

disturbance prevailed off the coast of northern California.—
A. G. McAdie, Professor.

PORTLAND, OREG., FORECAST DISTRICT.

During the first decade of the month two severe storms passed over the district, for which timely warnings were issued. The unusually high wind velocities of 72 miles southwest at Tatoosh Island, and 80 miles south at North Head occurred during the night of the 8th. Just at the close of this stormy period the German bark *Alsternarie* stranded at the mouth of the Columbia River while attempting to sail across the bar without a pilot. No lives were lost and the ship was afterwards floated and safely dry docked. From the 11th until the close of the month fair weather generally prevailed in consequence of disturbances appearing too far south to cause rain in the North Pacific States. Incoming vessels reported few storms east of the one hundred and eightieth meridian along the northern track of steamers plying between Asiatic and north Pacific ports.—*E. A. Beals, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocity.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I	1, a. m.	53	108	7, a. m.	32	65	Miles.	Days.	Miles.	Miles.
II	4, a. m.	45	123	8, a. m.	47	65	3,175	6.0	529	22.0
III	6, p. m.	39	120	10, a. m.	37	76	2,825	4.0	706	29.4
IV	12, p. m.	54	114	16, p. m.	47	101	2,950	3.5	843	35.1
V	14, a. m.	47	123	18, a. m.	30	82	725	4.0	181	7.5
VI	17, a. m.	53	105	20, a. m.	32	65	2,900	4.0	725	30.2
VII	19, p. m.	44	116	23, p. m.	32	65	2,800	3.0	933	38.9
VIII	22, a. m.	54	114	25, p. m.	40	75	3,100	4.0	775	32.3
							2,250	3.5	643	26.8
Sums							20,725	32.0	5,335	222.2
Mean of 8 paths							2,591		667	27.8
Mean of 32.0 days									648	27.0
Low areas.										
I	1 a. m.	39	120	5, p. m.	46	60	3,600	4.5	800	33.3
II	4, a. m.	34	118	9, p. m.	46	60	3,925	5.5	714	29.8
III	7, a. m.	48	123	12, p. m.	46	60	3,300	5.5	600	25.0
	8, p. m.	35	112				3,450	4.0	862	35.9
IV	14, p. m.	35	112	17, p. m.	46	60	2,350	3.0	753	32.6
V	19, a. m.	54	114	22, p. m.	46	60	2,625	3.5	750	31.2
VI	25, a. m.	32	106	28, p. m.	48	68	2,925	3.5	836	34.8
Sums							22,175	29.5	5,345	222.6
Mean of 7 paths							3,168		764	31.8
Mean of 29.5 days									752	31.3

For graphic presentation of the movements of these highs and lows see Charts I and II.—*Geo. E. Hunt, Chief Clerk, Forecast Division.*

RIVERS AND FLOODS.

At the end of February there was considerably more ice in the rivers of the northern districts than at the corresponding date of 1902, although the upper Mississippi was not frozen so far to the southward. The increase varied from 1 to 7 inches in the upper Mississippi and from 4 to 10 inches in the Missouri. The actual thickness in inches at a few selected stations was as follows: Moorhead, Minn., 38; Bismarck, N. Dak., 33; Sioux City, Iowa, 24.5; Omaha, Nebr., 14.5; St. Paul, Minn., 24, and Davenport, Iowa, 14.5.

The river stages of the lower Missouri and upper Mississippi did not differ materially from those of the preceding month.

Over the Ohio Valley, the Gulf and Atlantic States, however, the precipitation was frequent and heavy, ranging from 2 to 10

inches above the normal amount without any unusually low temperatures. As a consequence, all the rivers of those districts rose to flood stages. The Mississippi below the mouth of the Ohio had passed the danger line at all points and was still rising steadily at the end of the month. Reports of these floods are given below, except those of the lower Ohio, lower Mississippi, and the Tennessee, which will be published later.

PITTSBURG DISTRICT.

