Mr. H. O. Forbes's Discoveries in the Chatham Islands.

IN a recent letter in NATURE (vol. xlviii. p. 27), under the above heading, Mr. Wallace has done me the honour to make some observations on the conclusions I have arrived at on other discoveries I have made in the Chatham Islands, and on the evidence adduced in my paper read before the Royal Geographical Society on March 12 last, *i.e.*, that an Antarctic continent—which I may name Antipodea—is necessary to explain the distribution of life in the southern hemisphere. Mr. Wallace says, "It is this tremendous hypothesis which appears to me to be not only quite unnecessary to explain the facts, but also to be inadequate to explain them. If one thing more than another is clear, it is that these comparatively small flightless birds were developed, as such, in or near to the islands where they are now found, since they could not possibly have arisen on any extensive land inhabited by carnivorous mammals and reptiles, and, if introduced into such a country could not long survive." If by this Mr. Wallace means that only the flightlessness of these birds, apart from their general structure as members of the genus *Aphanapteryx*, arose in or near the islands where they now are, he still leaves the, to me, greater difficulty unexplained how two so closely related species of the same genus should have arisen in regions separated by nearly one half of the circumference of the globe. For it has to be remembered that *Aphanapteryx* belongs to the *Ocydromine* group of the Rails, which is quite unknown in the northern hemisphere, and, therefore, to have reached "Lemuria" (the ancient land of which Madagascar, Mauritius, Bourbon, Rodriguez, and the Seychelles, are the fragments) the genus must have arisen independently in both regions where its species are now found, or it spread from one or the other centre, or from some common land *by flight*. Mr. Wallace has himself pointed out that to explain the presence of the flightless *Notornis* and *Ocydromus* in two groups of islands in the New Zealand region requires a land connection, for it has been hitherto considered an axiom of geographical distribution that the regions inhabited by the same genus or species have been continuous, or have been, at all events, such as to afford possibilities of migration from one to another. If *Aphanapteryx* could have spread from the Chatham Islands to Mauritius by flight, surely *Notornis* and *Ocydromus* did not require a land connection to reach from New Zealand to the nearer outlying islands, for they may equally have lost the use of their wings only after they reached their present homes.

When Mr. Wallace asserts that these birds "could not possibly have arisen on any extensive land inhabited by carnivorous mammals and reptiles," he affirms what does not really appear to me to carry with it conviction without more proof. Rails belong to a family of birds that have become of world-wide distribution, not improbably because of the habits of its members enabling them to escape destruction. They are better runners than flyers; they are water and marsh-loving birds, many of them living in reed and rush brakes, and the dense vegetation surrounding marshes, amid which pursuit is difficult or impossible. I was much struck when in the Chatham Islands by observing how the habits of the small *Ortygometra tabuensis* protected it. The upland districts of Wharekauri are covered by a very dense rush-like vegetation—the *terahina* of the natives—in which this little Rail lives. We hunted over acres and acres of country with the aid of a dog well trained to pursue and catch this species, but only after two days did we succeed in securing a specimen. We could see that the dog disturbed plenty of birds, but so rapidly could they make their way through the *terahina* that they all escaped, for they never took to flight. The *Cabalus modestus* is a nocturnal bird hiding securely hollow trees and grass thickets all day. *Notornis* inhabited, and perhaps still inhabits, the dense scrub of the south-western portion of New Zealand, and could have there escaped the severest persecution of carnivorous animals and reptiles. But even if *Aphanapteryx* had been subjected to the incessant and successful attacks of such enemies, its extinction, whether early or late, would de-

pend on the numbers in which it was reproduced. Many species of animals, it is needless to point out, such as rats and mice, are ceaselessly persecuted by enemies, and yet survive, and from time to time spread over vast areas. The lemming, notwithstanding that thousands yearly perish by their own act, and from the attacks of enemies during their migration, has not become extinct. Nor can I see that 2000 miles is such an "enormous extent of land" for a migration to extend over, even in face of carnivorous mammals and reptiles. It is at least not so great as the distance covered during the migration of the South American tapirs from Central Europe *via* Behring's Straits to Brazil, the route supposed by Mr. Wallace to have been taken by the ancestors of these interesting animals.

Mr. Wallace asks, "What difficulty is there in the same or closely allied species of this widespread group finding their way at some remote epoch to Mauritius and the Chatham Islands, and from similar causes in both islands, losing their power of flight while retaining their general similarity of structure?" I must reply, none; and then ask in turn, from where did they find their way? which is the point under discussion. I am constrained to believe that they came from an extensive land, capable of supporting large numbers of them, which must have been continuous with (as indicated by other evidence) or approaching close to both regions, otherwise we have to believe that this strictly Notogæan group has "found its way" across half the globe, or has arisen independently in both regions from different sections of the family—an occurrence which we have no evidence to warrant our believing has ever taken place.

I am unable to speak for the present opinions of Prof. Newton or his brother; but I know of no additional evidence that has come to light that is likely to have modified their well-considered opinion of a few years ago. On the contrary, it seems to me confirmatory of their views.

I beg, however, to protest against the implication that I have invoked this "tremendous hypothesis" to account for the distribution of the *Aphanapteryx* and *Fulica* I discovered. I have given prominence no doubt to the valuable evidence their presence contributes, additional only, however, to the numerous other facts I have adduced in my paper before the Royal Geographical Society, in support of the theory that a land of extensive dimensions—not isolated islands only as Mr. Wallace agrees to—existed in the southern seas, in order to explain the distribution of plants and animals, *unknown in the northern side of the equator*, in regions so distant as South America, Australia, New Zealand, and "Lemuria." I have, in my own opinion, adduced no more cogent facts pointing in this direction than those published by the late Prof. W. K. Parker, showing plainly the common ancestry existing between the Notogæan (Gymnorhine) crows of Australia, and the Deudrocolaptine birds of South America. Their common progenitor must have occupied some *southern* land connected with both Australia and South America.

I might adduce still other weighty examples from the domain of ornithology, tending to support my opinion, which have been kindly communicated to me by Dr. Bowdler Sharpe, but I forbear now, as I understand that this will form the subject of the second lecture of the course he is now delivering on Thursday afternoons at the Royal Institution.

104, Philbeach Gardens, May 20. HENRY O. FORBES.