

## New Aurora Mystery Solved

*Astronomy*

A mystery as to why a certain green color appears in the light of the Aurora Borealis, or northern lights, was dispelled at the closing session of the Ottawa meeting of the American Astronomical Society. The astronomers' attention was turned from more distant celestial objects to an astronomical phenomenon that happens in the earth's own atmosphere when they heard a paper sent in by Dr. V. M. Slipher and L. A. Sommer, of the Lowell Observatory, in Flagstaff, Arizona.

In July, 1928, there was a brilliant display of the northern lights visible from Flagstaff. Dr. Slipher, and his associate, proceeded to analyze its illumination by passing its light through the prisms of a spectroscopic, and obtaining a record of the spectrum on a photographic plate. This spectrum showed the usual bright lines that had previously been observed in the auroral spectrum. They included a green one with a wavelength of 5577. Light waves, like their big brothers, radio waves, are identified by their wave length. Only instead of using meters, the astronomer uses what he calls the "angstrom unit," about one 250 millionth of an inch.

The line at 5577 was shown a few

### Astronomers Elect

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At the election of officers, Dr. R. G. Aitken, who has charge of the Lick Observatory of the University of California, was elected vice-president of the American Astronomical Society. Dr. E. S. King, of the Harvard College Observatory, and Dr. F. H. Seares, assistant director of the Mt. Wilson Observatory at Pasadena, Calif., were made members of the society's council. Dr. S. A. Mitchell, of the University of Virginia, will represent the society in the National Research Council. Dr. R. S. Dugan, of Princeton University, the secretary, and Dr. Benjamin Boss, of the Dudley Observatory, at Albany, N. Y., treasurer, were reelected to their respective offices. It was decided to hold the next meeting at the end of December at the Harvard Observatory, in Cambridge, Mass.

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About one-third of the United States receives too little rainfall for important crop production.

years ago by Dr. J. C. McClennan, of the University of Toronto, to be caused by a transition taking place in atoms of oxygen high in the earth's atmosphere when excited by electrons from the sun. Near this line, however, there was another, at wave length 5206. Nobody had ever noticed this before, so it seemed that one mystery had been solved only to have a new one appear.

The two Arizona astronomers now report that atoms of nitrogen undergoing a transition from one state to another are the cause. In fact, light showing this line can be obtained experimentally in the laboratory by electrical discharges in mixtures of ordinary nitrogen and inert gases such as helium and neon.

They summarized their work as follows:

"The investigations up to the present time have shown that in the high atmosphere, where the aurora originates, nitrogen molecules, nitrogen molecule ions and oxygen atoms are present during an auroral display. The observation of the line 5206, and its interpretation as atomic nitrogen, indicates the presence of nitrogen atoms at the time of such a display."

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## Checks Jupiter's Moons

*Astronomy*

Prof. E. W. Brown, of Yale University, president of the American Astronomical Society, told the members of his work on computing the orbit of the eighth moon of Jupiter. Several times this faint satellite has been lost by the astronomers, but Prof. Brown hopes that his work will permit them to predict its path with sufficient accuracy that they will always be able to find it. He is known as the world's greatest authority on the motion of our own moon. This is one of the most difficult of astronomical problems, because of the numerous ways that it is pulled to and fro by the gravitational attraction of all the other things in the solar system. The path of the eighth moon of Jupiter is much more elliptical than that of the moon, and this fact, with other of its peculiarities, makes it very hard to calculate its motion.

"It has all the difficulties of the lunar theory, all of the planetary theory, and then some!" he declared. But now he has completed the first stage of his work, and he hopes, when he has finished it, which he expects to do this fall, that the satellite will behave in a seemly manner, and move in the paths of rectitude to which it has been assigned.

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## Describes Longest Eclipse

*Astronomy*

Hope that any astronomer might have had of some day seeing a total eclipse of the sun lasting nearly eight minutes were blasted when Mrs. Isabel Lewis, of the U. S. Naval Observatory, in Washington, reported on her investigations of how long an eclipse may really last. She was led to this investigation, she said, by finding that three different authorities gave three different values. One old figure, but still given, was 7 minutes and 58 seconds, another was 7 minutes and 40 seconds, while Simon Newcomb, a famous American astronomer, said that 7 minutes and 30 seconds was its maximum possible duration.

A total eclipse of the sun occurs when the moon's shadow touches the surface of the earth. The shadow is a cone, so it is largest where it hits the earth when the moon is nearest the earth and the sun farthest. This condition must exist, and the shadow must fall on the

equator, so that the observer may travel fastest with the shadow, in order to have the longest possible eclipse, said Mrs. Lewis. Then the sun will be obscured for 7 minutes and 31 seconds, she discovered.

As the combination of sun farthest and moon nearest now occurs about two weeks after the beginning of summer, an eclipse of longest possible duration would have to occur about July fourth. But no astronomers need expect to celebrate American Independence Day with the longest eclipse, for many centuries will elapse before one occurs under the proper conditions. Owing to one of the notions of the solar system, the necessary conditions are changing for the worse. Five thousand years from now, said Mrs. Lewis, the moon will be nearest in September, and then an eclipse will only be able to last 7 minutes and 14 seconds.

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