

London. It is impossible to say whether the others arrived in Brussels, and, if so, what has now become of them. Dr. Christy's list is a very interesting one, and I will venture to give extracts from it. The specimens are distinguished by numbers. "No. 507, ♂ juv., not full grown; shot by myself, April 10, 1913. Skin good, skeleton complete." "No. 531, ♂, full grown. Shot by a Congo official, out shooting with me, May 22, 1913. Horns  $1\frac{1}{4}$  in., skin-covered. Skin good, skeleton complete." "No. 686, ♀, big. Shot by myself, October, 25, 1913. Skin good, skeleton complete." "No. 717, ♂, old. Shot by Reid. Skin good; horns and hoofs attached to skin. Skeleton complete. Horns 4 or 5 in. long, and bare at tips." "No. 532, ? ♂. Skin only: from natives." "No. 533, ? ♀. Skin only; from natives." "No. 695, juv., ? sex; half-grown, 1913. Skin dried by natives. Skeleton complete."

In this list it will be observed that nothing is said about "horn-sheaths." It is perfectly certain that, as a sportsman and naturalist acquainted with the okapi, and the only "educated" European who has himself shot the okapi, Dr. Christy would have directed attention in his notes to the presence of "horn-sheaths" if he had discovered such structures to exist.

Only one of the seven specimens mentioned in Dr. Christy's list has come through to London. I have no doubt that it is the specimen No. 531, shot on May 22, 1913, at Mawambi, by a Congo official out shooting with Dr. Christy. The horns (ossicones) are stated definitely to be *skin-covered*. This agrees with my inference from a comparison with the Boyd Alexander specimen and the state of growth of the ossicones. It makes the "horny-sheaths" impossible. The measurement given by Dr. Christy for the horns (ossicones) is  $1\frac{1}{2}$  in. This is their vertical height from base to apex. As they are pyramidal in shape, the measurement along the side of the pyramid from apex to edge of the expanding base, is as given above by me, about 2 in.

I think that Dr. Christy's own notes settle the question against the horny sheaths which it was already really impossible to "fit" satisfactorily to the specimen with which they reached Mr. Gerrard.

As to how this label—with "Horns of the Okapi" written on it—became attached to these little horn-sheaths it is possible to form various conjectures. Perhaps some busy, well-intentioned servant, being told to be sure to see that the little horns (ossicones) were not omitted from the parcel, mistakenly picked up the small horn-sheaths belonging to some antelope skin, left by chance with other skins and skulls in the disorder of packing or preparing a mass of specimens, and conscientiously but erroneously labelled them "Horns of Okapi," and packed them with specimen No. 531, destined to produce astonishment and confusion on arriving two years later in London.

Dr. Christy is to be congratulated on the fine series of specimens of okapi which he obtained and sent to Brussels *en route* for London. We must hope that they may escape destruction or seizure by the enemies of mankind, and eventually yield their contribution to our knowledge of the okapi, especially since among them are the first specimens seen alive and shot by a competent European observer.

March 9.

E. RAY LANKESTER.

#### The Spectra of Hydrogen and Helium.

MR. E. J. EVANS has described recently some interesting experiments on the "4686" and Pickering series, which were obtained from vacuum tubes containing helium from which hydrogen was apparently completely eliminated. Stark has also observed the "4686" line in a vacuum tube showing no trace of the

hydrogen lines. The experimental evidence of a helium origin of the lines in question would thus appear to be strong, and Prof. Fowler, from analogy with the enhanced line series of the alkaline earths, has also concluded that the lines are due to helium. According to Dr. Bohr, who first suggested that the lines were due to helium, the series in question owe their origin to the binding of an electron by a helium atom from which two electrons have been removed. Dr. Bohr's theory involves a modified value of Rydberg's constant for these lines, and Prof. J. W. Nicholson, in a letter to NATURE of February 11, has pointed out that it can be put to the test by an accurate measurement of the lines of the "4686" series, from which the value of the constant can be calculated.

Although the spectroscopic evidence is in favour of helium as the origin of the lines, it may be pointed out that this evidence is not conclusive. Although 4686 does not appear in hydrogen in the absence of helium, the same may be said of ultra-violet members of the Balmer series, which do not appear in vacuum tubes containing pure hydrogen, but which make their appearance when helium is present. The difficulty of preparing vacuum tubes free from hydrogen is well known, and the fact that the ordinary hydrogen lines are absent from the spectrum cannot be taken as conclusive evidence that hydrogen is not present. In view of this fact, the writer has conducted experiments to determine the relative mass of the atom from which the "4686" series originates, by measuring the limits of interference of the "4686" line and the lines of helium and hydrogen. The circumstances which control the breadth of spectrum lines have been discussed by Lord Rayleigh in the current number of the *Philosophical Magazine*.

At low pressures the order of interference at which fringes are still visible is proportional to the square root of the atomic weight of the atom from which the radiation originates. It is hoped shortly to publish a full account of the experiments, but the following may be stated as a preliminary result. A vacuum tube containing helium and hydrogen at a low pressure was excited by an induction coil with capacity and a spark-gap in the circuit, the spectrum consisting of helium lines, 4686, and the hydrogen lines. With an interference apparatus giving a suitable difference of path, moderately sharp ring systems can be obtained for all the helium lines, whilst no trace of interference can be detected in the 4686 line or the hydrogen lines.

Further observations are required to determine the exact limits of interference of the 4686 line and the hydrogen lines, but the results indicate that the mass of the atom from which 4686 originates is definitely smaller than that of the atoms concerned in the production of the ordinary helium spectrum.

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University of London, King's College, March 15.

#### Musical Sand in China.

AMONG the immense mass of ancient Chinese records and manuscripts brought back from the buried cities and caves of ancient Khotan, in Central Asia, and now stored in the British Museum, is one called the Tun-Huang-Lu, a topographical description of part of Khotan itself. This little geography was written in the time of the Tang dynasty, in the seventh century, but probably contains matter from earlier authors.

Among the specially interesting natural phenomena of the country described in the Tun-Huang-Lu is a large sandhill, which at certain times gave forth strange noises, so much so that a temple in its vicinity was entitled the "Thunder Sound Temple."