

The areas in the above table are calculated on the assumption that both shell and foot are ellipses, which is fairly near the truth. I need hardly point out that the old theory of atmospheric pressure will not account for these figures, and in the case of *Patella* the mucus is too thin to have much cohesion. Perhaps some of your readers can throw light on the subject.
29 St. James's Street, Jersey. PERCY A. AUBIN.

On the Variation of Latitude.

IN connection with the interesting investigations of Dr. Chandler on the variation of latitude, permit me to suggest the desirability of calling attention to Maxwell's remarks on the same subject at the conclusion of his paper "On a Dynamical Top," Ed. Phil. Trans., xxi., Part iv. p. 568 (read April 1857).

Maxwell, taking the value of $\frac{C}{A}$ as 1'00309, as deduced from the amount of precession (Pontécoulant, ii. 268), finds the time of revolution of the pole of the earth about the true pole to be about 325'6 solar days. Dr. Chandler's period of 427 days would on the same principles correspond to the value $\frac{C}{A} = 1'00235$.

ROBT. B. HAYWARD.

Fairlight, Harrow, February 28.

ORNITHOLOGY OF THE SANDWICH ISLES.

THE departure for Honolulu of Mr. Robert C. L. Perkins (as already announced in these pages), the gentleman sent out by the Joint Committee appointed by the Royal Society and by the British Association to investigate the zoology of the Sandwich Islands, may render the present moment opportune for noticing what has already been done towards obtaining a knowledge of their presumably expiring Fauna, though I can only lay claim to acquaintance with a single Class of it—the Birds. Yet students of that important branch of Biology which is known by the clumsy and not strictly accurate title of the "Geographical Distribution of Animals," will bear in mind that the first successful attempt to grapple with and elucidate it was based upon this very Class; and, furthermore, that by far the most comprehensive work on the subject has proceeded from the pen of a most proficient ornithologist, while nobody can doubt that but for his intimate knowledge of Ornithology many of his results would have been inconclusive if not unattainable. Into the reason why the most vagrant Class in creation was thus so serviceable to Mr. Sclater and to Mr. Wallace, there is no need here to enter. It is perhaps enough to state that indubitable fact to warrant the publication of the present remarks having reference to a small portion only of the Hawaiian Fauna; and, if they should furnish an indication of what may be proved when the rest comes to be better known, it will so much the more redound to the credit of Ornithology; while, should further acquaintance with other Classes contradict the inferences to be drawn from the Birds, the suspicion, to call it by no stronger name, at times expressed, that what is a good Law of Nature for one set of animals will not hold for another, may be justified.

Moreover, within the last six months has been published a very remarkable dissertation, "On the Structure of certain Hawaiian Birds, with reference to their Systematic Position," contributed by Dr. Gadow to Mr. Scott B. Wilson's beautifully illustrated "Birds of the Sandwich Islands." From its title, this essay might be supposed to interest only the taxonomer or the ornithotomist; and the zoologist of wider views might leave it unheeded as having a scope too limited for his purposes. The very contrary is the truth, and those who will follow the author's deductions to their logical end will perceive that his "Remarks" disclose a state of things which is not only subversive of the generally-received opinion as to the nature and affinities of the avifauna of the Sandwich

Islands, but is fraught with evidence of a kind hardly hitherto suspected in regard to the origin and derivation of the animal population of that group. Hints to this effect may, indeed, be gathered from Mr. Wallace's works, and especially from his "Island Life"; and that, with the few facts at his disposal, he was able to give them, is proof of the depth of his perception; but henceforth he will be able to speak boldly, and drop every uncertain phrase.

