radio telescopes detected the radiation from cold neutral hydrogen atoms in space, paving the way for a much clearer understanding of the raw material of the universe and the formation of stars from it. In addition, radio waves were detected from the Sun, the Crab Nebula and other remnants of exploding stars, from several peculiar galaxies, and even from the planet Jupiter.

Progress in astrophysics was revolutionizing our understanding of the structure of stars and how they evolve. New large telescopes such as the 200-inch on Mount Palomar were peering deeper into the universe and producing new evidence in support of an expanding universe of galaxies. The *P.A.S.P.*'s contents reflected these changes, and the research reports it published were often very detailed and not easily understood by the layperson. This eventually led to the creation of the A.S.P.'s popular journal *Mercury*, and the complete professionalization of the *P.A.S.P.*

In 1951, because the Society was again running a deficit, the A.S.P. dues were finally raised to $6.50 for active members, $4 for students, and $100 for life members. In the 1980's these dues look nostalgically low; but at the time the increases were subjects of great debate among the officers and directors.

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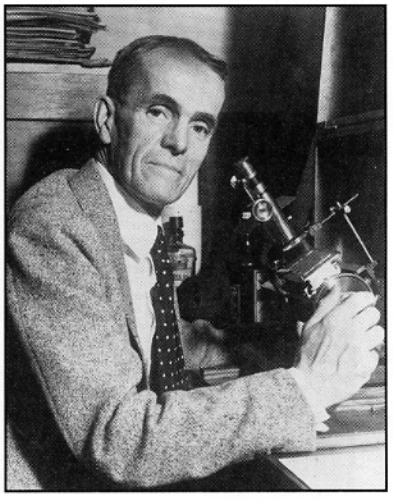
It was clearer and clearer to the Society's Board that dues alone could not support the work of the Society, even with a growing membership. Like many other scientific societies around the world, the A.S.P. began to look to private philanthropy as a long term solution to its financial problems.

In 1939, during its fiftieth anniversary year, the Society had received a welcome bequest: Mrs. Alexander F. Morrison left $25,000 to fund a lectureship in honor of her husband, a life member who had died in 1921. Morrison, born in 1856, had received his law degree in 1881, and practiced law in San Francisco for forty years. He had a wide range of interests, and his private library of 15,000 volumes was given by his wife to the University of California after his death. He had

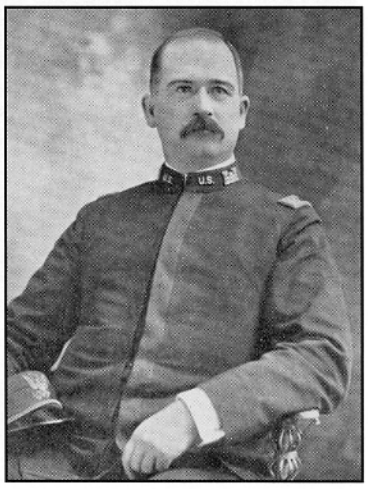


Walter S. Adams. This noted Mt. Wilson astronomer (no relation to Charles Adams) gave the first Morrison Lecture in 1941. (Photograph courtesy of Mt. Wilson Observatory.)

joined the A.S.P. in 1917, and was in his first term as a director in 1921 when he died. His wife, a life member since 1935, had already been a generous donor to Lick Observatory. (A Morrison donation was also instrumental in endowing a planetarium at the California Academy of Sciences.) Her bequest to the A.S.P. recognized "Mr. Morrison's interest in astronomy and...his desire that a knowledge of this subject should be brought within the reach of all persons."

The income of the fund was to be used to provide an annual series of nontechnical lectures, free to the public, to be given in San Francisco or wherever else (originally within California) the Board might decide. In mid-1940 a committee was appointed to arrange for the first series, which began in January 1941 with a talk in San Francisco by Mount Wilson astronomer Walter S. Adams (no relation to Charles) on "What Lies Between the Stars." This talk was repeated in Pasadena and was printed in the April 1941 issue of the *P.A.S.P.* Other lectures in the first series were given by the noted astronomers Edwin P. Hubble and Robert J. Trumpler. These were well received, and the program has continued to provide lectures by astronomers at colleges, amateur astronomy meetings, astronomy conferences, and teacher workshops over the years.

A major boost to the Society's endowment came in 1954 with the receipt of two sizable bequests. The larger was from the estate of Thomas L. Casey, who had been a member of the A.S.P. since 1916. Born in 1857, he graduated from West Point in 1879, and became a Second Lieutenant in the Corps of Engineers; he worked his way up to Colonel, and served on commissions responsible for many river and harbor improvement projects. But he always had strong interests in the sciences, especially astronomy and entomology. He accompanied Simon Newcomb to the Cape of Good Hope in 1882 to observe the transit of Venus, and also calculated orbits for several binary stars. He retired from active military service in 1912, but continued his scientific pursuits until his death in 1925. In his will he left a sizable bequest to the A.S.P., to be transferred to the Society upon the death of his wife. Mrs. Casey died in 1951, and the assets (over $200,000) were transferred in late 1953. This was the largest bequest in the history of the Society and made an enormous difference in its financial situation.



Colonel Thomas Lincoln Casey. Col. Casey's will bestowed the largest single grant to the A.S.P. in the Society's history and eventually made possible the growth of its public outreach services. (Photograph from the October 1925 issue of the Publications of the A.S.P.*)*

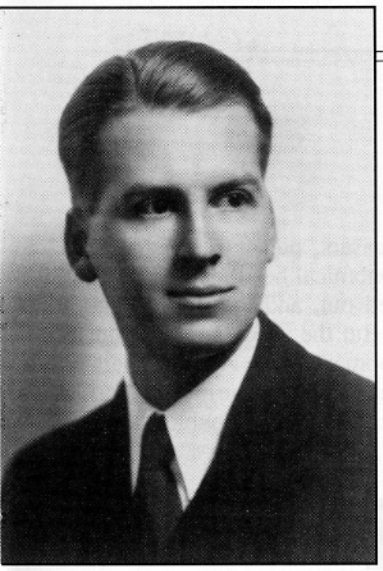
The second bequest came from Louise Ware. Miss Ware had graduated from Vassar College in 1902, and worked for a few years at the Yerkes Observatory before coming in 1906 to the new Mount Wilson Observatory in Pasadena. She worked there as a "computer" (back when astronomical calculations were done by hand or by using adding machines) until her retirement in 1942, measuring the wavelengths of absorption lines in the Sun's spectrum and determining stellar brightness with one of the first microphotometers (very sensitive light-measuring machines) at the Observatory. Upon her death in 1953, she left an amount in excess of $25,000 to the A.S.P., despite the fact that she seems never to have been a member of the Society.

The Ware and Casey bequests gave the Society much-needed capital. When, in the late 1960's and early 1970's, the Board would begin to plan the expansion of the Society's educational programs, the endowment would give them the resources required. As the Society today plans for its second century, the Board is again looking to private and corporate giving as the key to allowing the A.S.P. to continue and expand the educational programs for which the Society has received so much praise.

Chapter 13:

The Passing of an Era

World War II had its impact on the A.S.P. and on American astronomy in general. The education of many astronomy students was interrupted, and professional astronomers left their observatories for work directly related to the war. Some even lost their lives. In 1942 Arthur B. Wyse, a promising young Lick astronomer and a member of the editorial committee of the Society, who had gone to war as a civilian scientist, was killed in the collision of two blimps off New Jersey. His widow requested copies of his *Leaflets* and *P.A.S.P.* articles for their children. Charles Adams, the Society's secretary, arranged for this, donating some of his own copies and making sure that she received everything free of charge.



Arthur B. Wyse. Wyse, a promising young astronomer and member of the A.S.P.'s editorial committee, was killed in a blimp collision during World War II. (A.S.P. archives.)

Robert J. Trumpler. Trumpler's fundamental work on star clusters and the interstellar medium left an indelible mark on 20th century astronomy. He was also a member of the Board of Directors of the A.S.P., and the Society's annual award for an outstanding PhD thesis is named after him. (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

Summer scientific meetings of the Society ceased until 1946; in 1943 no Bruce Medal was given, due to difficulties in getting nominations from foreign observatories. Membership held fairly steady, however, and began to rise again after the war's end; by the end of 1950 it was up almost 30 percent from what it had been at the beginning of 1946.

In the 1950's the A.S.P. lost several of its long-time and most dedicated leaders. Armin Leuschner, a Berkeley astronomer who had been president of the Society three times, and had received the Bruce Medal in 1936, died at the age of 85 in 1953. Leuschner had joined the A.S.P. as a student at the second meeting in 1889 and was involved in the governance of the Society several times between 1902 and 1943. Two years later, banker and paper company executive James K. Moffitt, a long-time director of the A.S.P., passed away. Moffitt was vice president of the A.S.P. for 15 years and served for many years on the Finance Committee.

The next year, 1956, saw the death of astronomer Robert J. Trumpler, who had left an indelible mark on 20th century astronomy. Trumpler was born in Zürich, Switzerland, in 1886, and developed an interest in astronomy as a boy. His father preferred that he work in business, and he tried banking for a short time, but began to study astronomy formally at the University of Zürich in 1906. In 1910 Trumpler received his Ph.D. at the University of Göttingen, and went to work in Switzerland. In 1915 he came to the United States to work at the Allegheny Observatory, and in 1918 he moved to Lick Observatory, where he remained until transferring to the Berkeley astronomy department in 1938.

Trumpler's best known achievement is his work on the distances and diameters of open clusters of stars, demonstrating the existence of interstellar dust which dims and reddens starlight, making us think the stars are more distant than they really are. He also did some pioneering speculation on the evolution of stars. Trumpler joined the A.S.P. in 1920, and was vice-president in 1931, president in 1932 and 1949, and a director for seven terms between 1931 and 1953. After his death in 1956 his widow made a gift to the Society which, in 1958, led to the establishment of the A.S.P.'s Trumpler Award, to be given to a young astronomer who would deliver a lecture at the Society's annual summer meeting. The first Trumpler Award went to George W. Preston in 1963. The award procedure was later revised so that today the Trumpler Award goes to a recent astronomy Ph.D. who has done an outstanding piece of research for his or her thesis (see Chapter 17). Trumpler's influence also continues to play a role in Society affairs in the person of his Ph.D. student (and son-in-law) Harold Weaver, who has been an important leader and catalyst in the expansion of the A.S.P.

At the same time that the leadership of the Society was changing, the A.S.P. was in the throes of changes caused by a growing professionalization. In 1949 the *Publications* contained 52 percent nontechnical material; as the practice of astronomy changed more and more into astrophysics, with observations using nonvisible radiation (such as radio waves), and with new instruments on Earth (and eventually in space), many of the research papers became quite technical and not easily read by the lay members. Increasingly, the A.S.P. seemed, at least to some, to be more hospitable to the professional scientists. The members of the Board were now nearly all professional astronomers, whose interests were mainly in the research realm; no lay person had served as A.S.P. president since Benfield in 1926.

