explains these facts on the supposition that the cause is not to be sought in the mechanism of the ear alone, but in the relation of this mechanism to different parts of the brain.

The paths by which nervous impulses, generated by a sonorous vibration, say, in the cochlea, are communicated to the brain, are very complicated, and come into anatomical connection with many nervous centres. Such centres may be considered as being of higher and lower orders, and the nervous impulses may pass from lower to higher, calling forth at each stage a particular sensation—say, that of a noise or of musical sensations—until they reach the highest cerebral centres where there is the appreciation of all kinds of auditory sensations, such as noises, music, and speech.

Prof. Marage's method of stimulating the ear by his ingenious syren is well known. This instrument can transmit to the drumhead sonorous waves of a measured intensity (that is, the air-pressure is measured), and the special quality of each vowel tone is produced by sending the waves of pressure through resonators moulded on the form of the mouth and throat cavities for each vowel. Thus, by using the syren methodically, the ear may be stimulated by tones that, as regards both intensity and quality, are natural to it, instead of tones produced by tuning-forks, or noises, or by spoken words. Thus the ear and the nerve centres may be put through a course of education, a kind of drill, in short, produced by the syren. The results are said to be very encouraging with cases of whole or partial deaf-mutism.

Prof. Marage also gives in this pamphlet copies of tracings of vowel-forms produced by this syren which are well worthy of study, but he does not mention how these beautiful photographs were obtained. The gist of the whole matter is that in attempting to explain auditory mechanisms, we must not confine our attention to the ear alone, but to the ear as associated with auditory nerve centres. The investigation, in short, becomes more and more complicated.

JOHN G. MCKENDRICK.

NATURAL HISTORY IN CEYLON.

SPOLIA ZEYLANICA is an excellent quarterly publication designed to promote a knowledge of the natural history of Ceylon and its surrounding seas. It was established by Prof. A. Willey (now at Montreal) some eight or nine years ago when he was director of the Colombo Museum, and has been kept up since with admirable skill and energy by his successor, Dr. Joseph Pearson the present editor. The part for January, 1913, contains, along with several notes on land and fresh-water animals, three articles of special interest on pearl-oyster fisheries.

The first article, by Captain Legge, "Master Attendant" at Colombo and inspector of the pearl banks, is semi-popular, and is written rather from the navigator's and the historian's point of view, containing notes and stories of fisheries and celebrated pearls. Here and there in Captain Legge's chatty account of his personal adventures on the pearl banks one comes on quite important observations, such as, when describing a walk in diving-dress over the sea-bottom:

> Immediately I walked off the "paar" I was upon very loose sand, in waves like giant furrows in a ploughed field; whilst for quite two feet high above the ground there was sand in suspension. Here oysters are covered up, buried and destroyed immediately.

Yet some recent writers have argued that there can be no movement of the sand on the bottom, and that beds of oysters cannot be silted up by moving sand.

Captain Legge gives us an additional instance of the now well-known danger to beds of oysters from predatory elasmobranch fish, as follows:

> At the inspection in November, 1902, I decided that a certain bed was quite the gem of those to be fished in March, 1903; the oysters were larger and older than any others I had inspected, and were very plentiful; however, as I was passing over this spot on my way back at the end of the inspection, I observed a very large shoal of rays in the vicinity. In the following March, about the second week of the fishery, I moved to this my pet bed of oysters, only, however, to be told by the divers that there were no living oysters there. I at once descended in the diving dress and found the bottom of the sea strewn with empty oyster shells, each valve turned nacre upwards and shining, giving a very curious effect, whilst each shell or valve was broken obviously by external pressure into three pieces. This could only have been done by the powerful jaws and teeth of the ray.

The second article is a well-considered, judicial account of the scientific work on the Ceylon pearl banks in the last decade, 1902 to 1912, by the editor, Dr. Pearson, director of the Colombo Museum and Government Marine Biologist. Dr. Pearson passes in review the scientific exploration of the pearl banks in 1902, the recommendations in Prof. Herdman's report to the Government, the formation of a financial syndicate in 1906 to take over a twenty years' lease of the fisheries at a large annual rental, their two highly profitable fisheries which cleared the ground of adult oysters, and then the subsequent failure of yield and resulting barren condition of the banks. The various operations suggested and performed are discussed, and the conclusion is reached that:

> The work subsequent to Herdman's reports gives very little evidence that his recommendations have been carried out seriously.

Dr. Pearson brings together a good deal of argument in favour of the possibility of oyster-beds being buried and lost by movements of the sand, and he quotes some personal observations, made on the bottom by the inspector of pearl banks, such as:

> What impressed me most was that the spots I dived on last March, which were then level rock, with a coating of 3 or 4 in. of sand, had now as much as a foot of sand in places. All over the sand was in fairly deep ridges, not so deep as the ridges of the

paar proper, but quite distinct from the appearance of the sea bottom last March.