The dearth of facts with which Mr. Wallace had to contend, even in 1880, shows that the Sandwich Isles have not been fortunate in their Natural Historians, though perhaps no worse off in this respect than many another group "lying in dark purple spheres of sea." Discovered in 1778 by Cook, during the last of his celebrated voyages, his ships communicated with one of the more western islands—Atooi, as its name sounded to him and his companions, but since, and doubtless more correctly, written, Kauai. The admiration of the visitors was excited by the cloaks and helmets of the natives, beautifully bedecked with feathers, the more or less moth-eaten remains of which may yet be seen in many a Museum; and the scarlet birds which furnished the most brilliant adornment of these ingenious works of art were duly mentioned by Cook in his journal as published. After less than a fortnight's stay, in the course of which the existence of five islands was made out, his ships stood off to the northward to prosecute their voyage of discovery. Towards the end of the year they returned, and Cook, having had experience of the hospitable treatment of the islanders, designed to make his winter-quarters in the Sandwich Isles, as he had named them, after the then First Lord of the Admiralty; but, keeping more to windward, the first land he made was the most eastern of the group, one that he had not even seen on his first visit. This was the historic Owhyhee—nowadays written Hawaii—which, being the largest of them, and that which produced the warrior-king and statesman who eventually subdued all the rest, has given its official name to the Archipelago.

Though Owhyhee was sighted on November 29, Cook's course along its eastern and southern coast was so deliberate that it was not until January 17, 1779, that he found a safe anchorage, and that in Kealeakakua Bay, on its western side. What passed there during the next three weeks need not be here recorded, but those who know how to read his narrative and the accounts since divulged from native sources will admit that it throws an important and yet most lurid light on the history of superstition. To the unprejudiced it must be doubtful whether even now the whole truth is or ever can be known. The ships sailed on February 4; but in making her way to the northward, the *Resolution* sprung her mainmast, and within a week returned to her old anchorage. Three days later occurred the terrible tragedy which deprived the world of one of its greatest seamen. A week after Cook's death, the ships sailed to the westward, touching at some of the intermediate islands—Mowee (Maui), Lanai, and Morotai (Molokai), making once more for Atooi (Kauai) and Oneehow (Niihau), the last famous for its yams. Then, on March 15, they bore away again to the northward, and did not return.

Now, the object of giving here these details is to show that the natural history specimens obtained by Cook's ships were procured only on the islands of Hawaii, Kauai, and Niihau. This is the more needful because the first descriptions of any of the birds of the Sandwich Isles were given, with two exceptions, by Latham in his "General Synopsis of Birds," published in 1781-85, and most of the specimens so described no longer exist. Some were in the British Museum or the collection of Sir Joseph Banks, afterwards transferred thereto; the rest were in the Leverian Museum. Of the former, as is

well known, not one remains; but fortunately, at the breaking up of the last in 1806, a few were bought by the then Lord Stanley, who (dying in 1851, as thirteenth Earl of Derby, and President of the Zoological Society) bequeathed his collection to the borough of Liverpool, and there, thanks to the care that has been taken of them, they still exist in fair condition. A few more were bought for the private collection of the then Emperor of Austria, and are still carefully preserved in the Museum of Vienna. Of several of the species it is not known that any other specimens were brought to Europe until some three years ago. On both of Cook's previous voyages qualified naturalists had been sent; but, as is known, the arrangements for publishing their discoveries were so imperfect that little credit followed to anyone concerned. On this, his third and last voyage, there was no expert, though Mr. William Ellis, who in an irregularly published narrative, calls himself "Assistant Surgeon to both vessels," was somewhat of a draughtsman, and made a series of sketches, which, becoming the property of Banks, subsequently passed to the British Museum. The commoner species of Sandwich-Island birds are generally recognizable, but others are so unhappily limned that even the word caricature (which always implies some likeness) seems too strong to apply to them. Nevertheless, Mr. G. R. Gray adventured to determine all of them.

