

OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made partly in accordance with the new form, No. 1040, and the arrangement of the columns, therefore, differs from those previously published.

Meteorological observations at Honolulu, August, 1900.

The station is at 21° 18' N., 157° 50' W. Hawaiian standard time is 10h 30m slow of Greenwich time. Honolulu local mean time is 10h 81m slow of Greenwich. Pressure is corrected for temperature and reduced to sea level, and the gravity correction, -0.06, has been applied. The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force or amounts of cloudiness, connected by a dash, indicate change from one to the other. The rainfall for twenty-four hours is measured at 9 a. m. local or 7:31 p. m. (not 1 p. m.), Greenwich time, on the respective dates. The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Table with columns: Date, Pressure at sea level, Temperature (Dry bulb, Wet bulb), During twenty-four hours preceding 1 p. m., Greenwich time, or 2:29 a. m., Honolulu time (Temperature, Means, Wind, Force, Average cloudiness, Sea-level pressures), Total rainfall at 9 a. m., local time.

Mean temperature for August, 1900 (6+2+9)+3=79.0°; normal is 77.6°. Mean pressure for August (9+3)+2 is 29.953; normal is 29.976. *This pressure is as recorded at 1 p. m., Greenwich time. †These temperatures are observed at 6 a. m., local, or 4:31 p. m., Greenwich time. ‡These values are the means of (6+9+2+9)+4. §Beaufort scale.

OBSERVATIONS FOR LOCAL THUNDERSTORMS AT SKYLAND, PAGE COUNTY, VA., AUGUST, 1900.

By Messrs. H. W. and H. S. CRAIGIN.

August 1.—8 a. m., 66°; 2 p. m., 75°; 8 p. m., 65°. Fair, with falling temperature; fresh northwest winds. About 4 p. m. there were some showery formations but they did not amount to anything.

August 2.—8 a. m., 58°; 2 p. m., 67°; 8 p. m., 62°. Fair and cool; fresh northwest winds.

August 3.—8 a. m., 60°; 2 p. m., 71°; 8 p. m., 64°. Fair and cool; fresh north winds.

August 4.—8 a. m., 61°; 2 p. m., 73°; 8 p. m., 65°. Fair, with moderate temperature and light northeast winds.

August 5.—8 a. m., 63°; 2 p. m., 78°; 10 p. m., 64°. Fair, with slowly rising temperature; light east winds. It turned warmer during the night.

August 6.—8 a. m., 70°; 3 p. m., 85°; 10 p. m., 74°. Fair and warm; light north winds.

August 7.—8 a. m., 72°; 3 p. m., 86°; 12 p. m., 70°. Fair and very hot, with light northwest winds.

August 8.—8 a. m., 70°; 2 p. m., 85°; 11 p. m., 72°. Fair, continued warm, with brisk northwest winds.

August 9.—8 a. m., 72°; 3 p. m., 83°; 10 p. m., 72°. Partly cloudy and warm, with fresh northwest winds. It tried hard to rain, and even sprinkled a little about 3 p. m.

August 10.—8 a. m., 70°; 3 p. m., 85°; 11 p. m., 73°. Fair, continued warm, with light northwest winds.

August 11.—8 a. m., 73°; 3 p. m., 87°; 8 p. m., 67°; 10 p. m., 71°. Fair and very warm, with light southwest winds. Between 12 a. m. and 3 p. m. there were some showery formations but they amounted to nothing.

August 12.—8 a. m., 72°; 3 p. m., 85°; 10 p. m., 71°. Fair and hot in morning; partly cloudy in afternoon. About 7 p. m., after a long period of development, two showers appeared: one in the Shenandoah Valley to the west of New Market Gap, the other in the Page Valley several miles to the northeast of the gap. Both moved northeast; the one in the Page Valley crossed the Blue Ridge a little to the north of here, while the one in the vicinity of the gap crossed the Page Valley and passed over camp. By 8 p. m. they had crossed the ridge and the thunder immediately ceased. These showers were full of electricity but contained very little rain. The lightning struck twice in the immediate neighborhood of camp. A strong west breeze sprung up during the night and modified the heat somewhat.

