

Observations were also made on the 10th, 12th, 18th and 23rd at 3 p. m., on the 11th at 9 a. m. and 4 p. m. and on the 15th, 19th and 22nd at 4 p. m., but no spots seen at these hours. Mr. David Trowbridge at Waterburg, N. Y., examined the sun on the 8th, 10th, 11th, 12th, 14th, 16th, 17th, 19th, 20th, 21st, 22nd, 23rd, 30th, but observed no spots. On the 1st, 4th, 5th, 6th, 7th, 25th, 26th 27th, "spots re-appeared by solar rotation." Mr. H. D. Gowey at North Lewesburg, Ohio, reported as follows: 4th, 7:30 a. m. one spot; never observed a spot as far north of the sun's equator before. Observations were also made at Ft. Whipple throughout the month, but no spots seen.

*Locusts.*—Genoa, Neb., 1st, 7th and 12th, flying southeast; Fort Sill, I. T., 11th, moving south in great swarms, very few alighted; Leavenworth, Kansas, 12th, p. m. large numbers observed flying too high to distinguish direction, very few alighted; Weatherford, Texas, 23rd, large numbers have disappeared in the Keachi valley to the southward; Jacksboro, Texas, 13th, 14th and 15th, in large numbers, doing great damage to cotton plants, 16th, disappeared; Henrietta, Texas, 10th and 15th, large numbers passed over station, from northwest to southeast, no damage done; Graham, Texas, 14th, vast numbers seen moving to the southward; Creswell, Kansas, 1st, 2nd and 3rd, flying south, very few alighting, 7th, southwest, 12th and 13th, south; Clear Creek, Neb., 2nd, flying south; Walla Walla, W. T., 3rd, very large numbers flying high in the air, very few alighting; for the past two weeks they have been appearing in variable numbers.

*Geese.*—Priuceton, Cal., 14th, first appearance; Genoa, Neb., 23rd, flying south; Pembina, 14th, flying north; Keokuk, 13th, flying south; Creswell, Kan., 14th, flying south; Clear Creek, Neb., south, 16th, 20th, 23rd.

## NOTES AND EXTRACTS.

[From London Quarterly Journal, January, 1879.]

"*Meteorology of Bangkok, Siam.*—By J. CAMPBELL, Staff Surgeon R. N.—The following observations were made at Bangkok, the Capital of Siam, during the years 1858-1868, omitting 1862. A glance at a map of Indo-China will show that that kingdom, Muang Thai, the Land of the Free, has a geographical position such as to preserve it from the heat, deluges of rain and devastating cyclones so common to adjoining countries; the elevated land of the Malayan Peninsula, Burmah and the Gulf of Siam, contributing largely to an anomalous state of things, and which meteorologically considered will be apparent in the tables herein given.

"The instruments employed were partly private during the first four years, but they were compared at Kew with standards. The last six years' records were entirely from those supplied by the Meteorological Department of the Board of Trade. The rain-gauge during the first four years was of my own construction. Up to April, 1859, the barometer was a mercurial one—Government—but it got out of order, and till 1863 I depended on an aneroid. This instrument evidently deteriorated yearly, though slightly. It is, however, evident that the first two instruments were originally at a less height than the barometer of the last six years. Up to May, 1859 the instruments were placed in the north verandah of a floating house, 7 ft. above tidal influence, the rain-gauge 20 ft. above the river, so as to be higher than the houses and completely secluded from the sun; after the above date they were placed, for a time, in a large airy room of my house on land, and subsequently in its north verandah, at an elevation of 21 ft. above high water level. The rain-gauge was at an elevation of about 45 ft., but for the last two years it was only 3 ft. above high water. These changes of elevation ought, theoretically considered, to have a disturbing influence on the regularity of the items recorded, excepting the barometer; but such does not appear to have ensued to any appreciable extent.

"*Barometer.*—The pressure of the atmosphere attains its maximum in December, sometimes in January, and then falls till June, July or August, when its maximum is reached: these are uninfluenced by any local causes, an unusual inundation, much rain, drought or heat having no observable effect upon the height of the mercurial column of its daily tides, which takes place about 3½ a. m. and p. m. for minima, and 9½ a. m. and p. m. maxima. The range is about 0.110 in., but occasionally it amounts to 0.180 in.

"*Temperature.*—The lowest temperature of the year occurs in December, though sometimes it may be in November, January or February, and the highest usually takes place in April, but it may be noticed in the preceding or subsequent month. In this record the minimum, 57°, took place in December, and the maximum, 97°.5, in May. The monthly means make the extremes in December and April. The *Tension of Vapor* follows a similar rule, viz. the lowest in December and highest in May, but the tables of *Humidity* and *Rain-fall* are different; these agree in making December the minimum and September the maximum of the year. The years 1859 and 1864 were remarkable for little rain, years of drought, in 1865 rice was imported, whilst 1860 and 1868 were the years of greatest rain-fall.

"*Hail* occurred only once, one afternoon, during my residence of fifteen years.