More than a quarter of a century passed before any further progress was made in the knowledge of the zoology of the Sandwich Isles, though they were visited by numerous ships, and in 1794 were ceded to Britain under Vancouver. In 1814 an attempt was made to seize them for Russia; and Kotzebue, whose voyage has so much scientific interest, was there in 1816-17, but the accomplished naturalists, Chamisso and Eschscholtz, who were with him, took little heed of the fauna of the islands.¹ The year 1822 saw the arrival of the more celebrated William Ellis, whose missionary labours throughout the Pacific and in Madagascar are so widely known. The Sandwich Isles had by that time fallen under the sway of the conquering Kamehameha I., whose son and successor, desirous of seeing European civilization, arrived in England in 1824 with his wife—both to die of measles within a few weeks. The British Government determined to send their remains for interment in Honolulu, by that time become the capital of the islands, and accordingly H.M.S. *Blonde*, commanded by George Anson seventh Lord Byron (first cousin and successor to the poet), was commissioned to convey the dismal freight. The duty was performed, and the islands again were ceded to the British Crown, but again declined. On board the *Blonde* sailed as chaplain Mr. Rowland Bloxam, together with his brother Andrew, who was somewhat of a naturalist, and it was intended that the published account of her voyage should contain a proper appendix on the natural history of the islands. An "Appendix" there indeed is, but one utterly unworthy of its reputed author, for the book was edited by a lady (as I have been informed) who had nothing but a few of his notes to guide her, and though assisted, as it is stated, by "the gentlemen connected with that department in the British Museum," is a disgrace to all concerned, since, so far from advancing the knowledge of the subject, it introduced so much confusion as to mislead many subsequent writers.² Some years later another great opportunity was missed, and this time by the American traveller Townsend, who, after crossing the Rocky Mountains to the Columbia River, sailed, in company with Nuttall, the well-known naturalist, for the Sandwich Islands, where they arrived in January 1836, and stayed nearly

three months, visiting Oahu and Kauai. Returning at the end of the year, Townsend found the Prussian naturalist Deppe at Honolulu, and with him passed some time in the pursuit of natural history, visiting most of the windward islands before he left in March 1837. Among the specimens obtained by Deppe for the Berlin Museum were some of two species for which Lichtenstein rightly established a new genus—the singular form *Hemignathus*—and, as it has since proved, both these species were new, though he had, not unnaturally, identified one of them with a species described by Latham. Of Townsend's collection, a considerable part was given to the Academy of Natural Sciences at Philadelphia,³ where it still remains; but he sent several specimens to Audubon, at that time, I believe, in Edinburgh, and he parted with them to Carfrae, a dealer there, who sold them to the late Sir William Jardine, at the dispersal of whose collection I was so fortunate as to secure them—some of them bearing Townsend's label—for the Museum of this University. If Townsend had but published a list of his captures, he would indeed have rendered a very good service; but of course the value of island-forms, to say nothing of the fact that many of them were threatened with extirpation by colonization and civilization, had not then been appreciated, if even entertained, by naturalists. In the year of Townsend's departure, the French frigate *Vénus*, in the course of her troublous career under Du Petit-Thouars, arrived in the Sandwich Islands, with two naturalists, Léclancher and Nébox, on board; and some years later the atlas of plates illustrating the zoology of her voyage appeared; but the text was deferred for a long while, and, indeed, was not completed till 1856. Herein was figured and described, though not for the first time, a third species of the curious *Hemignathus*. In the meanwhile the celebrated expedition of Comodore Wilkes took place, and he, with some of his ships, wintered there. In the course of their six months' stay, the naturalists attached, Pickering and Peale, seem to have made large collections; and nearly all was lost in the shipwreck of the *Peacock*, one of the ships of the squadron. By 1848, Peale had completed his report on the specimens of Mammals and Birds collected, and it was printed off. A few copies only had been distributed, when the rest were destroyed by fire. It was by no means a bad performance; and I cannot understand why the late Mr. Cassin made so many changes in it when he, ten years later, brought out a new edition of it. Some of them (I speak only of those relating to the Sandwich Island fauna) were certainly not improvements. However, a distinctly forward step was made by the Peale-Cassin labours, and since few can obtain access to the original work, I may mention that Dr. Hartlaub considerably published an abstract of it,² just as two years later he did³ of the French "Voyage au Pôle Sud," wherein, having sorted out the different species observed by various voyagers on the several Pacific groups, he gave a useful list of those found on each, and thus he assigned to the Sandwich Isles thirty species of birds, marking two of them as doubtful. One of them is now known to be rightly included, but the other must be struck out, as well as, for one reason or another, four more—leaving a total of twenty-five, only sixteen of which are Land-birds and only fourteen *Passeres*.

Hitherto, no list of the birds of the Sandwich Isles had been published, so that Dr. Hartlaub's met a great want, though it had, of course, been possible, since 1814, for anyone to pick out for himself the species assigned to that group from the general list compiled by Tiedemann

¹ In mentioning these facts, I desire to record my deep gratitude to the authorities of both these Museums—Berlin and Philadelphia—for their obliging readiness in allowing me to have these valuable specimens, one of them unique, for examination.

