



# Robert G. Aitken

## The Twenty-First Bruce Medalist

Joseph S. Tenn

Sonoma State University

Robert Grant  
Aitken

31 December 1864 - 29  
October 1951<sup>1</sup>

1926 Bruce Medalist

(photograph 1923,  
courtesy of the Mary Lea  
Shane Archives of Lick  
Observatory, University  
of California, Santa Cruz)

<sup>1</sup>The author regrets that  
Aitken's birth date was  
given incorrectly in  
*Mercury*, vol. 15, page  
106 (Jul/Aug 1986).

**A**fter awarding two successive Bruce Medals to theoretical astrophysicists in their forties, the A.S.P. returned to a more familiar type of medalist, a senior astronomer who still looked through telescopes. Although most observers had turned to photography and spectroscopy, Robert G. Aitken was still observing visually, and he was so good at it that he was the world's leader in the discovery and measurement of double stars.

Born shortly after the California gold rush in the small mining town of Jackson, Aitken entered Williams College intending to become a minister. There he was inspired by astronomy professor Truman H. Safford and took his B.A. in mathematics instead. Returning to California, he became an instructor of mathematics and astronomy, first at Livermore College, and later at the University of the Pacific, then in San Jose. Soon he was taking classes on field trips to the Lick Observatory on nearby Mt. Hamilton.

In 1894 he wrote Lick director (and A.S.P. founder) Edward S. Holden,

Please tell me under what conditions and at what expense it will be possible for me to become a student at the Lick Observatory for a few weeks during June or July. I am teaching a class in Descriptive Astronomy and have charge of our Observatory ... But all the knowledge I have of the use of these instruments I have acquired without instruction. I should like now to have skilled instruction especially in the use of the transit and the micrometer, if only for a week, so that I may be able to make practical use of these instruments here.

Holden suggested that Aitken formally apply "to be enrolled as a special student" at the Lick Observatory for two weeks. All went well, and by November Aitken was writing, "Now that my transit instrument is in good shape I want some other definite observing work to do."

Soon afterward he was asking Holden whether he could keep his teaching job and work summers on an advanced degree in astronomy at Lick. Or, better yet, might he obtain a fellowship which would allow him to support his family while studying astronomy full-time. He wrote Holden,

It is like this, Professor, I am tired of teaching ... under the management of men who do not seem to know their own minds thoroughly and can therefore give no assurance of a permanent position to any of their teachers. If I leave here I want to devote my time to Astronomy ...

**Moving to Mt. Hamilton was an adventure, Robert Aitken recalled:**

On the morning of June 1, 1895, the Aitken family, father, mother, and three little children, counting six-months' old baby Malcolm, arose unusually early, for they had to get breakfast and make their way ... to the Vendome Hotel in time to take their places in or on the great four-horse stage which started for the Lick Observatory on Mt. Hamilton shortly before 7:30 every morning except Sunday. Dr. E.S. Holden, director of the Observatory, had given me the privilege of spending the summer there as a special student...

Two weeks later he was offered a one-year appointment as an assistant astronomer. He took it and stayed forty years. In the 1890s life on the mountain could be quite lonely. Before the Aitkens arrived, there were only 28 persons in residence, including seven astronomers and two astronomers' wives. Aitken found

that they were "five hours' travelling distance from our base of supplies, from the nearest doctor and dentist, from the nearest church, school, concert hall, lecture hall, and theater. One telephone, in the main observatory building, served the entire community and every household had to send a representative to it daily to order perishable supplies [which came up on the daily horse-drawn stage].

Even before beginning work at Lick, Aitken wrote Holden that he wished "to measure a list of double stars under Professor Barnard's direction." Barnard soon put Aitken in contact with the world's leading double star observer at the time, S.W. Burnham, who sent the young man lists of double stars to measure.

The work was straightforward. Find a pair of stars close together, measure their separation, and measure the angle between the line joining the two and a line joining the brighter with the north celestial pole. Repeat over the years and hope to find that the stars are a true binary system, with each orbiting the center of mass of the pair, and not a chance projection with one star far beyond the other. With enough observations of a binary system, its orbital parameters could be computed, a mathematical task which Aitken enthusiastically learned. He seems to have been most interested in discovering new double stars and in determining what fraction of all stars are double (he found one in 18), but others, especially theorists, were eager to know the masses of stars, and these can only be obtained from orbits of binary systems.

By 1899 Aitken had set about systematically to observe all stars as bright

as ninth magnitude that were not too far south to be seen from Mt. Hamilton and to catalog all those which were double. At first he and W.T. Hussey divided the sky and alternated with the 36-inch and 12-inch refracting telescopes, but after Hussey left in 1905 to become director of the University of Michigan Observatory, Aitken finished the job alone. He personally discovered more than 3100 new double stars; when Burnham published his *General Catalogue of Double Stars* in 1906, he had to add a supplement to include nearly a thousand new pairs discovered by Aitken and Hussey while the catalogue was in press.

Later Aitken inherited Burnham's files from the latter's scientific heir, brought them up to date, and published two great volumes in 1932 titled *New General Catalogue of Double Stars Within 120° of the North Pole*. The book is widely known as *ADS* for Aitken Double Stars, and some 17,000 stars are known by their *ADS* numbers. Even after retirement Aitken kept up the huge card catalog. Today it is maintained by Charles Worley at the U.S. Naval Observatory in Washington and is disseminated on magnetic tape. Aitken now ranks sixth on the all-time list of visual double star observers with a total of 26,650 observations reported. Aitken's 1918 book, *The Binary Stars*, updated in 1935 and reissued later in paperback, has been the indispensable guide to generations of double star observers.

In 1923 W. Wallace Campbell (see *Mercury*, March/April 1992), who had been Lick Observatory director since 1901, moved to Berkeley to become president of the University of California. For the next seven years

Aitken, as associate director, was in day-to-day charge on Mt. Hamilton, but he had to consult the autocratic Campbell, who remained director, on all major decisions. Particularly galling to Mrs. Aitken, the Campbells kept the big director's house for occasional use. Aitken handled the difficult role well, and although he could occasionally be almost as stern a boss as Campbell, he was a much kinder, gentler person. In a letter recommending Aitken for a public lecture Campbell called him "about the finest gentleman who ever lived."

Observing and measuring up to 150 stars a night was physically taxing, but he managed it efficiently. This type of research "required essentially no thinking at all," according to Donald Osterbrock, John Gustafson, and Shiloh Unruh, in their history of Lick Observatory *Eye on the Sky*. There was time for writing, public speaking, and educating the public, especially through the Astronomical Society of the Pacific. A member of the ASP board of directors and its committees for 57 years, Aitken edited the *Publications of the ASP* for nearly forty, and served as ASP president in 1898 and 1915.

Today's high-tech astronomy is vastly different from that of Aitken's day, but his observations are still indispensable to obtaining orbits, and from them masses, of a great many binary stars.

Acknowledgements: Quotations are from the Mary Lea Shane Archives of the Lick Observatory; an interview with Douglas C. Aitken by David DeVorkin, 1977, American Institute of Physics; Aitken in *The California Monthly*, 1935; and Heber D. Curtis in *The Sky*, 1941. The author is grateful to Douglas Aitken and John Aitken for providing information about their grandfather and to Richard Walker for valuable comments.