(abundance of suitable nourishment the primary condition); theory of propagation; animal ethics; and lastly, human ethics.

Abriss der Zoologie für Studirende, Ärzte und Lehrer. Von Dr. A. Brass. (Leipzig: W. Engelmann, 1882.)

IN this octavo volume of over 360 pages we have a sketch of the modern aspect of zoology fairly well executed, and with woodcut illustrations after Frey, Hæckel, Kölliker, and Gegenbaur. The first section treats of zoology in general, discusses the subject of the differences between the animal and vegetable kingdoms, and considers the animal in general. The second section is devoted to the morphology and developmental history of animals. The third is the systematic portion. The classification adopted is for the most part a copy of Claus's. The volume forms a handy compendium of zoological science, and, like all the works from the establishment of the well-known Leipzig publisher, is well printed on good paper.

The Two Hemispheres: A Popular Account of the Countries and Peoples of the World. By G. G. Chisholm, M.A. Illustrations. (London: Blackie and Son, 1882.)

THIS work contains in one volume much useful geographical information, methodically arranged. It is, indeed, a systematic and succinct account of the various continents, countries, and oceans, somewhat after the style of a gazetteer, for which it may be used by means of the copious index. The information seems to us in the main accurate, though many of the illustrations appear well worn. Mr. Chisholm, however, gives the old erroneous measurements of Mounts St. Elias and Fairweather, in Alaska, evidently unaware of the survey made by Dall six years ago, and which showed them to be 4000 feet higher than given here.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

Sun-spots

THE spot seen on the sun by Mr. W. A. Holland (NATURE, vol. xxv. p. 316) would appear to have been simply a large sun-spot which made its appearance at the sun's east limb on November 15, and went off the disk on November 27. It is shown on photographs taken at Greenwich on November 16, 17, 18, 19, 20, 21, 23, 26, and 27. On November 21, 11h. a.m. it was north-east of the centre, Pos-angle 50° 27′, Dist. 0·188 of sun's radius, and on November 23 0h. it was north-west of the centre Pos-angle 313° 39′ dist. 0·412. The estimate of its size by Mr. Holland is very much exaggerated, the dimensions of the whole spot (nucleus and penumbra), as measured on the photographs, being one-twentieth of the sun's diameter in length, and one-twenty-fifth in breadth. The area, corrected for foreshortening and expressed in millionths of the sun's visible hemisphere, was 832 for the whole spot, and 152 for the nucleus on November 21, and 970 for the whole spot, and 171 for the nucleus on November 23. The spot had begun to break up between November 21 and 23, and the area for November 21 is really the largest as applying to a single undivided spot. This spot is one of the largest yet recorded at Greenwich. Two other large spots of about the same size were photographed in 1881, on March 22 and June 1, their areas being respectively 919 for the whole spot, and 195 for the nucleus; and 931 for the whole spot, and 158 for the nucleus. The next largest spot in previous years was that of 1877 November, with an area of 801 for the whole spot, and 109 for the nucleus.

While on the subject of sun-spots, I may mention with reference to Mr. J. B. N. Hennessey's letters on an Outburst of Sun Spots (NATURE, vol. xxiv. p. 508, and vol. xxv. p. 241) that a photograph taken at Greenwich, 1881, July, 24d 23h. 11m. 10s., G.M.T., only 11m. before the new group was noticed on the ground-glass at Dehra Doon, shows no indication whatever of the group in question, and that no trace of it appears on a photograph taken next morning, July 25, 22h. 17m. 55s. G.M.T. Thus the new group, if real, must have formed suddenly in less than eleven minutes at a part of the sun's surface where there was not the slightest previous disturbance of the photosphere, and must have completely disappeared within the space of 23h. It might have been expected that the granules of the photosphere, which are well defined in the Greenwich photographs referred to, would have given some indication of such an outburst.

W. H. M. CHRISTIE.

Royal Observatory, Greenwich, February 6

THE importance attached to the solar observations of Mr. W. A. Holland by so great an authority as Sir W. Thomson, would alone suffice to warrant me in forwarding for your publication exact drawings of the spots observed on November 22 and 23 of last year, and the wording of the letters of Mr. Holland makes it still more urgent to determine the precise extent of the spots in question.

The small optical power used on November 22 and 23, on board the *Sarah Bell*, places the result almost on a level with direct eye observations, and the description strongly recalls to mind the accounts given of solar spots previous to the discovery of the telescope. Thus on November 22 we have two eye-estimates of the size of the spot. "I, myself," writes Mr. H., "estimated the spot on the sun to be $\frac{1}{4}$ diam., but conferring with the captain, he estimated it to be $\frac{1}{3}$ diam.; it was purely an estimate of the eye."

The pictures of the sun, which I inclose, were taken at Stonyhurst Observatory on November 20 and 22, and they give an exact outline of the spot seen on board the *Sarah Bell*, clearly showing what meaning we may reasonably attach to those ancient carefully denoted sun-spots, which were said to have a diameter equal to $\frac{1}{4}$, $\frac{1}{8}$, or even $\frac{1}{2}$ of the solar disk. The length of the spot observed on November 22 agrees very fairly with Mr. H.'s approximate estimate, if we include the whole group, but this gives a very incorrect notion of the spot-area, and of the disturbing forces then apparently at work in the sun.

From accurate measurements of the original drawings, which give the relative dimensions of the spots on the solar disk, I find the diameter of the sun to be 267 mm., the length of the group 54 mm., and its breadth 22 mm., whilst the length of the large spot, including its whole penumbra, is only 15 mm. The group is a scattered one, and the whole spot area in the picture can scarcely exceed 225 sq. mm., and therefore, being situated almost at the centre of the disk, will not cover more than one thousandth part of the visible hemispheres, although the whole group is spread over a space nearly five times as large. We thus get a more correct notion of the disturbance on the solar surface than by measuring merely the diameter of the group, or by expressing the spot area in millions of square miles.

The drawing of November 22 contains another spot in the *n.p.* quadrant, which is not mentioned by Mr. Holland, but which a few days previously, when nearer the centre of the disk, was as conspicuous an object as the spot under discussion, and was easily seen by the naked eye on November 18, shortly after sunrise. The group which followed was then near the limb, and was a fine object in a small binocular, but not visible to the naked eye.

The fact of two separate spots, each seen easily without a telescope, being on different portions of the solar disk at the same time is, I think, rather extraordinary, but the area covered by spots has never approached of late to what was sketched by Tacchini in 1871, or even what was photographed by Rutherfurd in 1870. I might perhaps also mention that the spot which crossed the disk in May and June was as large as that of November.

S. J. PERRY

Stonyhurst Observatory, Whalley, February 5

[The drawings sent by Mr. Perry seem to us to quite bear out his statements.—ED.]

Rime Cloud observed in a Balloon

A SINGULAR phenomenon was observed in Paris in the month of January. An obscure cloud remained in a state of suspen-