superfical quality of the descriptions and technical discussions. Nowhere does the author give evidence of felicity in the treatment of those characters of fundamental importance derived from skulls and teeth.[7] The vital part of a monograph of the order therefore remains unwritten. To an experienced systematist the results of such tendencies can not fail to bring annoyance and disappointment, while to a beginner, or to a person who has no access to large collections of primates, they must render the book often confusing and misleading. The frequent inaccuracy of statement by which the text is marred[8] will be a further source of difficulty to every one who attempts to use the Review in any serious work.

In these initial numbers of its series of "Monographs" the American Museum of Natural History has established a high standard of excellence in book-making. Good paper, clear type and unsurpassed half-tone plates are its main characteristics. Consistent italicization of generic and specific names would have made the text more easy to use, one series of numbers instead of four would have made the plates less perplexing to cite, while "editing" might have been expected to eliminate an allusion to the opossum as a member of the order Carnivora (I., xxi.), together with such solecisms as "cratarrhine and platarrhine" (I., xxi.), and the almost uniform incorrectness in the printing of Greek.

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black or nearly so'' in two paragraphs of a description based on a single specimen (II., 200); ''no skull'' as part of a color description (III., 70); the application of the same new subgeneric name to two different groups (II., 224, 319); the application of two new names to one group (I., xl., lx., and II., 319); the listing of the name *Pavianus* under Lemuroidea (I., xxviii.), and again under *Anthropoidea* (I., xxxii.).

[7] The striking peculiarities of the skulls and tooth cusps in the lemurs are barely mentioned; the equally interesting molars of the American monkeys receive no more attention (the remarkably primitive structure shown by those of *Alouatta* is not even alluded to); the molars of the three genera, *Pongo, Gorilla* and *Pan*, the cusps of which furnish unmistakable generic characters, are described in practically identical terms; the skull of an ordinary immature male gorilla (the age clearly indicated by the open sutures shown in the photographs) is made the type of a new genus ''*Pseudogorilla*'' (III., 224), supposed to be intermediate between *Gorilla* and *Pan*. Cranial characters are described for none of the 8 subgenera and for only 3 of the 84 species and subspecies of the genus *Lasiopyga*, though in the preliminary discussion of the monkeys of this group the remark is made that: ''Cranial characters . . . are of supreme importance in the discrimination of species . . .'' and also that they furnish ''one of the most important methods of determining species'' (II., 290).

[8] The following examples have been found during actual use of the book, and without search for errors as such: *Tarsius philippinensis* for *T. philippensis* (I., 9, 10, 12, 13); *Nycticebus menagensis* Lydekker, *Zool, Rec.*, etc., for *Lemur menagensis* Lydekker, etc. (I., 32); I. Geoffroy, Cat. Primates, p. 51,'' cited as authority for alteration of *Brachyteles* to *Brachyteleus* (II., 49) though the change is not mentioned by Geoffroy. (It is apparently published for the first time by Elliot); *Cynopithecus niger* Desm., Mamm., etc., for *Cynocephalus niger* Desm., Mamm., etc., (II., 162); *Cercopithecus mona* Hollister for *Lasiopyga mona* Hollister (II., 350); description of color of *Pygathrix melanolopha* beginning: ''Long black hairs along the forehead, golden cream yellow'' (III., 33); original reference to the name *Presbytes batuanus* given as ''*Presbytis batuanus* (!) . . . p. 470'' (III., 44) when it was actually published on p. 65 and with the masculine form of the generic name; *Pygathrix femoralis* (III., 45), Horsfield cited as authority, though first description was published by Martin, type locality said to be ''Tenasserim, Bankasun, (Thomas)'' though Thomas merely recorded a specimen from Bankasun as ''precisely similar'' to the type; *Pygathrix obscura* (III., 52), Reid cited as authority though he is said to have published no description; *Callithrix goeldi* Thomas . . . p. 100 for *Midas goeldii* . . . p. 189 (III., 261 and I., 224, *not* 324 as cited on III., 261).

NOTES ON METEOROLOGY AND CLIMATOLOGY

DYNAMIC PRESSURE UNITS

BEGINNING January 1, 1914, the Blue Hill Meteorological Observatory will use dynamic units of pressure instead of millimeters of

mercury for barometer readings (760 mm. = 29.92 in. = 1,013,303 dynes = 1,013.3 millibars). Also temperatures will be expressed in absolute centigrade degrees (273° A. = 32° F.). Until January 1, 1915, the old units will be retained for comparison with the new. Professor Alexander McAdie, director of the observatory will be glad to help any one wishing to adopt this new pressure scale. These changes were first proposed for adoption in the United States by him in 1908.

IN the report for the year ending March 31, 1913, the Meteorological Committee of England announces that the centibar or millibar will be used instead of the inch as far as possible for all barometric measurements. Specimens of daily and weekly weather reports are given with pressures expressed in dynamic pressure units instead of inches of mercury, and with temperatures in absolute centigrade degrees.