As a step towards countering this trend, an affiliation of the Western Amateur Astronomers with the A.S.P. took place in 1951. This arrangement, in a way, formalized the interaction between professional and amateur astronomers begun by Holden and Burckhalter back in 1889, and guaranteed a seat for amateurs on the A.S.P. Board.

Local amateur astronomy clubs had grown up in many cities of the United States; in the west the earliest may have been Oakland's Eastbay Astronomical Society, founded in 1923 and still active today. Across the nation, some of these societies had felt the need for a national organization as early as the 1930's, and in 1939 a group of 300 amateurs had met and drafted plans for such a group. Charles A. Federer, editor of the magazine *The Sky* (soon to merge with *The Telescope* and become *Sky and Telescope* in 1941) was a strong supporter of such an organization and helped publicize the idea in his magazine. After a hiatus due to World War II, the Astronomical League became official in

1946 and held its first meeting in 1947, with 32 member clubs and several organized geographical regions.

Due to some personality conflicts and perhaps to their great distance from the majority of the Astronomical League's clubs and activities, some of the western societies felt a need for closer communication among themselves, and the umbrella group known as the Western Amateur Astronomers was founded in 1949. Thus it was that in 1951 the A.S.P. received a proposal from the W.A.A. that they should become affiliated with the Society. After discussion, the A.S.P. Board agreed to this affiliation, and modified its bylaws accordingly in 1952. One A.S.P. Board member would be selected by the W.A.A.; the A.S.P. would help the amateur societies in obtaining speakers for their meetings, and would announce amateur meetings and activities in the *Publications*. In return, the W.A.A. urged its members to join the A.S.P., and asked each member society to buy a bulk supply of *Leaflets* to distribute to its members.

Harry L. Freeman, of the Los Angeles Astronomical Society, was the first W.A.A. representative to the A.S.P. Board; when he died in less than a year, Harold W. Milner of Palo Alto replaced him, and subsequently a number of distinguished amateur astronomers have ably represented the W.A.A. on the A.S.P. Board. Several of the recent A.S.P. summer meetings have been held jointly with the W.A.A. and other amateur astronomy groups, and amateurs continue to contribute useful data to astronomy in such areas as observations of variable stars, sunspots, planetary features, and discoveries of comets and novae. The Society recognized these contributions in 1978 with the creation of its Amateur Achievement Award.

In 1989, as part of the general expansion of the Society's activities on the national level, the A.S.P. Board broadened the amateur representation on the Board by allowing nominees for the amateur position not only from the W.A.A. but also other large amateur groups in North America.

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At the same time that the Society was reaching out to amateurs, its leaders began to expand the Society's work in public education. A prophetic step was the creation of an A.S.P. astronomy film library in 1963. Board member George Perkins (the W.A.A. representative) took charge of this project. Films could be borrowed by schools, colleges, or amateur astronomy clubs, for a rental fee of $3.00. By the end of 1964 eight films were available; two more were added in 1968. An article about the film program in *Sky and Telescope* for January 1965 caused a surge of activity, and Perkins reported to the Board in May 1965 that "Since then we have had a difficult time filling all requests. All films are out constantly."

By 1969, as the films themselves began to age and new discoveries about quasars, pulsars, and distant galaxies grabbed the astronomical headlines, requests for the older films petered out, and the library was eventually discontinued. But the success of the film library inspired the development of the A.S.P.'s mail-order catalog, which has become one of the most important ways in which the Society serves the public today.

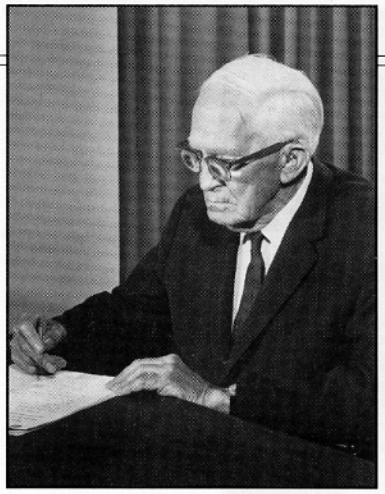
Chapter 14:

The 1960's: Changes in the Wind

The 1960's brought new challenges and opportunities to the A.S.P. One of these concerned the *Publications*, which suffered from several problems. A change of printers in 1963 led to delays which were increased by a typesetter's strike, so that the *Publications* appeared at least a month late. The editor, Katherine G. Kron, also complained that authors seemed reluctant to contribute papers, and issues had been held up for lack of suitable material. Time and more active solicitation of papers cured this problem so that by 1968 "...the supply of willing authors and timely subjects [was] greater than the journal's capacity."

That same year, the Board decided to increase the number of pages, and to publish review articles, with

Katherine G. Kron and D. Harold McNamara, the two most recent editors of the Publications of the A.S.P. *(Photo by A. Fraknoi.)*



Alfred H. Joy on his 90th birthday, September 23, 1972. In 1964, Joy wrote an anniversary review of "Seventy-Five Years of the A.S.P." He was a member and contributor to the A.S.P. for many years (including a long term as editor of the Leaflets*). Among his more lasting (yet less publicly visible) contributions to the Society is the gavel — prominently engraved with his name — which is used to open and close meetings of the Board of Directors. (Hale Observatories photograph.)*

extensive bibliographies, on topics of current interest. A new editor, D. Harold McNamara, took over in 1968; this occasioned some severe delays in publication as the editorial offices were moved from Flagstaff, Arizona to Provo, Utah, but these were overcome within a year. The *Publications* have continued to come out of Provo ever since.

Since 1972, when *Mercury* magazine was inaugurated, the *Publications* have contained only technical material aimed at the professional astronomer. The A.S.P. Board set a goal for the *P.A.S.P.* to become one of the leading professional astronomical journals in the United States, and to broaden its coverage of the areas within astronomy. Editor McNamara has pursued this goal with much success. In 1971 the page size was increased, to facilitate the publishing of tables and diagrams; and publication went from bimonthly to monthly in 1983. The 1987 volume ran to 1,400 pages, compared with 888 pages in 1972 (the first year of the change in content). In 1988, volume 100 carried a series of special Centennial retrospective articles, each starting from an earlier *P.A.S.P.* article that was epochal in its field and reviewing the progress since that paper. (See Chapter 18.) The Board has also decided to try to make the *Publications* the principal U.S. journal for papers on astronomical instrumentation and software, and recent issues have carried articles on such topics as interferometer systems for infrared astronomy, photon-counting arrays for spectroscopic and imaging purposes, and a television system for telescope guiding.

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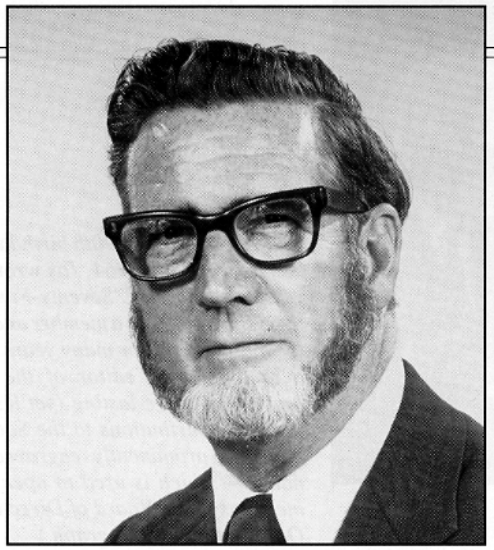
In 1964 the A.S.P. observed its 75th anniversary at an annual meeting held in Tucson in December (rather than in the summer). Astronomer and former A.S.P. President Alfred H. Joy had published an account of the Society's beginnings in the February 1964 *P.A.S.P.*, and at the Tucson meeting he presented a review of "Seventy-five Years of the A.S.P.", which subsequently also appeared in the *Publications*. Outside the meeting session room in Tucson there was an exhibit of photographs of early Society members and officers. Joy himself was a member and contributor to the A.S.P. for over forty years, including 23 years as the editor of the *Leaflets*.

At the same time that the A.S.P. was looking back at its origins, it was looking ahead to see how it could better achieve its goals. By the mid-1960's, the Society's meetings and activities had not kept up with the growth of astronomy itself, and a number of officers and directors felt that it was time to re-examine the Society's structure and programs. In 1968 the Board appointed what turned out to be a crucial Aims Committee, consisting of Helmut Abt, George Abell, George Perkins, and Harold Weaver, "to analyze the future goals of the Society, to implement more specifically some of its broadly-stated objectives, and to attempt to correlate these ideas into a meaningful pattern that would expand the role of the Society within the astronomical community." Their conclusions, published in detail in the October 1970 *P.A.S.P.*, were implemented in the next few years, and changed the A.S.P. in profound ways.

For example, the *Publications* had customarily concentrated on observational optical astronomy, and the committee suggested a broadening into other areas and permitting longer papers. The *Leaflets* were helpful to the lay members, but their format was "restrictive and not conducive of respect by professional astronomers, who are the principal contributors." The committee felt that the Society was failing to attract the younger professional astronomers (especially those in newer fields like radio, infrared, and x-ray astronomy). At the same time the lay members and amateurs were having less impact on the Society and getting less from it, and their membership was declining. The scientific meetings were "either decreasing or static in (a) frequency, (b) the numbers of attendees, (c) the numbers of papers presented, (d) the caliber of the astronomers attending, and (e) the impact on a field that is otherwise growing rapidly." The committee concluded that the Society was "gradually failing to live up to its original aims," and was stagnating.

The general purposes, they believed, should continue to be "services to astronomy at large and public information and education." In the services category, they made several specific proposals, including:

- The *Publications* should become a technical journal, in a larger format, and a second popular journal should be created which would replace the *Leaflets* and also include Society news and business, information for teachers, and general news notes.
- Single-topic symposia on current areas of research interest should be sponsored by the A.S.P. either at the summer meetings or separately.
- An Awards Committee should be formed to gather information for the Board on Bruce Medalist nominees and to consider other



George Abell, member of the pivotal Aims Committee and A.S.P. President in 1969 and 1970. (Photograph courtesy of U.C.L.A.)

awards like a modification of the Trumpler Lectureship.

In the area of public information and education, several specific ideas were also put forward. They included:

- The proposed popular journal should be aimed at "lay people interested in reading about astronomy, professional and amateur astronomers, teachers, and planetarium personnel." The success of such a journal would depend largely on its editor.
- Lecture programs should be expanded, especially outside of California. Good lectures are needed in high schools, colleges, and public forums, as well as for amateur groups.
- The film library should be publicized more, and supplemented with film strips.
- A public information spokesman to interpret astronomical news to the media is greatly needed.
- A television series on astronomy might be guided (but not funded) by the A.S.P.
- Guidance should be provided to amateurs who want to make useful contributions to observational astronomy.

