and zoological nomenclature, and that the use of a generic name in the one kingdom did not debar its use in the other. The different branches of zoology have now become so extended and specialized that the same rule of divorce might well be extended to the different branches of zoology. Little, if any, confusion could arise to ornithologists, or mammalogists, or ichthyologists, if a bird name, a mammal name, or a fish name should have currency for a genus of insects, or mollusks, or crustaceans, or echinoderms, or in each of these branches. If it could be agreed—and I am aware of no opposition—that the same generic name may hold good in different branches of the animal kingdom, but must not be used twice in the same branch (as in vertebrates, for example), it would result in the restoration of not a few familiar names that have had to give way under the animal kingdom priority rule, and lessen, if not quite do away with the present incipient call for an impracticable 'one-letter rule.'

5. *The Authority for Names.*—It is difficult to see the reason for Canon XXIX., which appears not to be published in full in *The Condor*. It is contrary to current usage and to other modern codes, that the authority for a name, given in manuscript on a museum label, is to be cited as the proper authority for such names when published by another author, who supplies the description and assumes the responsibility for the species. This canon says: "If a writer ascribes one of his species to some one else, we must take his word for it. Thus the manuscript species of Kuhl and Van Hasselt in the Museum of Leyden, although printed by Cuvier and Valenciennes, should be ascribed to Kuhl and Van Hasselt." This is not only a confusion of responsibility, but is bibliographically misleading, tending to throw the investigator off the track in looking for the original description of the species. Unless the publishing author endorses the supposed new species, he simply ignores the manuscript name and takes the responsibility for its suppression, just as in the other case he takes the responsibility for its publication and supplies the necessary description. If the author of a manuscript name supplies a description to accompany it, which only rarely happens, and the publishing author uses it as inedited manuscript, then the author of the name is also the author of the description and is to be cited as the authority for the species. In the other case, the name should be cited, in synonyny, as Cuvier (ex Kuhl, MS.), and otherwise as simply Cuvier. In the case of inedited matter, the citation would be Kuhl (in Cuvier, etc.), and otherwise as Kuhl. This, like the other points criticized above, is a singularly retrograde step.

J. A. ALLEN.

CURRENT NOTES ON METEOROLOGY.

METEOROLOGICAL RESULTS OF THE BLUE HILL KITE WORK.

THE meteorological work done at the Blue Hill Observatory by means of kites has so often been alluded to in these 'Notes' that no comments on the value of this work are necessary at this time. The latest publication in this connection is a valuable report by H. H. Clayton, entitled 'The Diurnal and Annual Periods of Temperature, Humidity and Wind Velocity up to Four Kilometers in the Free Air, and the Average Vertical Gradients of these Elements at Blue Hill' (*Annals Astron. Obs. Harv. Coll.*, LVIII., Pt. I., 1904). Although some of the results herein discussed have already been brought forward in previous publications by Mr. Rotch and Mr. Clayton, the compact and careful summary now issued will be welcomed as giving a definite and complete presentation of the principal conclusions which have been reached through the well-known, extended and laborious series of scientific kite flights—a field of investigation in which Blue Hill has taken a front rank.

A study of the sources of error in the instruments and methods precedes the discussion of the results. Six possible sources of constant error are recognized as influencing the records, and also one source of error, not constant, which arises from temporary local differences of condition, and from the fact that the kites do not rise vertically. A glance at these preliminary pages will show with what extreme care the observations have been treat-

ed before being employed in obtaining any definite results. Mr. Clayton's thorough study of the sources of error must also bring up many doubts concerning the accuracy of results obtained by observers who exercise less care. It may be noted that, in Mr. Clayton's opinion, the excessive temperature gradients, greatly exceeding the adiabatic rate, which have several times been referred to in various publications, are probably due, for the most part, to the fact that the observations in question were not made simultaneously at the two levels (p. 14). Temporary local differences of temperature may also explain gradients which exceed the adiabatic rate (p. 15).

The interest which attaches to all reliable meteorological data obtained in the free air is so great as to warrant the inclusion, in the pages of SCIENCE, of the following summary of the most important points contained in Mr. Clayton's report.

Diurnal Period of Temperature at Different Heights.—On several occasions observations were obtained during many hours at heights of about 3 kms., but there was no evidence of any change of temperature due to a diurnal period. On June 18–19, 1900, for example, the temperature at a height of 2,900 ms. was recorded at intervals throughout twenty-four hours, and although there was a general fall under the influence of some general atmospheric change, there was no appreciable diurnal period (Fig. 3, p. 16), in spite of the fact that there were only a few cirrus clouds to obscure a small portion of the sky. At 1 km. there is a diurnal period of temperature, as is evidenced by numerous records, but with a tendency to a secondary maximum at night as well as by day. A marked feature is also a sudden fall of temperature after sunrise (about 9 A.M. in summer), the evidence from the movements of the kites at this time being to the effect that the diurnal convectional currents from the ground reach the kites then. This 'chilling' of the air at a height of about 1 km. is explained by Mr. Clayton as due to the rise of the ascending currents, on account of their inertia, to an altitude greater than their point of equilibrium. The ascending air is cooled by adiabatic expansion below the temperature of the air into which it penetrates; hence, at the tops of convectional currents of this kind, rising from the ground, there ought to be a belt of chilled air, above which there must be a higher temperature. Such an inverted temperature gradient is usually found above cumulus clouds. The diurnal change of temperature at the greatest altitude reached by the ascending currents must, therefore, be the opposite of that at the ground, *i. e.*, the temperature is lower by day than by night. The records of May 1, 1902, show clearly that an inversion of the march of the diurnal temperature does occur at the top of convectional currents rising from the warm ground (Fig. 4, p. 20), for while at 500 and 1,000 ms. the afternoon maximum is well marked, the temperature curve becomes inverted at 1,230 ms. At 2,000 ms. there is no perceptible diurnal period. This cooling at the tops of convectional currents begins nearer the earth's surface early in the morning, and reaches a maximum altitude about the warmest part of the day. The diurnal period of temperature at different heights is graphically summarized in Fig. 5 (p. 25), and verbally, on p. 29.