² *Archiv für Naturgeschichte*, 1852, Hef. i. pp. 93-138.

³ *Journal für Ornithologie*, 1854, pp. 160-171.

¹ The same negative results attended his second visit in 1824-25.
² I have reason to believe that Mr. Bloxam's original notes are still in existence, though hitherto they have not been accessible to me. It is possible that they would remove uncertainty on several points.

("Anatomie und Naturgeschichte der Vögel," ii. pp. 426-436), and, in like manner, since 1859, from Mr. G. R. Gray's useful "Catalogue of the Birds of the Tropical Islands of the Pacific Ocean," printed by order of the Trustees of the British Museum, but the former was obsolete, and the latter, as we now know, very erroneous.¹ Mr. Gray's references show him to have been as usual a model of accuracy, but his judgment as an ornithologist was frequently at fault. It was, therefore, with great pleasure that, some time in the winter of 1870-71, I received a copy of a "Synopsis of the Birds hitherto described from the Hawaiian Islands," which had been communicated in February 1869 to the Boston Society of Natural History, by Mr. Dole, a resident in those islands, and had been published in the Society's Proceedings (xii. pp. 294-309); and Mr. Sclater, who I knew had long taken an interest in the ornithology of the group, lost no time in noticing this very important publication (*Ibis*, 1871, pp. 356-362), adding thereto some valuable observations.² This list has naturally proved a serviceable foundation for future work. Forty-eight species were included, the author stating that this number "probably comprises but little more than half the avifauna of the group." That the list should be free from error was not to be expected, and a revised version of it, published in the "Hawaiian Almanack and Annual for 1879" (pp. 41-58), corrected some of the mistakes; but it was an honest piece of work, doing credit to its compiler. In the meanwhile, however, the historic voyage of H.M.S. *Challenger* had commenced, and one of the places at which she was to call was the Sandwich Islands. Of course the main object of her voyage was the exploration of the depths of the sea. Nevertheless, the terrestrial zoology of the countries visited, though forming a very subordinate part of the original plan, was not to be wholly neglected—nor was it in this case, for, during the three weeks she stayed in Hawaiian waters (July 27 to August 19, 1875), her officers availed themselves to some extent of the opportunity of studying the ornithology of the islands, though it does not appear that they had received any special instruction in regard to our imperfect knowledge of it. Here, then, was another great chance lost; for had those who drew up the directions for the scientific members of the Expedition taken the trouble to acquaint themselves with the particular points on which investigation was needed, so as to indicate the lines on which further research was desirable, no doubt some one of the *Challenger's* staff would have supplied, even in the short time of her stay, some of the missing facts, or at least would have thrown some light on the subject. As it was, the collection was reported as "small" (24 bird-skins and no specimen in spirit), and "containing nothing absolutely new except a single species of *Anas*," afterwards named *A. wyvilliana*³ (Proc. Zool. Soc., 1878, p. 350). Something more, however, may yet be expected. The late Prof. Moseley, in his "Notes of a Naturalist on the *Challenger*," states (p. 514) that the last excursion on shore of his colleague, Von Willemö's Suhm, was at Hilo in Hawaii, with a native guide, "in pursuit of the interesting endemic birds," and that "almost the last notes he wrote were some on the Sandwich Islands, relating especially to the birds." These notes do not seem to have been placed at the disposal of

the ornithologists who described the specimens obtained by the *Challenger*; but they can hardly have been destroyed.