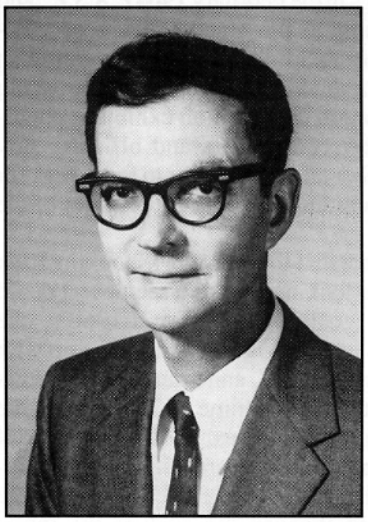
To effect these changes, the committee recommended the creation of a full-time position of *executive officer*, who should be an astronomer or a scientific administrator or both. Such a person would edit the popular journal, plan the logistics of Society meetings, oversee lecture series and films, serve as an information source to the news media, and have other duties as these programs expanded.

The committee also recommended that elections and other Society business should be done by mail rather than at the Annual Meeting, so that all members could participate, and that Board members be limited to two consecutive three-year terms, to get more people involved in running the Society. An increase in dues was recommended to finance the new staff and journal.

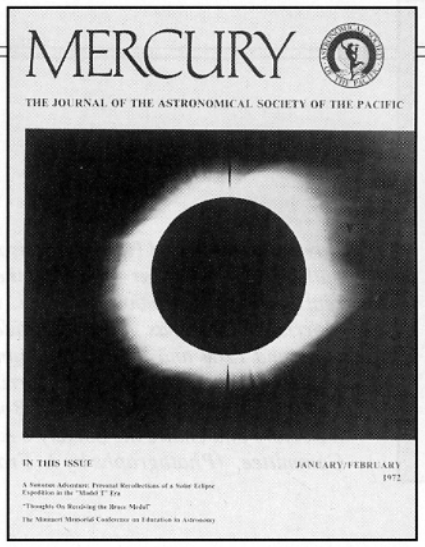
The recommendations of the Aims Committee led to immediate action on the part of the Board. By the time this extensive report appeared in print, the Board had already appointed an Awards Committee. They had also approved a larger format for the *P.A.S.P.*, produced a pilot lecture series, and approved mail ballots and the two-term Board limitation.

In November 1969 the Board approved a search for an A.S.P. executive officer, and a committee was chosen to conduct interviews. In November 1970 the Board selected Leon E. Salanave, who began work on May 1, 1971. Salanave had been an A.S.P. member since 1935, when he joined as a student member, and had written several notes and articles for the *P.A.S.P.* and the *Leaflets*.

Born in San Francisco in 1917, Salanave received A.B. and M.A. degrees from the University of California, where he was an associate in astronomy from 1940-1947, taking time out to teach navigation during World War II. He then taught at Sacramento College for several years, and was a lecturer at the new Morrison Planetarium in San Francisco from 1949-1953, and associate curator of the California Academy of Sciences from 1954-1956. In 1956 he went to Arizona, first as a research associate with the site survey for what became Kitt Peak National Observatory, then as a research engineer and in 1961 as a research associate in optics at the Institute of Atmospheric Physics at the University of Arizona. He remained there for ten years, until he took the A.S.P. position. His background in public education through his planetarium work, and his administrative experience at the Academy of Sciences, put him in a good position to fill this new post and begin work on the expanded roster of A.S.P. programs.



Leon Salanave, the Society's first Executive Officer.



Mercury's *first cover.*

Chapter 15:

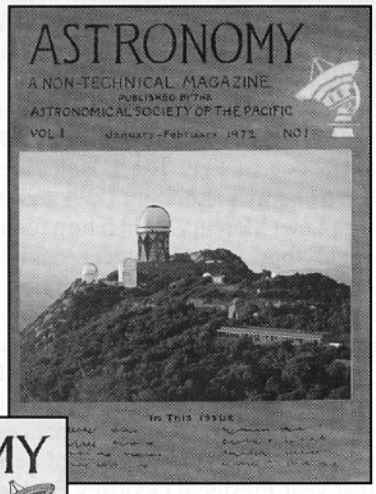
Mercury Magazine and the Challenges of Growth

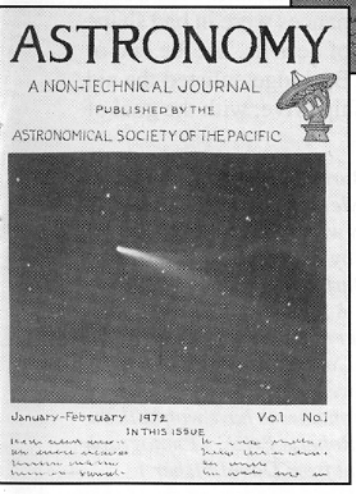
Salanave's first task was the creation of the new popular journal. After rejecting a number of names (including *Astronomy*), he proposed that it should be called *Mercury* — after the messenger of the heavens in Roman mythology who appears on the A.S.P. seal. In honor of the new name, noted astronomical artist Chesley Bonestell, who had contributed designs for the new magazine, even painted a Mercury landscape. Although it was never included in the magazine, the painting hangs proudly in the Society's San Francisco office.

The first issue of *Mercury* appeared in January of 1972, and has continued as a bimonthly publication ever since. This first issue was 24 pages in length, and contained among other features an article on the 1923 solar eclipse in Mexico, personal notes about astronomers and observatories, reflections by Caltech astrophysicist Jesse Greenstein on receiving the Bruce Medal, and an editorial by A.S.P. President Harold F. Weaver, who played a pivotal role in making the suggestions of the Aims Committee a reality.

Weaver wrote: "Publication of this first issue...represents the most evident step in a series now being taken by the Society to provide better public understanding of astronomy." He pointed out the increased complexity of astronomical research with new developments in electronics and computers, and noted that "Our Society can make a contribution of far-reaching importance to the science of astronomy by interpreting the results of astronomical research for the nonspecialist. It is a task worthy of our strongest efforts."

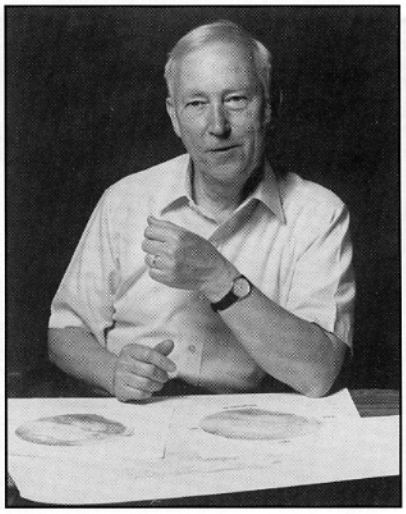
Mercury has earned the strong approval of Society members and other readers over the years, pioneering a number of features which would be imitated by other magazines. "Noted in the Current Journals", a column



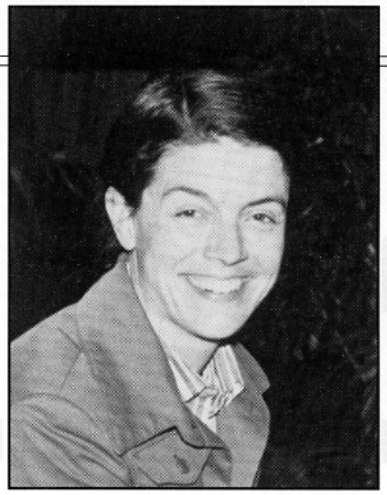


Two mock-ups of possible cover styles for the A.S.P.'s new magazine, designed by reknowned space artist Chesley Bonestell. An early suggestion for the name was "Astronomy".

(The name Mercury *was eventually chosen — in honor of the central figure in the Society's venerable seal — leaving the more generic name available for another magazine.)*



Harold Weaver. Weaver was (and is) a pivotal figure in the A.S.P. during the second half of the 20th century. He served as a member of the Aims Committee, as President during the introduction of Mercury, *as the Treasurer who oversaw the purchase of the Society's building, and in many other capacities. (Photograph copyright © 1987 by g. Paul Bishop.)*



David Morrison and Nancy Morrison, co-authors of the popular "Noted in the Current Journals" column in Mercury. *David Morrison served as A.S.P. President in 1983 and 1984 and has written numerous books in astronomy. Nancy Morrison is currently a member of the A.S.P. Board of Directors and chairs the Society's Awards Committee. (Photographs by A. Fraknoi)*

initiated by David and Nancy Morrison, keeps readers abreast of new developments as astronomers are just reading about them. "Astronomical Book Trek" (later "Astronomical Resources") reviews books, software, audio-visual materials, and provides indexes to astronomy articles in magazines such as *Scientific American* and *Discover*. "The Astrophysical Zoo" examines one interesting celestial object in some detail. And the *Mercury* "Photo Feature" displays new photographs from the world's leading observatories and from space probes in Earth orbit or among the planets. The standard reference on periodicals for librarians now recommends *Mercury* as "an essential magazine for school libraries."

By 1973, the A.S.P. was receiving such a good supply of general interest articles for *Mercury*, that the editor significantly curtailed the amount of space devoted to the more routine reports of Society business. In 1987 however, a new section, called "The Society Pages", was introduced to bring readers news of expanding Society programs and publications and once again to provide a place where news about Society leaders and members could find a home.

As expected, the new journal and the salary of the executive officer had a major impact on the Society's budget: in 1971 they led to a $30,000 deficit, which was funded from the interest and dividends that had accumulated on the Society's endowment. The directors approved a 1972 budget with a deficit of $18,000, and agreed to work actively on a membership campaign. However, by late 1972 Salanave reported that *Mercury* costs (printing and mailing) were running 50 percent higher than first estimated and that membership and other revenues had not risen sufficiently to cover the deficit. As one solution, the Society's Finance Committee was instructed to look into increasing the income from the Society's investments, but the financial problems caused by the expansion of the A.S.P.'s outreach programs would continue for several years.

Salanave resigned as executive officer in 1974, and was replaced by Richard Reis. Reis had received his Ph.D. degree in education from Stanford, and from 1971 to 1974 taught science education at Memorial University of Newfoundland. He came to the A.S.P. with ideas for increasing services to members and the public, such as radio programs and traveling lecture series, as well as changes in the somewhat conservative format of *Mercury*. To finance these projects and the additional staff they required, in addition to improving the investment returns and probably raising dues, he proposed to work harder to find outside support from private donors.

