

beak appear to be slightly separated; it is also probable that the separation increases with the depth of the probing, although the upper and lower portions remain nearly parallel until they are thrust in to their extreme limit, when the terminal part of the upper one becomes expanded at the moment of contact with the "find."

The already overcrowded list of so-called British birds has been increased by the capture, on Fair Isle in September, 1908, of a specimen of Eversmann's warbler (*Phylloscopus borealis*). This bird, which is really a dark-coloured willow-wren, has been recorded once in Heligoland, in 1854, but its normal summer haunts are Finmark, northern Russia, and Siberia, while in winter it wanders to Burma, Malaya, and China. Fuller details of the capture will be found in the January number of Witherby's *British Birds*.

Captain Stanley Flower and his assistant, Mr. M. J. Nicoll, have drawn up a list of the species of wild birds which have been observed to visit the zoological gardens at Giza during the period between October, 1898, and October, 1908. This list, which has been published by the Egyptian Government, comprises no less than 166 species, eleven of which are, however, not indigenous to the country, and were accordingly, in all probability, represented by imported individuals. The very large number, both as regards species and individuals, which visit the establishment adds considerably to the attractions of the Giza Gardens, and the list has been published in response to inquiries from visitors as to their names. It is a prevalent idea that song-birds are lacking in Egypt, but a visit to the gardens when the nightingale and the rufous and olive warblers are singing will at once dispel this illusion.

In the report of the vertebrate section of the Yorkshire Naturalists' Union for 1908 reference is made to the appearance of a flock of Pallas's sandgrouse on the northern slope of the wolds during the autumn of that year. The great grebes on Hornsea Mere have been reduced to three, and it is believed that the diminution is mainly to be attributed to egg-collectors and other visitors. The peregrine falcons again built on Bempton Cliffs, where they reared a single young one.

The birds of the Barotsi district of the Zambesi form the subject of a paper by Mr. A. Sandberg in vol. vii., part ii., of the Proceedings of the Rhodesia Scientific Association. As an illustration of the teeming bird-life of the great valley, the author writes that "the traveller encounters enormous numbers of geese, ducks, and wading birds in wonderful variety of species, size, and coloration, and the sand-banks of the river, upon which they find a refuge, present an appearance at times which can best be described as kaleidoscopic. Above the almost deafening din of their shrill voices can be distinguished the incessant cry of the fish-eagle, for ever on the alert for prey."

PREHISTORIC ARGENTINA.¹

THE pottery described in the first of the papers mentioned below was mainly obtained in the province of Catamarca. The specimens are illustrated by handsome coloured plates drawn from photographs. The earliest type includes bowls and jars, ornamented in white, red, and black in imitation of the woven patterns of basket-work. Similar ornamentation is found in the baskets, cloth, and pottery of New Mexico and California. Another type, with red and black colouring, shows either geometrical designs or outlines of animals, especially frogs and snakes, usually conventional in character. Among the objects depicted are the anura, *Ceratophys ornata* and *Leptodactylus ocellatus*, and the ophidia *Elaps frontalis* and *Lachesis alternatus*, as well as the rhea and puma and a fern, a species of Hymenophyllum. There are also crude representations of human beings.

The second article describes two human faces in terra-

¹ (1) Alfarerías del Noroeste Argentino (Anales del Museo de La Plata, series ii., vol. i.). Pp. 5 to 40.

(2) Sobre el Hallazgo de Alfarerías Mexicanas en la Provincia de Buenos Aires (Revista del Museo de La Plata, v.l. xv., series ii., vol. ii.). Pp. 284 to 293.

(3) Arqueología de San Blas (Anales del Museo Nacional de Buenos Aires, vol. xvi. (series iii., vol. ix.)). Pp. 249 to 275. All by Señor F. Outes.

cotta, and part of the head of an animal supposed to be the coyote (*Canis cagottis*), in the same material. These were found in a high bank in the Laguna de Lobos, in the province of Buenos Aires. They are so closely similar to the earthenware "masks" found in such numbers in the ancient ruins at San Juan de Teotihuacan, in Mexico, that the author believes that they were manufactured there, but he declines to advance any theory to explain their presence in the Argentine.

The third paper deals with implements and fragments of pottery collected by Señor Carlos Ameghino on the site of a prehistoric settlement in the extreme south of the province of Buenos Aires, and distant 5 kilometres from the sea-shore. They were found on the surface at the foot of unconsolidated sand-dunes, and include flakes, scrapers, chisels, knives, arrow-heads, and grinding stones, all primitive in character. These appear to have been manufactured from ellipsoidal beach-stones, mainly jasper, though phonolite, chert, porphyritic breccia, and other materials were also employed. The grinding stones are of hard grit ("asperón").

The pottery was moulded of a sandy clay, and imperfectly baked. It was ornamented with grooves and pits made with the nail or a fragment of wood.

The collection indicates, we are told, a culture similar to that which still characterises the middle and lower parts of the basin of the Rio Negro, certain localities in the government of the Pampa, and the southern plains of the province of Mendoza. It presents many points of resemblance to that met with in the southern part of the government of the Rio Negro and in the governments of the Chubut and Santa Cruz, but differs completely from that of the rivers Salado, San Borombón and Luján, and generally the eastern portion of the province of Buenos Aires.

J. W. E.

THE INCREASED EXPANSION OF STEAM ATTAINABLE IN STEAM TURBINES.¹

I FIND it difficult to add anything to the words of many illustrious men who have addressed this society on previous anniversaries of the birth of James Watt, to the words of Sir Humphry Davy, Lord Aberdeen, and Lord Jeffrey, and in later years to those of Joule, Scott-Russell, Preece, and Kelvin. This evening I should prefer to recall to your memories the fundamental principles of steam discovered by James Watt, and to endeavour to trace their application in the engines constructed by him and by the firm of Bolton and Watt, then in the more highly developed forms of compound, triple, and quadruple reciprocating engines, and, lastly, in steam turbines on land and sea.

The laws of steam which James Watt discovered are simply these, that the latent heat is nearly constant for different pressures within the ranges used in steam engines, and that, consequently, the greater the steam pressure and the greater the range of expansion the greater will be the work obtained from a given amount of steam, and, secondly, as may be seen to us now as obvious, that steam from its expansive force will rush into a vacuum.

Having regard to the state of knowledge at the time, his conclusions appear to have been the result of close and patient reasoning by a mind endowed with extraordinary powers of insight into physical questions, and with the faculty of drawing sound practical conclusions from numerous experiments devised to throw light on the subject under investigation. His resource, courage, and devotion were extraordinary, and drew to his side a coterie of kindred spirits, with whom he discussed freely his theories and his hopes, and the results of his experiments.

In commencing his investigations on the steam engine, he soon discovered that there was a tremendous loss in the Newcomen engine which he thought might be remedied—the loss caused by condensation of the steam on the cold metal walls of the cylinder. He first commenced by lining the walls with wood, a material of low thermal conductivity. Though this improved matters, he was not satisfied; his intuition doubtless told him that there should

¹ The James Watt lecture delivered at Greenock by the Hon. C. A. Parsons, F.R.S.