

in a general way is off the Celebrass shoal, about forty miles from the Tonga Islands, toward the Fiji Islands. Its position is approximately in latitude  $20^{\circ} 28'$  south, and longitude  $175^{\circ} 21'$  west from Greenwich. Further details are expected by another steamer. The island was photographed by the British consul to Samoa, who was a passenger.

#### ASTRONOMICAL NOTES.

**Harvard college observatory.**—Professor Pickering's annual report was presented to the visiting committee on Dec. 3, and shows most gratifying progress in the work, in spite of the serious curtailment of the income of the observatory during the past year. The fifteen-inch equatorial is still devoted largely to photometry; and, besides a large amount of routine work accomplished, a series of observations of the temporary star which recently appeared in the nebula of Andromeda was obtained. Professor Rogers's excellent work with the meridian circle continues, and the reduction of his zone is nearly ready for the press. The meridian photometer also has been in active operation. By the aid of the Bache fund an important investigation has been undertaken in stellar photography, which has already been referred to (*Science*, vi. 443). Mr. Chandler's work with his almucantar we have noticed from time to time, and we look forward with much interest to the publication of a detailed description and theory of the instrument, which it is understood he has prepared. The telegraphic distribution of important astronomical discoveries, for which this observatory is the American centre, has been successfully continued under the supervision of Mr. Ritchie.

**The Lick observatory.**—The Clarks have made wonderfully rapid progress with the crown-glass disk of the immense three-foot lens for the Lick observatory. The work of grinding was begun on the crown-disk about two months ago, and already they are able to set up the lens for examination by artificial light. The flint-disk has been practically ready for some time, and, with continued favorable progress, they hope to finish the objective by the autumn of 1886. It has not yet been decided who is to make the mounting for the instrument, or the dome which is to cover it. We notice that the thirty-inch objective for the Nice observatory has just been finished by the Henry brothers, and that it has been sent to M. Gautier, who has charge of the construction of the equatorial; the whole to be mounted at Nice in April, 1886.

**The Biela meteor - shower.**—Reports from Europe show that we in this country entirely missed the thickest part of the meteor-shower

of Nov. 27, as it had dwindled to comparatively insignificant proportions when our twilight came on. From various places in England and on the continent, where the sky was clear on the 27th, come reports of brilliant showers, sometimes too rapid for counting, and in many cases exceeding sixty per minute for a single observer. They were also very bright, and left trains continuing visible in some cases as long as 30<sup>s</sup>, and frequently appeared almost simultaneously in bunches of five, eight, or ten. These were all early in the evening for European longitudes, and we shall have to wait for reports from farther east, in Arabia or India, perhaps even from Dr. Doberck at Hongkong, before we can be sure that we have heard of the maximum activity of the shower. This seems to have been well heralded in advance. The earliest observations thus far reported are by Mr. Barnard of Nashville, Tenn., who observed twenty or thirty meteors from the Biela radiant during an interval of two or three hours of clear sky on the evening of Nov. 25; and both he, and Mr. Denning of Bristol, England, counted them at the rate of one hundred or more per hour on the evening of the 26th. On the 27th none of the comets in this country appear to have exceeded two hundred or three hundred per hour for a single observer, and Mr. Denning reports that those of the 28th were very small and insignificant in a clear sky at Bristol.

**New star in Orion.**—A complete set of observations of the new star discovered by Mr. J. E. Gore, an English astronomer, on Dec. 13, was obtained at Harvard college observatory on Dec. 16,—the very evening on which the despatch was received from Lord Crawford,—settling the non-identity of the star with D.M. +  $20^{\circ}$ , 1172, the star named in the despatch. A meridian circle observation by Professor Rogers gave for the position of the *nova* R.A.  $5^h 49^m 4^s.25$ : Dec. +  $20^{\circ} 9' 15''.6$ . Professor Pickering's photometric measures made the magnitude 6.2, and the spectroscope showed the existence of bright bands. Two excellent photographs fixing the position of the star with reference to neighboring stars were obtained, and one photograph of the spectrum. The indications are suggestive of the new star being a long-period variable, and there was a slight suspicion of a diminution in magnitude during the first six or seven hours it was under observation.

#### METEOROLOGICAL NOTES.

**An unusual tornado.**—The Alabama weather-service report for November describes the tornadoes that occurred on the 6th of that month. At Decatur the storm is reported to have come