A special report on this meteor received from Prof. S. M. Woodward, of Tucson, says:

The meteor was seen by enough people to have determined everything about its path if those who saw it had taken pains to accurately observe the directions and the times. The way people were deceived by it was amusing. One thought that it fell a few hundred yards away from our buildings on the Mesa, but it must have been distant at least 60 miles; he says it looked like an incandescent lamp bulb floating softly down. A woman ducked her head and thought it went over her no higher than the tops of the telegraph poles. Many people thought they saw where it fell and went to look for it, but afterwards could not remember the exact point where they were standing or the direction in which it disappeared. I have not been able to substantiate the report in regard to a piece falling from it near St. David. The following is a summary of such facts as I have been able to gather:

About 2.50 p. m., Pacific standard time, on February 24, a large meteor fell in Arizona. It was seen by a number of people in Tucson and vicinity as a brilliant light in the east although the sun was shining brightly at the time. The path was nearly perpendicular to the horizon, and was marked by a distinct ribbon-like band of white vapor which persisted for several minutes. The meteor was seen by a man about 25 miles west of Tucson, by a man in Sonora, Mexico, and by people in Benson, Tombstone, and Solomonville.

From Sonora it seemed to fall in the direction of Tombstone or Pearce, and from Benson in a direction somewhat north of east. At Benson the meteor was seen to explode when near the horizon, and the loud noise of the explosion was heard after an interval, estimated at from one to three or four minutes.

At Dragoon the noise was heard and described as terrific. From Wilcox and vicinity there are only rumors of the meteor having been observed. At all places as nearly as can be learned the path seemed to be nearly perpendicular to the horizon. If any pieces reached the earth, they probably fell near Dragoon. The few accounts from points to the eastward would be accounted for by the bright afternoon sun.

To those who are disposed to assist in determining the altitude, the velocity, and the direction of the path pursued by such a meteor, the Editor would say that the observations required for this purpose are of the simplest possible character, but owing to the suddenness of the apparition and its short duration, such observations can not be expected to be very accurate. In fact, the principal difficulty that is usually found results from the discrepancies of observers who are bewildered by the novelty of the phenomenon. The intelligent voluntary observer who desires to contribute to this subject in case an aerolite or bright meteor passes near the station, should simply collect from as many persons as possible, accurate and definite statements as to the apparent angular altitude and azimuth or bearing of the point where the meteor was first seen, and again of the point where it was last seen. These two items, or either one of them are probably all that any one is likely to observe or remember. If the meteor causes trees and buildings to cast a sharp shadow, then by remembering the location of the shadow one may afterwards determine the angular azimuth and altitude of some point in the path of the meteor. If the observer can count seconds carefully by his watch and thus determine the time that elapses after the passage of the meteor, before he hears the sound, that is also a desirable item. Of course a number of observers must contribute the results of their observations in order to make it possible for any one to compute the true altitude and path of the meteor.

CYCLES IN METEOROLOGY.

An esteemed correspondent, the well-known voluntary observer at North Lewisburg, Ohio, Mr. H. D. Gowey, calls our attention to the fact that according to the year book of the Department of Agriculture for 1895, page 161, the severe freezes in Florida occurred in the winters of 1747, 1766, 1774, 1799, 1828, 1835, 1850, 1857, 1880, 1884, 1886, 1894–95, and that furthermore a cycle of about seventeen years is indicated by these numbers, that is to say, any one of these dates is removed from some other date by some multiple of seventeen years. He also asks whether high waters and low waters do not recur in similar periods. Our reply must be, that all depends on which temperature or high water, or frosts we choose to select for our study and which we reject as unimportant. The above list of severe freezes in Florida (see MONTHLY WEATHER REVIEW, 1895, pp. 336–337) may be supplemented by many other years when the frosts were less severe or more local, and the cycles will depend upon the dates that we study.

