

Melbourne on the same day or on the following day, so that the change in error of the places interpolated with second differences from the *Nautical Almanac*, has merely to be carried back for  $9\frac{1}{2}$  hours or carried forward for  $14\frac{1}{2}$  hours. The resulting mean solar parallax is  $8''\cdot96$ , and assuming that the probable error of a single observation of declination is  $0''\cdot5$ , the probable error of the result is  $\pm 0''\cdot051$ . The value obtained by Prof. Newcomb from similar observations in the year 1862 was  $8''\cdot855$ , nearly identical with that which Leverrier held to be pretty definitive, and which was given by the planetary theories, or  $8''\cdot86$ . In most of the national ephemerides, Newcomb's mean value, obtained in his paper on the sun's distance in the Washington Observations for 1865, or  $8''\cdot848$ , has been adopted; the *Connaissance des Temps* substitutes Leverrier's.

### METEOROLOGICAL NOTES

MR. E. KNIPPING, Tokio, has written a brief account of three typhoons which occurred in the China and Japan Seas in September, 1878. In twelve charts and one diagram he sets down the paths of the three storms and the weather of each day from the 15th to 21st, when the third and most violent of the typhoons occurred. The heaviest squalls and gusts of wind were met with in the front part of the typhoon, or with north-east and south-east winds, whereas they are hardly mentioned in the ship's logs with south-west winds in the rear of the storm. The path of the typhoon was to north-west from 15th to 19th, to north on 19th and 20th, when it recurved to the north-east, following a course midway between Japan and the continent. Its rate of progress was 10 miles an hour on the average, rising to 25, and falling to  $2\frac{1}{2}$  miles an hour. The diagram, which summarises the author's views regarding the behaviour of the winds, seems to raise questions which call for further inquiry. Thus the south-east wind shows, near the centre of the hypothetical typhoon, an in-curving tendency, which becomes less and less on receding from the centre, till, towards the outskirts of the storm, it is represented as blowing outwards. On the other hand, the north-east wind, immediately contiguous, very decidedly in-curves near the outskirts of the storm, but on approaching the centre the incurvation becomes less and less till it disappears. The statement is made that at a distance of 900 miles from the centre, with a north-east wind, the centre of the typhoon bears right ahead, but with a south-east wind the centre bears south. For a satisfactory examination of the points here raised, and other points, such as the remarkable changes in the form of the typhoon while off the coast of Shanghai, fuller data are required, so that the positions of the centre at different times be more accurately ascertained. The publication of details of the data in an appendix to the work is equally necessary.

PROF. NIPHER'S *Missouri Weather Service Report* for October last is to hand, and is of more than usual interest. The returns show the weather of that State to have been unprecedentedly warm for the season, the mean temperature of St. Louis, viz.,  $63^{\circ}\cdot1$ , being the highest for any October of the past forty years. At the same time the rainfall was only  $0\cdot57$  inch, being, with the single exception of 1872, when the rainfall was  $0\cdot29$  inch, the driest October in forty years. The rainfall was unusually small over no inconsiderable portion of the State, extending to north-west of St. Louis, and in the extreme north-east it amounted only to about a  $\frac{1}{4}$  inch, whereas, on the other hand, within a limited district immediately to southward round Cuba, and over a pretty extensive region in the west, lying to north and south of Kansas City, it exceeded 4 inches. The service is being ably and vigorously worked, eighteen new stations being added in November, so that there are now seventy-three stations, the results of whose observations are quickly sent broadcast over the State and beyond it, reaching Europe even in the third week of the following month. We observe with much satisfaction that the efficiency of this weather service is to be greatly enlarged by the active co-operation of the directors of the principal railroads, who have intimated their readiness to make meteorological observations a regular part of the duties of their station agents at points selected by Prof. Nipher himself.