August 13.—8 a. m., 69°; 3 p. m., 80°; 11 p. m., 70°. Fair and not so warm; brisk west winds.

August 14.—8 a. m., 67°; 3 p. m., 83°; 12 p. m., 67°. Fair and slightly warmer; light west winds. At 3 p. m. a light shower, devoid of thunder, formed in the Shenandoah Valley to the west of the gap. It dissipated without moving, though its tendency was to move south. At 9 p. m. there was a little shower at camp. There was some thunder to the east of the ridge, but it soon ceased.

August 15.—8 a. m., 69°; 3 p. m., 82°; 9 p. m., 72°. Fair and warm; fresh southwest winds. Between 7 and 8 p. m. a shower, destitute of thunder, formed several miles to the south of the gap. It moved slowly northeast, crossed the Page Valley, passed over camp, and disappeared to the east of the ridge about 9 p. m. It was a light shower.

August 16.—8 a. m., 71°; 3 p. m., 82°; 11 p. m., 71°. Partly cloudy and warm, with fresh southwest shifting to east winds at night. Between 4 and 5 p. m. there was some thunder to the east of the ridge, to the southeast of here.

August 17.—8 a. m., 65.5°; 1 p. m., 79°; 10 p. m., 68°. Partly cloudy and not so warm—the hot wave was again broken somewhat during the preceding night—with fresh west winds. During the night a moderate thundershower passed over this part of the country, but it failed to lower the temperature.

August 18.—8 a. m., 66°; 2 p. m., 78°; 9 p. m., 69°. Partly cloudy, with fresh west winds. About 3 p. m. quite a hard shower, with but little thunder, formed in the Page Valley 7 or 8 miles to the northwest of here and moved southeast, passing over camp. Its course beyond here could not be traced.

August 19.—8 a. m., 66°; 3 p. m., 79°; 10 p. m., 68°. Partly cloudy, with fresh west winds.

August 20.—8 a. m., 68°; 3 p. m., 78°; 10 p. m., 70°. Partly cloudy, with brisk west winds. During the night there was

considerable rain, with quite a high wind. There was no thunder.

August 21.—8 a. m., 64°; 3 p. m., 70°; 8 p. m., 65°. Generally cloudy weather during the day was followed by a fog and misting rain at night. Fresh southwest winds shifted to east at night. The temperature again fell somewhat during the preceding night and broke the persistent hot wave. A little rain fell for about fifteen minutes during the afternoon of the 21st.

August 22.—8 a. m., 65°; 2 p. m., 72°; 8 p. m., 66°. Partly cloudy, with fresh southeast to east winds. Between 1 and 2 p. m. a moderate thundershower, which extended from the gap several miles to the northward, crossed the Page Valley, moving in an easterly direction, and passed over camp. During the evening the fog set in, accompanied by a misting rain.

August 23.—8 a. m., 66°; 3 p. m., 72°; 10 p. m., 66°. Foggy weather, with considerable rain in the morning, was followed by fair weather in the afternoon. East winds shifted to south during the day. It turned warmer during the night, but the warm weather during the next day was apparently caused by low pressure.

August 24.—8 a. m., 70°; 1 p. m., 79°; 8 p. m., 71°. Partly cloudy, and warm, fresh south winds. Between 1 and 2 p. m. a belt of inert showers, with some thunder, developed to the west of the Page Valley. With the exception of one shower, which reached the western part of the Page Valley, they all dissipated where they formed. At the same time there was some thunder to the east of the ridge.

August 25.—8 a. m., 70°; 3 p. m., 78°; 1 p. m., 71°. Fair and warm, fresh southwest winds. About 7 p. m. a light shower, devoid of thunder, occurred near the gap. During the day the weather assumed a hot-wave character.