RADIATION AND CLOUD GROWTH

IN the October *Meteorologische Zeitschrift*[2] Dr. C. Braak, of Batavia, Java, ascribes to radiation certain peculiar phases in the development of cumulus clouds. His description of the formation of these clouds on a calm day may be stated as follows. When the rising sun has warmed the earth sufficiently to drive local air masses to the condensation level, at first single, then many small cumuli appear which soon cover the whole sky. Here and there larger heads rise out of the rather flat cloud sheet. Soon after reaching their maximum height they disappear. If the cumulus growth continues to the cirrus level (about 10 kilometers altitude) the top flattens out. The lower column melts away and leaves this growing sheet. When through energetic upward movement the cumulus cloud rises to even greater heights, there is no longer a maximum level where the vertical movement stops; the condensed moisture falls out, and in the upper parts of the cloud the air flows toward all sides, forming gigantic cirrus rays.

Thus there seems to be a division of the atmosphere into two parts as regards cloud building. This has a certain analogy with the division of the atmosphere into troposphere and stratosphere: the former designates the atmosphere to a height where decrease of temperature with altitude ceases, and the latter, the isothermal region of unknown vertical extent above this. According to Messrs. Gold and Humphreys[3] this is a radiation effect of the air. Below the stratosphere radiation exceeds absorption and convection balances the loss of heat; while in the stratosphere absorption exceeds radiation so the temperature rises over that of convective equilibrium. If one considers the disappearance of the lower part of the cumulus cloud to be the result of cooling and the continuance and energy of the upper part as the result of warming, the analogy becomes nearly complete. Observations in cumulus clouds over Batavia within the lower few kilometers show that the clouds are colder than the surrounding air at the same level. Radiation may thus have greater importance in cloud processes than is commonly assigned to it.

EXCESSIVE PRECIPITATION

SOME recent heavy rains have brought out the following records of excessive rainfall for short periods.

Period	Amount	Place	Date
24 hours	1,168 mm.[4]	Baguio, P. I.	July 14–15, 1911
24 hours	544 mm.	Alexandria, La.	June 15–16, 1886
18½ hours	523 mm.	Montell, Tex.	June 28–29, 1913
3 hours	406 mm.[4]	Concord, Pa.	August 5, 1843
80 minutes	292 mm.[4]	Campo, Cal.	August 12, 1891
30 minutes	235 mm.[4]	Guinea, Va.	August 24. 1906
20 minutes	205 mm.[4]	Curtea-de-Arges, Roumania	July 7, 1889
14 minutes	100 mm.	Galveston, Tex.	June 4, 1871
5 minutes	38 mm.	Fort McPherson, Neb.	May 27, 1868
30 seconds	4 mm.	Valdivia, Chile	June 11, 1912

[1] See Alexander McAdie, "New Units in Aerology," *Scientific American* Supplement, December 6, 1913, p. 357.

[2] "Uber den Einfluss der Strahlung auf die Wolkenbildung."

[3] See Dr. W. J. Humphreys, *Jour. Franklin Inst.*, March, 1913, pp. 216–222.

[4] Probably world's records.

SOME RECENT PUBLICATIONS

DR. NILS EKHOLM in a recent work[5] makes use of isallobaric charts (charts of equal changes of pressure) in addition to the usual isobaric charts. His study of the former indicates that pressure changes are of primary importance, while cyclonic and anticyclonic phenomena are secondary.

A thorough study of the thunderstorm observations in Germany for 1910 has recently appeared.[6] The thunderstorm observations of 1,570 stations are printed in extenso and summarized in a number of tables. The mean velocity for 979 thunderstorms was 38 kilometers per hour; the extreme velocities were 9 and 95 kilometers per hour. Twenty per cent. of the thunderstorms came in May, forty per cent. in June and twenty per cent. in July. There is a special article on the destructive thunderstorm of May 11, 1910.

The British Rainfall Association under the direction of Dr. H. R. Mill deserves credit for its large 52d volume "British Rainfall, 1912." Part 1 contains three special articles on "The Great Rainstorm of August 25–26, 1912"; "The Wettest Summer in England and Wales," and "The Seathwaite-pattern Raingauge." Part 2 is an extensive treatment of the British rainfall data of 1912. Part 3 is a general table of the rainfall observed at 5,272 stations.

The report of the Franco-Swedish sounding-balloon expedition in Lapland 1907, 1908 and 1909 has been published recently. As in middle latitudes, the base of the stratosphere was encountered at a mean elevation of twelve kilometers with temperatures of — 50° to — 60° C. These temperatures are higher than those at the base of the stratosphere in equatorial regions where records of — 80° C. are not uncommon.[7]

[5] "Das Wetter auf der Nordsee während der erste Hälfte von Juni 1911," Copenhague, 1913.

[6] Th. Arendt, "Ergebnisse der Gewitter-Beobachtungen im Jahre 1910," *Veröff. d. Kön. Preuss. Met. Inst.*, No. 266.

[7] See *Scientific American*, December 6, 1913, p. 432.

