

## BOSTON

Society of Natural History, November 3, 1869.—Mr. W. H. Dall made a few remarks upon the distribution of marine animals, asserting that their range was influenced more by the temperature of the water than by the depth or other conditions. He showed that the floating-ice line of Behring Sea (which passes between the Pribyloff and St. Matthew groups of islands, touching the continent near Kuskoquim Bay) governed the distribution of the fish and molluscs of those waters. It is the northern limit of all the more southern forms, some of which range as far south as Monterey. It is the southern limit of almost all the truly arctic species. The fur seal is never found to the north of it, though often erroneously spoken of as coming from Behring Strait; the polar bear never passes to the south of this line; the cod invariably keep to the south, and the mullet to the north, of it. It is also the limit of distribution of many fuci and seaside plants. Where the water is cooled by northern currents, or by glaciers, deep-water species of molluscs, especially brachiopods, are found at or even above low-water mark. Where the surface-water is warm, these molluscs, which in the north are found near the shore, are only obtained at a depth of many fathoms.

Section of Microscopy, November 10.—Mr. R. C. Greenleaf in the chair. Dr. H. Hagen called the attention of the section to the statements of Professor Listing, of Göttingen, who had recently (Nachr. d. kgl. Gesell. der Wissensch., 1869, No. 1, and Poggendorff's Annalen, 1869, T. xvi. p. 467) given some suggestions concerning the further improvement of the microscope. In all microscopes the dioptric arrangement is now analogous to the astronomic spy-glass; they have but one real image, from which the virtual image is formed and brought to the eye of the observer. Professor Listing proposes to have two real images, and in this way to form three successive augmentations instead of two, as before. It is well known that by a prolongation of the draw tube, or by increasing the distance between the objective and the eye-piece, the image becomes successively greater, but the definition and penetration is by no means better. Professor Listing has made some experiments, and states that with an eye-piece of his construction (a double eye-piece with four lenses, similar to those of terrestrial telescopes) the magnifying power of the instrument, and also to nearly the same degree the penetration, is raised, by a tube of 420 millimetres, 20, 28, 55, 97, and 137 per cent. (the latter, of course, with diminution of the field), more than the same objective (Hartnack's, No. 7) and eye-piece (No. 3) with a tube 200 millimetres in length. The object was *Pleurosigma angulatum*, and Professor Listing assures us that the latent power of the objective is developed by this means in an astonishing manner. He also remarked that the so-called Erectors have long been used, but always with a low power and a short tube. The most advantageous form for the eye-piece would be, for the two superior glasses, achromatic lenses from 15 to 20 millimetres in diameter, and with a diaphragm between, having an aperture of from 8 to 9 millimetres. For the two inferior lenses, a common Huyghens' eye-piece would be the best. Such a combined eye-piece, with a tube 420 millimetres long, would raise the power of the instrument 97 per cent. The use of an achromatic condenser adapted for oblique illumination is necessary for high powers. The experiment was only successfully made with the best objectives of English artists, or with the excellent new Hartnack objectives. According to his calculation, an objective of one millimetre distance will give the first real image at a distance of 200 millimetres from the second chief point of the objective, and combined with an eye-piece in Listing's manner, having a power of 25 diameters by itself, and a tube 405 millimetres long, the magnifying power of the whole instrument would be 5,000 diameters. In the common arrangement of the microscope, the dioptric cardinal points are in the same order as in a concave lens, and the focal distance of the whole microscope (not of the objective) would be equal to  $\frac{1}{5}$  millimetres, with a magnifying power of 400 diameters for a visual distance of 200 millimetres. In the Listing instrument the order of the cardinal points would be inverted and analogous to a convex lens, with a focal distance of the whole microscope equal to  $\times 0.4$  millimetres, with a magnifying power of 5,000 diameters. In the first case the objective would have a focal distance of 3 millimetres, in the last of 1 millimetre. The difference between the two chief points of the whole microscope is in both cases nearly equal to the whole length of the tube. In the last arrangement the whole microscope is analogous to a convex lens with very short focal distance.

## DIARY

## THURSDAY, JANUARY 27.

ROYAL INSTITUTION, at 3.—On the Chemistry of Vegetable Products: Prof. Odling.  
ROYAL SOCIETY, at 8.30.—Temperature of Strata in Sinking of Rosebridge Colliery: E. Hull.—Action of Rays of High Refrangibility upon Gaseous Matter: Prof. Tyndall, F.R.S.—Eclipse of Sun as observed in United States: J. N. Lockyer, F.R.S.—Theory of Continuous Beams: Mr. Heppel.—Remarks on Heppel's Continuous Beams: Professor Rankine.  
ZOOLOGICAL SOCIETY, 8.30.—On Cooking Pits and Kitchen Middens, containing Remains of Dinornis, New Zealand: Professor Owen, F.R.S.  
ANTIQUARIES, at 8.30.  
LONDON INSTITUTION, at 7.30.

## FRIDAY, JANUARY 28.

ROYAL INSTITUTION, at 8.—Graham's Scientific work: Prof. Odling.  
QUEKETT MICROSCOPICAL CLUB, at 8.

## SATURDAY, JANUARY 29.

ROYAL INSTITUTION, at 3.—On Meteorology: Mr. Scott.

## MONDAY, JANUARY 31.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, at 8.  
INSTITUTE OF ACTUARIES, at 7.  
LONDON INSTITUTION, at 4.  
MEDICAL SOCIETY, at 8.

## TUESDAY, FEBRUARY 1.

ROYAL INSTITUTION, at 3.—On the Architecture of the Human Body: Prof. Humphrey.  
INSTITUTION OF CIVIL ENGINEERS, at 8.—Statistics of Income, Expenditure, and Railway management, and their bearing upon future Railway policy: J. T. Harrison, C.E.  
PATHOLOGICAL SOCIETY, at 8.  
ANTHROPOLOGICAL SOCIETY, at 8.—Negro Slaves in Turkey: Major F. Milligen.  
SYRO-EGYPTIAN SOCIETY, at 7.30.

## WEDNESDAY, FEBRUARY 2.

SOCIETY OF ARTS, at 8.—On Recent Improvements in Small Arms.  
PHARMACEUTICAL SOCIETY, at 8.  
OBSTETRICAL SOCIETY, at 8.

## THURSDAY, FEBRUARY 3.

LINNEAN SOCIETY, at 8.—Revision of the genera and species of capsular gamophyllous *Liliacea*: J. G. Baker, Esq., F.L.S.—On a new form of Cephalopodous ova: Dr. Collingwood, F.L.S.

## BOOKS RECEIVED

ENGLISH.—Lichenes Britannici: Crombie (Reeve and Co.)—Elementary Introduction to Physiological Science (Jarrold and Son).—The American Naturalist, No. 11.—The Spherical form of the Earth, a Reply to Parallax: J. Dyer (Trübner and Co.)—On the Geographical Distribution and Physical Characteristics of the Coal Fields of the North Pacific Coast: Robert Brown.—Fresenius' Analysis, Quantitative, fifth edition (Arthur Vacher).—Fresenius' Analysis, Qualitative, seventh edition (Arthur Vacher).  
FOREIGN.—Ueber die Gährung und die Quelle der Muskelkraft: J. Von Liebig.—Bulletins de la Société d'Anthropologie de Paris.—Pflüger's Archiv für Physiologie.—Centralblatt für die medicinischen Wissenschaften, January, 1870.

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ERRATA.—Page 269, first column, last line: for "plan" read "position."  
—Page 269, second column, second line: for "supplemented" read "supple-  
mented as soon as possible."—Page 269, second column, fourth line: for  
"should" read "should not"

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