Having myself felt a good deal of interest in the avifauna of the Sandwich Isles—which, like that of many other islands throughout the world, was, as I had learnt, threatened with extirpation, chiefly in consequence of the destruction of the forests—I could not fail to be disappointed at the meagre results obtained by our people on this celebrated cruise, when it would have been so easy for them to have done better had their attention been duly called, and I cast about in several directions to find some suitable person to visit the islands with the view of investigating their ornithology in a thorough way. My young friend Mr. Scott Barchard Wilson (son of the well-known Mr. George Wilson, F.R.S.)—of whose taste for natural history I was well assured by his residence in my own College, by his journey to Portugal with Dr. Gadow, and by his subsequent sojourn in Switzerland (*Ibis*, 1887, pp. 130-150)—willingly took up the enterprise, and left Liverpool on February 24, 1887, for Honolulu, where he arrived on April 8, having on his way paid a visit to Washington to confer with Dr. Stejneger, whose name had already appeared in connexion with the birds of the Sandwich Isles. Mr. Wilson stayed in the islands until towards the close of the following year. He brought back such a collection as had never before been made there; but, rich as it was in some respects, defects became apparent as it was gradually worked out, and some of these defects are so grave that, until they are remedied, no complete list of the avifauna can be formed. I am deeply sorry that he has not been able to return; for, with his knowledge of what is wanted, it would be more easy for him to fill up the *lacuna* than anyone else; and I long hoped that he would pay a second visit with this object. However, he has done a great deal more than anybody before him: he has ascertained the precise localities of nearly all the birds hitherto known, and added to them not inconsiderably—fourteen new species or local forms of *Passeres*, two of which required generic acknowledgment—all, it needs not to say, being peculiar to the islands, and mostly to one particular island only. It can scarcely fail to be interesting that the distribution in the group of the different genera and local forms of *Passeres* should be shown, and this is best done by the accompanying table.¹

But Mr. Wilson was not content, as so many collectors in foreign countries are, with preserving only the skins of the birds he procured. He was careful to obtain specimens in spirit of all the important existing types; and these, having been properly subjected to examination by Dr. Gadow, have led to some remarkable results—the most remarkable that have been as yet made known in regard to the birds of the Sandwich Islands, and perhaps the most remarkable of those published during the past year in regard to Ornithology at large. They are contained in the dissertation I have already mentioned as being contributed by Dr. Gadow to Mr. Wilson's work. Most of the land-birds of the Sandwich Islands had been at one time thought to belong to the *Meliphagide*, or Honey-suckers—a Family very characteristic of the Australian Region, and known to be very polymorphic. It was thought to be still more so; and the surmise had been acted upon, so that some Finch looking birds, *Psittaciostrota* and *Loxioides* had been supposed to be Honey-suckers in disguise, and

¹ Many of its worst errors are doubtless due to the loss, before mentioned, of the type specimens, which had been suffered by the Museum long before Mr. G. R. Gray was connected with it. Latham, in 1822, had already lamented their decay. It is almost needless to add that such a loss is not now, nor for many years has been, possible.

² Mr. Sclater was pleased to remark that this "memoir" had "escaped" my notice as editor of *The Ibis*. Herein he was in error. It certainly did not come to my knowledge while I was discharging that duty, and I doubt whether any copy reached England until after I had laid down my office.

³ I do not venture to doubt the distinctness of this species, which had before been mentioned as *A. boscas*, var.; but its describer might have shown more clearly wherein it differs from the well-known American *A. obscura*, which seems its nearest ally.

¹ I have no desire to overlook the services of Mr. Valdemar Knudsen, of Kauai, who sent thence to the United States National Museum several collections, the most important of which was described by Dr. Stejneger in the Proceedings of that institution for 1887 (pp. 75-102), the year of Mr. Wilson's arrival in the islands. The Doctor's paper is of the exhaustive character to which one is accustomed in all his productions, and has been of considerable use in working out Mr. Wilson's collections, while these have enabled the latter to correct several mistakes—under the circumstances quite pardonable—made by the former, who subsequently described in the same Proceedings (xii. pp. 377-386) another collection from the same quarter.

classed accordingly. Dr. Gadow has shown that this supposition is wholly erroneous, and that these last, together with another form, *Chloridops*—one of Mr. Wilson's discoveries—are true *Fringillidæ*; while out of the whole Hawaiian avifauna, only two genera can be referred to the *Meliphagidæ*—namely, *Acrulocercus* (*Moho* of some writers) and *Chatoptila*, the last being presumably

Table showing the Distribution of Birds of the Order PASSERES in the Sandwich Islands.