August 26.—8 a. m., 72°; 3 p. m., 84°; 10 p. m., 71°. Partly cloudy, and warm, fresh, southwest winds. During the afternoon some light showers occurred to the west of the Shenandoah Valley. They were too far away to be accurately observed. Between 4 and 5 p. m. there was some thunder to the east of the ridge. Between 6 and 7 p. m. a shower occurred in the Shenandoah Valley to the west of the gap. Between 7 and 10 p. m. incessant lightning was observed to the east of the ridge far to the north of here.

August 27.—8 a. m., 71°; 3 p. m., 83°; 10 p. m., 67°. Partly cloudy and warm, with showers in the afternoon. Fresh southwest winds. About 2 p. m. a shower occurred in the Shenandoah Valley to the northwest of the gap. It dissipated without moving. Between 6 and 7 p. m. a shower occurred in the Shenandoah Valley to the north of the gap. Between 7 and 8 p. m. a shower appeared in the Page Valley to the north of Luray, and moved eastward, recrossing the ridge to the north of here. About 8 p. m. a shower developed over camp and moved eastward across the ridge. At the same time a shower appeared in the Shenandoah Valley, but it was observed in darkness. Between 8 and 10 p. m. a good deal of rain fell in camp.

August 28.—8 a. m., 64°; 3 p. m., 74°; 8 p. m., 66°. Fair and not so warm, with fresh west winds. A temporary fall was caused by the rain of the preceding night.

August 29.—8 a. m., 68°; 3 p. m., 76°; 8 p. m., 69°. Fair and slightly warmer; fresh south winds.

August 30.—8 a. m., 68°; 3 p. m., 75°; 10 p. m., 66°. Partly cloudy, with fresh southeast winds.

August 31.—8 a. m., 69°; 2 p. m., 78°; 8 p. m., 70°. Fair, with moderate temperature; fresh east to southeast winds.

APPENDIX.

The gap referred to is the Newmarket Gap, 4 or 5 miles southwest of Luray, in the Massanutton Mountain. The month of August was remarkably dry. The springs are very

low, and this region needs rain. The temperature for July and August has averaged higher than known for years, and the precipitation less. Cattle have to be fed, and the streams are so low on each side of the ridge that the mills can not be operated. The Page Valley, sometimes called the Luray Valley, is formed by the Blue Ridge and Massanutton Mountain. This valley begins a few miles above here, and extends, properly, to Riverton. Newmarket Gap runs through from this valley into the Shenandoah Valley proper about opposite this camp. An east current of air is drawn down the west side of the ridge about 5 p. m. on most warm days. It is frequent in June, and from August 15 to October, but liable to occur at any time. It is probably local, and caused by the gravitation of the cooler air of this region into the valley below. It is, however, affected by barometric conditions. An area of high pressure central to the north of the lower Lake region favors its occurrence. The fresh north winds prevailing during the day under such conditions become brisk northeast at night. A high area in the St. Lawrence region or on the New England coast also produces it, with stormy weather. Low pressure in the Lake region produces it, but generally without danger of a long storm. Low pressure in the south Atlantic or Southwest brings it about with stormy conditions. An area of high pressure in the south Atlantic is unfavorable to the easterly down draft, for it causes warm west to southwest winds day and night. High pressure anywhere to the west of here, except in the lower Lake region, which can be felt here, is also unfavorable. This east wind which prevails more or less every evening, unless unfavorable conditions prevent, dies away about 12 p. m.

There is no established record for this place, but I should say that this summer has been one of the driest for years, and the mean temperature higher. Practically no rain fell until the 12th. From that date until the 20th a few light showers occurred in this region. From the 20th to 25th unsettled weather with light showers and fog. From latter date to end of the month (August) only slight precipitation. Although a good many showers appear in his report, little rain fell, as they were light or ill-defined.

Popular report makes the season the driest within remembrance. Practically no rain fell from June 1 to 15, but from the 15th to 19th a northeast storm produced copious rain. From then to the last ten days of July there was very little precipitation. As a result the crops have been seriously injured. June was somewhat cooler than the average, but the heated term which began July 3 has been materially broken but once, from July 23 to August 5. From August 5 to 12 it was excessively hot. From August 12 to 21 temperature was somewhat lower. From August 21 to end of the month more or less changeable, but temperature considerably above the average.

