shore and Smethport on the 2d. The average precipitation was 3.33, or 0.64 below normal; the greatest monthly amount, 5.78, occurred at West Chester, and the least, 0.84, at Pittsburg.—*L. M. Dey.*

South Carolina.—The mean temperature was 83.0°, or 4.4° above normal; the highest was 106°, at Longshore on the 8th and at Columbia on the 20th, and the lowest, 60°, at Holland on the 25th. The average precipitation was 2.13, or 4.18 below normal; the greatest monthly amount, 5.55, occurred at Yemassee, and the least, 0.27, at Cheraw. The month of August was noteworthy in respect both to temperature and precipitation, having been the hottest August on record as well as the driest.—*J. W. Bauer.*

South Dakota.—The mean temperature was 75.5°, or about 5.0° above normal; the highest was 115°, at Cherry Creek on the 1st, and the lowest, 40°, at Ashcroft on the 26th. The average precipitation was 4.26, or 2.05 above normal; the greatest monthly amount, 10.35, occurred at Clark, and the least, 0.90, at Interior.—*S. W. Glenn.*

Tennessee.—The mean temperature was 79.7°, or 3.2° above normal; the highest was 104°, at Tracy City on the 11th, and the lowest, 51°, at Erasmus on the 1st. August was one of the hottest months ever experienced in Tennessee. For persistent, abnormally high temperature the month has not been surpassed since records began eighteen years ago. The average precipitation was 2.00, or 1.23 below normal; the greatest monthly amount, 4.70, occurred at Silverlake, and the least, 0.40, at Springfield.—*H. C. Bate.*

Texas.—The mean temperature, determined by comparison of 42 stations distributed throughout the State, was 0.8° below the normal. Nearly normal conditions prevailed, except over east Texas, the east portion of north Texas, and the central and east portions of the coast districts, where there was a general deficiency, ranging from 1.0° to 4.9°, with the greatest in the vicinity of Corpus Christi. The highest was 106°, at Colorado City on the 24th and 25th, and the lowest, 54°, at Alpine on the 1st. The average precipitation, determined by comparison of 52 stations distributed throughout the State, was 0.81 above normal; there was a general deficiency ranging from 1.00 to 3.03 over north, central, and west Texas and the extreme west portion of the coast districts, while there was a general excess elsewhere, with the greatest over the southeastern portion of the State; the greatest monthly amount, 12.63, occurred at Brazoria, while none fell at Fort Ringgold.—*I. M. Cline.*

Utah.—The mean temperature was 68.5°, or 1.9° below normal; the highest was 109°, at Hite on the 2d, and the lowest, 26°, at Henefer on the 22d and at Loa on the 31st. The average precipitation was 0.34, or 0.31 below normal; the greatest monthly amount, 1.11, occurred at Wellington, while none fell at Cisco and Kanab.—*L. H. Murdoch.*

Virginia.—The mean temperature was 79.4°, or 4.5° above normal, and was the hottest month on record; the highest was 107°, at Columbia on the 12th, and the lowest, 47°, at Burkes Garden on the 2d and 5th. The average precipitation was 2.12, or 1.69 below normal; the greatest monthly amount, 5.23, occurred at Sunbeam, and the least, 0.13, at Danville.—*E. A. Evans.*

Washington.—The mean temperature was 62.0°, or 3.3° below normal; the highest was 103°, at Hooper on the 14th, and the lowest, 28°, at Republic on the 26th. The average precipitation was 0.94, or 0.20 above normal; the greatest monthly amount, 4.05, occurred at Clearwater, and the least, trace, at Bridgeport.—*G. N. Salisbury.*

West Virginia.—The mean temperature was 76.0°, or 3.1° above normal; the highest was 100°, at several stations on different dates, and the lowest, 45°, at Cairo on the 1st. The average precipitation was 3.15, or 0.40 below normal; the greatest monthly amount, 7.20, occurred at Terra Alta, and the least, 1.03, at Burlington.—*E. C. Vose.*

Wisconsin.—The mean temperature was 74.4°, or 5.7° above normal; the month was without exception the warmest August on record; at Milwaukee the mean was 3° higher than that of any previous August for the past thirty years, and at St. Paul it was 4° higher than any previous record for the same length of time; the highest was 103°, at West Bend on the 6th, and the lowest, 37°, at Florence on the 3d. The average precipitation was 4.33, or 1.28 above normal; the greatest monthly amount, 9.43, occurred at Grantsburg, and the least, 1.32, at Stevens Point.—*W. M. Wilson.*

Wyoming.—The mean temperature was 65.6°, or about normal; the highest was 108°, at Bittercreek on the 19th, and the lowest, 23°, at Daniel on the 17th. The average precipitation was 0.37, or about 0.40 below normal; the greatest monthly amount, 1.15, occurred at Centennial, while none fell at Hyattville.—*W. S. Palmer.*

SPECIAL CONTRIBUTIONS.