	Niihau.	Kauai.	Oahu.	Molokai.	Lanai.	Kaho-lawe.	Mau.	Hawaii.
CORVIDÆ.								
<i>Corvus tropicus</i>								*
FRINGILLIDÆ—								
<i>Psittaciostira psittacea</i>		*		*	*			*
<i>Loxioides bailleui</i>								*
<i>Chloridops kona</i>								*
" <i>Fringilla</i> " <i>anna</i>							?	*
DREPANIDIDÆ—								
<i>Loxops coccinea</i>								*
" <i>flammea</i>					*			*
<i>Chrysonitridops cæruleirostris</i>								*
<i>Oreomyza bairdi</i>		*	*	*	*	*	*	*
<i>Himatione stejnegeri</i>		*	*	*	*	*	*	*
" <i>parva</i>		*	*	*	*	*	*	*
" <i>chloris</i>			*	*	*	*	*	*
" <i>maculata</i>			*	*	*	*	*	*
" <i>chloridoides</i>			*	*	*	*	*	*
" <i>montana</i>			*	*	*	*	*	*
" <i>kalaana</i>			*	*	*	*	*	*
" <i>sirens</i>			*	*	*	*	*	*
" <i>mana</i>			*	*	*	*	*	*
" <i>sanguinea</i>		*	*	*	*	*	*	*
" <i>doli</i>		*	*	*	*	*	*	*
<i>Vestiaria coccinea</i>		*	*	*	*	*	*	*
<i>Drepanis pacifica</i>								†
<i>Hemignathus procerus</i>		*	*	*	*	*	*	*
" <i>lichtensteini</i>			*	*	*	*	*	*
" <i>obscurus</i>			*	*	*	*	*	*
" <i>hanapepe</i>			*	*	*	*	*	*
" <i>lucidus</i>			*	*	*	*	*	*
" <i>olivaceus</i>			*	*	*	*	*	*
MELIPHAGIDÆ—								
<i>Acrulocercus braccatus</i>		*						*
" <i>apicalis</i>				?				*
" <i>nobilis</i>								*
<i>Chatoptila angustipluma</i>								†
TURDIDÆ (?)—								
<i>Phæornis myiadestina</i>		*						*
" <i>lanaiensis</i>				?	*			*
" <i>obscura</i>								*
MUSCICAPIDÆ—								
<i>Chasiempis</i> (quædam species non determinatæ)		*	*	*	*	*	*	*

All the species above-named are peculiar to the group, *i.e.* not found elsewhere. A * indicates that the species inhabits the island whose name heads the column. A † shows that the species is believed to be extinct.

extinct. All the other forms which had been accounted Meliphagine, present a peculiar structure of tongue, forbidding that alliance, or any affinity to the *Prionopidæ*, *Dicaidæ*, or *Nectariniidæ*, but revealing a distinct relationship to the *Cærebidæ*—now known as a Family characteristic of the Neotropical Region! Hereby a beam of light is thrown on the origin and derivation of the ornithic population of the Sandwich Islands. The

