That the term Indian summer was introduced into England from this country is made certain from the evidence presented in this paper; but, singularly enough, before the American expression found its way across the Atlantic, and even before the American expression made its appearance in the United States, there occurred in an English writer an example of the term Indian summer itself. Writing from London July 12, 1778, Horace Walpole said: "Has not this Indian summer dispersed your complaints?"

Is it possible that this is an anticipation of our American expression? Did Walpole have in mind the North American Indians, the West Indies, or India? Some further passages from his letters throw light on these questions. On August 22, 1778, he again wrote: "I hope this Elysian summer, for it has been above Indian, has dispersed all your complaints. Yet it does not agree with fruit; the peaches and nectarines are shrivelled to the size of damsons, and half of them drop. Yet, you remember what portly bellies the peaches had at Paris, where it is generally as hot."

On September 5, 1779, Walpole remarked: "Lady Blandford * * * told me when I expostulated with her, that the machine was worn out, and that life was of no value when uncomfortable. She has persisted perfectly cool and in her senses, begging for laudanum, suffering dreadfully, and the more, as you may imagine, from our late more than West Indian heats."

Finally, on August 16, 1780, Walpole observed: "My own little landscape is brown and parched. A sultry east wind has reigned for eight-and-twenty days, and left us neither grass nor leaves. This is the third summer that our climate has been growing as Asiatic as our Government; and the Macphersons and Dalrymples, I suppose, will hail the epoch of the introduction of camels and dromedaries in lieu of flocks of sheep; yet a Russian fleet riding in the Downs is a little drawback on our Ottoman dignity."[141]

It will be observed that these letters were written in the months of July, August, and September. Clearly, therefore, Walpole could not have had in mind, even if he knew about it, our supposed autumnal spell of peculiar weather, for though that has been stated to occur in every month from September to January, yet no one as yet has been rash enough to place it in July or August. Taking into consideration the high temperature of those three summers, the allusion both to the West Indies and to India, it seems tolerably certain that those two parts of the world were connected in Walpole's mind with intense heat, and that his "Indian summer" was merely a chance phrase giving expression to this association of ideas.[142]

Kaemtz, Complete Course of Meteorology, 1845, p. 283; Proceedings of the American Association for the Advancement of Science, xi, 203; Rear Admiral R. Fitz Roy, The Weather Book, 1863, pp. 76, 166, 167; Harper's Magazine, 1864, xxx, 124, 125; American Cyclopædia, 1876, xv, 466; K. C. Kwong, Dictionary of English Phrases, 1881, p. 527; Signal Service Notes, No. IX, Weather Proverbs, 1883, pp. 89, 104; The Bizarre, iii, 30; American Notes and Queries, ii, 268, 269, v, 185, 226, viii, 32, 33; R. Inwards, Weather Lore, 1893, p. 8; B. W. Green, Word-Book of Virginia Folk-Speech, 1899, p. 199.

[141] Letters, 1891, vii, 94, 112, 246, 425. I am again indebted to Mr. E. P. Merritt for calling my attention to these passages.

[142] What seems to be precisely the same idea is found in a letter written from New Jersey by an Englishwoman. Under date of April, 1820, Frances Wright D'Arusmont remarked: "The close of the winter, for one may not term it the spring, is here decidedly the least agreeable season of the year. Siberian winds to-day and Indian heats to-morrow, and then driving sleet the next day, and so on, from heat to cold and cold to heat, until the last finally prevails, and all nature bursts into sudden life as by the spell of a magician." (Views of Society and Manners in America, 1821, p. 451.)

Last spring Professor Abbe suggested that "some early traveler who had been in India and had experienced the dry, hazy weather of the dusty Indian plains recognized nearly the same kind of sky in our Indian summer haze." Of the British officers who served in America during the Revolutionary war, some, like Cornwallis, afterwards had distinguished careers in India, but probably few had been in India before their American campaigns. As for travelers, the only one I can recall in this country before 1800 who had previously been in India was Thomas Twining. He sailed from India in 1795, landed in Philadelphia in April, 1796, visited Baltimore, Washington, and New York, and sailed for England in June. While here he kept a journal, which has recently been published, but it contains no allusions to climate. (Travels in India a Hundred Years Ago, with a Visit to the United States, London, 1893, pp. 347-448; and Travels in America 100 Years Ago, New York, 1894.)

