the Sponges of such strikingly beautiful ones as belong to the genera *Euplectella*, *Holtenia*, &c., though, indeed, some allusion is made to these in the chapter on the geographical distribution of marine life. But perhaps we have said enough to show that while the subject of this work is a good one, it might easily have been treated by a writer more familiar with it in a better, a more original, and a more comprehensive manner. E. P. W.

OUR BOOK SHELF

The Theory of Evolution of Living Things. By Rev. G. Henslow. (Macmillan and Co.)

SCIENTIFIC men cannot but feel how false is the stimulus given to that form of literature of which the above-named work is an example. If considerable pecuniary reward is offered for the production of treatises in favour of any theory, or of the mutual compatibility of any two or more different doctrines, the work will undoubtedly be produced, however inaccurate the theory, or however dissimilar the doctrines. That mistaken enthusiasm which led to the production of the Bridgewater Treatises and the establishment of the Actonian Prize, has resulted in the publication during the last year of two Actonian prize essays, the former of which, by Mr. B. T. Lowne, we noticed on a previous occasion, whilst the latter is the one under consideration. The present author's treatment of his subject is much that which would have been adopted by Paley if he had been living at the present day. Several previously accepted axioms are shown to be incompatible with the existing position of biological science, and their weakness is well brought forward. Other considerations of modern development are introduced, and it is in these that the difficulty of combining the two doctrines appears. For instance, the origin of moral evil is said to be "the conscious abuse of means, instead of using them solely for the ends for which they were designed." But on evolutionary principles, it can hardly be said that there are means for designed ends, because that peculiarity in an organ which is of service is the only one retained, inasmuch that if the delicate sensitiveness of the conjunctiva of the eye were to prove of more value to the individual than its sight, the power of vision would most probably become lost at the expense of the developing tactile organ. "The continual effort of beings to arrive at mutual and beneficial adjustments" is said to be a great principle of nature; does not the term "struggle for existence" imply something very different from this? Again, that "animals and plants do not live where circumstances may be best suited to them, but where they *can*, or where other animals and plants will respectively let them live," is quoted by the author as an instance of Nature falling short of that absolute degree of perfection which may be conceived as possible; however, there cannot be many who think a locality a suitable residence, in which they are prevented from taking up their abode, or perhaps entering, by the animals and plants which inhabit it. In other places similar weaknesses may be found in the argument adopted. In one thing Mr. Henslow has done great good: he has shown that it is consistent with a full dogmatic belief, to hold opinions very different from those taught as natural theology some half century and more ago.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

Transfer of the South Kensington Museum

I AM glad to see that an effective opposition is likely to be made to the ill-advised proposal of the Government to place the

South Kensington Collections under the control of the fifty irresponsible Trustees of the British Museum.

In common with many other naturalists I had always hoped that the national collections of natural history, when removed to the new buildings in South Kensington, would be freed from the rule of the Trustees and placed under a responsible director. The memorial of which I enclose a copy, and the republication of which would, I think, be opportune at the present juncture, will serve to show that I am by no means alone in believing that such a change would be beneficial to Science.

It would seem, however, that the Government, so far from acceding to our views, have resolved to proceed in exactly the contrary direction, and to increase the power of the Trustees. I can only hope that we may succeed in preventing them from carrying this retrograde measure into effect.

P. L. SCLATER

44, Elvaston Place Queen's Gate, Nov. 17

"Copy of a Memorial presented to the Right Hon. the Chancellor of the Exchequer

"To the Rt. Hon. the Chancellor of the Exchequer

"Sir,—It having been stated that the scientific men of the metropolis are, as a body, entirely opposed to the removal of the natural history collections from their present situation in the British Museum, we, the undersigned Fellows of the Royal, Linnean, Geological, and Zoological Societies of London, beg leave to offer to you the following expression of our opinion upon the subject.

"We are of opinion that it is of fundamental importance to the progress of the natural sciences in this country, that the administration of the national natural history collections should be separated from that of the library and art collections, and placed under one officer, who should be immediately responsible to one of the Queen's Ministers.