During the next few years he initiated such fund-raising efforts as the sale of A.S.P. bumper stickers (with slogans like "Black Holes are Out of Sight" and "Astronomy is Looking Up") and the "sale" of lots on the planet Mercury — in return for a donation, a person could "buy a choice parcel, complete with quitclaim deed and a photograph identifying the purchase, both suitable for framing." An ad in *Mercury* for July 1974 gave details and costs (making clear it was all in good fun), and readers were invited to share in "a flight of space whimsy." Nevertheless, the deficits continued.

By 1975, the Society's finances were in bad shape as the result of several years of deficits. At the end of that year President Geoffrey Burbidge enlisted the aid of all members in a membership drive, with the goal of

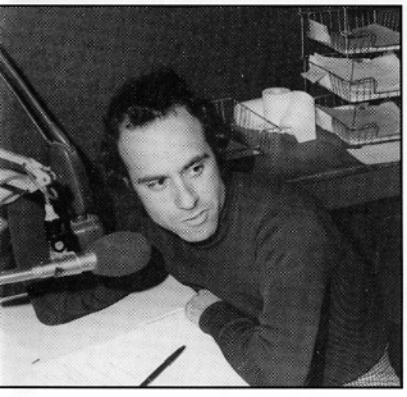
(From left to right): Margaret Burbidge, Geoffrey Burbidge, William Fowler, and Fred Hoyle, affectionately known as B²FH among astronomers. They wrote a pivotal paper in the 1950's describing the pathways by which stars synthesize the chemical elements. Margaret Burbidge won the 1982 Bruce Medal and has served on the A.S.P. Board of Directors. Geoffrey Burbidge was President of the Society in 1975 and 1976 and serves on the Finance Committee. William Fowler won the 1979 Bruce Medal (as well as a later Nobel Prize). Fred Hoyle is the only living astronomer to have won both the Bruce Medal and the Klumpke-Roberts Prize. (Photograph courtesy of William Fowler, print from David Fisher.)

adding 6,000 new members. Ads in *Mercury* set forth the benefits of membership, including book discounts and the beginnings of a mail-order catalog of astronomical items. Within a year almost 1,800 members had been added, though at the same time the deficit for 1976 was in excess of $75,000. President Burbidge called special meetings of the Board in response to the financial crisis, and deep cuts were made in the staff of the Society and the size of *Mercury*. By 1977 the tide had turned, and the 1977 fiscal year ended without a deficit.

At the beginning of 1978 Reis resigned as executive officer, to take an administrative position at Stanford. At his departure he could point to several new developments for the Society, in addition to the various fund-raising efforts. Perhaps the most important of these was the establishment of the A.S.P. catalog, featuring astronomical books, slide sets, and other educational materials. This catalog has become one of the most important ways in which the Society now serves the international astronomical community.

Another project the Society could point to with pride was a weekly newspaper column on astronomy, begun in a San Francisco area paper in 1975, and syndicated nationally in 1976. Under the title *Exploring the Universe,* these 500-word columns each dealt with a single astronomical topic (such as the volcanoes of Mars, the discovery of Comet Kohoutek, or "What the Atoms in Your Body Were Doing Eight Billion Years Ago"). The columns were written in a popular style by Reis, Andrew Fraknoi, and Sherwood Harrington, with occasional guest columns by astronomers from around the country. A.S.P. members were urged to work at getting their local newspapers to carry the column, and at its height of popularity in 1979 it was running in seventeen papers in North America, from Alberta to Florida.

Unfortunately, interest among newspaper editors never reached the levels required to sustain long-term national syndication, and the column was reluctantly terminated in March of 1981. Still, the project reached millions of readers during its existence and also gave the Society's staff valuable experience in dealing with the media, which was to stand them in good stead during the next phase of the A.S.P.'s growth.



Richard Reis conducting his radio program "Perspectives on Science" in the mid-1970's. Reis was the Society's second Executive Officer. (A.S.P. archives.)

Chapter 16:

New People, New Awards, New Approaches

The Board of Directors chose Andrew Fraknoi to replace Reis as executive officer. Fraknoi, an instructor in astronomy and physics at Cañada College in California, held a B.A. from Harvard and an M.A. in astronomy from the University of California at Berkeley. He had been working for the A.S.P. already for several years, particularly as an editorial consultant and contributor to *Mercury*, and had a special interest in astronomy education.

Fraknoi has now served as executive officer for more than eleven years, and has helped the Society to grow and expand its endeavors in many directions, especially towards the greater involvement of teachers, amateurs, and lay people. Membership has doubled, and the financial state of the Society is generally much healthier. A strong emphasis has been placed on getting the Society and its work more widely known and extending the programs of the Society to be truly national and international in scope.

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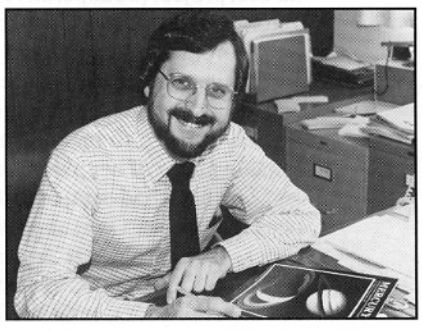
One interesting area of expansion has been that of awards. The Society had recognized astronomical achievement from its earliest years, in the form of the Bruce Medal for distinguished services to astronomy and the Donohoe Comet Medal for the discovery of a new comet. The latter had been discontinued in 1950 after the 250th medal had been awarded, but in 1968 the Board voted to create a new Comet Medal, to be awarded once a year "to an outstanding nonprofessional



Andrew Fraknoi, third and current Executive Officer of the Astronomical Society of the Pacific. (A.S.P. photograph.)

Dorothea Klumpke Roberts (1861-1942) as a young woman. She joined the Society in 1890, and her support of astronomy is still felt today, in the form of her bequest. Interest from the Klumpke-Roberts fund is used for the A.S.P.'s annual award for "outstanding contributions to education or popularization in astronomy". (Photograph courtesy of the Mary Lea Shane Archives of Lick Observatory.)

astronomer in recognition of his past contributions to the study of comets." The first Comet Medal was given in 1969 to Reginald L. Waterfield, a British physician and amateur astronomer noted for his position measurements of comets (which were of great help in the calculation of preliminary orbits). After 1974 this medal was also discontinued, and a more general award for amateurs eventually took its place.

The Robert J. Trumpler Award, mentioned earlier, was given first in 1963 and again in 1966, but was inactive for some years thereafter. In 1973 the Society decided to offer an annual award to a young astronomer in North America who had recently completed the Ph.D. and "whose thesis research [was] considered unusually important to astronomy." Each recipient gives a talk on his or her research at the following scientific meeting of the Society. This reactivated Trumpler Award was first given in 1974 to David L. Schramm of the University of Texas for his work on the chronology of nuclear processes in stars and has gone to a host of promising research astronomers since then.

At about the same time the A.S.P. instituted the Klumpke-Roberts Award, for "outstanding contributions to education or popularization in astronomy." This award, the Board of Directors hoped, would demonstrate the importance the Society placed on the need for scientists to help the public understand the new discoveries and developments in astronomy and their significance. It was named in honor of Dorothea Klumpke Roberts (1861-1942), a native San Franciscan who became the first woman to receive a Doctor of Science degree at the University of Paris. She worked at the Paris Observatory for many years on the gigantic Carte du Ciel project (a cooperative effort among many observatories to photograph the entire sky).

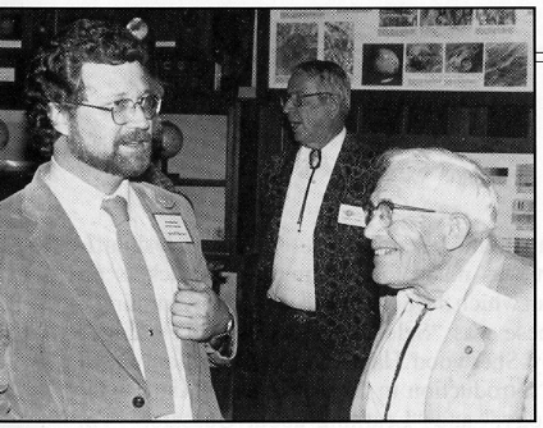
Dorothea Klumpke had joined the A.S.P. in 1890 (becoming one of the first female members). Near the end of her life, and then again in her will, she gave the Society money, to be known as the Klumpke-Roberts Fund in honor of her parents and husband (her husband Isaac Roberts had been one of the premier astronomical photographers). One suggestion was to endow a lecture series to share the excitement of astronomy with the public. A few lectures under this fund were given in the next twenty years, until the Board decided in 1974 to redirect it to a Klumpke-Roberts Award.

The first recipient was Carl Sagan, who was recognized for having "become the leading astronomical spokesman to the American public." (And this was years before the *Cosmos* television series!) Other recipients have included science popularizer Isaac Asimov, astronomy author and TV host Patrick Moore, astronomers Bart Bok and William Kaufmann, planetarium director E. C. Krupp, and journalists Walter Sullivan and Timothy Ferris.

In 1978 the Awards Committee recommended the creation of an Amateur Achievement Award, to recognize the many contributions of amateurs to astronomy. The first award went in 1979 to James H. McMahon, a metallurgical engineer of China Lake, California, who was active both in public education (as one of the guiding spirits of the China Lake Astronomical Society and as a presenter of astronomy in local schools) and in observational astronomy (specializing in occultations of stars and asteroids by the Moon). The Amateur Achievement Award has turned out to be one of the most geographically diverse of all astronomical awards, having gone since its inception to amateurs in Australia, New Zealand, Great Britain, France, Belgium, Canada, and many regions of the U.S.

The most recent A.S.P. award to be inaugurated is the Muhlmann Prize, stemming from a gift by Maria and Eric Muhlmann of Kona, Hawaii, both A.S.P. members and astronomy enthusiasts. The prize is given annually "for outstanding research done at any Mauna Kea observatory." Mauna Kea, a dormant volcano at an elevation of nearly 14,000 feet on the island of Hawaii, is the site of one of the leading astronomical research centers of the world, with a battery of large optical and infrared telescopes at its summit. The first Muhlmann Prize was given to Monique and François Spite of the Paris Observatory, who studied the abundance of the

Eric and Maria Muhlmann (seated) congratulating François Spite (right). Spite and his wife Monique won the first Muhlmann Prize in 1983. A.S.P. President Sidney Wolff (standing next to Spite) looks on. (Photograph by A. Fraknoi)



Sherwood Harrington (left), the Society's education projects coordinator and current managing editor of Mercury, *amusing Clyde Tombaugh (right) at the A.S.P.'s 1985 summer meeting in Flagstaff, Arizona. (A.S.P. photograph.)*

element lithium in old stars with the Canada-France-Hawaii 3.6-meter telescope, an observation which has great significance for our understanding of the processes that shaped the early history of the universe. Appropriately, this first presentation took place in Hawaii, when the A.S.P. met there in 1983, and the Muhlmanns were able to participate.