As Mr. Gowey states that he is not much of a believer in cycles of weather we may, without giving offense, quote this 17-year cycle as another illustration of the ease with which artificial and empirical numerical relations can be discovered in the complex phenomena of meteorology. These relations are usually not very exact but they look mysterious to the wondering eye, and always suggest an inquiry as to whether there is anything in them, that is to say, whether they represent a natural law and can be utilized for weather predictions. So many such cycles have been worked out and they are, one and all, so useless for the purposes of weather prediction that we can not encourage any one in giving much attention to them; and yet as Kepler with his planetary laws and Schwabe with his 11-year sun spot cycle, and Chandler with his 423-day period in latitude, have each respectively discovered important natural cycles, so we suppose it not impossible that cycles of corresponding importance may be discovered in meteorology. On the other hand the ground has been worked over so well in the past three hundred years that there seems no probability of discovering any *simple* natural cycle; in fact, meteorological conditions are so complex that no simple cycle can possibly exist for any long time with any reasonable degree of accuracy. For instance, if we have a daily cycle of temperature in the temperate regions, it will repeat itself for two or three days only before some disturbance breaks it up; if we have a weekly cycle of rainy days and fair weather it may last four or five weeks at the most before being broken up, and it will be several weeks before it starts over again; if we have an annual cycle of cold and hot weather, or rainy weather and drought, or stormy weather and pleasant, it will continue for only two or three years before being so entirely changed as to be unrecognizable. Even the long cycles of eleven, seventeen, nineteen, thirty-five, and fifty-five years that have been "demonstrated" by their respective advocates, disappear after two or three repetitions, only to start up again by and by. These all remind one of the great ocean waves that advance across the Atlantic with perfect regularity but when they reach their limit die away, soon to be replaced by another set of similar waves, so that the whole ocean is covered with waves superposed upon each other, each having its own periodicity, and each set dying out as another replaces it. Within each group of waves there is the periodicity that the cyclist is seeking after, and yet there is also therein an element of dissolution that soon brings the cycle to naught. The cycle like the wave was evolved by a temporary combination of minor elements, and like it soon dissolves into other combinations.

As bearing upon this same subject, the Editor has just received a most instructive pamphlet, *Wetterperioden*, by Guido Lamprecht, published as a scientific appendix to the annual report for 1897 of the gymnasium or college at Bautzen. In this work Lamprecht gives the result of computations that have occupied his time for the past ten years, and he hopes that he has demonstrated that there are short periodicities in the weather. We must, however, distinguish between those periodicities that we have some reason for expecting, such as the lunar tidal periods and those that are purely empirical; we must also distinguish between apparent periodicities whose uncertainty, as shown by the disagreement with observations, is large, and those whose agreement is very close. Lamprecht derives his results from over 52,000 months of total rainfall, a number vastly greater than those used by any of his predecessors, and his stations are scattered throughout Germany, Austria, Italy, Sumatra, Java, and the East Indies. He first examines this mass of data for lunar periods. The synodic lunar month has an average length of 29.53059 days; the anomalistic month is 27.55457 days. The common period for these two is 411.7934 days. Within this interval the moon experiences the greatest disturbance in the form of its orbit, whose eccentricity varies between 0.044 and 0.066. Arranging his monthly data with reference to this period he finds that for six groups of stations in Prussia, Saxony, Austria, Italy, and Sumatra, the precipitation is a maximum when the perigee of the moon agrees with the lunar octant. For Java and Sumatra he had only sixteen years of observations, which was not quite long enough to demonstrate the action of the moon. His conclusions may be expressed in other words, as follows: The influence of the moon is such that the greatest rainfall occurs when the lunar perigee coincides with the full moon, and the least rainfall when the perigee coincides with the new moon. The excess when the perigee agreed with the full moon averaged about 10 millimeters in forty-one days, or 1 millimeter in four days, over the minimum rainfall when the perigee agreed with the new moon. In a second check computation Lamprecht considers only the number of the rainy and the dry months, calling those months rainy that had an excess of rain over the normal, and those dry that had a deficiency. He finds that 61 per cent of the months when the perigee agrees with the full moon are also wet months, leaving 38 per cent that do not agree with his previous conclusions. This is quite opposed to the hypothesis of Falb, according to whom the moon exerts its greatest influence in producing rain when the perigee agrees with the new moon. Having firm faith in the physical reality of the 411 or 412 day period, or 14-month period of the rainfall for Europe, Lamprecht assumes that it applies to the whole earth, and undertakes to explain the corresponding necessary action of the moon on the atmosphere in order to produce this period. He goes into a discussion of the zodiacal light considered as a ring of matter revolving around the earth and subject to perturbations from the moon, and urges that photographs of this light be obtained for further investigation. After some lucubrations on atmospheric electricity, he passes to the discussion of another period in the rainfall, namely, 423.82 days. This gives him for Europe a maximum rainfall at the middle of the period. The difference between the length of the lunar period, 411.79, and this new astronomical period, 423.82 days, is almost exactly twelve days, and the period common to them both is 39,732 years. Lamprecht says:

> I consider the period of 423.82 days as that in which the node of my hypothetical ring of matter circulating around the earth describes 360 degrees on the earth's equator, but it is very possible that my period is identical with Chandler's period in the variation of the earth's axis, so that this latter remarkable variation may be due to the oscillations of the ring of matter around the earth.

