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ADDRESS OF THE FIRST VICE-PRESIDENT, AT THE FIFTH ANNUAL MEETING, MARCH 25, 1893.

BY E. J. MOLERA.

The President of this Society, being now more than 5,000 miles away, and constituting, alone, the expedition from the observatory at Mt. Hamilton, to observe the coming total eclipse of the Sun, cannot address you to-night.

A week ago I was in the City of Mexico, and had to travel nearly 3,000 miles from the Halls of Montezuma to this Temple of Science, for the pleasure of attending this meeting. I crave your kind indulgence, if, instead of the excellent addresses you have heard on similar occasions, you hear to-night the improvisation of an amateur astronomer.

The prosperity which our Society has enjoyed since its beginning has continued during the last year, and is still on the increase. The numbers 40, 192, 360 and 432 represent the membership at the formation of the Society, and at the beginning of the years 1890, 1891, 1892; this year began with 493 names on our roll, of which 438 are active contributing members, and the other 55 life members. The report of the Treasurer shows to you the sound financial basis on which our institution rests, and the reports of our different committees are evidence of our activity during the past year. Our publications, however, are the pride of our Society, containing, as they do, contributions from the best astronomers in every quarter of the earth. The fact of being a semi-official organ of the LICK Observatory makes them, to a certain extent, the conveyor of the important discoveries

FOREST FIRE NEAR MOUNT HAMILTON, AUGUST, 1891
FROM A NEGATIVE BY PROFESSOR CAMPBELL.

of that great observatory. To its astronomers, and specially, to Prof. HOLDEN, the Chairman of our Publication Committee, the thanks of the Society are due.

The past year has been fertile in celestial phenomena and in discoveries made both by professional and amateur astronomers. Hardly had the new year commenced, when a new star was discovered in *Auriga*, by Dr. ANDERSON of Edinburg, an amateur astronomer. A remarkable fact in connection with this discovery is that the photographic plates exposed by Prof. PICKERING of Harvard College Observatory, had already registered the existence of the star a month before the visual observation. Probably no other star in the firmament has been so well observed, and by so many noted astronomers, as the *Nova* in *Auriga*. I will not detain you with a description of its vicissitudes, as you have already read in our transactions the master descriptions of Mr. CAMPBELL and other members of our Society.

Following the discovery of *Nova Aurigæ* came the great Sun spot of February 1st, observed by Mr. HUSSEY, and independently discovered with the naked eye by the President of our Society. That great spot, one of the largest ever seen, covering, as it did, 2.850 millionths of the Sun's visible surface, was accompanied by violent and characteristic magnetic disturbances and by brilliant auroræ.

One of the most interesting phenomena during last year was the opposition of *Mars*. Of all the celestial objects, this is the most romantic, being the favorite subject of imaginative astronomers. A look at that neighboring planet with a good telescope reveals the existence of two white polar caps and of markings on its surface, giving it a certain appearance not unlike that of our own Earth. The existence of an atmosphere, together with that appearance, has, no doubt, suggested to some the idea of its inhabitants.

It is not, then, wonderful that the popular mind was excited at the coming of the opposition of *Mars*, and that sensational discoveries were impatiently expected. For the thinking astronomer, no such discoveries were anticipated, realizing that at its nearest position from our planet it would still be 35,000,000 miles away, which, even with the best telescopes, would be as if we would look at Europe from America placed seven times apart.

Many interesting observations of *Mars* were made during the

time of its opposition, especially at the LICK Observatory, where SCHIAPARELLI'S discovery of 1877, viz., the so-called "canals" were confirmed.

The members of the Society will soon have an opportunity of judging of the work done at Mt. Hamilton during the past opposition, by a series of many admirable drawings, which will be published by the observatory and reprinted in these *Publications*.

I think that the name of "canal" for the straight double lines first discovered* by the Milanese astronomer was unfortunate, specially, as there was no necessity for such a name. The Italian word "canale" first given to the dark double lines on *Mars*, means not only "canal," but also "channel" like a water-course, a narrow passage of the sea between two portions of land; a gutter; a furrow, etc. The word canal implies the work of man, channel does not. I am convinced that the great Italian astronomer intended by the word "canale" to convey the meaning of our word "channel."

The interpretation given by Prof. SCHAEBERLE to the above named markings on *Mars* would be misnamed by the word "canal," but would be well described by the word "channel." This will show the care to be taken in translating scientific papers.

No sooner had the activity in observing *Mars* diminished, when a new discovery was announced; in fact, one of the most important astronomical discoveries of this century — the fifth satellite of *Jupiter*, by Prof. E. E. BARNARD of the LICK Observatory, made at midnight of September 9.

The *Publications of the A. S. P.* had the honor to be the first to print the original telegram sent to the observatories of the world that a new satellite had been added to those attendants of the giant planet discovered nearly three centuries ago by GALILEO with a telescope made by his own hands.

A remarkable coincidence is, that while the city of Padua was doing honor to the memory of the great astronomer who had taught the new astronomy in its University, one of the youngest astronomers in the New Continent, at the youngest and best observatory, was completing the great master's discovery by adding another satellite to his list.

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*These canals were first observed by Prof. HOLDEN, at Washington, in the opposition of 1875.

When we take into account that *Jupiter* is probably the planet most observed by the best astronomers with the finest telescopes, and that the small size of the new satellite, 100 miles in diameter, together with its close proximity to the planet's center, about 112,500 miles, make the observations extremely difficult, on account of the planet's glare, BARNARD'S discovery is not short of that of genius.