By Mr. Frank Ridgway, Official in Charge of the United States Weather Bureau office, Pittsburg, Pa.

The conditions prevailing on the morning of the 3d throughout all sections southwest of Pittsburg indicated rising temperatures, heavy rains accompanied by thawing, and general thawing conditions over the Allegheny and Monongahela valleys, and, as a consequence, high water. As all of the ice had passed out of the Allegheny and Monongahela rivers and their tributaries during the last week of January, a rise at this time could be caused only by the melting of what snow remained in the mountains and by heavy rains. On the 3d the rivers had begun to show the effect of the melting and during that night they were steadily rising. In addition to this, heavy rains were falling, due to the storm development in the southwest. At 8 a. m. of the 4th the rivers showed a rise at Pittsburg of about 4 feet, and reports indicated that all of the tributaries were rising steadily and that heavy rains were falling as anticipated. The upper river stations were immediately called upon for special hourly observations, and these showed an average rise of 0.2 to 0.5 foot an hour in all of the streams. At noon preliminary advices were sent out in all directions through special editions of the newspapers and by means of the telephone that all interests affected by high water should keep in touch with the Weather Bureau office night and day.

At 4 p. m. I informed the police departments of Pittsburg and Allegheny that all interests in the lower districts of their respective cities should be notified to make preparations for a stage of 23 feet by Thursday morning, February 5, and that all property affected by a stage of 25 feet should be moved at once. This information was also given to the press, which promptly published the same. The rivers rose slowly and steadily all that day and throughout the night. The danger line of 22 feet was passed at 3 a. m. of the 5th, and the maximum stage of 24 feet was attained at 9 a. m. of that day, making a total rise of about 7 feet in eighteen hours.

Mr. Ridgway also made the following report on the moderate flood of the 16th, when a 22-foot stage was reached at Pittsburg:

On the morning of the 16th the reports from the Monongahela and Kiskiminitas rivers and tributaries showed that heavy rains had fallen and that the rivers were rising rapidly. The stage at Pittsburg was then 12.9 feet, a rise of nearly 3.0 feet during the previous twelve hours. Special hourly reports were at once called for, but before they were received warnings were issued through the departments of police of Pittsburg and Allegheny, through the noon special editions of the press, by telephone, and by telegraph, notifying all concerned to make preparations for a stage of 22.0 feet, or over, at Pittsburg by midnight. Inspection of the special reports from the upper river stations soon disclosed the fact that the maximum would not be over 22.0 feet, as the Kiskiminitas, Monongahela, and tributaries were contributing all the water, the Allegheny River above Freeport doing practically nothing, as the heavy rains had not reached the upper Allegheny and tributaries, and what did fall there was controlled by low temperature. At midnight the stage at Pittsburg was 21.5 feet, a rise of 8.6 feet since 8 a. m., or a total rise of 11.7 feet. The river was then rising about two-tenths of a foot an hour, with all the upper streams about stationary. The maximum stage reached was 21.9 feet at 2 a. m. of the 17th, at which height it remained stationary until 4 a. m., when the water commenced to fall. At 8 a. m. of the 17th it showed a stage of 21.3 feet and was falling at the rate of 0.2 of a foot an hour. No warnings were necessary for points below Pittsburg.

CINCINNATI DISTRICT.

By Mr. S. S. Bassler, Official in Charge of the United States Weather Bureau office, Cincinnati, Ohio.

During the month of February, 1903, there were two overflows of the Ohio River, neither of which, however, quite reached the danger line in the Cincinnati district, except at Point Pleasant, W. Va.

On February 2 there was a decided local rise of 11.3 feet during the twenty-four hours ending at 8 a. m. Heavy rainfall in the immediate region caused a rapid rise in the neighboring streams emptying into the Ohio near this point. Truck gardens were overflowed and much early vegetable stuff destroyed. Traction lines suffered considerably and traffic was delayed. Merchants in the "Bottoms" became anxious about the rising water, and kept in touch with the Weather Bureau office. They