ANALECTA ORNITHOLOGICA.

Second Series.

BY LEONHARD STEJNEGER.

VI. ON THE PTARMIGANS OF NELSON'S 'BIRDS OF BERING SEA,' etc., ESPECIALLY THOSE BELONGING TO THE GROUP Attagen KAUP. *

IN a recent review of Nelson's 'Birds of Bering Sea and the Arctic Ocean' (Auk, 1884, p. 79), Dr. E. Coues makes the following remarks upon the Ptarmigans : —

"The case of the Ptarmigan, as presented by Mr. Nelson, can be understood only by reference to the erratum leaf. One is *Lagopus albus*. Two others (Nos. 78 and 79) are to be treated as one, both being headed '*Lagopus rupestris*, Rock Ptarmigan.' Thirdly comes No. 80, a certain '*Lagopus rupestris occidentalis*, Turner, Atkhan Ptarmigan.' . . . Mr. Nelson's fourth Ptarmigan is headed '*Lagopus alpinus*, Subalpine Ptarmigan,' and is only reported as from Siberia, and upon Nordenskjöld's authority."

Dr. Coues will take no offence when I declare that I cannot "understand the case by reference to the erratum leaf," and that I find it quite comprehensible if, in this case, we only pay no attention whatever to that ominous erratum leaf of the 'Cruise of the Corwin.' In reading Nelson's article about No. 79, *Lagopus rupestris bis*, it is evident that it is written under the supposition that the heading contained a name different from that of *rupestris*, either specifically or subspecifically. We turn now to that famous 'leaf' in order to find the name which ought to distinguish No. 79, the 'Ounalaskan form,' of which "but two specimens in the summer plumage are in existence"; but we will only find there that "through an error the notes under numbers 78 and 79

^{*}Attagen Kaup, Entw. Eur. Thierw., p. 170, 1829 (types montanus [=mutus] and islandicus [=islandorum]) (nec Naum. 1833, quæ Tetrastes; nec Atagen Gray, Gen. Birds, III, 668, 1845, quæ Fregata Briss.; nec Attagis Geofr. and Less. 1830) = Keron "Montin" Gray, Handl. Birds, II, p. 278, 1870.—Attaqnv Aristot. (IX, 36, 5) a gallinaceous bird, probably Perdix cinerea. Lat. Attagen Plinius, is Lagopus muta, among others.—Keron is not used by Montin as a generic or sub-generic term, but is simply the Lappic name appended to Tetrao in brackets. In the same manner is the Finnish name for L. alba, 'Rehusak,' appended to the systematic name of the latter.

were not placed under a single heading." But if we unite them, the passage referring to the Ounalaskan birds becomes simply meaningless; and under No. 78 is expressly said: "On the Aleutian Islands it [L. rupestris, sic stricte!] is represented by forms which are mentioned below"; whence, therefore, came the 'No. 79,' if it was not originally intended to be a distinct form? We are now justified in asking: What does the phrase on the erratum leaf mean? Was it prepared by Mr. Nelson himself, and does it indicate that he has given up 'No. 79' as a distinct form? Does it mean that "The detailed description of this form will [not] be given in the account of the Birds of Alaska, now in course of preparation"? This seems to be the most reasonable supposition; but it ought to have been clearly stated. As the case is, the unlucky erratum leaf only adds to the confusion.

There was no need, however, for Mr. Nelson to cancel 'No. 79' of his list, as this form certainly is distinct and rather easily characterized, and I take great pleasure in naming it

Lagopus rupestris nelsoni,

in honor of its discoverer.

It is remarkable for the rich ferrugineous-brown of the upper parts of its preæstival plumage, without gray intermixture - in this respect agreeing with Lagopus ridgwayi recently described by me from the Commander Islands, it resembling, in fact, the postæstival plumage of the latter, being, however, very distinct from its preæstival garb. It shares, together with L. r. athkensis (Turner), the uniform aspect of the upper surface and the minute blackish vermiculations without crossbars, either black or white, a peculiarity which gives their plumage an appearance similar to the postæstival plumage of other forms; but Nelson's bird differs from Turner's in being of a saturated brown color, while the latter is pale gravish suffused with rusty. In both these forms the jugulum and præpectus of the preæstival plumage are very distinctly and rather regularly transversely barred with black, in contradistinction to the Commander Island species, which has these parts almost uniform black, consequently belonging in the neighborhood of L. muta and not of L. rupestris.

