

position of the condyle high above the tooth line. (3) The incisors are reduced to a single pair in the lower jaw of *Calamodon*, and are probably completely absent in *Stylinodon*. (4) The posterior portion of the tooth line below passes well behind the anterior border of the coronoid. (5) The canines in all are enlarged, and in *Calamodon* and *Stylinodon* grew from persistent pulps, as in *Megalonyx*. (6) All the molars and premolars in *Stylinodon* are greatly elongated, of persistent growth, and the enamel is confined to narrow vertical bands. (7) There is a thick deposit of cementum on the dentine in those situations in which the enamel disappears. (8) The cervical vertebrae strongly resemble those of the *Gravigrada*. (9) There were well developed clavicles present. (10) The humerus bears a striking resemblance in all of its essential features to those of *Myiodon*, *Megalonyx* and *Megatherium*. (11) The ulna and radius are also similar. (12) The manus is almost identical with that of the ground sloths. (13) The humerus and ulna and radius have no medullary cavities; and (14) the femur has all the characteristic features of the *Gravigrada*. (15) The lumbar vertebral formula was the same as in the *Edentata*. (16) The pelvis is decidedly *Edentate* and (17) the caudals bear a striking resemblance to those of the Ground Sloths."

It follows, or at least is extremely probable, that not only the *Gravigrada*, but all the South American *Edentates* had their origin in North America. Thus a group which has been traditionally assigned to South America now appears to have taken its origin in the north, for the sloths first appear in the Santa Cruz beds of Patagonia, which are not older than the North American White River beds or Oligocene, whereas in North America they are found immediately over the Cretaceous. The importance of this discovery can hardly be exaggerated,

both because of its bearing upon phylogeny, and upon geographical distribution. It appears certain that there was an early land connection between North and South America, and it is in the highest degree improbable that the sloths found their way to South America by way of Asia and Antarctica, as Lydekker has suggested. This early land connection enables us to connect the South American Ungulates, especially the *Litopterna*, with the American Condylarthra, as Cope and others have suggested, so that it will throw renewed life into the study of the genetic relations of these northern and southern faunas. Another important result is, that the *Edentates* are proved to be of tritubercular origin, thus reinforcing the evidence of a trituberculate stem form of all the mammalia.

H. F. O.

CURRENT NOTES ON METEOROLOGY.

THE EXPLORATION OF THE AIR.

IN *Appalachia*, Vol. VIII., No. 1, pp. 179-189, Mr. A. L. Rotch has a paper on 'The Exploration of the Free Air,' in which he gives a general outline of the way in which this work is being done, by means of mountain stations, balloons, cloud measurements and kites. The following facts are of general interest: The first summit station in the world was established on Mt. Washington, N. H. (6,280 ft.), in 1870. The Pikes Peak station (14,134 ft.), now closed, was for many years the highest in the world, but at present the highest station is that of the Harvard College Observatory on the summit of the volcano El Misti, in Peru (19,200 ft.). On Mont Blanc there is a station at the Rochers des Bosses (14,320 ft.), operated during the summer, and on the summit (15,780 ft.), the latter still being idle. The Sonnblick (10,170 ft) in the Austrian Alps; the Saentis (8,200 ft) in Switzerland; Monte Cimone (7,100 ft.) in the Apennines, near Lucca, and Ben Nevis (4,400 ft.) in Scot-

land, are the other well-known high altitude stations. Epoch-making balloon ascents were those of Dr. John Jeffries, of Boston, who made the first scientific balloon voyage from London in 1784; Gay Lussac in 1804 (23,000 ft.); Coxwell and Glaisher in 1862 (29,000 ft.), and Crocé-Spinelli, Sivel and Tissandier, in 1875, in which the two former were asphyxiated. In 1894 Berson ascended alone to an altitude of about 30,000 ft., his barometer reading 9.1 inches, and the minimum temperature being -54° Fahr. Pilot balloons, without aëronauts, have ascended over 10 miles on two occasions, the 'Cirrus' in July, 1894, bringing down a barograph reading of 3.3 inches, and a thermograph reading of -64° Fahr.

VISIBILITY OF MOUNTAINS AND ATMOSPHERIC DUST.

