

a middle maximum, as a reference to my former letter (*NATURE*, vol. viii. p. 245) will show; and I do not find any reference to 1846 as a maximum in Prof. Tyndall's letter, or in that of Mr. Symons, which alone I had seen when I last wrote. In both of these 1848 is named, and I demur to the changes to 1849 and 1872; to the first because, apparently without any sufficient reason, a dry year (48.10 inches) is discarded, and a wet year (67.88 inches) is added, and to the second, not because it affects my calculations, but because no reason is given. The change appears to favour Mr. Meldrum's views, but it scarcely does so, because the estimated quantity of 65 inches in 1873 resulted in an actual average of only 51.26 inches, which would make a difference of 13.74 inches in that year, and would change the trifling excess of 2.64 inches on the maximum side into a larger excess of 11.10 inches on the minimum side.

It is unnecessary, however, to go beyond the calculation which I have above submitted to show that Barbados does not bear out Mr. Meldrum's theory. I am quite prepared to agree with him that, if the preponderance of evidence drawn from a wider area and from longer periods does support it, the opposite results obtained in Barbados, although it is most favourably situated for observations of this nature, being fully exposed to the trade winds blowing over the Atlantic during the greater part of the year, and not apparently subject to any disturbing influences, only show that no particular locality can draw a safe inference as to the manner in which the presence or absence of sun-spots is likely to affect it.

A further consequence presents itself to my mind. It appears to me that the atmospheric influences entering into this question—chiefly evaporation and rainfall—must balance one another pretty equally over the face of the globe, either contemporaneously or by seasons; that the excess of rain received by some places has been drawn from others, which have consequently experienced the opposite effects of evaporation and drought. If therefore certain solar influences, whose presence is indicated by the appearance of sun-spots, have the effect of causing an excess of rain in certain years over so wide an area as Mr. Meldrum supposes, whence does this excess come? If from some atmospheric reservoir, independent of the globe, the excess would be general; the alternations of rain and drought might vary by years or by seasons, more or less long, but not contemporaneously by, or in, localities. If, however, they be drawn from the earth, or from atmospheric strata near the earth, there must be evaporation and drought in those parts whence the excess is drawn. Barbados, as I have pointed out, is singularly free from local influences which would affect its rainfall differently from the rest of the globe. When therefore I find the experience of Barbados differing from that of Mauritius, and of many other parts of the world, I am driven to the conclusion that the influences indicated by the existence of sun-spots are not universal, although they may possibly operate on, and intensify, other influences already existing from other causes; and that the absence of those influences and the existence of different effects in Barbados is not an exceptional result, but a necessary consequence, to be expected in other parts of the globe also, and to be anticipated from the ordinary operation of known physical laws. I shall not, however, be dogmatic on the point, and shall hail further proof of the correctness of Mr. Meldrum's theory as a welcome contribution to the "Meteorology of the future."

RAWSON W. RAWSON

#### Care of Rabbits for their Dead

SEVERAL months ago you published, among others, a letter of mine, on the "care of monkeys for their dead." Since then I have been making observations upon a similar attention displayed by rabbits, although the considerations which lead to its exercise are apparently much more practical than in the case of monkeys.

Most people are aware that if a rabbit is shot near the mouth of its burrow, the animal will employ the last remnant of its life in struggling into it. Having several times observed that wounded rabbits which had thus escaped appeared again several days afterwards above-ground, lying dead a few feet from the mouth of the burrow, I wished to ascertain whether the wounded animals had themselves come out before dying—possibly for air, —or had been taken out after death by their companions. I therefore shot numerous rabbits while they were sitting near their burrows, taking care that the distance between the gun and the animal should be such as to ensure a speedy, though not an

immediate, death. Having marked the burrows at which I shot rabbits in this manner, I returned to them at intervals for a fortnight or more, and found that about one half of the bodies appeared again on the surface in the way described. That this reappearance above-ground is not due to the victim's own exertions, I am now quite satisfied; for not only did two or three days generally elapse before the body thus showed itself—a period much too long for a severely wounded rabbit to survive,—but in a number of cases decomposition had set in. Indeed, on one occasion scarcely anything of the animal was left, save the skin and bones. This was in a large warren.

It is a curious thing that I have hitherto been unable to get any bodies returned to the surface, of rabbits which I inserted into their burrows *after death*. I account for this by supposing that the stench of the decomposing carcase is not so intolerable to the other occupants of the burrow, when it is near the orifice, as it is when further in. Similarly, I find that there is not so good a chance of bodies being returned from an extensive warren of intercommunicating holes, as there is from smaller warrens or blind holes; the reason probably being, that in the one case the living inhabitants are free to vacate the offensive locality, while in the other case they are not so. Anyhow, there can be no reasonable doubt that the instinct of removing their dead has arisen in rabbits, from the necessity of keeping their confined domiciles in a pure condition.

GEORGE J. ROMANES

Dunskait, Ross-shire, July 26

#### THE NEWFOUNDLAND SEAL FISHERY\*

THE vessels employed in this fishery are generally built for the purpose at Aberdeen, Greenock, or Dundee; but some obsolete men-of-war have been bought and strengthened to meet the requirements of the trade. Those steamers built for the purpose range from 170 to 470 tons register, and have screw propellers. The *Bear*, in which I went, belonging to Messrs. Walter Green and Co., and commanded by Captain Alexander Graham, a sealing master of thirty years' experience, was a new vessel of the largest class, built by Messrs. Stephens, of Dundee, was barquentine rigged, and had compound engines of 110 H.P.

The smallest rod in the latter was  $2\frac{1}{2}$  inches in diameter, the minimum that has been found to stand the shock of concussion with the ice. Propellers are made in one piece of cast-iron; metal having been tried was found to twist, and those made with separate blades to screw in inevitably broke in the thread of the screw. They are about 7 in. in thickness near the boss and about 2 in. at the point, and should be made without a sling hole, two propellers of the *Bear* having broken at that place. Over the banjo frame are the "slip boards," pieces of hard wood about 3 in. thick, that slide down the screw well on each side of the Sampson posts to prevent ice getting in above the propeller. They should be made to hoist up in one piece with the banjo, otherwise considerable time is lost in unbolting them. The brine from salt-meat casks is kept and poured down boiling to loosen the gear set fast by frost and ice. The propeller may be known to be broken by the great increase in vibration that inevitably follows when in the ice. After watching for a long time I found the effect produced on the engines by the ship striking the ice was scarcely perceptible, and the stoppage of the propeller by ice even at full speed only caused the connecting rod to vibrate slightly.

The bows for about 20 ft. from the stem are built nearly solid with the numerous beams, timbers, and diagonals; this space is called "the fortification." The bows are sharply built with a raking gripe, the advantage of which is that the vessel does not strike the ice on all the stem at once, but gradually meets the pan, and by the force of the way runs on it as up an inclined plane, and thus adds weight to momentum in breaking a passage. The stern should be

\* The following notes from personal experience were made in the present year by Navigating Lieutenant Wm. Maxwell, R.N., and communicated to the Hydrographer of the Admiralty.