The type of this new form is No. 93,488, U. S. Nat. Mus., a fine *3* collected by Mr. E. W. Nelson, on the Island of Unalashka, May 18, 1877.

A detailed description is not thought necessary in this connection, as probably Mr. Nelson's original description will soon be published.

In respect to Nelson's remark about Dall's winter specimen from Unalashka, that the lack of "the black border through the eye appears to be a merely individual character," it may be mentioned, that the specimen in question is labelled 'Q,' and consequently is in the normal plumage of the female, which usually lacks the black stripe.

The often-mentioned erratum leaf, however, does not correct a most important typographical error contained in the heading "Lagopus alpinus. (81.) Subalpine Ptarmigan"; for it is evident that it ought to be either "Lagopus alpinus. (81.) Alpine Ptarmigan," or "Lagopus subalpinus. (81.) Subalpine Ptarmigan"; but which of the two it is not possible to tell without turning to Nordenskjöld's original account.

Looking through Nordenskjöld's 'The Voyage of the Vega' (Amer. Ed., 1882, pp. 431-436) we find in his account of the animal life near his winter station, some notes given him by Lieutenant Nordquist (for which consequently the latter gentleman, and not Nordenskjöld, is responsible), and there (p. 433) occurs the following relating to our case: "Of land birds there winter in the region only three species, viz., an owl (Strix nyctea, L.), a raven (Corvus sp.), and a ptarmigan (Lagopus subalpina, Nilss.); the last-named is the most common." From this it would seem as if Mr. Nelson had intended to have No. 81 headed Lagopus subalpinus Nilss.; but in that case No. 81 only duplicates No. 77, Lagopus albus, of which it is and always has been an unconditional synonym. This is under the supposition that Lieut. Nordquist's determination is correct, which may be seriously doubted ;* but if referable to a species of the Attagen (or mutus) group, his remarks should have been placed under rupestris, as it is to the latter form, and not to the true mutus (=

^{*}Mr. Nelson, on page 60, accepts a name from the same work without suspecting it to be identical with another bird of his list. Although no description accompanies the statement, that *Sylvia eversmanni* "in June settled on the black deck of the *Vega*," it seems little doubtful, that the bird was *Phyllopneuste borealis* Blas., of which, in fact, *Sylvia eversmanni* Midd. nec Bp. is a synonym. There is, consequently, every reason for uniting Nos. 8 and 9 under the heading of the latter. Of course it is much less likely to be the true *Ph. eversmanni* Bp., which is a synonym of *Ph. trochilus*, a Western Palæarctic form occurring not at all as far east as the 'Vega's' winter quarters.

alpina Nilss.),* that the Siberian Tundra Ptarmigan has been referred, while *mutus* is said to occur on the mountains of Southern Siberia only.† It will thus be seen that No. 81 of Nelson's list ought to disappear altogether as a separate heading.

VII. ON SOME CHANGES NECESSARY IN NORTH AMERICAN AND EUROPEAN ORNITHOLOGICAL NOMENCLATURE, IF GENERIC APPELLATIONS PREVIOUSLY APPLIED IN BOTANY BE NOT REJECTED.

A most superficial examination of a list of genera of birds will soon convince us that quite a number of names are in use both in ornithology and botany, while a closer examination shows that some of the ornithological generic names have been dropped and replaced by others because preoccupied in botany.

The following short list, picked up at random while hurrying over an alphabetical index, is evidence enough : —

Acrocephalus,	Dasycephala,	Petrophila,
Aegialites,	Diomedea,	Phaetusa.
Arenaria,	Drymophila,	Platylophus,
Bartramia,	Erythrina,	Polysticta,
Brachyrhamphus,	Glaux,	Prunella,
Calendula,	Hylophila,	Salicaria,
Callicephalus,	Linaria,	Sibia,
Ciconia,	Micropus,	Spathulea,
Citta,	Nectris,	Undina,
Corydalis,	Pallasia,	Vidua,
Corypha,	Passerina,	Wilsonia.
Cyanocephalus,	Peristera,	

Several of these are also preoccupied in other branches of zoology, and are thus altogether out of question, for instance, *Erythrina* and *Pallasia*[‡]; others have been in unchallenged use since

+Saunders, Yarr. Brit. Birds, 4th ed. III, p. 86.