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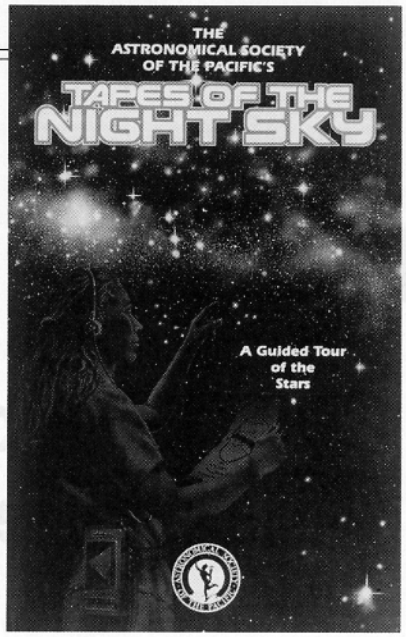
The Society has developed many other activities in the past decade which are designed to enhance the teaching and public understanding of astronomy. Perhaps the largest and most important of these is the mail order catalog, whose success has led to much wider recognition and appreciation of the Society's educational work. Growing out of the film library and the development of gift items for fund-raising, the catalog added books and posters in the late 1970's and was soon being mailed not only to Society members but also to thousands of other people with an interest in astronomy and education.

At first most of the items in the catalog were produced by others and simply resold by the Society. But as the popularity of the catalog grew (and especially after Sherwood Harrington joined the A.S.P. staff as educational projects coordinator), the Society began to produce more and more of its own materials, combining the expertise of its many professional members with the skills of its staff in interpreting astronomy in everyday language.

The A.S.P.'s slide sets have been particularly successful, and have earned high praise for including extensive booklets with captions, background materials, and reading lists, so that even beginners can use these slides for teaching, lecturing, or in social gatherings. The sets cover a wide variety of astronomical topics ranging from *The Solar System Close-up,* devoted to the results of planetary flyby missions, to *The Radio Universe,* giving 50 outstanding radio images from the Very Large Array of radio telescopes in New Mexico. Other popular sets include *The Sky at Many Wavelengths, Splendors of the Universe, Telescopes of the World,* and *Astronomers of the Past* with portraits and brief biographies of fifty famous astronomers from Copernicus to Rudolph Minkowski.

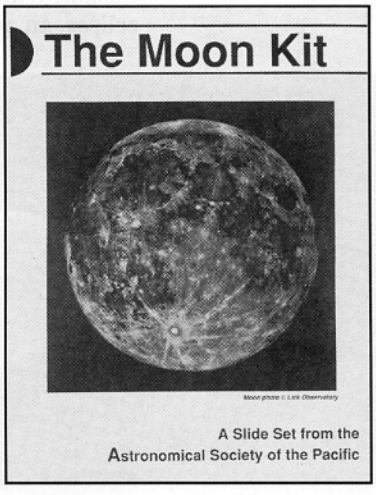
In 1987, the Society's staff began to add a series of slide kits created specifically for teachers of grades 3 - 12, which include even more detailed background material and class activities and research projects. Recently the catalog has also included astronomical software and several videotapes, as well as books and activities for children.



The redesigned Tapes of the Night Sky. *Originally developed by Tom Gates in the mid-1970's, the* Tapes *were revised, updated, and repackaged in 1988. They have become the A.S.P.'s most widely distributed educational item.*

Perhaps the greatest success for the catalog has been the Society's innovative *Tapes of the Night Sky,* which feature guided tours of the heavens for each season of the year and are ideal for the modern era of portable cassette players. Over 30,000 of these tapes have been carriedover the years and in 1989, the tapes have been sold not only by the A.S.P., but such outlets as the Smithsonian Institution, *Sky & Telescope* magazine, *Science News*, and the Adler Planetarium.

Through the efforts of many staff members, particularly Shawn Lockyear, who took over as its manager in 1987, the A.S.P.'s catalog has become one of the most successful programs in the Society's history. Reviews of the A.S.P. materials have appeared in *Scientific American, Science Teacher, Popular Science,* and many other science and education oriented magazines. Over 150,000 catalogs were distributed between fall 1988 and summer 1989 and the Society's staff filled over 10,000 orders from around the world. Any surplus from sales goes to help support the other educational programs of the Society and increases its ability to reach students, teachers, and the public with up-to-date information and materials.



"The Moon Kit", one of the Society's new resource materials designed for use by teachers in grade schools and high schools.

Chapter 17:

Expanded Services, Larger Meetings

In the late 1970's and through the 1980's, the A.S.P. began to reach out even more actively to other scientific groups and to the public as its activities continued to expand. Working with amateur, professional, and educational groups, and making effective use of the national media, the Society has become a strong force in the improvement of science education and science literacy.

A good example of these efforts is the development of a series of information packets on current astronomical topics. The first of these independent packets was put together by the Society's staff in 1973, when there was tremendous public interest in Comet Kohoutek. This celestial visitor had been discovered quite early in its pass into the inner solar system and was at first predicted to be a very bright naked-eye comet when it came near the Earth. Although the comet eventually turned out to be much dimmer than expected, the Society was swamped with requests for information from the media and the public. A pamphlet of background and observing information was assembled and advertised to the public. Over 30,000 requests for the pamphlet were quickly processed, putting quite a strain on A.S.P. staff and local volunteers who were brought in to help.

Undaunted, the Society put together another packet in 1978, for the February 26, 1979 total solar eclipse visible in the northwestern United States and western Canada. It included a reprint of a *Mercury* article on the eclipse, an explanation of eclipses, and directions for photography and for safe observing. Again, there was strong interest in the packet and the staff began to realize how difficult it is for many teachers, librarians, and others to get reliable astronomy information.

Comet Kohoutek as photographed on Jan. 11, 1974. (Photograph courtesy of the Joint Observatory on Cometary Research)

When Fraknoi became executive officer, a significant effort was made to assemble other packets on topics about which the Society received many inquiries. Among these was "Selecting Your First Telescope" (written by Sherwood Harrington), "Astronomy as a Hobby," "Introduction to Black Holes," "Astronomy vs. Astrology," and "Learning about Quasars." An extensive Halley's Comet packet was very popular in 1986. Recently, the staff has added a series of bibliographies and information sheets to the Society's publications, which have been sent to and duplicated by planetaria, amateur clubs, science museums, and teachers around the country.

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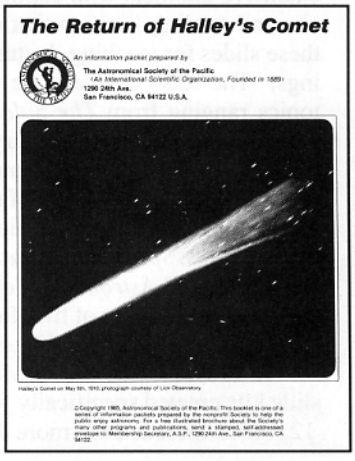
Another area where the hiring of staff has allowed the Society to expand its work is the planning and sponsorship of lectures and lecture series on astronomical topics. While the Morrison Lectures continued to bring astronomical speakers to small colleges and amateur astronomy groups (eventually outside the Western U.S. as well), the Society began to look for opportunities to present lectures to larger and more general audiences.

The first such opportunity came in the form of a lecture series in San Francisco in 1972, co-sponsored with the City College of San Francisco and NASA's Ames Research Center. The series consisted of twelve lectures by noted scientists on the topic of "Cosmic Evolution," and was a great success; some 3000 people tried to get seats to the first talk. Since then, the A.S.P. has sponsored many public programs, including a weekend at Stanford University that drew over 800 people for a day of lectures by leading astronomers, and recently, a Centennial talk by Carl Sagan that brought 2000 people to Berkeley's Zellerbach Auditorium.

Although lectures have been a long A.S.P. tradition, the growth of the mass media in recent years represented a new opportunity to bring astronomy to even larger numbers of people. We've already discussed the A.S.P.'s syndicated newspaper column in an earlier chapter. In addition, for two periods, the Society had its own radio program in northern California. In the mid-1970's Reis hosted an interview program called "Perspectives on Science" on Pacifica


The Return of Halley's Comet

An information packet prepared by
The Astronomical Society of the Pacific
(An International Scientific Organization, Founded in 1889)
1290 24th Ave.
San Francisco, CA 94122 U.S.A.

Halley's Comet on May 9th, 1910, photograph courtesy of Lick Observatory

The A.S.P.'s most widely-distributed information packet. "The Return of Halley's Comet" was sent to many thousands of requestors in 1985-86.

Two group photographs of participants in A.S.P. summer meetings, showing well the change in number (and mode of dress!) of people attending. The portrait at left is from 1962; the one at right is from 1988. (Both meetings were held in Victoria, British Columbia, so travel distance has largely been eliminated as a selection effect in this comparison.) (A.S.P. archives)

station KPFA. In the mid-1980's Fraknoi was producer and host of "Exploring the Universe," a weekly two-hour talk show on science on KGO-FM, an ABC affiliate in San Francisco. That program ended after a year and a half when the station was sold.

Fraknoi has also been a regular guest on radio talk shows in the San Francisco and Los Angeles areas, including 15 years on radio station KGO in San Francisco, appearing on the popular *Jim Eason Show* every six weeks or so for an hour of astronomy news and discussion. More recently, he has appeared on NBC's *Today* show and the CBS late night *Pat Sajak Show,* using the brief television segments to convey at least the flavor of astronomical research and exploration. Other A.S.P. officers and members, such as Directors Ed Krupp and Donald Goldsmith, have also made effective use of television, writing, hosting, or appearing on a variety of programs on public and commercial networks.

In addition, the Society has helped hundreds of reporters in covering astronomical stories or contacting astronomers as part of their coverage. The Society issues regular press releases on important astronomical developments and events, and makes its staff and leaders available at meetings and during the year to explain astronomical discoveries to the media. These days, a typical year will bring several hundred media calls to the Society's offices.

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In the mid-1970's the Society began to offer a 24-hour astronomy hotline, with a recorded message of astronomical news. This was the first national astronomy hotline in the U.S. and still remains the only one specializing not in sky events but in news from the arena of astronomical research. For the last eight years the A.S.P. Hotline has been recorded every week by Sherwood Harrington and now receives over 10,000 calls each year.

Harrington, who joined the A.S.P. staff in 1981, has a B.A. degree from Amherst College and an M.A. in astronomy from the University of California at Berkeley. With a strong background in observational astronomy, Harrington has made very important contributions to the Society's efforts to expand its educational offerings and programs and, as the administration of the programs of the Society have taken more and more of the executive officer's time, has become the managing editor of *Mercury* as well.

