

no sturring between one sound and another, but clear jumps from one multiple to another, and every one of them may be arrested and heard by itself by checking the piston. But, although I am glad to produce this tube before those who were not present on the last occasion, and to do honour to the memory of our eminent vice-president, who declined to refer in any way to himself, I have another motive also. This is a principle which has never been utilised. We have had pipes stopped at the top, like the usual pitch-pipe, but they have been found too slow in action to be suitable for any other purpose. This is rapidity itself, and might surely be utilised for some such purpose as pedal-pipes for an organ. The piston can be balanced outside to the greatest nicety, and one such pipe will take the scale of C, and another that of F. All that is required is to blow across the top in the manner of the Pandean pipes, or, as it appears, better still, to set free a fan or cogged wheel at the mouth tuned to each of the two fundamental notes. The wheel might be set free by the action of the foot upon the pedal. It is now well known that the length of a 32 or a 16 foot pipe may be greatly reduced by breadth of scale. We Europeans have made little, if any, use of resonators, and yet they have been long in use in Java. The drawing on the wall is of an instrument brought from Java by Sir Stamford Raffles more than half a century ago. There is one of the same kind in the British Museum. But this is perhaps of greater interest, as it may have suggested to Wheatstone the principle of the resonating tube. The natives of Java cast metal plates which they suspend in a row upon strings, and strike them with drum-sticks, which are fitted into circular heads. As all cast metal is more or less false in tone, owing to inequalities and lack of homogeneity, they place some of the largest bamboos, cut to short lengths, and placed upright, under the metal to make the true sounds of these resonators to overcome the false harmonics of the metal plates.

Resonators were used in the theatres of ancient Greece—we here find them used in Java; but these powerful auxiliaries to tone still await their development in modern Europe.

And now, in conclusion, permit me to draw your attention to a harmonium with two keyboards, the upper one having four octaves of our scale tuned without tempering, and the lower with the five octaves of the harmonic scale, and the sixteen notes in the fifth octave. Much has been said of the harmonic scale, and this is perhaps the only instrument on which the harmonics can be fully heard and sustained for experimental use.

ROBERT SWINHOE, F.R.S.

WITHIN the last thirty years or so their respective vocations happen to have called two able lovers of natural history in the direction of the Celestial Empire—Mr. Robert Swinhoe, from England, and the Père Armand David, a Frenchman. The simultaneous investigations of these two biologists have added immensely to our knowledge of a country whose fauna not long ago was thought to be in no way interesting, because the huge population had succeeded in extirpating all the indigenous species. How far from the truth such an assumption is, has been demonstrated by the researches of the two naturalists above mentioned, the lamented death of the former of whom, at the early age of forty-one years, were recorded last week.

Mr. Swinhoe was born at Calcutta on September 1, 1836, and was educated at King's College, London, whence he matriculated at the University of London, in 1853. The next year he went, as supernumerary interpreter, to Hong Kong, being transferred to Amoy in 1855, and to Shanghai in 1858. In the same year he was attached to the Earl of Elgin's special mission to China,

and afterwards to H.M.S. *Inflexible* as interpreter in a circumnavigating expedition round Formosa, in search of certain Europeans said to have been held in captivity at the sulphur mines on the island.

In 1860 Mr. Swinhoe attended Gen. Napier, and afterwards Sir Hope Grant, the Commander-in-Chief, as interpreter, and received a medal for war service. At the end of the same year he was appointed Vice-Consul at Taiwan, Formosa, and in 1865 to the full Consulship. In 1866 he was Consul, temporarily, at Amoy, and in 1868 went to explore the Island of Hainan. From May, 1871, to February, 1873, he was acting Consul at Ningpo, and at Chefoo until October of the latter year, when he had to retire from the service, on account of increasing paraplegia, from which he died on October 28 last.

Mr. Swinhoe was a Fellow of the Asiatic Societies of China and of Bengal, as well as of many other societies, having been elected into the Royal Society in 1876.

By far the majority of Mr. Swinhoe's scientific communications—fifty-two in number—mostly on the mammalia and birds of China, are to be found in the *Proceedings* of the Zoological Society of London between 1861 and 1874. Other papers appeared in the *Ibis* and the *Annals and Magazine of Natural History* within the same period. Among the most important of these are the "Catalogues" of the mammals and birds of China and its islands, in which are to be found descriptions of many new species of both classes, among which are St. John's Macaque (*Macacus sancti-johannis*), the Water Deer of Shanghai (*Hydropotes incrunis*), the Manchurian Deer (*Cervus manchuricus*), the Orange-bellied Helictis (*Helictis subaurantiata*), the Superb Flying Squirrel (*Pteromys grandis*), Boyce's Stork (*Ciconia boyciana*), together with a great number of other birds, for a complete account of which we cannot do better than refer our readers to a work upon the birds of China, by M. l'Abbé David and M. E. Oustalet, published at Paris a week ago.

Michie's Deer (*Lophotragus michianus*) is the name given by Mr. Swinhoe to a small deer from Ningpo, with antlers more diminutive than many other species. This, or a very closely-allied species, was previously sent to Paris by Père David, and described by M. A. Milne-Edwards under the name *Elaphodus cephalophus*.

Mr. Swinhoe, besides the collections which he made, was indefatigable and particularly successful in his endeavours to send living animals from China to this country, and there are many species, including *Cervus swinhoii*, *Hydropotes incrunis*, and *Ciconia boyciana*, which were first procured by him.

It will be some time, we fear, before so enterprising a naturalist as Mr. Swinhoe takes up his residence in China, and employs every available opportunity for the prosecution of his favourite line of research.

DOUGLAS A. SPALDING

OUR readers must be familiar with this name as that of an occasional contributor to NATURE of thoughtful and acute articles in the department of mental science; they will be sorry to hear—but those who knew him will not be surprised—that Mr. Spalding died on October 31, at Dunkirk, just as he was preparing to go to the Mediterranean coast to spend the winter. Not much is known of Mr. Spalding's early life, but we are told by one who ought to know that his parents, belonging to Aberdeenshire, were in very humble circumstances, and that he was born in London about the year 1840. He himself spent his early years in Aberdeen as a working slater, doing his best to educate himself. By the kindness of Prof. Bain Mr. Spalding was allowed to attend the classes of Literature and Philosophy in Aberdeen University free of charge, in the year 1862. After that he got some teaching about London, and worked very hard to support himself, and even managed to keep his