"We regard the exact locality of the National Museum of Natural History as a question of comparatively minor importance, provided that it be conveniently accessible and within the metropolitan district.

GEORGE BENTHAM, F.R.S.
WILLIAM B. CARPENTER, M.D., F.R.S.
W. S. DALLAS, F.L.S.
CHARLES DARWIN, F.R.S.
F. DUCANE GODMAN, F.L.S.
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ALFRED R. WALLACE, F.Z.S.

"London, May 14, 1866"

Deep-sea Soundings and Deep-sea Thermometers

WILL you allow me to reply to a letter from Messrs. Negretti and Zambra that appeared in vol. viii. p. 529, in reference to my Casella-Miller Deep Sea Thermometer, in which they accuse me and the late respected Dr. Miller of "plagiarism."

I presume, by this remark, that they intend to convey the idea of their own introduction having been imitated, because they state also that "their thermometer is identical in every respect except in size." Without venturing to trespass upon your valuable space by now going into more detail to prove the con-

trary, I will merely remark that if you, or any of your numerous readers who may feel interested in this subject, will favour me with a visit to my establishment, I shall be happy to give the fullest explanation as well as show the great difference existing between the two, will point out the cause of failure in their arrangement, and also the reason of the complete success of my own thermometer.

Though perhaps it is unfortunate for your correspondents that their reference to Dr. Miller was not made during his lifetime, yet, admitting that he said he was not aware of their arrangement, I must ask in all seriousness, What had their thermometer accomplished to make any one acquainted with it?

Facts speak for themselves. Their arrangement still remains without result, whilst my thermometer, which has solved the great problem of the true temperature of the sea even at its greatest depths, has been adopted not only by our own Government, but also by all the principal Governments and scientific authorities throughout the world.

LOUIS P. CASELLA

147 Holborn Bars, Nov. 3

Squalus spinosus

ON the 9th inst. the fishermen of Durgan, in Helford Harbour, sent for me to look at a fish new to them, which had been caught (with a $\frac{1}{2}$ d. hook) on the preceding night near its entrance. Congers had been numerous, but suddenly ceased to bite. The fish (a spinous shark) had been hooked in the corner of its mouth, out of the reach of its sharp teeth, had wound the line many times round its body, which was 7 ft. in length, and 30 in. in girth, being longer and more slender than one of which I sent a notice to the Royal Cornwall Institution 38 years ago. The back, sprinkled over with spines, was of a dark grey colour, the belly nearly white. It was a male fish. The lobes of the liver were 4 ft. in length. In the stomach was a partially digested dogfish, 2 ft. long. The upper lobe of the tail was muscular and long, perhaps to aid its ground feeding, the lower lobe more marked than in Dr. A. Smith's drawing, as given by Yarrel, and entirely unlike that of the Filey Bay specimen. Twelve hours or more after its capture, when all external signs of life had disappeared, I was surprised to observe the regular pulsations of the heart.

Prof. Huxley has not observed a correspondence between the mass and large convolutions of the brain of a porpoise and its intellectual power.

Several years ago a herd of porpoises was scattered by a net, which I had got made, to enclose some of them. It was strong enough to catch tigers if set in the straits of Singapore, across which they sometimes swim. The whole "sculle" was much alarmed, two were secured. I conclude that their companions retained a vivid remembrance of the sea-fight, as these cetacea, although frequent visitors in this harbour previously, and often watched for, were not seen in it again for two years or more.

Trebah, Falmouth, Oct. 27

C. Fox

Zodiacal Light

It is a matter for regret that with the magnificent opportunities of investigating the character of the Zodiacal Light afforded to Maxwell Hall by his elevated position in Jamaica, he does not seem to have brought the powers of either the spectroscopic or polariscope to bear on it.

I think the full importance of the inquiry is hardly appreciated by many. Taking the generally accepted theory of the light—that of a lens-shaped disc of luminous matter, with the sun for its centre and a diameter exceeding that of the earth's orbit—its matter, lying as it does in the plane of the elliptic, actually connects us with the sun, and may be the medium through which the solar magnetic forces act upon our own.