Subsequently the fifth satellite of *Jupiter* has been observed at Princeton College by the telescope of 23″ aperture; at the University of Virginia with the 26-inch refractor; at Dearborn Observatory with an 18½″, and by Mr. ALBERT TAYLOR with Mr. COMMON'S 5-foot reflector.

As if fortune had not sufficiently favored the young astronomer, a photograph of the Milky Way, taken by him on the night of October 12 last, showed a dark blurry spot; for most of observers, such a small spot would have been passed unnoticed; but the comet discoverer suspected the presence of one of those knights-errant of the firmament. On the following night his suspicions were confirmed, and thus, for the first time, the sensitive photographic plate revealed the existence of a new comet. This fact, in connection with the one noticed already, referring to *Nova Aurigæ*, shows what a future photography presents for the automatic registering of celestial phenomena.

If the year just passed has afforded a rich field for astronomical observations, the present year gives promise of an equally abundant harvest. Our President is now in Chile to observe the coming total eclipse of the Sun, and to confirm or disprove his own theory of the solar corona by his own observations and those of the other expeditions in the same country, and those sent to Brazil, the west coast of Africa and elsewhere. We all are expectant, and anxiously await the telegrams of April 16 with fervent wishes and sincere hopes for his success.

I wish to call the attention of our Society to the debt of gratitude we owe to Mrs. PHŒBE HEARST, even at the risk of offending her modesty, who generously has furnished the funds for the expedition, and also for creating Fellowships in Astronomy at the LICK Observatory. The latter is now giving, by authority and direction of the Regents of the University of California, the highest class of instruction to students who may be elected Fellows in Astronomy, and is filling a want keenly felt before.

The work of photographing the Moon in all its phases is being continued at Mt. Hamilton, and the negatives are being assiduously studied by Prof. WEINEK at Prague, who has been rewarded by a number of interesting and suggestive discoveries.

A new Section, called "The Mexican Section of the A. S. P." has been organized in the City of Mexico, under the rules of our Society. All the reasons presented to the Society by its first President in favor of such organizations apply forcibly to our Mexican members. On account of the great distance from our home, the only bond of fellowship is the reception of our *Publications*, which, in this particular case, are printed in a language foreign to their vernacular. The membership will largely increase, no doubt, when they effect a closer union with each other through frequent meetings and mutual aid. Such was the idea that inspired the formation of the Mexican Section.

It was my privilege to enjoy the hospitality of the principal of our Mexican members at the National Astronomical Observatory, at Tayubaya, two weeks ago. The photographs of the buildings and instruments of that institution, which I have the honor to present to our Society to-night, will show to you that the equipment is fully equal to the requirements of modern astronomy. The principal instruments are two refracting telescopes, one 15″ and the other 6″ aperture; one 8″ meridian circle of excellent workmanship; an altazimuth 3½″ and a photo-heliograph 4″ aperture. By stating that nearly all those instruments are from the workshop of Sir HOWARD GRUBB, no other recommendation is required. Chronographs and the other usual instruments, together with an excellent library, complete the outfit.

The instruments are operated by the following gentlemen: ANGEL ANGUIANO, Director and Astronomer; Messrs. FELIPE VALLE, CAMILO GONZALEZ, FRANCISCO RODRIGUEZ REY, TEODORO QUINTANO, MANUEL G. PRIETO and GUILLERMO PUGA, all members of our Society. Of their thorough knowledge of the science of astronomy I can testify, as I was present at the examination of Sr. AGUSTIN ARAGON, another of our members. The Mexican Section of our Society is therefore in good hands, and its success is assured.

Among the committees appointed last year, one was the San Francisco Observatory Committee. It has so far progressed as to secure an observatory site in the Golden Gate Park.

An observatory in this city is needed for two reasons: First,

because the people who most need to be enlightened on elementary astronomy cannot visit the great observatory at Mt. Hamilton; second, because the astronomers of that institution should be relieved from visits of the simply curious people; their time and instruments being too precious for such purpose.

It is to be hoped that the noble example of JAMES LICK, CHAS. F. CROCKER, ALEXANDER MONTGOMERY, Mrs. PHŒBE HEARST, and other patrons of astronomy, will be emulated by our numerous wealthy citizens, whose memory cannot in any better way be perpetuated than by subscribing, during the present year, sufficient funds for the San Francisco Observatory of the Astronomical Society of the Pacific.

ASTRONOMICAL OBSERVATIONS.

MADE BY TORVALD KÖHL, AT ODDER, DENMARK, IN THE YEAR 1892.

VARIABLE STARS.

Z Cygni.

August 19 . . . . . Z invisible in the 3-inch STEINHEIL, power 42.
" 24 . . . . id.
September 14 . . . id.
" 18 . . . Z < e, extremely faint.*
" 28 . . . Z < e, yet constantly visible.
October 9 . . . . . Z = e.
" 14 . . . . . id.
" 18 . . . . . Z a little > e.
" 19 . . . . . Z plainly > e.
" 25 . . . . . Z perhaps a little > a.
November 10 . . . $\begin{cases} Z > b. \\ Z < 26. \end{cases}$
" 18 . . . id.
" 21 . . . id.
" 25 . . . id.
" 29 . . . id.
December 16 . . . id., perhaps a little decreasing.

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* Vide *Publications A. S. P.*, No. 22, pp. 62, 63.