In my last report I failed to record a thundershower which formed east of the ridge between 4 and 6 p. m., August 24. It was observed by others to extend as far as Culpeper, at least, which is 25 miles from here. I spoke of the unusual electric energy of the shower of the 12th.

Referring to the expression "North Mountains," misprinted "North Mountain," in Mr. H. S. Cragin's record for July, he writes to the Editor as follows:

The people of this region bound the Shenandoah Valley on the west by the North Mountains, and it is these that were referred to in the above paragraph, and not "the North Mountain," which is quite a long distance to the north or northwest of Skyland.

According to the Luray sheet published by the United States Geological Survey, the Blue Ridge on the east and the range, called the North Mountains, on the west include the whole of the lower part of the Shenandoah Valley; but between

these are smaller ranges, viz: the Massanutton Mountain, Powell's Mountain, Three-Top Mountain, and others. Skyland is so located on the west slope of the Blue Ridge, near Stony Man Mountain, that it has immediately on its west the gap called Newmarket Gap, near the southern end of Massanutton Mountain. To the west of this the line of sight passes over the hills of the southern end of the ridge of North Mountains and strikes the Shenandoah range of mountains. The upper part of the valley of the Shenandoah River lies between the Blue Ridge on the east and the Shenandoah Mountains on the west.

Mr. Cragin adds:

Many of the thunderstorms in the Shenandoah Valley seem to be what are called "valley" storms in Professor Davis's Meteorology, caused by ascending hot air in the way he speaks of, and not of much strength.

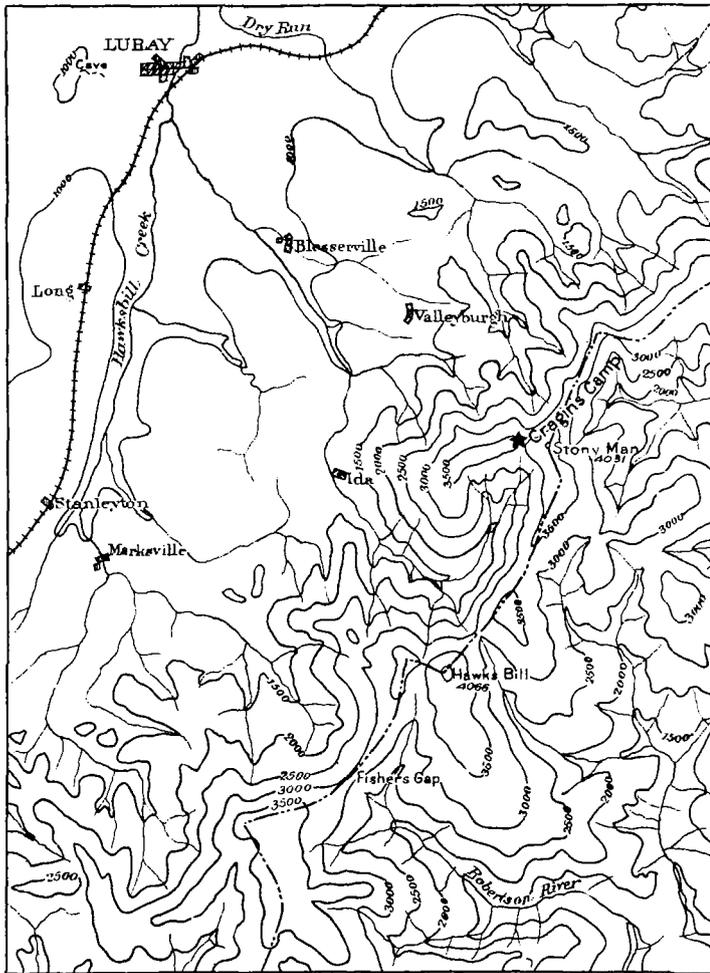


Fig. 1.—Showing location of Cragin Camp, Page County, Va.