DEATH OF MR. T. J. FLYNN.

It is with much regret that we have to announce the death of Mr. T. J. Flynn of the Weather Bureau, who died August 4, 1900, after an illness which lasted several weeks. Mr. Flynn was born December 12, 1842, in Ireland; he served valiantly in the civil war and was a respected member of the Grand Army of the Republic. He connected himself with the weather service of the United States Signal Office in October, 1883, as a lithographer, and served faithfully until death ended a useful career. Mr. Flynn was energetic and always at his post, courteous and ever ready to assist in an emergency.

The Weather Bureau loses a good and conscientious employee.—*L. W.*

NILE FLOODS AND MONSOON RAINS.

Editorial in Nature, August 23, 1900, Vol. LXII, p. 391.

The practice or science of weather forecasting will evidently proceed on two very different lines, according to the relative importance of local or seasonal changes in the general meteorological conditions, and whether the prediction has reference to a long or short period. The machinery employed, in cases where the forecast aims at great minuteness over a small area, consists mainly of the synoptical chart, based on information supplied by rapid telegraphic communication, and in the hands of experts this means probably proves sufficient, and furnishes a fair percentage of accurate predictions. But in the more difficult, as certainly in the more important, problem of predicting the weather some time in advance and over a considerable area, a problem which regularly recurs in the monsoon forecast for India, one must evidently depend upon the more general physical conditions that are produced by the motions of the earth and the distribution of land and water on its surface. These causes, it is true, are always operative, and to a certain extent meteorological phenomena, broadly considered, must be periodic in their main features. The causes of deviation from periodicity, and the extent of the area affected by such abnormal conditions, are problems which the professional meteorologist has to encounter, and it is to be feared with insufficient means. But it seems not unlikely that, in proportion as the problem becomes more general, by bringing wider areas within the scope of the discussion, the prospects of greater success will become more assured; and it can not but be considered a most significant feature that indications are not wanting that in the two considerable areas, India and Egypt, the respective climates betray peculiarities which may either react upon each other, or the origin of which must be sought in a common source.

From two independent investigations come attempts to trace a connection between the amount of the Nile floods and the abundance or deficiency of the southwest monsoon rainfall in India. Mr. Willcocks[1] broached this subject in a paper read before the Meteorological Congress at the World's Expo-

[1] The above reference to the paper by Mr. W. Willcocks, Civil Engineer in charge of works on the Nile, written in 1893, should perhaps be supplemented by the statement that the short reference by him to the fact "that famine years in India are generally years of low flood in Egypt" is apparently but a repetition of a generalization that we owe, primarily to Mr. Morgan Brierly of Port Said, who in Nature, October, 1881, XXIV, p. 532, published a table showing the rainfall at Bombay, the height of the Nile, and also Wolf's sunspot numbers for the years 1849–1880. He says: "The floods of the Nile are mainly caused by the heavy rains which descend upon the high table-lands of Abyssinia. * * * The great southwest monsoon which sweeps over the Indian Ocean in the summer months produces a like effect in both cases." Subsequently the Indian meteorologists have been able to show that when the great southeast trade of the southern Indian Ocean crosses the equator and becomes the southwest monsoon of India, it impinges upon the high lands of Africa and produces in that region a rain that constitutes a very important portion of the annual flood in the Nile. According as the trade is deflected to the east or to the west and according as it is stronger or feebler, there are resulting variations in the African and Indian rainfall, so that there is some connection between the floods of the Nile and the famines of India.—ED.

sition in Chicago, Ill., and there suggested that famine years in India are generally years of low flood in Egypt, and that when the summer supply of the Nile had been deficient and late, a high flood might well follow, since the drought in the valley of the White Nile must create a powerful draught[2] from the Indian Ocean or the Arabian Sea, a district in which is to be sought the origin of the massive currents of the southwest monsoon. Unfortunately, any exact data to establish this interesting connection are not forthcoming, and can hardly be expected, since the Nile is supplied from two distinct sources, and it is impossible to separate and trace the effect of either contribution. Of the great lakes of central-east Africa which constitute a reservoir for the Nile waters, little is known as to the variation in their relative height due to the rainfall in their vicinity, which lasts from March to December. At Port Alice, on the Victoria Nyanza, and at some other stations, observations, more or less regular, are made of the variation in the heights of the water, but in the absence of any common datum level these heights are referred to that of the mean lake. Much surveying work and long continued observations will have to be made before these scanty statistics can be turned to full account.