"*Winds.*—In September the SW. monsoon becomes weak; early in October N. breezes set in, varying from W. to E. by the northern segment, and during this month or November the NE. monsoon is quite established. Throughout December it continues strong, but in January it has lost half of its last month's vigour, and in February retains only a fifth of its original force; the deficiency being in part made up by an increase of wind varying from SSE. to SW. By the end of the month or early in March the N. winds have ceased and strong breezes from S. and SSW. prevail, locally termed the Kite and Junk winds. It is in April that the greatest heat takes place, and for two or three nights in succession, if no breeze stirs the air, the plight of foreigners, ay even of natives, is not to be envied. During the months of May, June, July and August, the SW. winds are strong and constant, sometimes boisterous, the direction being chiefly S. and SSW. till June, and thence SW. to September, when light variable winds are the rule, and foretell a breaking up of the SW. monsoon."

[From *Nature*, August 7th, 1879.]

"On the morning of Sunday, August 3d, a little before two o'clock a. m., the Royal Gardens at Kew were devastated by a hailstorm, which in the space of about ten minutes inflicted more damage than the Gardens have sustained since their existence as a national institution. After a rapid survey of the houses the following day, it was found that the number of broken squares of glass could not be estimated at less than 16,000. In the great temperate house alone 3,000 squares were shattered. The storm, which was accompanied by violent thunder and lightning, drove over the garden from the northeast, and expended its greatest fury in the direction of Richmond. The temperate house suffered the full effects while the palm house being apparently a little to the west of its course, escaped with the destruction of 700 panes. The hailstones were found to average one-and-a-half inches in diameter, and to weigh three-quarters of an ounce. They came down with sufficient force to bury themselves in the bare earth of the flower borders, and even penetrate the turf to the depth of an inch. In some cases perfectly circular holes were cut out of the glass panes, while the hailstones went through the succulent leaves of the Echeverrias planted out in the beds with as clean an outline as if it had been made with a punch. On account of the confusion produced by the damage and the danger from falling splinters of glass, it has been necessary to close all the houses to the public. The present night-temperature, and the probability of heavy showers, are grounds for the gravest anxiety as to the preservation of the collections which, however, speedy the repairs to the houses, cannot fail to suffer considerable injury. The damage is estimated at not less than 2,000*l.*, as many of the houses being a great deal dilapidated, cannot be put in order without entire re-glazing, repainting, and partial renewal, and application will have to be made to Parliament for a supplementary vote to defray the cost."

"On August 30th M. Gaston Tissandier made an ascent from La Villette Gas Works with his wife and his brother. The travellers started at 5h. and landed at 7h. 50 at Dawmartin. The observations were highly interesting. When the *National* left ground, the wind was blowing southwesterly, but at about 7h. the direction changed abruptly, and an instantaneous change took place in the direction of the balloon. It was caused by the *brise de mer* setting in after a hot day. The sky was covered with cumulus, intermixed with a few cirrus of small dimensions. When at an altitude of 600 metres, M. Tissandier passed through a cloud which was very cold indeed, as proved by the sensation which the travellers experienced, but the duration of the passage was so short that it was not possible to observe the temperature at the thermometer. When at a higher altitude M. Tissandier observed the refraction of the rays of the sun on icy particles, and at the same moment on the western sky splendid rainbows. At the same time a very large halo had been observed at Paris by the *Temps* meteorological editor, and noted by him."

"Dr. Dunant publishes in the *Journal de Geneve* a note on the low temperature of this summer. While the mean temperature for the years 1873 to 1878 was 18°.9 Celsius in June, and 21°.0 during the first half of July, in 1879 it was only 18°.8 and 16°.7."

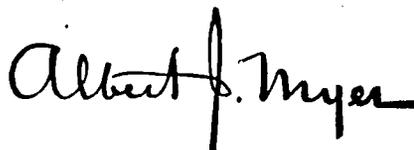
"A shock of earthquake was felt on July 20th, 3.30 a. m. at Vulpera, in the Engadine (Switzerland). It was accompanied by a rather strong rumbling."

An earthquake consisting of three moderately violent shocks is reported from Cairo. The phenomenon was observed in the night of July 11-12. In the quarter of Bab-en-Nasr, which is at some distance from the modern portion of the city, some isolated walls fell in, and an old and somewhat dilapidated minaret has suffered so severely that it must be taken down. During the last decades earthquakes have been extremely rare at Cairo and indeed in Egypt generally, and since the great earthquake of 1857, which caused so much damage amongst the shabby old buildings, in which the Caliph-city abounds, and though several lives were lost, no earthquake of importance has occurred. The phenomena of July 11-12 is said to have been noticed also at Gizeh, near the great pyramids."

The Manila papers state that a terrible thunderstorm passed over that city on May 31st. It was preceded by an almost suffocating warm atmosphere and rain, and lasted about an hour. The lightning struck the Binondo Tower, damaging the crystal shade of the clock, but not injuring the mechanism, though the stone work forming the arch was much damaged. Out of several persons in the tower at the time, four appear to have been killed. Several other places in the city were more or less injured."

"*Comptes Rendus hebdomadaires des séances de l'Académie des Sciences. Tome 89, Page 382.*"—"The month of July 1878 was one of the coldest ever experienced at Paris. At the 'Parc de Saint Maur,' where hourly observations are made, except at 2 and 3 a. m., we have found as a mean of the daily extremes 16°.18, and for the mean of 24 hours 15°.59. The maximum temperature 28°, occurred on the 30th."

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.


Brig. Gen. (Bvt. Assg<sup>d</sup>.) Chief Signal Officer, U. S. A.