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 intended for this or any other part of NATURE. *No notice is taken of anonymous communications.]*

A House divided against itself.

MOST of your readers have doubtless heard of a question relating to the site of the Natural History Museum at South Kensington, and to a site for a new Science Museum. For the latter it is proposed to utilise the waste land behind the Natural History Museum, together with a portion of the site assigned to the Natural History Museum. The supporters of this scheme state that there is plenty of land for both museums, and have presented a memorial to the Government to this effect. Biologists learnt of this memorial largely owing to a Question and Answer in the House of Commons. They considered that such a proposal seriously imperils the future of the Natural History Museum. A second equally influentially signed memorial expressing these views is sent to the Prime Minister.

The spectacle is an edifying one. The scientific men of the country are roughly divided into two camps opposed to one another, while, as Sir Norman Lockyer says in a letter to *The Times*, May 30, "there should be no contention between these persons—their aims are the same; they desire to afford the best facilities for the increase and coordination of knowledge in all its branches." Is there no machinery which can make such contention only possible as a last resort? The records of the Royal Society and the British Association afford a hundred instances of the cooperation of all sections of scientific men, while the search for instances of the pitting of the different sciences against one another is almost vain. In questions which affect several sciences, surely it is possible for representatives to come together privately and discuss them freely. Probably in 90 per cent. of the cases an agreement would be reached, and both sides would cooperate for the good of science as a whole. For the due progress of human knowledge the cooperation of the different sections of science is more needed to-day than it has ever been in the past. All branches are becoming more and more woven together, and public contention between sections can only weaken the influence of science as a whole.

J. STANLEY GARDINER.

Cambridge, May 31.

Fishes and Medusæ of the Intermediate Depths. A note on the work of the *Michael Sars*.

DR. HJORT'S account of the work of the *Michael Sars* during last summer's cruise[1] is of the very greatest importance to the marine geographer: it is the most illuminating article of its kind which has appeared within recent years.

Among the many interesting questions which are raised, I wish to direct attention here to one only, which is of particular interest to me because of my studies on the Medusæ of the intermediate waters, or the mesoplankton, if that term be preferred. This is the observations on the vertical range of the "black fishes," "shining silvery fishes," and "red prawns" of the intermediate depths.

Briefly stated, the result of Dr. Hjort's observations is that the adult black fishes and red prawns form an important community, the upper limit of which everywhere corresponds with the same intensity of light, *i.e.* practically with the lower limit to which sunlight penetrates with strength demonstrable by the photographic plate. This limit is deeper in low latitudes, nearer the surface in high, that is, about 500 metres between Newfoundland and Ireland; 700–800 metres at 33° N.; and when black fishes were taken from lesser depths, such captures were made at night.

The silvery fishes dwell at a higher level, where the light of the violet end of the spectrum penetrates with considerable strength.

These generalisations rest on such a mass of observation, and the methods of investigation were so well chosen, that they seem to me altogether deserving of acceptance; indeed, they form one of the most important of recent additions to our knowledge of oceanic biology.

Now, among the "intermediate" or "mesoplanktonic" Medusæ there are two similar colour groups, one unpigmented, or faintly pigmented, but often highly iridescent, as, for example, *Colobonema sericeum*, *Rhopalonema funerarium*, *Halicreas papillosum*; the second, characterised by very dense entodermic pigmentation, of a deep red, reddish-brown, or chocolate colour. Conspicuous genera among the latter are Atolla, Periphylla, Crossota, and Æginura.

Dr. Hjort's paper raises the question, Do the intermediate Medusæ, like the intermediate fishes, fall into two classes in their vertical distribution as well as in colour, and, if so, do the depth limits of the two correspond with those of the fishes and crustaceans?

Unfortunately, our knowledge of the bathymetric range of all the Medusæ in question is still extremely scanty. We know that they do not normally come to the surface except in very high latitudes, as, for example, Periphylla from the surface off Cape Adare in December, 1899, and January, 1900, the ice then being broken up, and in McMurdo Sound: On the other hand, the evidence which I have collated[1] shows that they are by no means exclusively abyssal. During the *Albatross* Eastern Pacific Expedition they were taken abundantly between 300 fathoms and the surface, and I have recently received an extensive collection from the north-western Pacific from the same depth zone.

Closing-net records are too few in number to be conclusive, but it is at least suggestive that in the eastern Pacific the *Albatross* took three genera of red Medusæ in a Tanner-net haul at 400 fathoms, one of which was also taken in the open net from 300 fathoms, but none of the transparent group, while at the same station two genera of the iridescent-transparent group were taken in a Tanner-net haul at 300 fathoms, and three specimens of a third transparent form, *Halicreas papillosum*, and one of a fourth, *Homoeonema alba*, were taken in the open-net haul from 300 fathoms to the surface.

These records certainly suggest that at this locality the red forms occurred, as a whole, below the transparent-iridescent ones, but that the two groups overlapped at, say, 250–300 fathoms.

In my discussion of the bathymetric range of the eastern Pacific Medusæ, I concluded that the upper limit of the intermediate forms probably corresponded, roughly at least, with the depth to which sunlight penetrates with appreciable strength. But the facts with regard to fishes brought out by Dr. Hjort suggests that my generalisation may not hold for the intermediate Medusæ as a whole, but only for the "red" genera.

This question can be settled only by further records; such, we hope, will be afforded by the *Michael Sars* Medusæ when they are worked up. But I direct attention to it here because, if it proves that red prawns, red or brown Medusæ, and black fish form a rather definite faunal group dwelling below the limits of light, as now seems likely, to which, too, the pelagic holothurian Pelagothuria probably belongs, the similarly excessive development of pigment in such divergent groups, in an environment of practical darkness, is a phenomena of great interest.

Such cases as this only emphasise the gaps in our knowledge of the life of the deep seas, and how rich a harvest of discovery still awaits the student who will explore the intermediate waters with a well-matured plan of operations.

HENRY B. BIGELOW.

Museum of Comparative Zoology, Cambridge, Mass.

Musical Sand.

WORKING with sand obtained from the beach at Barmouth, North Wales, I have been able to confirm most of the conclusions arrived at by Mr. Carus Wilson (NATURE, vol. xliv., p. 322) and by Mr. Skinner (NATURE, vol.

[1] *The Geographical Journal*, vol. xxxviii., pp. 349–377, 500–523, and NATURE, January 19, 1911.

[1] Reports on the scientific results of the expedition to the Eastern Tropical Pacific, in charge of Alexander Agassiz, by the U.S.F.C. steamer *Albatross*, ... XVI. The Medusæ, by Henry B. Bigelow. Memoirs Museum Comp. Zoology, vol. xxxvii.