Of the second source of supply to the Nile, viz, the flood waters in the Atbara, the Blue Nile, and other rivers, fed during the rainy season from June to November, we know practically nothing as to their amount. But it is this seasonal supply which is probably the greatest factor in causing variations in the Nile floods, and where a connection with the causes of the Indian rains is closest. Whatever influences the flow of the monsoon current from the equator northward over the Indian seas toward the heated regions of India and Malay Peninsula, must have a proportional effect on east Africa and south Arabia. With heavy monsoon rains, therefore, it is not unlikely that the contributing rivers add materially to the volume of the Nile waters, but it is not altogether a trustworthy guide to gage the amount of water that enters the Nile by measuring the quantity that passes a particular station. Much water enters the Nile that never contributes to the irrigation of Egyptian lands. Of the amount lost by evaporation no account can be taken, but a source of greater error arises from the peculiar flatness of the ground about Shambé, which forms the apex of the swamp delta. Here the Nile can spread its waters over a large area, and practically lose itself as a river among the beds of reeds and rushes which form a veritable swamp. Engineering works, already projected or actually begun, aim at clearing some or other of the feeding streams, such as the Bahr el Gebel or the Bahr el Zarab, and the effect must be, when completed, to break the continuity of such observations as have been made. Other sources of error are to be found in the varying quantity and character of the "sudd" which may interrupt the flow or diminish the amount of evaporation, but without insisting on too much accuracy there exists a certain amount of evidence that the two great agricultural countries of Egypt and India are likely to be prosperous together or to suffer in common.

Having mentioned some of the causes which prevent a rigorous comparison between the Nile floods and the Indian rainfall, one is not unprepared to find some discrepancies, but Mr. Eliot certainly does not overestimate his case when he contends that these tables indicate that in at least four out of five seasons in which there was a partial failure of the rains in India there was a low Nile, and that generally the two countries are similarly affected by the meteorological conditions and the variations of those conditions. The causes of these variations are obscure, and at present very imperfectly recognized, for a complete solution, as Mr. Eliot points out, demands a much more intimate knowledge of the atmospheric conditions that prevail over a large area. The meteorology of Australia and the Indian Ocean, and perhaps also of the Antarctic Ocean, must be linked to that of the Indian monsoon area "before it will be possible to ascertain the missing factors necessary to complete the explanations of the relations between the chief features of the monsoon currents and rainfall of India and the antecedent and concurrent conditions in the Indian area and the regions to the south." To trace and anticipate the effect of weather conditions over the area that embraces both India and Egypt, in which our interests are so largely involved, should stimulate further inquiry, with the result of placing at the command of science additional means for dealing with so grave a problem.

Mr. Eliot, the meteorological reporter to the government of India, in his recent forecast of the probable character of the southwest monsoon rains of 1900, not only fully indorses Mr. Willcocks's statement, but adds some statistics which render a connection highly probable. Omitting a few local particulars from Mr. Eliot's statistical summary, the broad features are shown in the following table.

Year.	Departure of mean annual Indian rainfall from normal, in inches.	Character of Nile flood.
1876	− 4.49	Good, high flood.
1877	− 4.28	Poor flood.
1891	− 3.54	Late flood.
1896	− 4.83	Low Nile.
1899	−11.14	Very low flood; lowest of century.

The years of excess of Indian rainfall tell a similar tale even more distinctly.

Year.	Rainfall departure, in inches.	Character of Nile flood.
1878	+ 6.34	Very severe flood; banks of river carried away in October.
1886	+ 3.02	High flood.
1892	+ 5.09	Very high and late flood.
1893	+ 9.07	High flood.
1894	+ 6.47	High flood.

[2]The indraught due to such drought must be inappreciable. A drought in the valley of the White Nile is the result of the cessation of the inflow of air from the Indian Ocean.—ED.

METEOROLOGICAL OBSERVATIONS DURING THE BURNING OF THE PLANT OF THE STANDARD OIL COMPANY AT BAYONNE, N. J., JULY 5, 6, AND 7, 1900.

By W. H. MITCHELL, Secretary of the Bayonne Kite Corps.

A little before midnight on July 4, a heavy thunderstorm broke over Bayonne, the rain coming down in torrents flooding the streets, as the sewers were incapable of draining the sudden downpour. The lightning was the most vivid witnessed here this year. At 12:15 a. m., on the 5th, came a blinding flash that, to the surprise of those who saw it, continued to illuminate the sky. The crash of the thunder that followed was augmented by an explosion that shook every house in the city, and it was difficult to distinguish which was thunder and explosion, so simultaneously did the reports take place.

Almost immediately the special fire whistles of the Standard and Tide Water Oil companies called the day men of both companies to the works, and the general alarm of the Bayonne fire department followed, calling out six steamers, eight hose carriages, two trucks, and 450 men, of whom some 300 responded.

The writer, being a member of the department, responded at once, arriving on the scene at 12:35. The officers of the oil company and the fire department at once realized that