The third "pearl-oyster" article, also by Dr. Pearson, is a report on the remarkable "window-pane oyster," *Placuna placenta*, in the great inland sea at Tamblegam, near Trincomalee; and other papers, by various authors, on fresh-water fishes, Oligochætes, Termites, &c., all show that the investigation of the natural history of Ceylon is in capable hands, and bids fair soon to make the fauna and flora of that charming island better known than those of most other parts of the eastern tropics.

NOTES.

As we went to press last week a case was concluded in the course of which the methods of anti-vivisectionists were again exposed. A Swedish lady, Miss Lindaf-Hageby, brought an action against *The Pall Mall Gazette* and Dr. Saleeby for alleged libel published in *The Pall Mall Gazette*. The jury, after listening to sixteen days of talking, gave their verdict for the defendants, and the judge received their verdict with most emphatic and outspoken approval. It has all happened before. There comes an opportunity for legal action: the statements of anti-vivisectionists are brought to the test of evidence on oath; the whole thing is thrashed out in the Law Courts, and the inevitable verdict is given. *The Pall Mall Gazette* has done a great service to the nation by thus exposing, once more, the uncharitableness—to say the least—of anti-vivisectionists. The Research Defence Society, likewise, deserves the thanks of lovers of truth. We trust that the public will bear in mind the lesson of this case, and will treat with contempt the methods upon which the obscurantism of anti-vivisection thrives. A campaign which appeals to those who have been least fortunate in the matter of education, inflames passion, stirs up hatred, and delights in imputing evil to men who are devoting their lives to the increase of knowledge of diseases which afflict mankind, may not be stopped on its downward course by the verdict given last week, but the light which was thrown upon it in the course of the evidence will perhaps do something to scatter the thick darkness of prejudice which anti-vivisection requires for its existence.

THE Bill to consolidate and amend the law relating to ancient monuments was read a second time last Thursday in the House of Lords. Such a measure must necessarily be tentative, and Earl Beauchamp admitted that it was not ideal. But he claimed justly that it was a considerable step for the object in view, while in no way penalising owners or interfering with the rights of property. The same difficulties occur as in other branches of the movement to make the country a decentralised museum, both of antiquities and of natural history and scenery. But there are also special difficulties in the case of ancient monuments. The Marquess of Salisbury pointed out that consideration would have to be given to the resident owner of a historic house. The question might arise as to whether he could be precluded from throwing two bedrooms into one. The case of cathedrals is peculiar, as Earl Curzon of Kedleston showed; they are not protected by a faculty, as churches are, but are the absolute property for the time being of the dean and chapter. Earl Beauchamp had not seen his way to include ecclesiastical buildings, but it appears that the bishops would not object to the inclusion of cathedrals. The power of purchase by the State is eliminated from the Bill; full powers for a Preservation Order are considered to render this unnecessary. The power of purchase is given to the local authorities, chiefly in view of the smaller monuments of local interest. Here comes in the difficulty of funds; even for small purchases there must be an increase of the rates. Meanwhile the larger monuments seem to be unprotected. There is no doubt that owners of great historic heirlooms do treat them as in trust for the nation. But the modern tendency is to bring this spirit into the machinery of organisation. The passing of such a Bill may be expected to react favourably on the connected questions of nature reserves and the endowment of science.

THE relation between insect-eating birds and the abundance or otherwise of insects, ticks, and other creatures which may act as hosts for organisms associated with various diseases, is known to every biologist. A correspondence between Sir Harry Johnston and the chairman and secretary of the Plumage Committee and Textile Trade Section of the London Chamber of Commerce, published in *The Times* of Tuesday, April 29, deals with some points of this relationship, with particular reference to tsetse-flies, mosquitoes, and other blood-sucking insects of Africa. Sir Harry Johnston points out that tsetse-flies of the genus Glossina are particularly abundant in all those parts of West and Central Africa where the plumage trade has done so much to lessen the numbers of the insect-eating birds—more especially white herons (egrets, large and small), ibises, rollers, bee-eaters, glossy starlings, drongo and "cuckoo" shrikes, bishopfinches, and kingfishers. As remedial measures to prevent the disturbance of the balance of nature caused by the destruction of these birds, he suggests "that the secretary to the British Museum (Natural History) or the secretary to the Zoological Society, or perhaps the two jointly, should be asked to compile a list of species, genera, and perhaps families of birds which should be placed on the prohibited list. That is to say, that the skins or other trophies of such birds should be forbidden as an article of import into Great Britain and Ireland and into all parts of the Empire of which the fiscal affairs are influenced by the Foreign and Colonial Offices; and that we should use our best endeavours with the Governments of the self-governing portions of the British Empire to secure a like prohibition in their own Customs regulations."

IN a letter to the Lord Mayor, the Prime Minister has announced the extent of the provision which the Government proposes to make for the dependents of Captain Scott and of those who so heroically lost their lives with him in the Antarctic. The Government intends to ask Parliament to sanction a Special