Another crucial staff member in the expansion and refinement of the Society's educational offerings has been Janet Doughty, who serves as the A.S.P.'s graphic designer. With an M.A. degree from Stanford, Doughty began work at the Society as office manager, but her creative skills in editing and design soon made her an ideal choice for assistant editor of *Mercury* and for the graphic artist for the catalog and information materials the Society was producing. In recent years, after Apple Computers donated a desktop publishing system to the A.S.P., Doughty taught herself to use computer layout and design software that has enabled all the Society's publications to take on a more professional and eye-catching appearance.

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The Society's annual summer meetings have expanded in length and scope as well. Although the early meetings of the Society involved many programs for nonscientists, by the 1960's and 1970's these meetings were primarily gatherings of professional astronomers to present papers and exchange ideas. There was occasionally a special evening lecture presented for the public; in 1977, for example, at the Pomona College meeting, Margaret Burbidge spoke on the Space Telescope. The 1977 meeting also saw an evening session of contributed papers by amateur astronomers. But as the Society's involvement with amateurs, teachers, and

the public grew, it was time for its meetings to provide more for these groups as well.

At the 1979 meeting at Sonoma State University, Fraknoi inaugurated some new features designed to involve the nonprofessional members of the Society. A special seminar for amateurs dealt with projects that could be carried out with small telescopes. And a full day was devoted to a series of nontechnical talks called "The Universe Unfolding," given by six professional astronomers. These drew a standing-room-only audience and were enthusiastically received, and such a series has continued to be a part of all subsequent A.S.P. meetings. Among the noted astronomers who have given nontechnical talks at A.S.P. meetings are Allan Sandage (whose work has been a cornerstone of 20th century cosmology), Frank Drake (who made the first scientific search for possible radio signals from extraterrestrial civilizations), and Owen Gingerich (the well-known historian of astronomy).

The 1980 meeting in Tucson was held jointly with the Western Amateur Astronomers, and a day-long workshop for educators was also held, dealing with astronomical activities for students in the primary and secondary grades. This workshop was such a success that it has been offered at all but one meeting ever since, often for credit from the university where the meeting is taking place. Between 100 and 200 teachers from around the U.S. and Canada come each summer to spend two to three days learning about astronomical discoveries, classroom activities, teaching resources, and computer software. The success of the A.S.P. workshops has inspired other groups, including the American Astronomical Society and the Western Amateur Astronomers, to try similar activities at their own meetings.

In 1987, the A.S.P. meeting (held in conjunction with six national amateur groups) drew over 900 people to Pomona College, an all-time record for a Society meeting. The Centennial Meeting held in Berkeley in 1989 came close, bringing over 800 scientists, amateurs, teachers, and interested laypeople for six days of meetings, workshops, tours, and celebrations. The staff and officers could look back to Holden's original hopes for Society meetings with some satisfaction, since these days "every person who takes a genuine interest in Astronomy" was indeed getting "a full return from the Society, either from its publications or from its meetings."

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The success of the summer workshops for teachers led to another project which brought the A.S.P. together with several other astronomical groups. Teachers who took the workshops asked if there might be a vehicle by which they could keep in touch with the Society, and with new developments in astronomy. In 1984, with the help of a small grant from the V. M. Slipher Fund of the National Academy of Sciences, the A.S.P. began to publish *The Universe in the Classroom,* a quarterly newsletter on teaching astronomy in grades 3-12. Each issue carries astronomical news, a classroom activity, and resources for teachers.

The Universe in the Classroom. *The A.S.P.'s free newsletter for teachers provides information and activities that reach an estimated two million schoolchildren per year.*

The A.S.P. staff expected that each year a few hundred teachers might write in for the newsletter and that information about it would spread slowly through word of mouth. Instead, the Society received 10,000 requests for *The Universe in the Classroom* during the first year alone. Articles about the project appeared in science and education newsletters and magazines, and requests continued to flood in, completely overwhelming the small budget that had been established for the program.

Once the need for such information in the schools became apparent, the newsletter project was quickly co-sponsored by the American Astronomical Society and the Canadian Astronomical Society, each of which saw an opportunity to help bring more modern astronomy to its nation's schools. The International Planetarium Society joined as a sponsor in 1987. Today over 21,000 teachers receive the newsletter and it has become one of the most influential sources of astronomy information for the schools. Many districts and planetaria duplicate the newsletter for local circulation, so that the information in each issue is being made available to an estimated two million students each year.

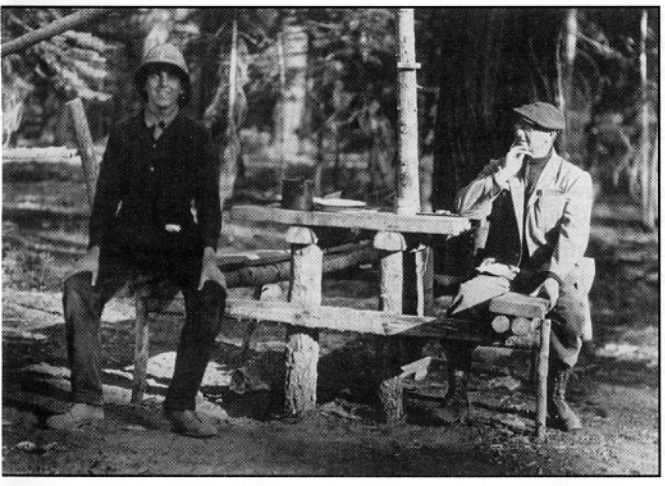
In 1988, the Education Commission of the International Astronomical Union held the first IAU Symposium on Astronomy Education in Williamstown, Massachussetts. Fraknoi was an invited speaker at this meeting and spoke about the newsletter project. As a result, astronomers in several countries offered to translate and distribute the newsletter locally, and copies have since appeared in Denmark, Brazil, Thailand, Malaysia, and Great Britain. (However, continuing Holden's and Burckhalter's tradition, still nothing has been heard from Afghanistan — although given the recent history of that country, their silence in the 1980's may at least be a little more understandable.)

Chapter 18:

The Annual Funds, a Building, and a Centennial

A key ingredient required for the success of the A.S.P.'s outreach programs has, of course, been the money required for additional staff and expenses. As a result of the more aggressive investment policy overseen by Harold Weaver and the Society's Finance Committee, and the efforts to produce new sources of income, the A.S.P. has for the most part been on a much sounder financial footing than in past decades. But some years have still seen deficits, despite increases in the number of members, annual dues, and *P.A.S.P.* page charges.

As a result, a number of the Society's leaders and the executive officer felt that additional steps needed to be taken to insure the Society's financial security. This was especially true because the increased activities were putting great strains on the limited office space the Society had available. Moreover, many of the members and directors hoped that the A.S.P. could purchase a permanent headquarters building in time for its Centennial in 1989.

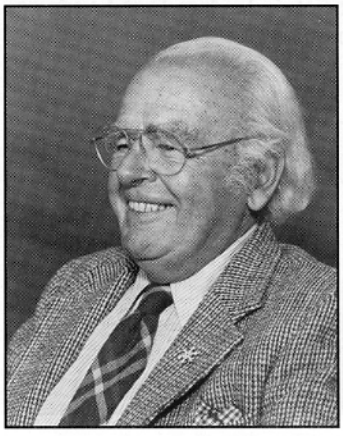


Ansel Adams (left) and his father Charles Adams in Yosemite circa 1919. The elder Adams's love of astronomy and long association with the A.S.P. were not lost on his son; Ansel Adams co-chaired the Society's first Annual Fund campaign in 1982. (Photograph courtesy of and property of the Ansel Adams Publishing Rights Trust, all rights reserved.)

In 1979 (the ninetieth anniversary of the Society), the Board began exploring the idea of buying a real home for the A.S.P. In late 1980 it hired Paula Gillett, who had been a fund-raiser at the University of California at Berkeley, to conduct a feasibility study to evaluate the likelihood of raising enough money to either buy an existing building or build a new one. Her study showed that such a purchase had to be approached carefully and gradually, and that the Society should first begin a program of encouraging regular donations by members and friends who shared the A.S.P.'s goals.

Thus a new development program was approved by the Board in 1982, which was not limited to new quarters for the Society, but was aimed more generally "to enable us to widen significantly the educational programs by which we advance the essential mission of the Society: to increase the public understanding and appreciation of the science of astronomy." With Gillett as the Society's new Development Coordinator, the Board announced the first annual fund in the Society's history.

As co-chairs of this fund drive they enlisted Ansel Adams and Bart Bok. As we saw earlier, Adams, whose influence on twentieth century photography was enormous, was the son of Charles Adams, A.S.P. secretary for many years; Bok was an outstanding research astronomer who made important contributions to our understanding of the Milky Way and of star formation. He was the 1977 Bruce Medalist, the 1982 recipient of the Klumpke-Roberts Award, and a former A.S.P. Board member whose extensive work in popularizing astronomy had won the respect and admiration of both professional and amateur astronomers. Adams and Bok sent a letter to all A.S.P. members in North America and to many other people as well, concerning the fund-raising campaign and the expanded educational program of



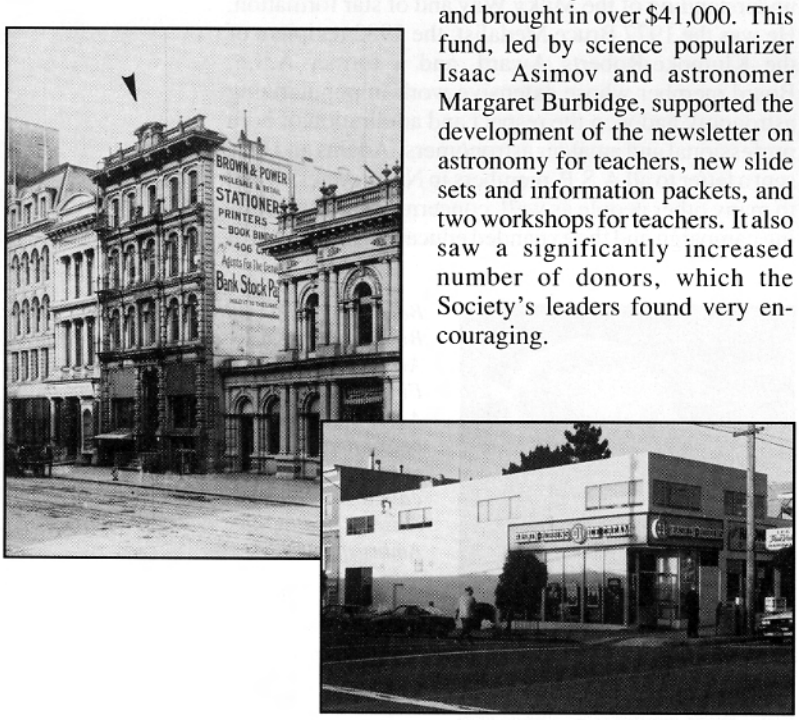
Bart Bok (1906—1983). A recipient of the Bruce Medal and the Klumpke-Roberts Award, Bok also served as co-chair of the First Annual Fund, was a member of the A.S.P. Board of Directors, and wrote a number of popular articles for Mercury. *A fund named in his honor supports the Society's educational programs. (University of Arizona photograph, courtesy of Joyce Bok Ambruster.)*

Isaac Asimov, one of the world's leading science popularizers and science fiction writers. Asimov is a winner of the Klumpke-Roberts Award and served as co-chair of the Second Annual Fund. (Photograph by Alex Gotfryd, courtesy E.P. Dutton)

the society. Fraknoi also described the campaign in a *Mercury* article, and explained in more detail why additional funds were needed: demands on the Society were increasing; printing and mailing costs continued to rise; federal and state support for science education was being cut back, and the help of private organizations like the A.S.P. was urgently needed.