distinct inference is that the first stock of their existing avifauna was received from America, in days when the range of the *Cærebidæ* extended further to the northward than it does at present, and that certain cognates or ancestors of the present *Cærebidæ* colonized the islands, there differentiating into the modern *Drepanididæ*. The importance of this inference on views which are held as to the Geographical Distribution of Birds in North America is a subject into which there is no need here to enter, for that would be a subject foreign to my present remarks; but I doubt not it will receive due attention from American ornithologists, whom it most nearly concerns. That these colonists from what I would venture to term a "Columbian" fauna—since it cannot be literally called a Neotropical one, and is certainly not "Nearctic"—were the earliest settlers which have left descendants one can hardly doubt, for they have existed in the Sandwich Islands long enough to undergo a great amount of change. Subsequently there has been a small infusion of blood from the "Australian Region." I say subsequently, because Dr. Gadow has shown that this immigration has undergone comparatively little modification. We have (or had) the two Meliphagine genera, *Acrulocercus* and *Chatoptila*—the latter, indeed, beyond anatomical examination, but showing no very great external deviation from well-known Australian types; while the former undoubtedly retains the normal Meliphagine tongue. To these may be added *Chasiempis*, a well-marked genus; but, without question, very nearly allied to the genus *Rhipidura*, so widely spread over the Australian Region, and found also in New Zealand. Thus three genera constitute, so far as I am able to see, the "Australian" element in the avifauna of the Sandwich Islands—and what are they among so many others? More recently than this Australian infusion, has supervened an influx of Holarctic types, and especially of the *Fringillidæ*. Whether these have arrived from America or Asia, I do not pretend to say; but the long chain of islets running to the westward—one of which produces a remarkable form (*Telespiza cantans*), the knowledge of which we also owe to Mr. Wilson (*Ibis*, 1890, pp. 339-341, Plate ix.)—suggests the possibility of an Asiatic origin, a possibility confirmed by the consideration that his fine *Chloridops kona* may be the magnified descendant of the long-known *Chloris kawararaha*, which has already an enterprising relative, *C. kittlitszi* (*Ibis*, 1890, p. 101), established in the Bonin Islands. Still later must have been the appearance on the scene of members of the genera *Corvus* and *Buteo*, both of which are, so far as is yet known, confined to Hawaii, the most eastern of the islands, and therefore suggest an emigration from the Nearctic area. These have been settled long enough to assume recognizable specific characters; but an apparently more modern colonist exists in *Asio accipitrinus*, the common Short-eared Owl of Asia, Europe, and North America, which extends its range over many islands in the Pacific Ocean, so far at least as the Galapagos, and has found a permanent home in the Sandwich Isles, breeding there, as it would seem, regularly—as it once did in England, and would again, if permitted by the gamekeepers. More than this, there is an indication that the tendency to colonization from the Holarctic region still continues. Within an hour or two of his leaving the islands, there was sent to Mr. Wilson a freshly-killed example of *Circus hudsonius*—the American Hen-Harrier—a species which he had already ascertained to have before occurred in the group; but, not being recognized by Judge Dole, it had been endowed with a new name, and figures in his second list as *Accipiter hawaii*. The existence in considerable numbers of a Californian species of *Carpodacus* is thought, and no doubt rightly, by Mr. Wilson to be

¹ In connexion herewith may be noticed the absence of Parrots, Kingfishers, and Doves—all Families that are very characteristic of an "Australian" Fauna.

due to human agency, and accordingly I do not attach any importance to the fact; but there is one very puzzling species, of which only a few specimens seem to have been preserved, that needs particular attention. This was described by Judge Dole under the name of "*Fringilla anna*," but, of course, is no true *Fringilla*. Mr. Wilson brought home but a single specimen, which he owed to the kindness of the Hon. C. R. Bishop, it having been formerly in the Mills Collection; and, I believe, will establish for it a new genus, *Ciridops*—so named because its bright coloration recalls the well-known *Emberiza ciris* of Linnæus, the Painted Bunting of authors, or "Nonpareil" of bird-dealers. It is supposed to be now extinct, but it was a truly native species; it probably belongs to the fauna which I have above called "Columbian" (for want of a better name); but I cannot suppose it to have been so early a settler as the *Drepanididae*, since it has changed so little. On the genus *Chasiempis* I would offer only one remark, and that is a word of caution to those who would, on the evidence of from a couple to half-a-dozen of specimens, or perhaps even on the evidence of a badly-coloured plate, attempt to break it up into definable "species." There remains of land-birds the genus *Phaornis*, which earlier systematists were inclined to put among the Flycatchers (*Muscicapida*). The examples in spirit, placed by Mr. Wilson at Dr. Gadow's disposal, have enabled the latter to set aside that view, and to show that, of all the Families to which this genus has been supposed to be allied, "it differs least from the *Turdida*," and he would regard it "as a generalized or rather primitive Thrush."¹