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

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—— London Fogs. P. 21880.
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STUDIES ON THE STATICS AND KINEMATICS OF THE ATMOSPHERE IN THE UNITED STATES.

By Prof. FRANK H. BIGELOW.

II. METHOD OF OBSERVING AND DISCUSSING THE MOTIONS OF THE ATMOSPHERE.

INTRODUCTORY REMARKS.

It has been suggested to me that it would be advantageous to many who are interested in the progress of modern meteorology, if the results of the observations on clouds, which were made by the United States Weather Bureau during the years 1896-97, could be put in a more compact form than was adopted in the original report.[1]

I am the more inclined to present anew some of my results because of the extensive use that has been made of the American observations generally in Dr. J. Hann's Lehrbuch der Meteorologie, 1901. In this judicious and comprehensive summary of the state of meteorology at the end of the nineteenth century, Dr. Hann has given very generous recognition to the contributions of the United States, including the Weather Bureau and the Blue Hill Observatory, to the advancement of meteorology. But more important than this, the views therein adopted regarding the theories of the circulation of the atmosphere in the general and the local cyclones, are fully in accord with the ideas set forth in my report on the cloud observations of 1896-97. It is apparent that meteorology is at last securing a set of principles founded on observations, which will supersede much that has been heretofore taught in this connection. It is therefore important to explain the results of the Weather Bureau observations of 1896-97 as briefly and simply as possible.

Taking a very general view of the present state of meteorology, it may be proper to classify the conditions as follows: The statistical side of the subject is being rapidly worked up, so that our knowledge of facts is relatively quite complete in climatology, and in the diurnal and annual periods of the various atmospheric elements, namely, pressure, temperature, vapor tension, and wind direction, in different parts of the world, so far as they prevail in the strata near the ground. But in the upper strata our knowledge of these elements is still very limited, though it has been considerably extended during the past ten years, by the cloud observations, and the balloon and kite ascensions. On the theoretical side of static meteorology it may be said that meteorological analysis is well advanced, as far as concerns the barometric relations of pressure to the height, the temperature and vapor tension variations, and the adiabatic thermodynamics generally. The practical extension and application of these formulæ to the upper strata is making fair progress, and is likely to result in very definite knowledge of the true state of the atmosphere throughout its extent. In dynamic meteorology, however, that is in the hydrodynamics of the atmosphere, affairs are in an unsatisfactory condition, and they can be reclaimed only by pursuing a sound policy regarding them. Looking over the entire field, one is surprised to find that but little has been done in the preliminary and the most necessary stages of this work, in order to make the dynamics of the atmosphere a practical scientific problem. It is wasting time to speculate on the mathematical analysis of the motions of the atmosphere till we know what the motions are, simply as a case of kinematics. In other words, the paths of motion of the average air currents should be systematically worked up all over the world, as the indispensable preliminary to this study. Of course the obstacle in the way of doing this is the invisibility of the air itself, and the labor of making any observations on its direction and velocity of motion much above the ground. It was for supplying just this need that the international cloud observations of 1896-97 were instituted, and to it they have contributed a valuable amount of data.

Furthermore, there are the great physical problems connected with the absorption of the sun's radiant energy in the atmosphere, its separation into several kinds of energy—electric and magnetic energy, heat energy of the visible and invisible spectrum, and so on. Also there is the question to be answered as to the amount of the solar output itself, the variations from its mean value, how much and what kinds of energy are absorbed in the upper strata, and what in the lower. The circulation of the atmosphere in its details really goes back to these questions about which we know only a very little. Hence,

[1] Report on the International Cloud Observations, May 1 1896, to July 1, 1897, by Prof. Frank H. Bigelow. Report of the Chief of the Weather Bureau, 1898-99, Vol. II.