The response to the fund drive was good, including several business and corporate donors (Perkin-Elmer, Eastman Kodak, the Orion Telescope Company, and Shaklee Corporation). Major gifts also came from the William Randolph Hearst Foundation, the Crowley Foundation, and the American Astronomical Society. The first list of donors was published in *Mercury* for March/April 1983 and the success of the drive led the Board to continue and expand the development program in the next few years.

The Second Annual Fund began in the fall of 1983, and brought in over $41,000. This fund, led by science popularizer Isaac Asimov and astronomer Margaret Burbidge, supported the development of the newsletter on astronomy for teachers, new slide sets and information packets, and two workshops for teachers. It also saw a significantly increased number of donors, which the Society's leaders found very encouraging.



During the A.S.P.'s first century, its San Francisco headquarters had at least 15 different addresses. Its first rented rooms (starting in the summer of 1889) were at 408 California Street (left, arrow); its last were at 1290 24th Avenue above an ice cream store (right). (408 California Street photograph courtesy of the Bank of California Museum.)

Subsequent Annual Funds, under Development Coordinator Juliana Ver Steeg (who replaced Gillett in 1984) have helped significantly to expand the A.S.P.'s educational programs, and the growing lists of donors have been published every year in *Mercury*. The Board also created the membership category of Corporate Affiliate of the A.S.P., to acknowledge companies which make significant contributions to the Society. By 1989, over 40 corporations had been elected to Corporate Affiliate status.

In 1983 A.S.P. Board member Bart Bok suddenly died, depriving the Society of one of its most inspiring leaders. In consultation with his children, the Society created a Bart Bok Memorial Fund, to support educational projects on a scale greater than had been possible before. By the end of 1985 this fund totaled over $35,000, as colleagues, students, "grand-students", and admirers of Bok contributed generously to it. The income from this fund has helped finance improvements to the Hotline, the production of new educational materials, and the expansion of the newsletter for teachers.

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Although the Society had grown tremendously since the changes inspired by the Aims Committee report, it still lacked the permanent home that would provide a central focus to its programs and activities. As we saw, the original library begun by Holden (and its replacements) had to be given away because the Society lacked the space to house it. As the centennial of the Society approached, the feeling grew that it was finally time to act on the question of an appropriate A.S.P. home. Actually, the search for a permanent home for the Society began as early as February of 1889, but the Board had always come down in favor of renting office space (or, on occasion, accepting free space for a while from a generous individual or institution).

In almost a century the Society had at least fifteen different addresses. The original meeting was in the PCAPA's rooms in San Francisco, which were used until that summer when the A.S.P. rented rooms at 408 California Street. From 1891-1906 the Society was at 819 Market Street, the California Academy of Sciences Building, which was destroyed in the great fire. After a few years at the Students' Observatory in Berkeley, in 1909 it rented new quarters in the Phelan Building in downtown San Francisco. It moved to the Lick Building in 1917, the Postal Telegraph Building in 1919, the First National Bank Building in 1924, and the Merchants' Exchange Building in 1925. This was where the then secretary, Charles H. Adams, worked, and the office remained there until 1943, when it moved to 129 24th Avenue, Adams' home.

From 1950 to 1960 the Society's address was at the home of the assistant secretary-treasurer, Mrs. Vera Graves; in 1961 it moved to the Natural History Mu-

Annual Fund Co-Chairs

1982:	Ansel Adams and Bart Bok
1983:	Isaac Asimov and E. Margaret Burbidge
1984:	William A. Fowler and Larry Niven
1985:	Loren Acton and Clyde Tombaugh
1986:	Arthur C. Clarke and George B. Field
1987:	Vera C. Rubin and Fred L. Whipple
1988:	Timothy Ferris and Maarten Schmidt
1989:	Paul Hodge and E. C. Krupp

seum Building at the California Academy of Sciences in Golden Gate Park. In 1973, the Academy needed the space and the A.S.P. office moved out of San Francisco to suburban Daly City. In 1975, the growing staff came back to the city, first to 1244 Noriega Street, and then in 1978 to 1290 24th Avenue, where it remained for ten years in cramped quarters over an ice cream parlor.

In the late fall of 1987 the Board of Directors concluded that the overcrowding at the Society's current offices made it imperative to find new, expanded quarters, and they authorized the search for a building. Board members felt (and a survey of a cross section of the members had confirmed) that with the centennial a year and a half away, the time really had come to find a permanent home. After a long and frustrating search, in which the staff looked at over 20 buildings selected by three real estate agents, an ideal building was found in one of the outer districts of San Francisco at 390 Ashton Avenue. Built in the 1930's and extensively remodeled in the early 1980's, it provides nearly 10,000 square feet of space for offices (and for storage of the A.S.P. catalog materials and back issues of *Mercury* and the *P.A.S.P.*).

The building — whose layout was so right for the A.S.P. that not a single wall or door had to be changed — was acquired for a very favorable price, due in large part to the efforts of Treasurer Harold Weaver in negotiating with the sellers. With the selection of the building and the move into new quarters out of the way, a Centennial Fund was established in 1989 to help the Society move into its second century from a position of financial security. With increased endowment, the Society will be prepared to undertake a much stronger effort to imporve scientific literacy in our schools, in our media, and among the public in general. A Centennial Fund Development Campaign is being launched with this as a goal, and given the careful preparation of the past decade, the Society is confident that the campaign's goal will be met within the next three years.

In the meantime the new building has turned out to be ideally suited for the Society's needs and has enabled the staff to make many of the Society's basic functions and programs more efficient and reliable. In addition, the new space allows volunteers and visiting members space that was never before available for assisting the Society or pursuing research projects of their own. Two rooms in the new building have been devoted to the revitalized A.S.P. library, and many members have donated books and journals to the Society to bring the collection back to its earlier levels.

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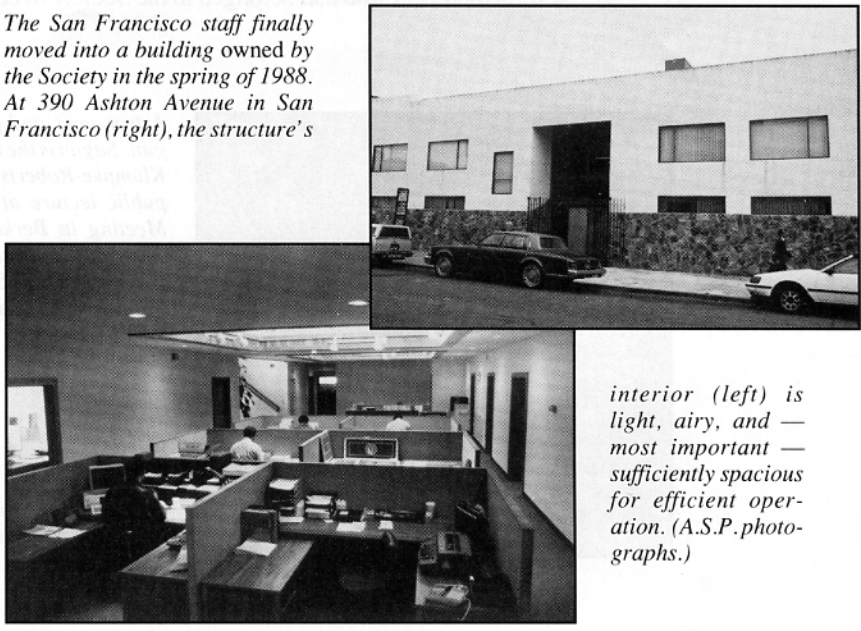
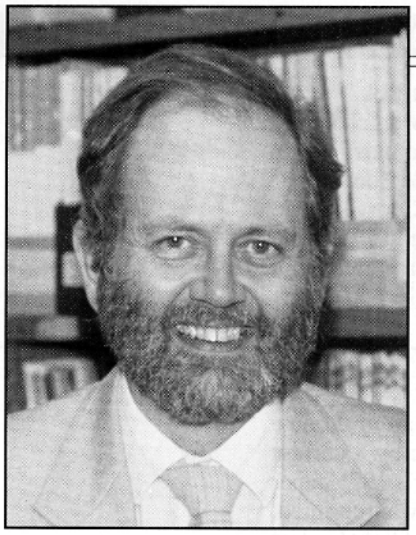
The Society has embarked on other centennial projects as well. Among these, A.S.P. President James Hesser in 1987 proposed a series of retrospective articles in the hundredth volume of the *P.A.S.P.* Published during 1988, each issue of this volume contains a facsimile reprint of an important article from a past issue of the *Publications*, together with an up-to-date commentary on this article and its topic by a current expert. For example, Robert J. Trumpler's 1925 paper on spectral types of stars in open clusters was reprinted, as was his 1930 article on the absorption of light by dust in the Galaxy, with commentary and updating in companion articles by Allan Sandage. I. S. Bowen's 1927 paper on emission lines in the spectra of nebulae formed the starting point for a more general review of the physics of gaseous nebulae by Donald E. Osterbrock. And P. J. E. Peebles commented on H. P. Robertson's 1955 paper on the theoretical aspects of the red shifts of galaxies.