Of the water-birds I do not now propose to speak. Though possessing very many points of special interest to the ornithologist, so far as I understand them they throw no particular light on the general questions I have attempted to consider; and I would conclude this sketch of the Ornithology of the Sandwich Isles by referring to the unhappy fate of one of the most beautiful of their birds—the "Mamo," as I am told it was latterly called—*Drepanis pacifica*, one of the rarest species in collections, and apparently wholly extinct. Until Mr. Wilson brought the specimen which he has kindly given to this University, there seems not to have been one in the British Islands since the dispersal of the Leverian Museum, when two were bought by the Austrian agent, and are now at Vienna. How many other specimens may exist in the world I do not know, but the number can hardly exceed half-a-dozen. The bird was destroyed for the sake of its rich yellow feathers, used in former days to decorate the state robes of the chiefs, and according to all accounts a glorious sight one of those robes when in all its freshness must have been. As the species became scarce, recourse was had to the yellow tufts of *Acrulocercus nobilis*, which in depth of colour are very inferior; and when the *Drepanis* had ceased to exist, the name "O-o," which it seems to have borne in Cook's days, was transferred to the surviving species, according to a practice of which I have observed several instances in other nations. The general similarity of coloration in *Acrulocercus* and *Drepanis* is, indeed, obvious, and Dr. Gadow is inclined to consider the latter to have been the imitating form. If so, its mimicry has proved its destruction; but it clearly could not have foreseen that fashion should ordain its acquired yellow and black feathers to become desirable commodities among the human race, and it would be well to suspend judgment on this point. It had most likely a very limited range, which would, of course, hasten its end; and its two most conspicuous relatives, the scarlet *Vestiaria coccinea*, and the crimson *Himatione sanguinea*, though in equal request for their gaudy plumage, still exist, inhabiting (as will be seen by the table) all the islands that have been examined. How to account for

the disappearance of *Chæoptila angustipluma* is beyond my power. It has no attractive colouring, and yet is declared to be extinct. The specimen given to us by Mr. Wilson is, I believe, the only one ever brought to Europe, and there seems to be but one (the type) in any American Museum. In mentioning the former I must acknowledge gratefully the generosity of Mr. Wilson, who promised a complete set of his bird-skins to the Museum of his old University on the completion of his work, a promise that he will doubtless perform.

Finally, I would point out that the conclusions established by Dr. Gadow's researches seem to coincide very much with those arrived at by Dr. David Sharp and Mr. Blackburn from their investigation of a small collection of Hawaiian *Coleoptera* (Trans. Roy. Dublin Society, series 2, vol. iii. Part 6). The entomological captures of Mr. Perkins are therefore awaited with considerable interest; and still more valuable, perhaps, may be his conchological collections, for it seems doubtful at present whether the Mollusks of the Sandwich Isles can be brought into line with their Birds and their Beetles. There is every chance of this question, among many others of importance, being solved if Mr. Perkins is enabled to prolong his stay for sufficient time; but that depends upon the financial support he may receive at home from the two learned bodies which I have mentioned, and from the Hawaiian Government and influential residents in the Islands.

ALFRED NEWTON.

Cambridge, 13 February, 1892.

PROF. BUNSEN AND THE CHEMICAL SOCIETY.

IT was announced at the last meeting of the Chemical Society that it was proposed to present the following address to Prof. Bunsen, who has now been fifty years a Foreign Member of the Society; and the wish was expressed that, among those who sign it, all who have been his pupils should, as far as possible, be included. Fellows of the Society who have been pupils of Prof. Bunsen are requested to communicate with the Senior Secretary before March 19, in order that they may receive a form for signature.

To Privy Councillor Prof. Bunsen, Fellow of the Royal Society.

YOUR EXCELLENCY,—Fifty years have elapsed since the Chemical Society of London honoured itself by electing you one of its Foreign Members. Your name, and that of your illustrious fellow-countryman Liebig, are, in fact, first on a list which includes the most distinguished cultivators of chemical science in every civilized country of the world.

Our Society remembers with gratitude that you enriched the first volume of its Transactions by communicating to it the results of your ever-memorable investigation of cacodyl and its compounds. That you should have sent to us, in the first and most critical year of our existence, a memoir which the chemical world will ever regard as one of the classics of our science, is a significant proof of the beneficent interest with which you regarded our efforts to foster the growth of chemical learning in this country.

Your masterly investigations, in collaboration with our Fellow, Sir Lyon Playfair, on the gases evolved from iron furnaces, made by methods which you were the first to bring to perfection, greatly extended our knowledge of the theory of the smelting of iron. By the permanent benefit thus conferred on one of the most important of our industries, you have largely augmented our national wealth.

The half-century during which you have been associated with our Society has been fruitful in great dis-

¹ A minute comparison with the New-Zealand *Turnagra*, if that be still in the land of the living, would be desirable.