

GLEANNINGS FROM THE MAILS

THE COMING TRANSIT OF VENUS.

THE UNITED STATES EXPEDITIONS WHICH
WILL TAKE OBSERVATIONS.*From the Washington (D. C.) Star.*

The transit of the planet Venus across the face of the sun occurs on the 6th of December next, and the scientific world is looking forward to that event with great interest. In every civilized country preparations are being made to observe the transit, and the various civilized Governments have made liberal appropriations to send out parties of observers to various points. The United States Government is not behind the rest of the world in this respect, Congress having appropriated \$75,000 for this purpose. It is the intention of the authorities to equip eight parties, and as those intended for distant parts of the earth will have to start in the early part of the next month, the preparations are now under full headway at the Naval Observatory. The same method employed in observing the transit of 1874, by means of photographs of the sun's surface, will be followed next December, and it is believed that the results will justify the wisdom of this selection. Besides the four stations in this country, which will be at Washington, Cedar Keys, Fla.; San Antonio, Texas, and Fort Thorne, New-Mexico, there will be four foreign stations, namely, Cape of Good Hope, Santa Cruz, Patagonia; Santiago, Chili, and one in New-Zealand.

The party for the New-Zealand station will start out first, and expect to leave about the 1st of September. It will be in charge of Mr. Edwin Smith, of the United States coast survey, who has for an assistant Prof. Pritchett, of Washington University, St. Louis. The party for Patagonia will leave about the same time, and will be stationed near the mouth of the Chilo River. Lieut. S. W. Very, United States Navy, will be in charge of this party, with Mr. O. B. Wheeler as assistant, and Mr. William Bell, of Philadelphia, as principal photographer, and Mr. Irvin Stanley, of Carmel, Ind., assistant photographer.

In order that the arrangements for observing the transit may go off without a hitch, the members of the parties have been devoting some time at the Naval Observatory to practice. An apparatus, similar to that which will be employed at all the stations, has been erected at the observatory, and the practice in photographing the sun has been made familiar to all those who are members of the parties. This apparatus consists of a long shed, having at one end a photographic lense and a heliostat, which turns the rays of the sun and throws them horizontally into a small frame house at the other end of the shed, where the photograph is made. With the exception of this apparatus, which is very simple, and is to be erected by the parties upon their arrival at their destination, no equipment of instruments is needed. A small equatorial telescope will be taken along to observe the contacts—the beginning and the end of the transit.

The two other parties for foreign stations will start about the middle of September. The one going to Santiago, Chili, will be in charge of Prof. Lewis Boss, of the Dudley Observatory, Albany, N. Y. Mr. Miles Rook, of the Naval Observatory, will be assistant astronomer, and Mr. T. Marceau, of Canandaigua, N. Y., chief photographer, and Mr. Gustav Theilkuhl, of this city, assistant photographer. The other party, under the charge of Prof. Simon Newcomb, the Superintendent of the "Nautical Almanac," will go to the Cape of Good Hope. Lieut. Thomas L. Casey, Jr., United States Army, will be assistant astronomer; Julius Ulke, of this city, principal photographer, and Ensign Holcomb, United States Navy, assistant photographer.

The parties for the stations in the United States will not start until the middle of October, and the *personnel* has not been agreed upon as yet. Prof. Hall will have charge of the party at San Antonio, Texas; Prof. Eastman at Cedar Keys, Fla.; Prof. Davidson at Fort Thorne, New-Mexico, and Prof. Harkness the one in this city. The parties that were sent out in 1874 to observe the transit of Venus had in many cases rather rough experiences, owing to the wild and desolate localities in which they were stationed. This year all the parties will be favorably situated, in most cases near large cities, with the exception of the Patagonian party. The latter, however, will be conveyed to the station on the United States steamer Brooklyn, which will remain with them until their work is completed.

While there is great interest manifested in the results of these observations, and considerable enthusiasm in scientific circles, still the chances of the entire preparation coming to nothing are so great that scientific men are not inclined to be very sanguine. The transit of 1874 was rendered valueless on account of the clouds which obscured the face of the sun during the transit and prevented photographs from being taken. A more favorable condition is hoped for this time. In order to avoid as far as possible the unhappy contingency of clouds, stations have been selected in the South instead of in the North—Washington being the furthest Northern station. The question might be asked by the unscientific mind why so much interest is attached to this phenomenon. Transits, eclipses, and other phenomena are continually occurring without any particular interest being attached to them. The reason is that Venus affords the best means of mastering a problem which is one of the most important within the whole range of astronomy—the distance of the sun from the earth. As the orbit of Venus is nearly on the same plane as the earth's orbit, it happens from time to time that it passes between the sun and the earth, and appears like a black spot crossing the luminous disk. This passage occupies several hours, and takes place at intervals of 8 years, then 13 $\frac{1}{2}$ years, 8 years, and 13 $\frac{1}{2}$ years, and so on. The last passage occurred in 1874, and the one following this year's will not occur until the end of 122 years, or in 2004. Two observers, situated in the stations most distant from each other, note the two points where the planet, seen from each of their stations, seems to be projected at the same moment in the solar disk. This measure gives the angle formed by the two lines starting from the stations and crossing each other on Venus and passing on to the sun. It is the measure of this angle, made by observers placed on all parts of the globe, which gives what is named the parallax of the sun. The determination of the solar parallax, therefore, is the object of these expeditions. Another object to be attained is the accurate position of Venus in reference to the centre of the sun, and also the measure of the diameter of Venus in the sun's disk.

The inaccuracy in the present estimate of the distance of the sun from the earth is, according to Prof. Hall, about 500,000 miles. By the use of the photographic method, which Prof. Hall considers far superior to any other, he hopes that the data will be obtained which will determine within a small fraction of a second the solar parallax. The foreign Governments, as stated above, have very generally decided to send out parties to observe the transit. The French will send an expedition to Santa Cruz, Patagonia, and will also have stations in Florida. The Belgians will have one station in San Antonio, Texas, and another at Santiago, Chili. The Germans will have two stations in Santa Cruz, one at Hartford, Conn., and one at Aiken, S. C. The English will have one at Cape Good Hope and one on the island of Madagascar, New-Zealand, and Australia. The English southern stations will be in the West Indies.