IN connection with the meteorological work proper of the Missouri Weather Service, Prof. Nipher has been carrying out a magnetic survey of the State during the summers of 1878 and 1879, the expense of the survey having hitherto been met by private subscriptions. The results of this survey are given on a valuable map which accompanies the October Report, showing the lines of equal magnetic variation, and attention is directed

to the tendency of the needle to set at right angles to those river-valleys which do not run north and south. A report on the climatology of Missouri is in course of preparation by Prof. Nipher, at the request of the State Board of Agriculture. It is with some surprise we learn that the expense of organising and carrying on this service has been wholly borne by two of the directors and Prof. Nipher. But this state of things the Americans are too sharp-sighted to allow to go on, it being in the interests of the State to provide that a service which is so energetically and effectually working out the climatologies of its various agricultural centres does not run the risk of being starved out for want of the few dollars required to meet its working expenses.

CAPT. TOYNBEE, in the *Journal* of the Meteorological Society for October, gives an interesting comparison of the temperature of the Atlantic during the Decembers of 1877 and 1878 from observations made on the temperature of the sea every four hours of these months by Capt. Watson, of the Cunard steamer *Algeria*. The result shows that for the outward and homeward passages to America the part of the Atlantic traversed by the *Algeria* was  $3^{\circ}\cdot2$  warmer in December, 1878, than in December, 1877. A comparison is also made of the mean temperature of the British Isles, and from observations at about forty stations it is shown that the December of 1878 was  $8^{\circ}\cdot0$  colder than that of 1877, "in spite of the fact that the sea to the westward was more than  $3^{\circ}\cdot0$  warmer." The higher temperature of the sea in December, 1878, would appear not to have extended far to northward, seeing that on the west of Scotland the sea was half a degree colder than in 1877, and in Farö  $1^{\circ}\cdot7$  colder, whilst on the north-west of Iceland the sea during December, 1878, was  $0^{\circ}\cdot2$  warmer. The interest attached to such an inquiry centres in the point that  $8^{\circ}\cdot0$  greater cold over the British Isles during 1878 as compared with 1877 may have been brought about in consequence of the fact that the Atlantic to west-south-westward was more than  $3^{\circ}\cdot0$  warmer. It is, for example, possible that this abnormal distribution of temperature in the Atlantic was more or less immediately connected with the more southerly course taken by our European storms since the end of October, 1878, from which have inevitably resulted the unusual prevalence of easterly and northerly winds and the cold weather we have had since. An inquiry more practically important could scarcely be suggested to meteorologists than an investigation of the point suggested many years ago by Sabine as to there being a possible connection between the temperature of the tropical and subtropical waters of the Atlantic during the autumn months and the severity or mildness of our European winters; and certainly no more suitable period could be selected for the inquiry than the last two years, a twelvemonth's warm, fine weather having set in during October, 1877, and a period of cold weather, exceptionally protracted and severe, having commenced in the end of October, 1878.

### GEOGRAPHICAL NOTES

AT the meeting of the Geographical Society, on Monday evening, Mr. Wilfrid S. Blunt read a paper entitled "A Visit to Nejd," in which he gave an interesting account of a journey made last winter in company with his wife, Lady Anne Blunt, from Damascus southwards to Jöf and the Jebel Shammar in Central Arabia. The results of Mr. Blunt's expedition may be thus briefly summed up. The oases of Kâf and 'Ittery have now been visited and the Wady Sirhan explored by Europeans for the first time. By taking barometrical observations along its entire length, Mr. Blunt ascertained that the Wady Sirhan from Ezrak to Jöf lies on nearly a uniform level of 1,800 feet above the sea, from which he thinks that it was formerly an inland sea, and is miscalled a Wady or valley. Along the whole distance he roughly surveyed the pilgrim road, marking the position of the wells and the reservoirs made by Zobeide. Mr. Blunt has also constructed a map of the Jebel Shammar district. The most interesting outcome of his journey, probably, is the collection of a series of facts relating to the physical condition of the great sand desert of Nefud, and in some material respects his observations are at variance with those of Mr. Palgrave. Mr. Blunt appears to be the first to call attention to the deep horse-shoe hollows, called by the Arabs *fulj*, with which the whole surface of the plain is pitted.

IN the present critical state of affairs between China and Japan in regard to the suzerainty of the Loochoo Islands, much