CLIMATOLOGY OF ST. KITTS, W. I.

By W. S. ALEXANDER, Observer, Weather Bureau, dated August 27, 1900.

A paper containing certain descriptive and tabulated data relative to this subject was published in the MONTHLY WEATHER REVIEW, Annual Summary, 1899, and some additional details in the February, 1900, REVIEW. The fact that these meteorological data cover a period of forty-four years seems to justify, if, indeed, it does not demand, a more extended discussion. It appears to be important, in order to arrive at the true and full value of these old records as well as of the service performed by the compilers of the same, that a statement in detail be made of the conditions and agencies involved in the original records, so far as can now

be done. The present discussion is, therefore, devoted to this end.

Following a suggestion from the editor of the REVIEW, the work of each observer concerned has been reduced independently and the results given in Table 1. The fact that the original records were prepared by different observers, at different times, with different instruments differently exposed, renders this procedure necessary in order to avoid fallacious results. Perhaps the materials supplied from these various sources can be reduced to a homogeneous system of normal values.

Referring to Table 1, it will be observed that there are four divisions, each presenting the means by hours as obtained from the compilations of the observer indicated at the head of the division. At the head of the first division is the name of George James Evelyn, to whom much praise is due for his long and patient labors, extending over a period of twenty-seven years (from 1856 to 1882, inclusive), and for his kindness in permitting the exclusive use of the same for publication in the MONTHLY WEATHER REVIEW. Mr. Evelyn came to St. Kitts sixty-nine years ago and, although now a nonagenarian, is still in the enjoyment of excellent health and a youthful spirit, his greatest impediment being, apparently, defective eyesight. The writer has more than once listened with pleasure to his reminiscences of the distant past. He was receiver-general or treasurer for the colony during the time he made his meteorological observations and did this work of his own accord in addition to his official duties.

The barometer used by Mr. Evelyn belonged to the government and was presumed to be a good one; it was one of the fixed cistern manufactured by J. Nixon, London. The tube of this barometer is smaller than the tubes of the barometers used by the Weather Bureau and is encased in a wooden frame, to which is attached a metal scale and vernier. It was exposed in an east room, on the ground floor of the treasury building, being attached to the partition wall on the west side of the room, and was not, perhaps, more than 12 feet above sea level. It was not moved during the whole series. The readings were made by simply adjusting the vernier and observing the figures then indicated. Mr. Evelyn is positive that no corrections were applied to the readings, hence it would appear that unless the manufacturer, by some method of calibration, made compensation for instrumental errors, and it seems he did, these readings may be considerably out. Inasmuch, however, as this error, whatever it may be, is constant, or nearly so throughout, there is a comparative value in the results which ought not to be overlooked.

Attention is invited to the explanatory note under Table 1. This table upon a cursory or superficial inspection may appear to be erroneous in view of the well-known diurnal barometric changes. Under normal conditions in all tropical regions the barometer rises from 4 a. m. to 10 a. m., and falls from 10 a. m. to 4 p. m., and so on. Mr. Evelyn's observations apparently run contrary to this recognized principle, as is seen by comparing the 8 a. m. mean, for instance, with the 9 a. m. or 10 a. m. mean. But this is evidently fallacious for reasons which will appear from a study of the note just referred to. If now we compare the 8 a. m. mean with the 12 noon and 4 p. m. means, as is manifestly proper, we find that they are in accord with this principle. For instance, the January mean for 8 a. m. is 30.015; for 12 noon, 30.025; and for 4 p. m., 30.017. The February mean for 8 a. m. is 30.019; for 12 noon, 30.033; and the 4 p. m., 30.026, and so on, just as the principle would lead us to expect. So, also, the 9 a. m. means may be compared with the 2 p. m. means and the same relation is observed. The same is true of the 10 a. m. and 2 p. m. means, with possibly one exception, namely, the means for February. Here we find the 10 a. m. mean less than the 2 p. m., whereas we should expect the reverse. The first