[‡]*Pallasia* was proposed by E. v. Homeyer in 1873 (J. f. Orn., 1873, p. 190) for a genus having *Alauda mongolica* Pall. for type. The group, being mainly characterized by the short secondaries, needs a new name, as that given by v. Homeyer is ante-dated by *Pallasia* Rob. D. 1830 (a dipter.), I propose to call it *Pterocorys* ($\pi \tau \epsilon \rho \delta v = ala$, $\kappa \delta \rho v s = galea$).

^{*}Cf. Seebohm's description of two male birds obtained by him on the 22d of July at the Yenisej, in Lat. 71 $1-2^{\circ}$ — "the throat and breast are rather paler than the back" and determined by Prof. Newton to be "most probably *rupestris*," while not belonging to *mutus* (Ibis, 1879, p. 148). The similarity of the Siberian bird with *rupestris*, as distinguished form *mutus*, was long ago mentioned by von Middendorf.

their creation; others again have had a varying fate, now being rejected, now again accepted, e. g., Bartramia (= Actidurus BP.), Drymophila (=Myrmeciza Gray, 1841) Linaria (= Cannabina), Passerina (= Cyanospiza Baird, 1858), Petrophila (= Orocetes Gray, 1840), Wilsonia (= Myiodioctes Audub., 1839), etc.; while a few have not been revived since first dropped on account of having been preoccupied in botany, three of them having even received new names from their original describer, when he became aware of the fact, viz., Micropus, Cyanocephalus, and Corypha. In endeavoring to find means for creating a stable nomenclature, our rules must be as free as possible from exceptions, and in the present case we have only the choice between two methods; either to accept or to reject all the names preoccupied in botany.

A glance at the above list will show at once that the changes resulting from a rejection of the names already applied in botany would be so radical and affect so many current names, that a choice in that direction must be considered very undesirable.

If we carry the rule out in the other direction, the changes will be less serious.

The first name to be considered then, is

Arenaria BRISS.

which antedates both *Morinella* Meyer and *Strepsilas* Illiger by fifty years (see my paper in Pr. U. S. Nat. Mus., 1882, p. 34). The two North American species would stand as

1. Arenaria interpres (Linn.) Vieill.- Turnstone.

2. Arenaria melanocephala (Vig.).-Black Turnstone.

Corypha GRAY, 1840,

was changed by the author himself in the following year to Megalophonus.

Cyanocephalus BONAP., 1842,

is eight years older than the same author's *Gymnokitta*, the synonymy of which stands as follows : —

1841.— Gymnorhina WIED, Reise Nord. Amer. II (p. 21) (nec GRAY, 1840).

1842.— Cyanocephalus BONAP., Oss. Stat. Zool. Eur. Vert. 1840-'41, p. 17 (nec Botan.).

1850.— Gymnokitta BONAP., Consp. Av., I, p. 382.

1880. — Gymnocitta Coues, Bull. Nutt. Orn. Cl., 1880, p. 98.

The only species belonging to the North American Fauna, is No. 285 of Ridgway's list, and would stand as

Cyanocephalus cyanocephalus (Wied) .- Piñon Jay.

Micropus MEY. & WOLF

unfortunately antedates the current name *Cypselus* of Illiger by a year only. Yet, under the supposition above, there is hardly any escape from accepting it.

The synonymy of the genus is as under : —

1758.— Hirundo LINN. Syst. Nat. ed. 10, I, p. 191 (part.).

1777.— Apus Scopoli, Introd. Hist. Nat. p. 483 (nec Pall. 1776 quæ Crust.).

1810. – Micropus MEY. & WOLF, Taschb. Deutsch. Vög. I, p. 280 (nec Botan., nec SWAINS., 1831).

1811. — Cypselus Illig. Prodr. Syst. Mam. Av. p. 230.

1815.— Brachypus MEY. Vög. Liv- und Esthl. p. 142. (nec SWAINS., 1824).

1816. — Cipselus VIEILL. Anal. p. 38.