Lamprecht then passes to the study of a period of 11.8846 days, and considers that its existence is established with sufficient accuracy, and that it is caused by the synodic revolution of his ring around the earth. "In general, these various periods, and others that may be established, are the cause of the great variety of weather that we experience from day to day."

To this latter remark the Editor would offer the suggestion that by careful arrangement of data we may be able to work out an immense number of periods whereby to represent the occurrence of any series of phenomena; but we are not justified in saying that the periods cause the phenomena, or that the phenomena are the result of these periodicities. Who, for instance, would say that school children have a periodic tendency to go schoolward in the morning and homeward in the afternoon, and that their general behavior is the result of a number of such periodic tendencies? The fact is that they, like the rain and weather, are controlled by laws higher than mere arithmetic periodicities. The study of the fundamental laws of nature gives us a higher style of meteorology than the study of periodicities.

A MACHINE FOR CALCULATING PERIODICITIES.

Our readers are doubtless familiar with many forms of calculating machines; those for mere addition and multiplication are in use in every large counting house; the Hollerith machine, invented for the use of the United States Census Bureau, for the purpose of classifying and averaging a great variety of data, was recognized as a labor saving contrivance of immense importance. A desire has often been expressed for a machine that should discover recurring periods in any given series of numbers. The Editor has often worked over the sine and cosine formula for this purpose, but neither that or the purely arithmetical, nor the purely graphical methods are entirely satisfactory when we wish to discover wholly new periods. For this purpose Mr. Lamprecht tells us that he has used such a machine, and the Editor hopes to obtain a description of it for publication.

THE DEVELOPMENT OF THE KITE BY EUROPEAN SCIENTISTS.

Inasmuch as it has been remarked that the literature of science seems to offer but few memoirs that deal with the mechanics of the kite, it is, perhaps, worth while to call attention to those that have come to our notice. The name "kite," or "paper kite," as used in English; the cerf-volant, or flying stag of the French; the Fliegende Drache, or flying dragon of the Germans, and the *draco volans papyrus* of modern Latin, all point to the ancient custom of constructing these kites in fanciful imitation of animals; this custom was doubtless introduced into both Europe and China from some more ancient common source.

To the kindness of Professor Hellman, the Editor is indebted for a copy of a work in French whose title may be translated thus: A Memoir on Methods of Protection from Lightning inside of Dwellings, followed by a Letter on the Invention of the Electric Kite, with documents corroborative of this same letter by M. de Romas. Bordeaux, 1776.

This interesting book contains 20 pages of preface, 95 pages of the memoir, 49 pages of the letter followed by 12 pages of documents, to prove that M. de Romas invented or thought of the electric kite before Franklin applied it. It seems to be established that already, June 12, 1752, de Romas had written a letter recommending that the kite should be used to raise an iron bar as conductor in order to test the question whether the lightning was due to electricity, and that, furthermore, August 19, 1752, de Romas communicated to the Chevalier de Vivens the project that he had conceived of drawing electricity from the clouds by means of the kite, and that, furthermore, de Romas had, in August, 1752, commissioned Dutilh to construct an electric kite, but that the latter had delayed until the season for using it in 1752 had passed by, so that the first actual experiment made by de Romas was May 14, 1753, after he had heard of Franklin's success.

We are not at present interested so much in this question of priority in electrical discovery, as in collecting the scattered items that bear upon the history of the development of the structure of the kite, and the theory of the mechanical problems involved in flying it. Some such items were published in the MONTHLY WEATHER REVIEW during 1896, and the following items bearing upon these questions are extracted from various parts of de Romas' little volume:

DE ROMAS ON THE KITE.

De Romas' first kite appears to have been ready for use only a little while before its first use on May 14, 1753. A picture of it is given in his frontispiece and a description of the