The pumping action (suction) of the wind particularly in mountain stations offers a serious obstacle to accurate barometer readings. Mr. G. v. Elsner in a monograph, "Über den Einfluss des Windes auf den Barometerstand an Höhenstationen,"[8] discusses this at length. As yet no way has been found to eliminate this wind effect.

NOTES

IN recognition of the fact that the Blue Hill Meteorological Observatory is now part of the Division of Geology of Harvard University, the members of that Division visited the Observatory November 8. Professor Alexander McAdie, the new Director, gave an address on "Modern Methods of Frost-fighting."

The Smithsonian Institution is to reopen the Langley Aerodynamical Laboratory, which was closed a few years ago. The first serious contribution from the scientific side of aeronautics is to be found in the work of Langley. His original purpose was not to construct a flying machine, but to determine the laws governing flight. Two wind tunnels are to be made for tests on models. In addition to these experiments, an aircraft field-laboratory is proposed for measurements of stress, moments of inertia, etc., and for the adjustment and repair of several full-scale land and water aeroplanes.

The part which high humidity plays in producing heat stroke was well illustrated in Vienna on August 20, 1913. With the relative humidity around eighty per cent. and temperatures between 20° and 23° C., several suffered from heat prostration.

The council of the Royal Meteorological Society has awarded the Symons Gold Medal to Mr. W. H. Dines, F.R.S., in recognition of the valuable work he has done in connection with meteorological science. The medal will be presented at the annual meeting of the society on January 21, 1914.

WE learn from *Nature* (London) that in November the British Meteorological Service

[8] *Veröff. d. Kön. Preuss. Met. Inst.*, No. 257.

began to issue comprehensive meteorological charts of the north Atlantic, somewhat similar to those discontinued by the United States Weather Bureau in August.

Dr. Julius Von Hann's first section of the third edition of his "Lehrbuch der Meteorologie" is now for sale by the publisher, C. H. Tauchnitz, of Leipzig, at 3.60 Marks.

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SPECIAL ARTICLES

MUTATION IN TOBACCO

Although recent work by Heribert Nilsson[1] and Davis[2] shows that the sudden changes which were observed in *Œnothera Lamarckiana* can be logically and simply explained by assuming a heterozygous parent, one should not conclude that this seriously weakens the general theory of the origin of new types by mutation. Even if the indirect evidence compiled by De Vries were also to be rejected, there remain a considerable number of mutations that have arisen in homozygous material of known ancestry. The truth of this statement is apparent if it is recalled that such a careful investigator as Morgan has witnessed the origin of over 150 such changes in *Drosophila*. Controlled botanical evidence is not as voluminous, though plant geneticists have all observed phenomena that seem best interpreted in this manner. For this reason we hope it is not out of place to describe the origin of a variation that appeared in 1912 in a field of Connecticut shade-grown tobacco, which seems likely to be of very great commercial value.

The variety of tobacco grown under cheesecloth cover in the Connecticut valley is called Cuban. It was first grown in this country in 1904 from seed which was brought from Cuba the previous year by Mr. William Hazelwood, of New York City. The crop of 1904 was very variable, but Hasslebring[3] has shown that this type of variability is due largely to the poor method of saving seed in Cuba. It is the result of a mixture of seed from various types of plants, for crossing seldom occurs naturally.

Individual plants were selected from the 1904 plot which was grown from Cuban seed, and self-fertilized seed produced by covering the seed head with a Manila paper bag. These individual selections were grown in row tests in 1905 and for succeeding years until 1909. The individual rows grown from self-fertilized plants presented a uniform appearance. Of the earlier types all proved of little commercial value except strain 13. One line known as 13–29 proved superior to all others in the value of the cured leaves. A considerable number of self-fertilized seed plants were saved from this line in 1908 and were used for commercial planting in 1910 at the Windsor Tobacco Growers' Corporation in Bloomfield, giving a crop of uniform appearance, in which no variations of importance were noted. A large quantity of seed was saved from this crop, although individual plants were not selfed, as it seemed very improbable that crossing would take place under the cheese-cloth cover, and even if some crossing took place, it was assumed that it would be between homozygous individuals. The Cuban variety was thus selfed for five generations, and in all probability for a sixth generation, and gave every evidence that it was of a homozygous nature.

In 1912 about one hundred acres, or over a million plants, were grown from the seed of the 1910 crop at the Windsor Tobacco Growers' Corporation. The general appearance of the crop this year was very uniform, but when clearing the field in the fall, one of the workmen was very much surprised to discover that one of the plants he had just cut down was very much taller than the others, and bore a large number of unpicked leaves. This plant was brought to the attention of the plantation manager, Mr. J. B. Stewart, who recognized the possibilities of such a plant. After systematic search two more such plants were discovered. These plants were carefully taken up and carried to the Connecticut Experiment Station greenhouse in New Haven. One of

[1] *Zeitschrift für induktive Abstammungs- und Vererbungslehre*, Band 8, Heft 1 u. 2, 1912.

[2] *Amer. Nat.*, Vol. 46, 1912.

[3] *The Botanical Gazette*, Vol. 53, 1912.