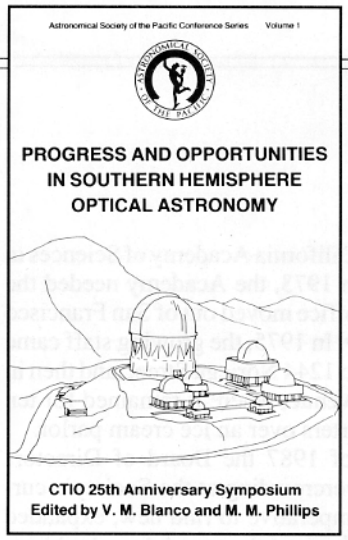
Another new project in the publishing realm is the *A.S.P. Conference Series*. These volumes present the proceedings of various colloquia and symposia at a relatively low price and only a short time after the conference takes place. The first volume, "Progress and Opportunities in Southern Hemisphere Optical Astronomy: The CTIO 25th Anniversary Symposium," which appeared in mid-1988, consists of the papers presented at a January 1988 conference at Cerro Tololo Interamerican Observatory in Chile. Other volumes include "Optical Surveys for Quasars," "Fiber Optics in Astronomy," and the "Extra-galactic Distance Scale" (the symposium held at the June 1988 meeting of the A.S.P. in Victoria, British Columbia). The Society hopes in this way to further its commitment to the professional astronomical community at the same time that it contin-



The San Francisco staff finally moved into a building owned *by the Society in the spring of 1988. At 390 Ashton Avenue in San Francisco (right), the structure's interior (left) is light, airy, and — most important — sufficiently spacious for efficient operation. (A.S.P. photographs.)*



James Hesser, Director of the Dominion Astrophysical Observatory in Victoria and A.S.P. President in 1987 and 1988. (Photograph by A. Fraknoi)



Cover of volume one of the A.S.P. Conference Series.

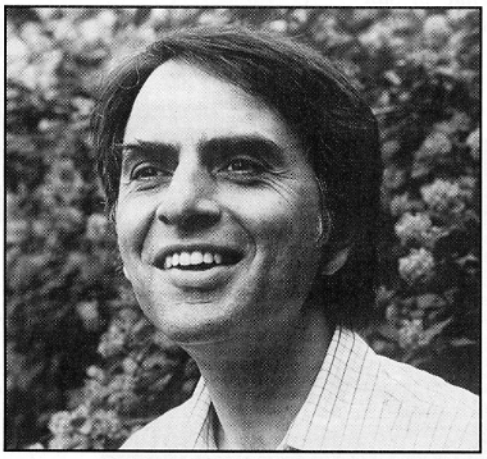
ues its many endeavors in public education. Along the same lines, the Directors in 1988 re-instituted a special membership fee for graduate students in astronomy and physics, to enable them to obtain the journals of the Society at a significant discount.

In June 1989, the Society held its Centennial Meeting, returning to the original Berkeley campus of the University of California, and to Lick Observatory and the Chabot Observatory, the three institutions most intimately involved in its founding. Congratulations were received from many astronomical organizations and observatories, and letters came from many members and elected officials to recognize the Centennial. The July/August issue of *Mercury* included one of these letters, from the President of the United States and Mrs. Bush. At the suggestion of long-time A.S.P. member Frank Edmondson, the International Astronomical Union agreed to name an asteroid "A.S.P." to commemorate the Society's centennial, so that members could say that the celebrations reached beyond the orbit of Mars.

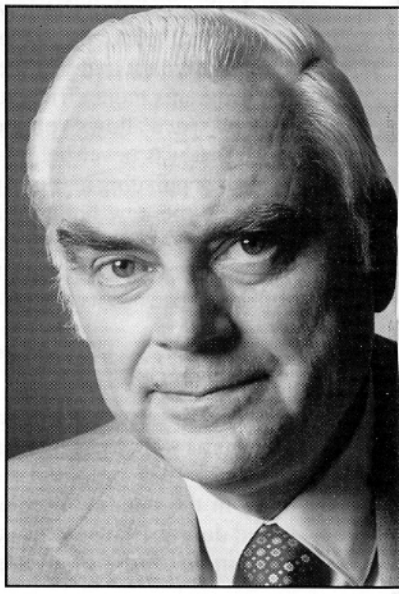
Among those attending the Centennial meeting were the granddaughter and great-grandson of A.S.P. founder Charles Burckhalter, the son and grandson of former A.S.P. President and editor Robert Aitken, and several members who had belonged to the Society over 50 years. At the banquet, President Frank Drake read some of the congratulations and spoke about the rich history of the Society and the hopes of its members and leaders for the future.

And so the Astronomical Society of the Pacific looks back on its first century from a position of strength and wide respect. From a modest beginning of forty members in San Francisco, it has grown to over six thousand, worldwide. Its *Publications* are one of the major astronomical research journals and *Mercury* is widely read in schools and colleges as well as by individual members. Its educational programs reach out to teachers and to the general public in ever-expanding ways. Its founders and staunch supporters over the years would be pleased and proud to see where the Society is today. As it looks towards the future, the A.S.P. expects to continue to thrive, and to continue to broaden its services to astronomers and friends of astronomy around the world. Holden's words written in 1889 are just as true today: "It would seem that...a Society possessing such exceptional advantage ought to grow and prosper, and be of real weight in the advancement and in the diffusion of knowledge."

May the Astronomical Society of the Pacific continue to carry out this mission in its second century as successfully as it has in its first! ■



Astronomer and popular author Carl Sagan. Sagan is the winner of the A.S.P.'s first Klumpke-Roberts Award, gave the invited public lecture at the A.S.P.'s Centennial Meeting in Berkeley, and has agreed to serve as Honorary Chair (with Dr. Sally Ride) of the A.S.P.'s Centennial Fund. (Photograph © Susan S. Lang)



Frank Drake (University of California, Santa Cruz), president of the A.S.P. during the 100th anniversary celebrations. (Photograph by Don Fukuda, courtesy U.C.S.C.)

The author's heartfelt thanks to:

Dorothy Schaumberg of the Shane Archives
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Carter Roberts, Archivist for the Chabot Observatory
Donald E. Osterbrock of the Lick Observatory
Woodruff Sullivan of the University of Washington
Andrew Fraknoi of the A.S.P.

Editors of the *P.A.S.P.*

Edward S. Holden	1889-1898
Robert G. Aitken	1898-1942
Seth B. Nicholson	1943-1955
William P. Bidelman	1956-1961
Katherine G. Kron	1961-1967
D. Harold McNamara	1967-present

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Harold Weaver

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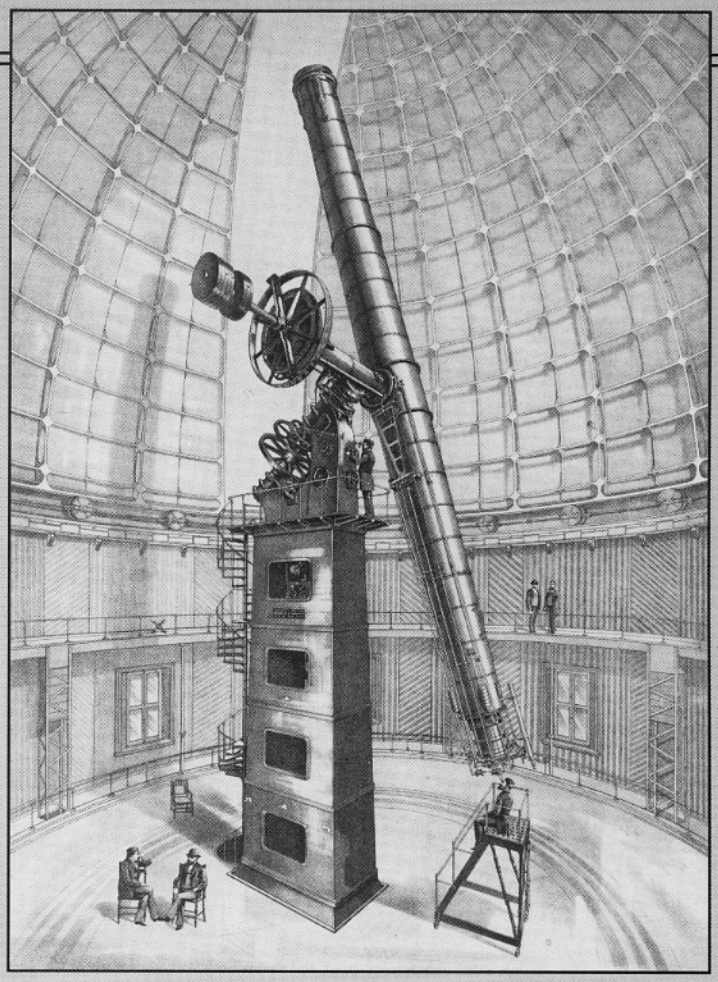

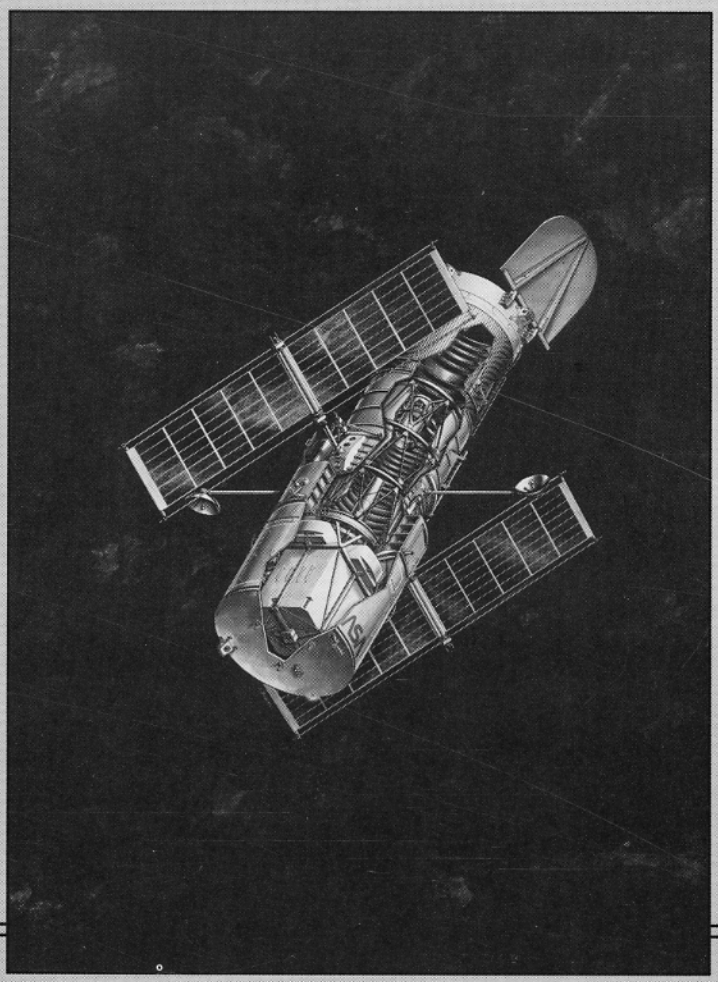

ASTRONOMICAL SOCIETY OF THE PACIFIC