The intimate connection between solar outbursts, auroras, and terrestrial magnetism is an established fact.

To the aurora, the zodiacal light is by many conceived to be nearly allied, and I do not think the evidence hitherto adduced against this theory is at all conclusive. The remarkable wave of light seen by Maxwell Hall is strongly in favour of it; and though spectroscopic observations seem to point the other way, they are as yet so scanty in number that it would be as unfair to argue from them the want of connection between the two phenomena, as it would be to assert that the planets have no volcanic fires of their own because they only give us a reflected solar spectrum.

Assume the zodiacal light to consist of solid particles of matter—planet dust—shining by reflected light, and it is not difficult to imagine the aurora playing amongst these tiny worlds, each of which might have its own small magnetic system, swayed like our own by the master magnet, the sun.

So far as my own experience goes I can see no objections to this assumption. Though I have seen the light very brilliant in both its branches, I have never yet found it to have a decided outline. Nor have I been able to trace it either east or west to 180° from the sun. Granting that this can be done, however, the apparent vanishing point of the earth's shadow lies comparatively near us, and far within this again is the point at which the shadow would subtend only a degree or two of arc, and at which it would be very hard to discern mid the feeble light of this portion of the zodiacal light; so that a slight extension of the diameter of the disc would remove any objection that might be raised under this head.

Imagine one of Saturn's moons revolving in an orbit within his belts, and fairly embedded in the matter, which, for the sake of the argument, we must assume to be illuminated by the planet. To inhabitants of that satellite each night would bring a phenomenon closely resembling our zodiacal light, only far more brilliant. At midnight two cones of light would taper upwards east and west, and meet overhead. The brightest portion of each cone would be that along the axis and nearest the horizon. Towards the summit and on the borders, where the line of sight would lie through less depths of matter, the light would gradually fade away, but from the satellite being embedded in the belt, the entire sky would be more or less luminous.

Has it not been noticed on our earth that when the zodiacal light has been seen unusually bright, a "phosphorescence" of the sky was everywhere visible? May this not arise from our solar belt in a somewhat similar manner?

From my personal observations I see no reason to give a lenticular form to the disc. Parallel faces would afford a perspective such as the zodiacal light appears to me.

I would urge observers who may be fortunately situated, not to neglect opportunities. So far as I am able I shall do my best to aid the work of inquiry, and with the powerful instruments that Browning is forwarding me, placed at an elevation of more than 6,000 ft., under the clear skies of our Indian winter, I trust I shall be able to add something to our knowledge of the zodiacal light.

I should feel much indebted to any of your readers who would inform me which is the best adapted polariscope for such researches, and whose (amongst makers) speciality such instruments are.

E. H. PRINGLE

Camp Udapi, South Canara, Oct. 3

Cold Treatment of Gases

ALLOW me to submit to your readers the following sketch of an apparatus for producing extreme cold, by which it might perhaps be practicable to liquefy or even solidify the elementary gases which have hitherto resisted the efforts of chemists.

The gas to be operated on is compressed to any required degree by means of one cylinder, is cooled to the lowest convenient degree in the ordinary way, passes into an expansion cylinder with a properly arranged cut-off, where in expansion its temperature is still further lowered. From the expansion cylinder it returns back to the compression cylinder, extracting the heat from the counter current proceeding from the compression cylinder, so that the latter will be always arriving at the expansion cylinder with a continually decreasing temperature.

As out here I have no possible means of trying whether there is anything in this idea, I offer it to any of your readers who may feel disposed to try it.

Graaff Reinet College, Cape Colony,

T. GUTHRIE

July 19.

The Relation of Man to the Ice-sheet

MR. TIDDEMAN has shown for Yorkshire what I proved six years ago for the South of England in a paper in the *Geological Magazine* (vol. iv. p. 193), that glacial conditions have obtained in this country since its occupation by Palæolithic man. Unfortunately an attempt which I made to explain this coincidence between his result and mine in a letter to the same periodical in February last was rendered abortive by a clerical (or perhaps printer's) error. I would press upon geologists to consider