

respect of their habits most nearly resemble them. From the observations of Tegetmeier¹ it would appear that in diving the movements of the Penguins under water are accomplished solely by the use of the wings, the legs being extended behind the bird, just as they are during flight, and taking no part in the propulsion of the bird through the water. It thus appears that the posterior extremities of the Penguins act chiefly as organs of progression when the bird is on land or when swimming on the surface of the water, but that when diving the legs take no part in the locomotion of the bird, which under these circumstances becomes truly a subaqueous flight.

The geographical distribution of the Spheniscidæ is of interest.² The various members of the group are entirely confined to the southern hemisphere, not one single species of Penguin being found north of the equator. In the southern hemisphere, however, their distribution is very extensive, reaching from the Gallapagos Islands on the equator southwards to the Antarctic Islands. Of the various species of Penguin referred to in the preceding pages, *Spheniscus demersus* is confined to the vicinity of the Cape of Good Hope, *Spheniscus magellanicus* to that of Cape Horn, *Spheniscus mendiculus* to the coast of Chili, while *Spheniscus minor* inhabits the South Pacific, in the neighbourhood of Australia and New Zealand. The genus *Eudyptes* includes, according to ornithologists, along with others which I have not had an opportunity of examining, the two separate species *Eudyptes chrysocome* and *Eudyptes chrysolophus*. Of these *Eudyptes chrysocome* has much the more extensive geographical range, being met with as far north as the island of Tristan d'Acunha, whence it extends southwards to Kerguelen Island. *Eudyptes chrysolophus* inhabits the island of Kerguelen, whence it extends southwards to the islands of the Antarctic.³ The genus *Aptenodytes* (including *Pygosceles*) has a wide geographical range, extending from the Falkland Islands in the north, to the islands of the Antarctic Sea in the south.

The limitation of the geographical range of the group of Spheniscidæ to the southern hemisphere is not a little remarkable, and so far as I am aware no explanation of the fact has hitherto been offered. That it does not depend on temperature is evident from the fact that they are met with from the equator southwards to the Antarctic Ocean.⁴ It appears not improbable that it may depend on the relative abundance of the food supply (cephalopods and crustacea) found in the southern and northern hemispheres respectively.

¹ Diving Birds in the Zoological Garden, The Field, April 28, 1883, p. 563.

² Wallace, Geographical Distribution of Animals, vol. ii. p. 366.

³ Gray, Handlist of the Genera and Species of Birds, part iii. p. 90.

⁴ With reference to this matter, I have been favoured with the following interesting remarks by the editor of the Challenger Reports. "The Penguins reach the equator only on the coast of Chili and Peru. Now the Peruvian current from the antarctic skirts along this coast, and takes a low temperature as far north as the Gallapagos Isles,—the temperature of the sea being there (equator) 62° to 66°, while in the middle of the Pacific (equator) the surface temperature is 81° to 88°. Temperature, therefore, most probably has something to do with the limitation of the geographical distribution of the Spheniscidæ."