

THE SOLAR ECLIPSE OF MAY 6.

THE members of the expedition for observing the total solar eclipse of May 6, who left New York on March 2, arrived in Callao, Peru, on March 20. At that port they were received by the U. S. vessel *Hartford*, and sailed on the 22d for Caroline Island, expecting to make the journey in about twenty-five days. Ample time is thus secured for the preliminary work for the contemplated observations.

It is not known yet whether the party will establish themselves upon Caroline or Flint Island. Preference is given to the former, on account of its larger size, and it will be chosen unless it is found that the French astronomers have already located there, in which case the Americans will select Flint Island, that both points may be occupied. The *L'Éclaireur*, the man-of-war which is to convey the French astronomers from Panama, was not in that port when the Americans passed through there.

The two English members of the party, Messrs. H. A. Lawrance and C. Ray Woods, joined the expedition at Panama. They are sent out by the Royal society and the Committee of solar physics, of which Messrs. Lockyer, Stewart, and Stokes are the leading members, and made important observations of the eclipse of last May. These gentlemen come from South Kensington, and have been engaged in spectroscopic work with Mr. Lockyer.

The plans of the party show that spectroscopic observations will be the principal work attempted. An outline of these plans will be of interest.

A spectroscope with a large prism, attached to a $6\frac{1}{4}$ -inch telescope, will be used by Dr. Hastings for studying the corona, especially the outer corona. During partial phase the chromosphere will be examined, a grating being substituted for the prism. Mr. Rockwell will observe with a grating spectroscope attached to a $4\frac{1}{10}$ -inch telescope, and will note the relative lengths of lines reversed just before totality within a small region of the spectrum. Probably just after this, the grating will be exchanged for a single 60° prism, and an examination made of the limits to which the line 1474K can be traced. A prismatic spectroscope, which consists of a large 30° prism placed before the objective of a $2\frac{1}{2}$ -inch telescope, will be used by Mr. Upton for observing the relative heights and brightness of the hydrogen group, and of other portions of the spectrum. Mr. Brown will use an integrating spectroscope for observing the lines which appear during totality, and the changes which they undergo.

Mr. Lawrance has planned an equatorial stand upon which is mounted a 6-inch objective, having at its focus a grating spectroscope with cameras on each side, for photographing the spectra of the first and second orders. On the same stand is a 6-inch photographic lens, in the focus of which is a spectroscope of low dispersion, armed with a camera. These three cameras will be used to photograph the flash just before and after totality, in order to confirm, if possible, by photography, Mr. Lockyer's eye-observations of last year. He observed the short, bright, chromospheric lines ten minutes before totality began, and, just before totality, the lines which are usually thickened in sunspots, extending as faint lines to a much greater elevation than those of the protuberances. Mr. Woods will employ a siderostat to throw a beam of light upon four instruments,—integrating, analyzing, and prismatic spectroscopes, and a Rowland grating. The photographic plate of the integrating spectroscope is very long, and will be driven by clock-work, in order that, as the portion of the plate illuminated at any given instant is small, the integrated effects that have hitherto been photographed may be differentiated if possible. The grating is provided with cameras on each side,—one to photograph the F region; the other, that more refrangible than H. The prismatic camera was used with great success in Egypt last year. It integrates the light from all parts of the corona; and it is hoped that all the rays, from the violet to the ultra-red, will be photographed. The analyzing spectroscope was also used with good result in Egypt. The plates will be 'red-end' ones, in order to take in all the rays of the spectrum.

In addition to the spectroscopic work, other important observations are planned. Professor Holden will search for intra-Mercurial planets with a 6-inch telescope, and Mr. Preston will use a Savart polariscope attached to a 4-inch or a $2\frac{1}{2}$ -inch telescope. Two photoheliographs will be used for photographing the inner and outer details of the corona, under the management of Mr. Lawrance. Observations of solar radiation, of meteorological phenomena, and of the times of contact, will also be made.

After the eclipse, the party is to be conveyed to Honolulu by the *Hartford*, from which point they will reach San Francisco by the Pacific mail line of steamers. Should there be no delay, intelligence of the results of the expedition may be expected by the middle of June.

W. U.

Callao, Peru, March 22, 1883.