The Diurnal Period of Relative Humidity at Different Heights.—In general, the diurnal period in relative humidity is the inverse of that of the temperature at all levels up to and including 1,500 meters.

The Diurnal Period in Wind Velocity at Different Heights.—Mr. Clayton finds the well-known explanation, given by Espy and Köppen, of the diurnal variation in wind velocity only a partial one, for at night the air from 300 to 1,000 ms. above sea level does not merely resume a velocity of movement proportional to its height, but increases in velocity until its movement is more rapid than that of the air strata above or below the given level. Some other forces must, in Mr. Clayton's opinion, be called into play besides the retardation of the upper currents by ascending currents from below. It is suggested that, as the atmosphere is trying to maintain a mean velocity of flow having a constant value for the vertical section above any given point on the earth, if in any given part of

the section the velocity is diminished, the air must flow faster in some other portion. This theory seems to explain satisfactorily the increased velocity between 300 and 700 ms. at night. The retardation of the air between 200 and 700 meters during the day, due to ascending currents, results in an increased velocity near the ground, and, as this is not sufficient compensation, also in the section of air between 1,000 and 2,000 meters. Hence, at the latter height, the velocity has a maximum by day and a minimum by night, as is the case at the ground.

Vertical Gradients of Temperature, Humidity and Wind Velocity.—At night the temperature rises with increase of altitude up to about 500 meters, and not until a height of over 1,000 meters is reached is the temperature in the free air as low as at the ground. During the day the temperature decreases with altitude nearly at the adiabatic rate for dry air up to 500 meters. Above that height the rate decreases, probably owing to frequent inverted gradients and to cloud formation. Between 500 and 1,500 meters the temperature decreases more rapidly by night than by day. The decrease is most rapid in summer and least in winter. During the day the rate of decrease diminishes to 2,000 meters, and then increases again. From 0 to 500 meters the rate is at a maximum by day and a minimum by night, but between 1,000 and 1,500 meters this condition is reversed, owing to the inversion of the diurnal period. An important point, noted on page 50, concerns the *mean vertical temperature gradient,* about which much has been written. Gradients which are the mean of two opposing conditions may not occur at all. The most frequent gradients which actually occur are (I.) an increase of temperature with increase of altitude, between $+0°.1$ and $+1°.0$ (C.) per 100 meters, and (II.) the adiabatic gradient, $1°.0$ (C.) per 100 meters. Some gradients exceeding the adiabatic rate have been observed, chiefly between 9 A.M. and 3. P.M. On the average, the relative humidity increases during the day up to about 1,000 meters, and then decreases to about 2,500 meters. During the night the relative humidity diminishes rapidly up to a height of 500 meters, and then more slowly, to a height of about 2,500 meters. Above 2,500 meters the relative humidity increases slowly again. There is a very rapid increase of wind velocity at night to a maximum at 500 meters, a slight decrease between 500 and 1,000 meters, and then an increase becoming more rapid with increasing height. There is a relatively rapid increase of wind velocity by day from the ground to 500 meters; a slower decrease from 500 to 1,500 meters, and almost no change from 1,500 to 2,000 meters.

R. DEC. WARD.

MEETING OF THE BRITISH ASSOCIATION IN SOUTH AFRICA.

THE British Association will hold its meeting this year in South Africa. In these exceptional circumstances, the general officers of the association requested the council to appoint a strong committee to cooperate with them in carrying out the necessary arrangements. This 'South African Committee' has held frequent sittings; and its work is so far advanced that the London *Times* is now able to make the following announcements:

Although the annual circular and program have not yet been issued, pending the receipt of information from South Africa, many members have already intimated their intention of being present at the meeting. The 'official party' of guests invited by the central executive committee at Cape Town, and nominated in the first instance by the council of the association, numbers upwards of 150 persons, comprising members of the council, past and present general officers and sectional presidents, the present sectional officers, and a certain proportion of the leading members of each section. To this list has yet to be added, on the nomination of the organizing committee, the names of representative foreign and colonial men of science, the total number of the official party being restricted to two hundred, including the local officials. It is hoped, however, that many other members of the association will also attend the meeting.

The presidents-elect of the various sections are as follows: