

undoubtedly closely allied to, if not identical with, the denizens of similar districts in Africa, yet it must be remarked that such forms should be regarded in much the same light as those which frequent wide seas, and that the determination of a desert-tract must therefore depend rather on the fauna which inhabits its islands—as we may term the oases which, whether plentifully or rarely, stud its surface—rather than on the fauna of the desolate space which surrounds these fertile and more favoured spots. Still, it is hardly to be denied that the influence of Ethiopian types is to be discovered in Sindh, Gujerat, and even further in the Indian peninsula. In the Ethiopian Region we again find a number of the sub-class *Ratitæ* in the very specialized form *Struthio*—the Ostrich—and this ranges, or did range, from the immediate vicinity of the Cape of Good Hope to the confines of Algeria in the north-west, and to the banks of the Euphrates in the north-east.<sup>1</sup> It is even possible that within historic times it penetrated much further to the eastward and reached Sindh at least, and if this be so, the fact would lend colour to the proposed inclusion of that country within the Ethiopian Region.<sup>2</sup> But without concerning ourselves with speculations of this kind, there is enough and to spare which marks the Region as one of the chief zoological portions of the globe, despite the mystery which still hangs over its interior and at present completely defies any attempt to trace the boundaries of its Subregions or provinces beyond a comparatively little distance from the coast.

General characteristics.

So large a portion of the Ethiopian Region lies between the tropics that no surprise need be expressed at the richness of its fauna relatively to that of the last two Regions we have considered. Between 50 and 60 families of land-birds alone are found within its limits, and of them at least 8—*Buphagidæ*, *Eurycerotidæ*, *Musophagidæ*, *Irrisoridæ*, *Leptosomidæ*, *Coliida*, *Serpentariidæ*, and *Struthionidæ*—are peculiar; but it is singular that of them only 2 belong to the Order *Passeres*, a proportion which is not maintained in any other tropical Region. The number of peculiar genera is too great for them to be named here; some of the most remarkable, however, especially of those peculiar to one of its Subregions, whose Bird-life has been differentiated to a degree that is very extraordinary, will presently be mentioned.

Limits of Subregions.

The subdivision of the Ethiopian Region is perhaps accomplished with less difficulty than in the case of the more temperate tracts with which we have lately had to do. Bounded on the north by the Mediterranean Subregion of the Palearctic Region, we have a Subregion extending from the Cape-Verd Islands on the one side of the continent to Socotra on the other; and with this we must comprehend all the Asiatic territory, whatever be its limits, which is, for zoogeographical purposes, to be annexed to the Ethiopian Region. On the West Coast of Africa the southern frontier of this Subregion, which we may call the "Libyan,"<sup>3</sup> seems to lie a little to the northward of lat. 10° N.; but, owing to the unexplored state of the country, we quickly lose trace of its confines. We may perhaps

<sup>1</sup> Xenophon, *Anabasis*, I. v. 2.

<sup>2</sup> For all that can be said as to the supposed former extent of the Ostrich's range in Asia, and, indeed, for the best account of this Bird that has ever been published, see Finsch and Hartlaub, *Vogel Ost-Afrikas* (pp. 597-607), forming the fourth volume of *Von der Decken's Reise in Ost-Afrika* (Leipzig und Heidelberg: 1870). Fossil remains of *Struthio* have been indubitably recognized from the Sivalik hills in India.

<sup>3</sup> In using this name the writer follows Blyth (*Nature*, iii. p. 423, March 30, 1871). Mr Sharpe, whose kind assistance in preparing this portion of the present treatise the author gratefully acknowledges, has proposed to call this Subregion the "Abyssinian," from its leading characteristics being most evident in that country, but that name would seem to be better applied to a province, and accordingly, here a more general designation appears preferable.

presume that they more or less follow that parallel to somewhere about long. 15° E., and then trend in a south-easterly direction. On the East Coast the frontier of the Libyan Subregion extends from near Cape Guardafui in a south-westerly direction towards the system of the Great Lakes, all the waters flowing to which it may be held to include; and is then succeeded by the "Mosambican" Subregion, which continues perhaps to Sofala. Beginning on the West Coast, where the Libyan Subregion stops, we have another Subregion, the "Guinean," comprising the seaboard from Sierra Leone to somewhere about Angola; but as to how far inland this penetrates we are absolutely without information. The rest of continental Africa forms what may be called the "Caffrarian"<sup>4</sup> Subregion, while Madagascar, the Comoros, and the widely-scattered Mascarene Islands, constitute a fifth Subregion, the most distinct and remarkable of all, and for this we may most reasonably use the name "Madagascanian."

(1.) *The Libyan Subregion*, the first we have separated, may perhaps be broken up into four provinces—the Arabian, Egyptian, Abyssinian, and the Gambian; but it must not be expected that all their respective boundaries can be distinctly drawn—those of the first excepted, which, however, seems to be the one that has precisely the fewest positive characteristics, and the propriety of its recognition, except on purely geographical grounds, is most questionable. We may doubt whether it has more than half-a-dozen peculiar species; but then we know next to nothing of the zoology of any part of Arabia, save the Peninsula of Sinai and the desert of the Tih. As before mentioned the Ostrich occurs here, but its present northern or eastern limits are indeterminate; we know, however, that within recent years it has been killed in the desert of Belka, just on the other side of the Dead Sea. The species which seem to be peculiar to the Jordan basin are—*Crateropus chalybeus*, *Nectarinia osea*, *Passer moabiticus*, *Amydrus tristrami* and *Caprimulgus tamaricis*, the last but one of which in its name commemorates Canon Tristram, the naturalist to whom we owe most of our information as to the fauna of this singular district.

The Egyptian province, so far as regards the valley of the Lower Nile, is remarkable for being, as already stated, overrun by migrants from Europe during the winter, and since it is chiefly from the observations of travellers at this season that most of our knowledge is derived, it is perhaps not very wonderful that many zoogeographers are inclined to include this district within the Palearctic Region. The number of species which occur in Egypt and Nubia, as given by Captain Shelley,<sup>5</sup> is 352, but many of them he says are of doubtful occurrence. Of these more than 230 are natives of the Palearctic Region; but only between 50 and 60, or about one quarter of them, remain to breed in Egypt, and of this number a considerable proportion do not breed in Europe, but only in the Barbary States. The extra-Palearctic character of the Egyptian ornis seems to be thus fully established.

Respecting the Abyssinian province very full particulars are included in the lately-completed work of Dr von Heuglin;<sup>6</sup> but for our purpose it is not easy thence to ascertain the precise features of its avifauna, since he has not discriminated between it and the Egyptian. North-east Africa, according to him, has about 950 species of Birds, of which he reckons about 325 as migrants from Europe or Western Asia—that is to say, from the Palearctic Region. Of these 113 breed in that Region, as well as in North-eastern Africa; 294 have been observed in the Bar-

<sup>4</sup> Again following Blyth (*loc. cit.*)

<sup>5</sup> *Handbook to the Birds of Egypt*. London: 1872.

<sup>6</sup> *Ornithologie Nordost Afrika's*. Cassel: 1859-75.

bary States; 438 are common to the West Coast, but whether to the Guinean Subregion, presently to be treated, or only to the Gambian province of the Libyan, is not stated; 318 are common to South Africa or the Caffrarian Subregion, and 253 only to the Mosambican; while 215 are peculiar to the district to which his work especially relates; the last statement being the most important for our present use, since it cannot be doubted that nearly all these 215 species are peculiar to the Abyssinian province, which may be taken as extending from about the southern frontier of Dongola to the Victoria Nyanza, and from the Kosanga River (long. 27° E.) to Cape Guardafui. One of the most wonderful forms of birds peculiar to this province is the gigantic Whale-headed Stork, *Baleniceps rex*. Of Socotra we know far too little to determine its provincial affinity.

Of the Gambian province we cannot say much, through want of materials to convey any definite notion of its character; and we are only able to confirm the general belief that it has a good deal in common with the Abyssinian, next to be mentioned, for without lists carefully drawn up by those who have a special knowledge of the avifauna of a country, or the power to compile such for oneself, which in this case the present writer does not possess, any attempt at a critical examination of its details would be rather misleading than otherwise. The province probably lies between lat. 18° and lat. 10° N., but whether it preserves those limits in the interior, whether it passes directly into the Abyssinian, or whether another province intervenes, are questions that cannot be now decided. It would seem to have in common with the East Coast several very characteristic species, of which *Buphaga africana*, *Vidua paradisæa*, *Parus leucopterus*, *Corythornis cyanostigma*, *Coccyzus nœvia*, and *Toccyzus nasutus*, with *T. erythrorhynchus*, may be mentioned.

To the Gambian province belong the Cape-Verd Islands, which, out of 17 or 18 Land-birds enumerated by Dr H. Döhrn (*Journ. für Ornith.* 1871, pp. 1-10), seem to have 2 peculiar species—a Sparrow (*Fringillidæ*) and an aquatic Warbler (*Sylviidæ*).

(2.) *The Guinean Subregion* is the next to be treated, and occupies what is commonly spoken of as the "West Coast" of Africa, extending from Sierra Leone to the south of Congo, while its breadth is a matter of the greatest uncertainty. Hitherto no catalogue even of its birds has been published, for the work of Dr Hartlaub<sup>1</sup> comprehends also those of the Gambian province of the Libyan Subregion, while, admirably executed as it was at the time of its appearance, so much has since been done by collectors in this part of Africa, and by those who in Europe have examined their collections (especially Professor Barboza du Bocage and Mr Sharpe), that its results must be regarded as out of date. Yet no good, and much harm, would follow from any attempt to generalize on the facts thus recorded, at various times and in various publications, except it were made by one especially acquainted with African ornithology; and we must therefore, perforce, leave the continental portion of this Subregion without trying to exhibit its particular characteristics. Respecting the islands belonging to it, however, somewhat may be advanced with more confidence. The chief of these are four in number—Fernando Po, Prince's Island, that of St Thomas, and Annobon. The first, lying in the Bight of Biafra, was once believed to possess a very peculiar avifauna; but one by one, all, or nearly all, of the supposed peculiar species have been found on the mainland, until it seems likely to have none whatever. Prince's Island, situated outside the Bight, but still lying within the Gulf

<sup>1</sup> *System der Ornithologie West Africa's*. Bremen: 1857.

of Guinea, has been said to possess 1 peculiar genus, *Cuphopterus* (of perhaps uncertain affinity, though it has been referred to the *Timeliidæ*), comprising a single species; (but this has since been sent from the Gaboon) and 6 other species—1 each of *Dicaeida* and *Hirundinidæ*, and 2 of *Ploceidæ* and *Columbidæ* respectively. A curious assertion has been made with regard to this island, namely, that it is not inhabited by any Diurnal Bird-of-prey, all such being, it is said, driven off by the Grey Parrots (*Psittacus erithacus*) which there abound. The island of St Thomas, lying nearly or just under the equator, also has 6 peculiar species, belonging respectively to the *Turdidæ*, *Dicaeida*, *Oriolidæ*, *Ploceidæ*, *Columbidæ*, and *Strigidæ*; while another species of the family last mentioned is common to this and Prince's Island, but seems to be found nowhere else. Of Annobon we know nothing.

(3.) *The Caffrarian Subregion* has its inland boundaries as ill-defined as either of the preceding, yet its distinctive features are much more marked—a fact which is doubtless to some extent explained by so great a portion of it lying without the tropic. Though this part of Africa has perhaps received the closest attention from ornithologists, the several labours in various districts of the Subregion of Levaillant and Jules Verreaux, Andersson and Andrew Smith, Mr Layard and Mr Ayres, assisted at home by Sundevall and Mr Gurney, all require digesting before their bearings upon the subject of geographical distribution can be fully comprehended; and, as in the cases previously mentioned, the careful collation and comparison of different lists can only be usefully accomplished by one who has a special knowledge of the objects treated of by those writers, and any attempt to attain this end by an inexperienced would be dangerous. Only one island can be with certainty affiliated to this Subregion, and that is St Helena, where the indigenous Land-birds, if any there were, have probably been extirpated with most of its original and peculiar flora. Yet, curious as it may be, it seems to be a fact that this isolated spot possesses a peculiar Water-bird, albeit it is of a group which greatly affects dry places. This is a small Ringed Plover (*Egialitis sanctæ-helenæ*), and, though belonging to a genus the members of which are remarkable for very wide distribution, it is not known to have occurred off the island. Tristan da Cunha, commonly assigned to the Ethiopian Region, and therefore to this Subregion, seems, from reasons before stated, to have at least as much affinity to the Neotropical, and Ascension appears to have no indigenous Land-birds whatever, so that its appropriation must remain in doubt.

(4.) *The Mosambican Subregion* next follows, and its relations to the Abyssinian the numbers already quoted from Dr von Heuglin will have shewn, but these must be taken with caution, since the limits of the Subregion are so indefinite. Whether we should comprehend in it the whole of the country drained by the Zambesi and its tributaries seems to be very uncertain; but, judging from the collections he has received, Mr Sharpe is now inclined to think that this part has more affinity to South Africa. The general uniformity of distribution which obtains among the Birds of all the tropical portion of the Region, especially noticed by Dr Kirk in writing on those of Zambesia (*Ibis*, 1864, p. 307), requires much fuller geographical details than are at present available to entitle us to form any very decided opinion, though the in most respects excellent monograph of Drs Finsch and Hartlaub (see note at page 758) gives ample information as to the literature and descriptions of the 448 species which, according to those learned authors, constitute its avifauna, and no attempt can possibly be made to subdivide the Subregion into provinces. Lying off its coast are three considerable islands—Pemba, Zanzibar, and Monfia, but as yet there is no reason



to expect that they have any very important bearing from a zoogeographical point of view. Zanzibar is the best known, and that seems to have a few species peculiar to it—for instance, *Laniarius salimæ*, *L. orientalis*, and *Franco-linus kirki*,—but further investigation may prove that some of them also occur on the mainland.

(5.) *The Madagascarian Subregion* remains for consideration, and this from its insularity is obviously well defined, while a good deal of attention has been paid to its remarkable peculiarities. Indeed, except New Zealand, it may be safely deemed the most peculiar Subregion on the earth's surface, while from the richness and multifariousness of its animal and especially of its ornithic population, New Zealand cannot for a moment be compared with it. Its principal subdivision, Madagascar itself, once possessed in the extinct gigantic bird *epyornis* a form of *Ratite*, not less singular than the Ostrich or the Moa, and though some writers would fain see in the remains of this marvellous creature a realization of Oriental fables respecting the Roc, not a vestige has been recovered which can be declared to belong to any period to which history or even legend can reach, and Arabian tales are not corroborated by the hypothesis of Professor Bianconi, while they are virtually contradicted by the researches at home of M. Alphonse Milne-Edwards, and Herr von Nathusius, and of M. Grandidier abroad. Three also of the satellite islands—Mauritius, Réunion (Bourbon), and Rodriguez—possessed brevipennate Birds totally dissimilar from but hardly less singular than the *epyornis*; and here the Dodo and its kindred, together with other Birds now extirpated, flourished peacefully till they felt the power of man and his agencies. But brief particulars of these extinct forms have already been given (pp. 732, 733), and we must now restrict ourselves to the consideration of those which survive.

This Subregion is easily divided into two provinces—Madagascar and the Mascarene Islands; but then it becomes a question whether the Comoros should not be considered to form a third, and also how the Seychelles should be treated. Not without scruples we propose to refer the latter to the Mascarene province as an outlying group, and to regard the former in the same light in reference to the Malagash province or Madagascar proper.

Long studied as the Birds of Madagascar have been, hardly a year now passes without some new form being added to its list; and what is especially remarkable is that a very large proportion of the additions are not merely new species of genera previously known, but are the types of undeniably good and new genera, while it would seem also as if many of these had a very limited range in the island, for every fresh district visited by a collector is almost sure to produce something which neither he nor his predecessors have met with in other parts, though the actual distance between the localities may be inconsiderable. The number of genera of Land-birds amounts to nearly 100, and of them almost one-half are peculiar to the Subregion; by far the greatest number of them belonging to the Order *Passeres*, though the *Picariæ* are also well represented by peculiar genera, and the *Psittaci* and *Columbæ* possess to a certain extent the same characteristics. Many of the genera belonging to the two Orders first named can be but with difficulty referred to any family existing elsewhere, but for fear of exaggerating the singular character of the Subregion we prefer regarding two only of these families as absolutely peculiar. These are *Leptosomidæ* and *Eurycerotidæ*, the single genus and species constituting each of which it seems impossible to place with any other family. Almost the same may be said of the genera *Brachypteracias*, *Geobiastes*, and *Atelornis*, which may perhaps be linked in one group, though to what family it should be attached seems very doubtful; and there is

*Phleppitta* so isolated that by one author it is referred to the *Turdidæ*, by another to the *Paradisidæ*, and by a third to the *Pittidæ*, the probability being that each assignation is wide of the mark. But the avifauna of Madagascar is not entirely composed of such singularities as these. We have homely genera, even among the *Passeres*, occurring there, such as *Acrocephalus*, *Motacilla*, *Pratincola*, and *Alauda*, while a *Cisticola*, which, though it has received a distinct trivial name, is undistinguishable from the well-known Fantail-Warbler (*C. schœnicola*) of southern Europe, Africa, and India, has long been known as an inhabitant of Madagascar. But there are also species, though not Passerine, which are absolutely identical with those of Britain—*Aluco flammeus*, *Coturnix communis*, *Porzana pygmaea*, and *Podiceps minor*—all of them common in the island. The number of species of Birds hitherto found in Madagascar cannot be safely put at less than 200, of which 120 are Land-birds, and of these latter fully 100 are peculiar. The Comoros, so far as they have been explored, have yielded more than 20 Land-birds, of which 12 at least are peculiar, the remainder being common to Madagascar; but, no doubt, throughout every part of the Malagash province there is room for further discoveries.

The principal islands of the Mascarene province have had their original fauna so largely destroyed by colonization, as has just been stated, that we are hardly in a condition to judge its peculiarities accurately. Mauritius and Réunion, lying within sight of each other, and possessing about the same number of existing species, seem not to have more than 3 in common. There is 1 genus (*Oxyotus*) belonging to the *Campephagidæ* which is peculiar to these two islands, and represented in each by a distinct species. Réunion also had within the memory of men yet living a peculiar genus of *Sturnidæ*—*Fregilupus*. Rodriguez is now known to possess only 4 species of Land-birds natural to it; and of these 3 are peculiar, 1 being the Parrakeet before mentioned as on the verge of extinction, and another an aberrant form of *Drymœca*, pointing possibly to a common origin with certain Indian species.<sup>1</sup> The Land-birds of the Seychelles which have not been introduced are 14 in number, and of these 12, according to Mr Edward Newton (*Ibis*, 1867, p. 359), are peculiar; but there is no good genus which can be so termed. Finally, we may mention that the small island of Aldabra has a Dove which has been described as a distinct species, and that of St Denis a Water-hen which probably merits the same remark. Taken as a whole, we cannot but be struck with the force of the evidence as to the land-connection which must once have existed—though not necessarily all at once—between the various units forming the whole Subregion. Even the scanty remnant that is left enables one to see how the denizens of its most distant quarters represent one another, a clear token of their long-continued isolation and the working of a differentiating power. But this is no place to pursue theories.

#### VI. THE INDIAN REGION<sup>2</sup> completes our survey of the

<sup>1</sup> This same leaning towards India is also indicated by the genus *Hyppipetes*, one of the *Turdidæ*, all the members of which, save 4, belong to the Indian region, and these four are peculiar respectively to Madagascar, Réunion, Mauritius, and the Seychelles, and it would be easy to cite similar cases of isolated Birds of either the Indian or Ethiopian Region which have their nearest relatives natives of the other.

<sup>2</sup> It must be mentioned that objection has frequently, and not without show of reason, been taken to the name "Indian" applied to this Region; and, except for the awkwardness of the title, we must admit that "Indo-Malayan" would have most likely been found a more expressive and suitable epithet, since what we commonly mean by "India" forms but a small and perhaps not the most characteristic portion. Mr Wallace proposes to use the name "Oriental," against which it may be not unreasonably urged that it errs on the side of vagueness, just as "Indian" does on the side of particularity. On the

globe; and its boundaries, so far as they can be defined, have been already sketched out when treating of the adjoining areas. Large as is its extent, and greatly varied as are its physical features, it would seem to have but 2 peculiar families of Birds (*Phyllornithidæ* and *Eurylamidæ*) out of upwards of 70 which occur within its limits. There is peculiar difficulty in determining the zoological Subregions and provinces into which this Region should be separated. While the fauna of some districts, or even larger portions, has been studied so that we possess a knowledge of them almost as full as of any country in the world, Europe and the tracts of other Regions settled by Europeans alone excepted, the greater part is not much better known zoologically than is the centre of Africa. Yet we cannot treat the Indian Region with the same audacity of ignorance that we did the Ethiopian, drawing our boundaries here and there in a manner which the experience of a few more years will very likely prove to be exceedingly wide of the mark, for our acquaintance with the Region now under consideration is such as to convince us that throughout its whole extent there are districts, large or small, which have an unmistakable affinity to one another, and yet appear to be cut off from all communication with their neighbours. True it is that we may readily account for this on the ground that the similarity to be observed is due to corresponding elevation above the sea-level, and that throughout the whole Region the hill-countries are, as a rule, disconnected; but such an explanation does not make our task the easier, and we are filled with the consciousness that we cannot map out the Indian Region according to the method we have hitherto followed. We find the characteristics of the Himalayan avifauna shewing themselves not only on the highlands of Southern India and Ceylon, but far away to the eastward also, as in Formosa, Hainan, and Cochin China, and again repeated in a lesser but still perceptible degree to the southward in the mountain ranges of Malacca and Sumatra. This then being the case, we think it better to follow in the main the scheme adopted by Mr Elwes, to whose essay on the geographical distribution of Asiatic Birds we have before referred (page 754). Right or wrong in his results, he has the merit of having arrived at them, as he tells us, contrary to a certain bias which he had entertained at the beginning of his investigations, and these are marked by uncommon care and a diligent study of all the means of information at that time available to him. Mr Elwes would establish three Subregions—the "Himalayan" "or Himalo-Chinese," the "Indian" (proper), and the "Malayan."

(1.) *The Himalo-Chinese Subregion*, according to his view, includes all the middle slopes of the Himalayan range, from an elevation of about 3000 to 12,000 feet, and, beginning with Cashmere, extends through Nepal, Bhotan, the highlands of Assam, and thence, marching with the as yet undetermined frontier of the Palearctic Region, to the sea-coast of China. To this Subregion belong the islands of Formosa and Hainan, and it not only includes a great part of China proper, but probably the whole of Cochin China and Siam, with the hill-country of Tennasserim and Burmah, merging into the Malayan Subregion somewhere about lat. 12° N. In its western part, he observes, it is merely a narrow border-land, in which the members of two very different faunas meet, and, being inhabited during some part of the year by nearly all the principal Palearctic genera, and those of the proper Indian Subregion, probably includes some of the richest portions of the world. Besides this, as already remarked, its influence is felt far to the southward, even in the islands of Ceylon and Sumatra.

whole, it seems as though "Indian," having been the distinguishing term first applied to this region, had better be retained.

From what has been said above as to the way in which some of the Subregions of the Indian Region are broken up, and this Subregion especially, it is useless to attempt any partitioning of them into true zoological provinces. We can only follow Mr Elwes in taking the various countries in succession, and stating what is known of them. Cashmere is the first. Here there seems to be 171 Land-birds, referable to 116 genera; of the latter, 34 have a wide range, 32 are characteristic of the Palearctic Region, 29 of the Indian, and 21 peculiar to or characteristic of the Himalo-Chinese Subregion. There is only 1 species peculiar to the country—a very normal Bullfinch (*Pyrrhula*) belonging to *Fringillidæ*. *Cephalopyrus*, an aberrant Titmouse (*Paridæ*), and once thought to be a peculiar genus, extends eastward so far as Simla. Of the species 70 seem to be peculiar to the Himalayan district, and 30 are common to the Palearctic Region.

Nepal is the next country of which we know enough to Nepal. give any satisfactory account; and, indeed, thanks to Mr Hodgson's labours in years gone by, our knowledge of its zoology is very tolerably complete, though of late years little has been added to it. Its rich avifauna is said to consist of 553 species of Land-birds, belonging to 294 genera; of the latter, 62 are of wide range, 30 characteristic of the Palearctic, and 122 of the Indian Region, while 80 are peculiar to, or characteristic of, the Himalaya. Of the species there are 330 peculiar to the Himalayan district, and 60 common to the Palearctic Region.

The small state of Sikkim seems to be richer still. Ex-Sikkim, including the *Accipitres* there are here found 423 species of Land-birds, of which 270 do not occur out of the Himalaya, except as migrants or stragglers. Of these, 63 belong to genera of wide range, 60 more are of Palearctic distribution, and 154 are nearly peculiar to the Indian Region, while 146 are peculiar to, or characteristic of, the Himalo-Chinese Subregion. Passing to Assam, the hills to the north and east of which, however, are very little known, its ornithic character seems greatly to resemble that of Sikkim; but we have from its southern boundary a few genera which are not actually found in the Himalaya, such as *Anthreptes*, *Turdinus*, and *Rhytoceros*, belonging respectively to *Nectariniidæ*, *Timeliidæ*, and *Bucerotidæ*, while we are acquainted with only 16 species which are not found also in Sikkim, and of these one-half are Burmese.

Burmah must be taken next, though a district intervenes, Burmah, of which we are quite ignorant, and this country, its high-lands especially, requires much more exploration, but the valley of the Irrawadi, Aracan, and Pegu are very fairly known. Of 373 species of Land-birds, 97 are common to India, and the rest to the Malay peninsula. 193 more are found in India, and 27 in the peninsula alone, while 46 are peculiar to Burmah or to Burmah and Tennasserim. In Tennasserim, taking it to extend from Martaban to the isthmus of Krau, we have 313 species of Land-birds, 93 being common to India and the rest of the peninsula, 117 more being found in India, and 56 in the peninsula alone, while 47 are peculiar to Tennasserim or to Tennasserim and Burmah. This country is especially rich in species of the peculiarly Indian family *Eurylamidæ*, possessing a majority of the known forms.

Lying in the Bay of Bengal are two remarkable groups of islands—the Andamans and the Nicobars—which the authority we are following would, from the similarity of their avifauna to that of Pegu, include in this Subregion. Lord Walden, however, thinks (*Ibis*, 1873, p. 297) the former have a greater affinity to the highlands of India south of the Himalaya and west of the Brahmopootra, and Mr Hume (*Stray Feathers*, ii. p. 136) considers both groups to form an outlying bit of the proper Indian Subregion on which many foreign intruders have established



hemselves. It is certain that many genera, or even families, which are common in Burmah are wanting in the Andamans, such as the *Timeliidae*, *Pittidae*, *Eurylaimidae*, and *Bucerotidae*, though a peculiar form of the last occurs on Narcondam, an island between the Andamans and Burmah, and there is an extreme paucity of several other families. Still the Andamans possess an avifauna of some 155 species, 17 of which (all Land-birds) are peculiar. The precise number of species found in the Nicobars is not explicitly stated by Mr Hume, but he gives 10 as peculiar to that group, which is inhabited by two very noteworthy forms—*Calomas*, a very remarkable genus of *Columbidae*, widely spread throughout the Malayan archipelago, and a species of *Megapodius*, belonging to one of the most characteristic families of the Australian Region. The presence of these two forms would almost incline one to remove the Nicobars from the Subregion to which they have generally been assigned, and refer them rather to the Malayan Subregion.

It is now necessary to retrace our steps northward and notice China;<sup>1</sup> but this is a branch of the subject on which it is as yet impossible to form an opinion. The chief authority on Chinese ornithology is unquestionably Mr Swinhoe, who has for so long a time laboured in various parts of that country equally as a public servant and a naturalist; but the results of his multitudinous contributions to our knowledge of its avifauna have never yet been tabulated, and probably their author is alone competent to perform this task without running into errors that would be disastrous in their consequences. In his latest catalogue of the Birds of China,<sup>2</sup> he enumerates 675 species as found in that country and its islands; but valuable and carefully-drawn up as this list is, it is impossible to eliminate therefrom the species not strictly belonging to that part of the Celestial Empire which lies within our present bounds; or even were this possible, an intimate acquaintance with its ornithology would be required to separate the birds-of-passage from the residents, and still more to classify them according to their several Orders and families. Add to this, that assiduously as Mr Swinhoe has himself worked in the field, and diligently as he has availed himself of such information as he could obtain from other trustworthy observers, only the outskirts of this great territory have, with few exceptions, been examined. Much is it to be hoped that he will be able in due time to bring forth the ripe fruit of his labours, but meanwhile the attempt to elucidate the peculiarities of the avifauna of China proper, that is, south at least of the Yangtze-kiang and of Cochin China, would be vain if not misleading.

The two principal islands lying off the Chinese coast, however, are in a different condition. One of them has been extremely and the other tolerably well ransacked by Mr Swinhoe. In Formosa he has found 144 species, referable to 102 genera, of which 98 are found in the Himalayan Subregion, and 70 in the Malayan. The species may be thus assorted:—74 belong to wide-ranging genera, 47 to genera common to the Himalayan and Malayan Subregions, 18 are peculiar to, or characteristic of, the former Subregion, and 5 to China itself; 18 are not found in the Malayan Subregion, and no less than 34 are peculiar to the island. For Hainan Mr Swinhoe has enumerated 130 species belonging to 96 genera, of which latter 86 are common to the Malayan Subregion, and 93 to the Himalayan. Of the species 54 belong to wide-ranging genera, 59 to genera characteristic of the Indian

<sup>1</sup> Of China proper Mr Elwes says little, but he includes Eastern Tibet in this Subregion. The present writer, however, is disposed to refer that, or at any rate the scene of Père David's discoveries, to the Palearctic Region.

<sup>2</sup> *Proc. Zool. Soc.* 1871, pp. 337-343.

and 16 of the Palearctic Region, while 16 are believed to be peculiar to the island.

(2.) *The Indian Subregion*, still following Mr Elwes, is India, the next to be considered. This consists of the remainder of the peninsula of India lying to the south and west of the last, as well as of the island of Ceylon. Its partition into provinces has been several times attempted, and doubtless the method proposed by Mr Blanford, when treating of the geographical distribution of Indian Reptiles,<sup>3</sup> is one of the most reasonable, but even this may perhaps be premature,<sup>4</sup> and here it seems preferable to abstain from doing more than consider, so far as materials are available, the avifauna of the various districts of which it is composed—the more so since the extraordinary impulse given to the study of ornithology in India by the publication of the late Dr Jerdon's work<sup>5</sup> will doubtless in a few years place the whole subject in a very different light, for the number of Indian ornithologists is grown so considerable that that country has now a journal especially devoted to the record of their observations.

Beginning in the north-west with the Punjab, we have, as yet no complete list of the Birds of this most important district, and we can only infer that we shall here find the Malayan influence at its least, and the Palearctic at its greatest; but descending the Indus to Sindh we have a discursive account of its ornithology by Mr Hume,<sup>6</sup> from which Mr Elwes gives the following results:—of 150 species observed, 41 are peculiarly desert-forms, and as such either very nearly allied to or identical with the like forms of the Palearctic and Ethiopian Regions; 40 are peculiar to the Indian Subregion, 8 are common to the Malayan, 4 to the non-desert portions of the Ethiopian, and 12 to the similar parts of the Palearctic Region, while 45 do not come under any of these heads. Omitting the desert-forms as not leading to any just conclusion, it would appear that Sindh has less affinity to the Ethiopian Region than to the Palearctic, that is to say, to its Mediterranean Subregion. The very remarkable district of Cutch yielded 115 Land-birds to Stoliczka,<sup>7</sup> and these were mostly migrants or common Indian species of wide range.

Of Rajpootana and Central India we know very little, but near Goona, about 200 miles to the south of Agra, Dr King some years since observed 116 species of Land-birds;<sup>8</sup> and more lately Mr Adam has noticed 171 species of Land-birds around the Sambhur Lake in its western portion.<sup>9</sup>

We must next turn eastward to Oudh, wherein Col. Irby (*Ibis*, 1861, p. 217) obtained 108 species of Land-birds, but of these 23 were found only on the hills of Kumaon. There seems to be a remarkable absence of many of the most widely-spread genera of the Region, and many forms generally common to Africa are also wanting; but no doubt Mr Brooks, who has of late industriously investigated this portion of the country, will be able to supply some of these unaccountable deficiencies.

We may judge of what are politically known as the "Central Provinces" of India, as well as of Bundelcund, Malwa, and Chota Nagpore, forming the "Gangetic" sub-province of Mr Blanford, from observations made by that gentleman and Colonel M'Master,<sup>10</sup> wherein 190 species of Land-birds are enumerated, of which 38 have a very wide range, 57 belong to widely-ranging genera but are almost

<sup>3</sup> *Journal of the Asiatic Society of Bengal*, 1870, pp. 335-376.

<sup>4</sup> Compare Dr Günther's remarks, *Zoological Record*, vii. p. 67.

<sup>5</sup> *The Birds of India*. Calcutta: 1862-64.

<sup>6</sup> *Stray Feathers*, i. pp. 44-49, 91-289, 419-421.

<sup>7</sup> *Journal of the Asiatic Society of Bengal*, 1872, pp. 211-258.

<sup>8</sup> *Op. cit.* 1868, pp. 208-218.

<sup>9</sup> *Stray Feathers*, i. pp. 361-404.

<sup>10</sup> *Ibis*, 1867, p. 461; *Proc. As. Soc. Beng.* 1869, p. 104; *Journ. As. Soc. Beng.* 1871, pp. 207-216.

confined to India, 37 to genera common to tropical Africa and India, 8 to genera of Ethiopian type, and 53 to purely Indian genera.

Pursuing our way southward we come to the Deccan or table-land of India, and our information respecting its ornithology chiefly rests on the catalogue given by Sykes many years ago,<sup>1</sup> which only contains about 150 species of Land-birds, of which about 105 belong to genera common to the Himalayan and Malayan Subregions, 27 to Himalayan but not Malayan genera, 30 to genera having Ethiopian or Palearctic affinity, and the rest to widely-ranging genera or to genera peculiar to the Indian Subregion.

The avifauna of Southern India seems to be small relatively to the extent and variety of the country, and most of its peculiar species are said to have a considerable range of latitude, though some, which are restricted to the highest hills, are only found to the southward of lat. 12° N., where several mountain-ranges reach the height of 8000 feet. No single comprehensive list of the Birds of this part of India seems lately to have been put together, and Mr Elwes gives us no statistics as the result of his investigations whereby we may compare its ornithic products with those of other districts.

Ceylon has profited by the residence of several competent naturalists—especially Mr Layard and Mr Holdsworth, and taking also its isolation into account, we are in a position to speak of this island with greater certainty than of the preceding portions of the Subregion. The latter of these gentlemen gives a list<sup>2</sup> numbering 323 species, of which 224 are Land-birds, and an analysis shews that, though 37 species are peculiar, only 4 belong to genera not found in Southern India, 22 belong to genera inhabiting the Himalaya but not the Malayan Subregion, and only 6 to Malayan but not Himalayan genera, while 14 are members of genera only found in India.

(3.) *The Malayan Subregion* is the last of which we have to treat, and we have already hinted that it possibly has a connection with the Indian through the Nicobar Islands, but of course the most intimate communication between the two exists on the mainland. The birds of its continental portion, the Malay Peninsula, have never formed the subject of a separate memoir, and to compile a complete list of them at present is a task which a more competent author has found impossible. Stoliczka has given us a catalogue<sup>3</sup> of 95 species obtained in the Wellesley Province, lying opposite to Penang, and numerous species have been constantly described by various authors as coming from Malacca or Singapore, which in most cases probably means that the specimens have been purchased at one of those places. To enter into any details with respect to the Malay Peninsula, therefore, would here be impossible, but the case is different as regards the islands which form the greater part of the Subregion.

The Philippines, for more than a century, have supplied European ornithologists with materials of study, yet it is little more than ten years ago that any attempt to compile a complete list of their Birds was made, and that list, by Dr von Martens,<sup>4</sup> was manifestly imperfect. It is only since the present article has begun that a satisfactory account of their avifauna has appeared. This is the work of Lord Walden,<sup>5</sup> and we here avail ourselves of the results which he has so ably set forth. He enumerates 219 species, of which 150 are Land-birds; but in consequence

<sup>1</sup> *Proc. Zool. Soc.* 1832, pp. 77, 149.

<sup>2</sup> *Op. cit.*, 1872, pp. 404-483.

<sup>3</sup> *Journ. As. Soc. Beng.* 1870, pp. 277-334. This, however, must not be read without referring to Lord Walden's remarks on it (*Ibis*, 1871, pp. 158-177).

<sup>4</sup> *Journal für Ornithologie*, 1866, pp. 5-31.

<sup>5</sup> *Transactions of the Zoological Society*, ix. pp. 125-252.

of the caution he has exercised, it is most probable that this number is really too small. Of these, 106 species are peculiar to the archipelago—96 of them being Land-birds. There is no species, he remarks, which is common to the Philippines and the neighbouring island of Celebes which does not also possess a more extended range, and there is only one genus—*Prioniturus*, a very singular form of *Psittaci*—common to both and yet found nowhere else. The genera peculiar to the group are 11 in number—*Pseudolalage*, belonging to *Campephagidae*, *Zocephus* to *Muscicapidae*, *Rhabdornis* to *Certhiidae*, *Sarcops* to *Sturnidae*, *Penelopides* to *Bucerotidae*, *Dasylophus* and *Lepidogrammus* to *Cuculidae*, *Pseudopteryx* to *Strigidae*, *Phabotreron* and *Ptilocolpa* to *Columbidae*, and *Amawornis* to *Rallidae*. There is also only 1 species common to one of the Philippines—the island of Negros—and to one other island. This is *Xantholema rosea*, which is also found in Java, and seems to be the representative of the widely-spread *X. hematocephala*, which ranges over India, Malacca, and Sumatra, but is not found either in Java or Negros. It will thus be seen that the amount of peculiarity exhibited by the avifauna of the Philippines is very great, but it must be observed that hardly anything is as yet known of Palawan or the Sooloo cluster—lands which connect the Philippines with Borneo.

Borneo is the next island to which our attention should be directed, and this magnificent country, large enough as Mr Wallace has remarked for the whole of the United Kingdom to be set down in its midst and hidden, has lately had its avifauna carefully investigated by Dr Salvadori, the result of whose labours was published in 1874.<sup>6</sup> The following may be given as a summary of them. There are 392 species, of which 325 are Land-birds, 27 belonging to the Order *Accipitres*, 4 to *Psittaci*, 99 to *Picariae*, 172 to *Passeris*, 14 to *Columbae*, and 9 to *Gallinae*. Yet there are only 3 unquestionably peculiar genera<sup>7</sup>—*Pityriasis*, a most singular form, doubtfully referred to *Laniidae*, *Schwaneid* belonging to *Muscicapidae*, and *Heterococeyx* to *Cuculidae*. There are 58 or 59 peculiar species, all but 1 Land-birds, and at least 25, or perhaps as many as 32, which have no representatives elsewhere. Of Land-birds Borneo has, in common with Malacca and Sumatra, 226 species; in common with Java, 149; with the Philippines, 25; with the Indian Subregion, 53; with China, 72; and with Celebes, 28. A species of *Megapodius* (*M. cumingi*) is found in Borneo and also in the Philippines,<sup>8</sup> and its presence in both, like that of a member of the same genus in the Nicobars already noticed, is a very remarkable fact.

The comparatively little-known island of Banca, lying between Borneo and Sumatra, produces 2 peculiar species of *Pittidae*, the one representing a species which inhabits the whole Subregion and extends to China and Siam, the other allied to two species, the first ranging from Nepal to Malacca, and the second inhabiting the Philippines, Borneo, and Sumatra.<sup>9</sup>

Sumatra must be considered next, or perhaps it ought to have been taken after Malacca, from which it is divided by so narrow a channel. The greater part of this island, its northern half especially, is unknown, and not more than 240 species can be assigned to it, of which about 20 appear to be peculiar. Its avifauna is much allied to that

<sup>6</sup> *Annali del Museo Civico di Storia Naturale di Genova*, v. pp. 1-430.

<sup>7</sup> A reputed fourth, *Anais*, referred to *Artamisa*, is suspected to be founded on a manufactured specimen! *Lobiophasis*, since established by Mr Sharpe (*Ann. and Mag. Nat. Hist.* Ser. 4, xiv. p. 373), and belonging to *Phasianidae*, probably makes another.

<sup>8</sup> Mr Sharpe, however, considers the species distinct (*Proc. Zool. Soc.* 1875, p. 111).

<sup>9</sup> But on this point compare Mr Hume's remark (*Stray Feathers*, ii. p. 475).