A PAPER by Schultheiss, in the *Meteorologische Zeitschrift* for December, discusses a matter of some interest that has not yet been much considered. It concerns the effect of the dust in the atmosphere in relation to the greater or less visibility of distant mountains. Observations on the visibility of the Alps have been made for 20 years past at Höchenschwand, a station in the southern Black Forest, at an altitude of 1,000 meters and commanding, under favorable conditions, an extended view of the Alps as far as Mont Blanc. Three degrees of visibility are noted, designated respectively as 0, 1 and 2, the latter figure denoting the greatest clearness of view. A careful study of the records and of the weather conditions prevailing at the times of observation reveals the fact that the visibility is best under anticyclonic conditions or during the prevalence of a foehn wind. In both cases there is a descending movement of the atmosphere, and as the upper strata are cleaner and purer than the lower this process results in causing greater clearness of the air and hence a higher degree of

visibility. Ninety per cent. of all the cases in which the view of the distant Alps was clear are found to be associated with such anticyclonic or foehn conditions. Cleaning the air by means of rain seems to be the controlling factor in the majority of the other 10 per cent. of cases. Naturally, as anticyclones are more frequent and longer-lived over central Europe in winter, the visibility is greater in winter and less in summer. There is a common belief, here as well as in Europe, that very clear days, which give very good views of distant mountains, are most likely to be followed by rain. Schultheiss has investigated this question in the case of the Alps as seen from Höchenschwand, and finds that an especially clear view is seldom closely followed by rain. He also finds that the dust in the atmosphere at 1,000 meters is very fine and does not include large quantities of coarser smoke particles as it does at lower levels.

THE BLUE HILL METEOROLOGICAL OBSERVATORY.

It is a very great satisfaction to learn from the volume of Blue Hill Observations for 1895 (*Annals Harv. Coll. Obs'y*, Vol. XL., Pt. V.) that the President and Fellows of Harvard College have secured from the Metropolitan Park Commissioners of Boston a lease of about one and a quarter acres of land on the summit of the Hill. This lease is for ninety-nine years, and will enable the work of the Observatory to be continued without any change in the present conditions of exposure of the instruments. There was some fear, when, a few years ago, the Metropolitan Park Commission added the Blue Hills to the Boston Park system, that the future usefulness of the Observatory might be seriously interfered with by the possible erection of buildings in its vicinity. It would have been a very serious loss to science, not only in this country but in the

world, had anything happened to interfere in any way with the work that the Blue Hill Observatory has been doing so admirably since its foundation. The present volume of observations contains the usual data for the year and, in addition, summaries for the lustrum and decade, with a discussion of the annual and diurnal periods, by Clayton. A number of interesting points are brought out, among them the grouping of thunderstorms around certain dates; the occurrence of maxima in the frequency and amount of snowfall at intervals of twenty or thirty days; of the greatest snowfall in February, and of a minimum of rainfall in June, with a maximum in October.

R. DEC. WARD.

HARVARD UNIVERSITY.

CURRENT NOTES ON ANTHROPOLOGY.

THE SO-CALLED 'BOW-PULLERS' of ANTIQUITY.

THIS is the title of a carefully prepared essay by Professor Edward S. Morse, in the *Essex Institute Bulletin*, Vol. XXVI., the essential facts of which have been copied in *Globus*, Bd. LXXI., No. 10, and other foreign journals. The subject discussed is the purpose of certain objects of bronze or iron found in Greek, Roman and Etruscan tombs. These objects are two connected rings of the metal about seven centimeters in full length, the space between them being about two centimeters, from which space three or four knobs, projections or spines, of irregular height, arise.

Professor Morse proves that these objects can be neither bow-pullers, spear throwers, curbs, bits, caltrops, nor anything else which has been proposed by classical archaeologists; but what they are, he says, after seven years' study, he cannot suggest, nor do the European editors who have republished his article offer an explanation.

I take, therefore, some special pleasure in solving this enigma, and in identifying this curious and puzzling object. It is without doubt the Greek *myrmex* (μύρμηξ) which, in pugilistic encounters, was strapped or chained on the hand over the leathern cestus. This identification answers every condition of form, material, decoration and use mentioned by Professor Morse. I shall shortly publish an article giving the Greek and Latin authorities at length, confirming this opinion.

FAIRYLAND.

IN his presidential address, published in *Folk-lore* for March, Mr. Alfred Nutt discusses the origin of the fairy-lore which has been such a prominent feature in English literature and rustic narrative. He brings together many reasons for attributing it to a Celtic source. It is, in fact, a survival of the belief in the pre-Christian, pagan gods of the Celtic tribes. These have been best remembered in Ireland, where they are still spoken of as the *tuatha de Danann*—the folk of the goddess Danu; and they are to this day considered the occupants of the fairy hillocks.

Mr. Nutt does not explain why the fairies were considered very little beings, as this is not mentioned in the earliest Irish myths. I may suggest that there are reasons for believing that the goddess Danu was the moon (from the O. I. verb, *daon*, to arise, to ascend; and compare Harley, *Moon-lore*, p. 121), and her followers, or folk, the little twinkling stars; whence by an easy step of personification they were transformed into the tiny fairy folk.

RECENT ETRUSCOLOGY.

THE 'Etruscan problem' is one of perennial interest, and now that the Metropolitan Museum of New York and that of the University of Pennsylvania have acquired large and valuable collections from ancient Etruria, the affinities of its mysterious in-