water. Then, Mr. Reade supposes all the organisms in the bulk of water taken to die and fall to the bottom each day. Mr. Murray, in his calculations, supposes only one-sixteenth part to die each day. From the same data the former makes out a rate of accumulation of deposit of 1 inch in 29 years, the latter a rate of 1 inch in 470 years. Dana estimates the growth of a reef at not greater than one-sixteenth of an inch in one year, *i.e.* 1 inch in 16 years. Yet it will be admitted that a reef must grow much more rapidly than a deep-sea deposit. What then would justify us in accepting these figures as in any way representing what is now taking place in Nature? The fact is we much want definite information on the rate of growth of these calcareous deposits, and if Mr. Reade has the information his language would warrant, he should make it known for the benefit of science.

We know that these deposits do accumulate to hundreds of feet in thickness in some places, notwithstanding solution; and it seems to me that, as we can imitate in the laboratory the conditions of solution while we cannot those of secretion by organisms, then by experiments in this direction we may at least arrive at a knowledge of the minimum rate of accumulation of oceanic calcareous deposits. JAMES G. ROSS.

14 Argyll Place, Edinburgh, April 14.

Bernicle Geese on Coniston Lake.

THIS afternoon while walking by this lake I saw four large birds flying overhead. These birds, after making several circuits in the air, pitched on the lake. I had with me an excellent pair of field-glasses, and as I succeeded in approaching within 20 yards of them, I was enabled to examine them with sufficient accuracy to convince me that they were Bernicle geese (*Anser leucopsis*, Yarrell). What struck me as most worthy of remark was their extreme tameness, as they allowed me, first on land, and then in a boat, to approach within 20 yards of them. They were in excellent plumage, and seemed in good condition. After remaining about three hours swimming about on the lake, they rose, and after circling round once or twice, flew off in a northerly direction.

May I ask if this is a rare bird to see in the Lake District at this time of year? I have inquired in the neighbourhood, and do not think they could have come from any private water. Several people who have been here for many years assure me they have never seen this bird on the lake before, and this has certainly been my own experience. Is it possible their extreme tameness was due to fatigue? WILLIAM R. MELLY.

Tent Lodge, Coniston Lake, Lancashire, April 8.

The Muzzling of Oysters.

THIS practice, described in the current number of NATURE (p. 572) as owing "its existence to a careful study of the habits of the bivalve," is by no means new, though probably original on the part of the American naturalists. Our London fishmongers have muzzled oysters on a large scale from a time that is immemorial among them. Barrelled oysters are all very carefully muzzled, but without wires, as anybody may learn by watching an expert in the process of barrelling. It will be seen that he lays the oysters one by one carefully in tiers up to the top of the barrel, and then lays another tier rising *above* the level of the top. Having done this, he places the lid of the barrel on this exuberant tier, and thumps and rattles the barrel on a stone pavement or other solid ground until, by close packing of the whole, it descends to the level of the barrel top. The mass of oysters being thus compressed so as to render the slightest gaping of any one quite impossible, he firmly nails down the head of the barrel.

Experience has proved that oysters thus effectively muzzled may take long slow journeys (as they did in the old coaching days) and be kept fresh and without loss of flavour for two or three weeks, provided the barrels are unopened. If, however, they are loosely barrelled, a few days are too many. In some old country houses the barrels, unopened, were placed in salt water, and thus kept until required, but whether this was advantageous I cannot say.

W. MATTIEU WILLIAMS.

The Grange, Neasden, April 13.

SUGGESTIONS ON THE CLASSIFICATION OF THE VARIOUS SPECIES OF HEAVENLY BODIES.[1]

I.

I.—PROBABLE ORIGIN OF SOME OF THE GROUPS.

I. NEBULÆ.

IN a paper communicated to the Royal Society on November 15, 1887, I showed that the nebulæ are composed of sparse meteorites, the collisions of which bring about a rise of temperature sufficient to render luminous one of their chief constituents—magnesium. This conclusion was arrived at from the facts that the chief nebula lines are coincident in position with the fluting and lines visible in the bunsen burner when magnesium is introduced, and that the fluting is far brighter at that temperature than almost any other spectral line or fluting of any element whatever.

I suggested that the association or non-association of hydrogen lines with the lines due to the olivine constituents of the meteorites might be an indication of the greater or less sparseness of the swarm, the greatest sparseness being the condition defining fewest collisions, and therefore one least likely to show hydrogen. This suggestion was made because observations of comets and laboratory work have abundantly shown that great liability to collision in the one case, and increase of temperature in the other, are accompanied by the appearance of the carbon spectrum instead of the hydrogen spectrum.

The now demonstrated meteoric origin of these celestial bodies renders it needful to discuss the question in somewhat greater detail, with a view to classification; and to do this thoroughly it is requisite that we should study the rich store of facts which chiefly Sir William Herschel's labours have placed before us regarding the various forms of nebulæ, with the view of ascertaining what light, if any, the new view throws on their development.

To do this the treatment must be vastly different from that—the only one we can pursue—utilized in the case of the stars, the images of all, or nearly all, of which appear to us as points of light more or less minute, while, in the case of the nebulæ, forms of the most definite and, in many cases, of the most fantastic kind, have been long recognized as among their chief characteristics.

It will at once be evident that since the luminosity of the meteorites depends upon collisions, the light from them, and from the glow of the gases produced from them, can only come from those parts of a meteor-swarm in which collisions are going on. Visibility is not the only criterion of the existence of matter in space; dark bodies may exist in all parts of space, but visibility in any part of the heavens means, not only matter, but collisions, or the radiation of a mass of vapour produced at some time or other by collisions. The appearances which these bodies present to us may bear little relation to their actual form, but may represent merely surfaces, or loci of disturbances.

It seemed proper, then, that I should seek to determine whether the view I have put forward explains the phenomena as satisfactorily as they have been explained on the old ones, and whether, indeed, it can go further and make some points clear which before were dark.

To do this it is not necessary in the present paper to dwell at any great length either on those appearances which were termed *nebulosities* by Sir William Herschel or on irregular nebulæ generally; but it must be remarked that the very great extension of the former—which there is little reason to doubt will be vastly increased by increase of optical power and improvement in observing conditions and stations—may be held to strengthen the view that space is really a meteoritic plenum, while the forms indicate motions and crossings and interpenetra-

[1] The Bakerian Lecture, delivered at the Royal Society on April 12, by J. Norman Lockyer, F.R.S.