years. It will long be a standard reference book for the region it covers, while many of the analytical tables and keys will be of use elsewhere. The illustrations, particularly the volume of plates, are very fine and of inestimable value. It is rare indeed that better photographs of starfishes are seen. The Harriman Alaska Expedition did much to advance our knowledge of the zoology of the northwestern American coast, and the volumes containing its results are notable for contents and appearance alike. But among them all, none take a higher rank or make a better impression than do these volumes on the starfishes, by the Nestor of American systematists.

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The Weather and Climate of Chicago. By H. J. COX and J. H. ARMINGTON. Bulletin 4. The Geographic Society of Chicago.

The authors, for many years official forecasters at Chicago, are to be congratulated upon the completion of a laborious piece of self-imposed work. The volume is essentially the station Means Book *in extenso* with stress laid upon unusual and extreme conditions. Reading between the lines, one is conscious of the effort to deduce definite laws bearing upon forecasting, but the hope is not realized and indeed we are told that "careful examination fails to afford any clue by which the nature of a season or year may be foretold, from any of its predecessors."

The discussion of temperature occupies 148 pages, with 44 tables and 30 figures. Nowhere is there given an equivalent value in Absolute or Centigrade degrees. The mean annual temperature determined from doubtful records dating back to 1830, is 282° A. (48° F.), which does not differ greatly from the mean obtained from the official records, 1871–1910. The latter, however, are of somewhat doubtful value since they were made at no less than seven different localities. The table of daily normal temperatures on page 33 leads us to infer that the normals used by the Weather Bureau cover a period of 32 years only, while data for 42 years are at hand.

The highest temperature officially recorded is 312° A. (103° F.), and the lowest 242° A. (—23° F.). The year 1911 was the warmest since the establishment of the office, if we accept the Federal Building records without correction. On 22 days the temperature reached or exceeded 305° A. (90° F.). This record was equaled in 1913. The greatest daily range was 290°–261° A. (62°–10° F.) which actually occurred between the hours of eight A.M. and midnight.

In discussing the effect of winds from Lake Michigan it is stated "the specific heat of air being less than one quarter that of water, the interchange of heat will result in a larger change of air temperature than of water temperature."

The meaning is not quite clear, but it should be remembered that while the specific heat of air (at constant pressure?) is 0.24, the specific heat of water vapor is twice this, and it is water vapor rather than air or water which is the effective temperature control. The cooling effect is noticeable at times far inland, but in general decreases rapidly with distance, often disappearing within 15 or 20 miles. The wind records need not, however, be taken too seriously, since the type of instrument used by the Weather Bureau gives only eight points of the compass, *i. e.*, one direction covers 45 degrees. A shift of 22 degrees could not be detected. Again, the elevations have been changed a number of times, making the velocities uncertain. Calculated on the basis of hourly frequency, northeast is the prevailing wind. The highest daily wind, 2,167 kilometers (1,347 miles), occurred at the Auditorium Tower, but the highest recorded at the present location is only 70 per cent. of this. The authors think that the present velocities should be increased 10 per cent. to be comparable.

The precipitation records likewise are open to criticism, owing to faulty exposures and frequent changes. The authors frankly state that the effect of the poor conditions at the Auditorium Tower can not be questioned.

Apparently Chicago receives the same precipitation as the surrounding prairie region. Unfortunately no hourly readings of relative humidity are available and the period of bihourly values shown in Table CXII. is much too short to establish with any degree of accuracy values for the various hours. A table of average monthly and annual relative humidities for 15 cities in the United States is given, but no mention made of corresponding temperatures. As it stands, the table is without value for comparative purposes.

The authors give generous credit to all who have helped in the work. The Geographic Society of Chicago has done well in making accessible data which otherwise might have remained buried in official files. The general make-up of the book is good.

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SPECIAL ARTICLES

SOME OBSERVATIONS ON THE FOOD HABITS OF THE SHORT-TAILED SHREW (BLARINA BREVICAUDA)

Of the six species of short-tailed shrews of the genus *Blarina* occurring in the United States, *Blarina brevicauda,* called the large blarina or mole-shrew, is the only one found north of the Austral region, and consequently is the only representative of the genus here in Massachusetts. It inhabits deciduous woodlands and fields, where it makes shallow tunnels that are often marked on the surface by little ridges.

This shrew is described as follows on page 11 of North American Fauna No. 10, U. S. Dept. of Agriculture:[1]

> General characters.—Size, largest of the subgenus (total length about 125 mm.); skull largest and heaviest of the American Soricidæ; pelage glossy. Color.—Sooty-plumbeous above, becoming ashy-plumbeous below, varying with the light; paler in summer; glossy in fresh pelage.

It has a stout body, nose rather long and tapering, external ears not visible, eyes very small, front teeth chestnut colored at tips, and tail about one quarter the length of the head and body. It depends on the highly specialized senses of touch, hearing and smell for guidance in probing about and searching for food, the eyes being very slightly developed.

General works on natural history speak of the diet of shrews as being chiefly worms, larvæ of insects and small mollusks.

Audubon and Bachman,[2] in speaking of the Carolina shrew (*Blarina brevicauda carolinensis*), an animal somewhat smaller than the short-tailed shrew, say:

> In digging ditches and ploughing in moderately high grounds, small holes are frequently seen running in all directions, in a line nearly parallel with the surface, and extending to a great distance, evidently made by this species. We observed on the sides of one of these galleries a small cavity containing a hoard of coleopterous insects, principally composed of a rare species (*Scarabœus tityus*) fully the size of the animal itself; some of them were nearly consumed, and the rest mutilated, although still living.

Merriam[3] says that "it subsists upon beechnuts, insects, earthworms, slugs, sow-bugs and mice." He also speaks of its feeding on chrysoledes and the larvæ of insects. He quotes Mr. John Morden, in the *Canadian Sportsman and Naturalist,* Vol. III., 1883, in which the latter describes the mouse-killing and eating propensities of the short-tailed shrew and draws these conclusions:

> According to my observations, the little mammal under consideration eats about twice or three times its own weight of food every twenty-four hours, and when we consider that their principal food consists of insects, it is quite bewildering to imagine the myriads one must destroy in a year.

Merriam proceeds to tell of an encounter between a short-tailed shrew weighing 11.20 grams and a deer mouse (*Peromyscus leucopus*) weighing 17 grams, in which the former was victorious, and after eating an ear, the brains, side of the head and part of the shoulder of the mouse, weighed 12 grams. He says:

[1] U. S. Dept. Agriculture, North American Fauna Series No. 10, p. 4, 1895. "Revision of the Shrews of the American Genera *Blarina* and *Notiosorex,*" by C. Hart Merriam.

[2] Audubon and Bachman, "The Quadrupeds of North America," 1849.

[3] Merriam, "The Mammals of the Adirondack Region," 1884.