ART. LXVI.—*Observations on the Transit of Mercury.* Letter to the Editors from JOHN RODGERS, Rear Admiral U. S. N., Superintendent of the United States Naval Observatory, dated May 11, 1878.

It may interest your readers to learn that the transit of Mercury, occurring on May 5-6, was very successfully observed at the Naval Observatory, and throughout the country generally. Satisfactory observations of all the contacts were made here, and good observations of the contacts have been reported from the observers of the United States Coast Survey in Washington, and in different parts of the country. Reports of observations of the contacts have been received from the French astronomers at Ogden, Utah, and from the astronomers at Cincinnati, Chicago, Glasgow, Mo., and from amateur observers at New Orleans, Savannah, and various other points; so that we have an abundance of observations of this kind.

Since, however, observations of the contacts give only the correction of the longitude of the planet, the larger part of the appropriation of \$1,500 made by Congress for observing this transit was expended in photography. The directors of the observatories at Cambridge and at Ann Arbor, Professors Pickering and Watson, kindly undertook the work of making photographs at their observatories; and a set of the instruments used in photographing the transit of Venus in 1874, was sent to each of these observatories. The method of taking the photographs was the same as that followed in the case of the transit of Venus. The dry-plate process was, however, adopted in the present case, in place of the wet-plate process used in the transit of Venus. The great advantage of the dry-plate process, if it can be used successfully, is evident. The plates were all prepared here by Mr. Joseph A. Rogers; and seventy-two plates were sent to each of the observatories, where they were exposed and then returned here for development. The same number of plates were exposed here by Mr. Rogers.

The day at Washington was very favorable, and the plates were exposed here in groups of six, along the chord described by the planet across the disc of the sun. The development shows that all the photographs taken here can be measured accurately; and we think they will furnish data for a very exact determination of the latitude and longitude of the planet on the day of its transit.

The day at Cambridge was not favorable, and the development of the plates exposed there gives very thin photographs; some of which, however, can be measured. At Ann Arbor the day was cloudy during the latter part of the transit, and the plates were all exposed in the earlier part of the day. These photographs are all very dense, but probably all can be measured. Measurements of these photographs will be made as soon as possible and the results published.

A set of the transit of Venus photographic apparatus was furnished the French astronomers, Messrs. André and Angot, at Ogden, for the purpose of comparing the different methods of photographing the transit. These gentlemen report a snow storm during the early part of the day, but clear weather in the afternoon, during which a good number of photographs was secured.

Our experience in photographing transits of planets, and in measuring the photographs, indicates that while the American method is correct in theory, the apparatus needs some change. In order to obtain good measures, the picture should be sharp, and the exposure short. It is probable, therefore, that the reflectors, which now lose about nineteen-twentieths of the light, will have to be changed.

A comparison of the observations of contact with the ephemerides of the American and English Nautical Almanacs shows that the English Almanac is much nearer the truth. Since the ephemeris of the American Almanac is based on Leverrier's old theory, and that of the English Almanac on his recent one, the result of the present observations appears to be a confirmation of Leverrier's theory with respect to an intra-mercurial planet.

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