Illiger was very well aware of the two earlier names. Here are his reasons for rejecting them: "Nomina Apus, Micropus terminis zoographicis reddenda sunt, quam ob causam nomen Aristotelicum Cypselus, quod de nidis in foraminibus absconditis deductum videtur, generi restitui."

The American species would stand as

R. 349. - Micropus saxatilis (Woodh.) [*].

Those of Dresser's List Eur. B., p. 20, as

284. Micropus apus (Linn.).

285. Micropus affinis (Gray).

286. Micropus pallidus (Shelley).

287. Micropus unicolor (Jard.).

288. Micropus melba (Linn.).

The last genus of the list is

Wilsonia BONAP.,

which has also been rejected mainly on account of being preoccupied in botany. Dr. Coues (Birds Colorad. Val., p. 323)

[July

^{[*} It seems desirable to adopt for this species Professor Baird's name *melanoleucus*, for reasons which will be apparent on reference to page 143 of "Birds of North America" (Vol. IX., Pacific RR. Reports). The name of the White-throated Swift would therefore be *Micropus melanoleucus* (Baird).— R. RIDGWAY.]

remarks that it, besides being preoccupied in botany, is also used in entomology. Its use in the latter connection is of very recent date, however, and cannot prejudice its use in ornithology, being proposed by Clemens in 1864 (Proc. Philad. Entom. Soc., II, 1864, p. 428) for a lepidopterous insect.

The name *Wilsonia* was given by Bonaparte in 1838 (Comp. List., p. 23) as a GENERIC term ("Genus 108, WILSONIA, Nob."), and in this genus he included the following species, thus named: —

138. Wilsonia mitrata, Nob.,

139. Wilsonia bonapartii, Nob.,

140. Wilsonia minuta, Nob.,

141. Wilsonia pusilla, Nob.;

these being exactly the same four species which at the present date are admitted into the genus. If the name *Wilsonia* cannot be rejected, because preoccupied in botany, it will have to take precedence of *Myiodioctes* Audub., 1839.

VIII. Larus schistisagus, A New Species of Gull from THE NORTH PACIFIC.

Among the specimens of Gulls collected by me on the Commander Islands is a very dark-mantled large species, somewhat intermediate between L. marinus and L. cachinnans, although in general aspect much nearer to the former, and when on the wing indistinguishable from it.

The occurrence of this new species in the Kamtschatkan waters easily explains the abnormality in the alleged distribution of *Larus marinus*, as it is almost certain that all North Pacific references to the latter species really belong to the present form.

Larus schistisagus n. sp.

DIAGN.— White; mantle dark bluish slate-gray. First primary with a long white tip, apical and subapical spots being fused together, and a gray 'wedge' on the inner web; second with a subapical white spot on the inner web only, and the gray wedge reaching further down towards the tip; third with the wedge reaching the white subapical spot; no gray wedge on outer web of the four first primaries. Feet pinkish flesh-color. Total length, 670 mm., wing, 460 mm.

TYPE: U. S. Nat. Mus. No. 92,885.

SYN. 1858.- Larus cachinnans KITTLITZ, Denkw. Reise, I, p. 336 (nec PALL.).

1858. – Larus argentatus KITTLITZ, op. cit. II, p. 225 (part.).

- 1860.— Larus argentatus var. cachinnans SCHRENCK, Reise Amurl. I, p. 504.
- 1871 .- "Larus fuscescens Mus. St. Petersb." MEVES. Œfv. Sv. Vet. Akad. Förhandl. 1871, p. 787.
- 1874.— Larus marinus Swinh. Ibis, 1874, p. 165 (nec Linn.).— Saun-DERS, P. Z. S. 1878, p. 180 (part.).-SEEB. Ibis, 1879, p. 24.-BLAK. and PR. Tr. As. Soc. Japan, X, 1882, p. 104.- RIDGW. Bull. Nutt. Orn. Cl. 1882, p. 60.-BEAN, Pr. U. S. Nat. Mus. 1882, p. 168.— NELSON, Cruise Corwin, p. 107 (1883).
- 1876.- Larus pelagicus TACZAN. Bull. Soc. Zool. France, 1876, p. 263 (nec BRUCH).

HABITAT. Coast of Kamtschatka and other parts of the North Pacific.

This species was found by me in small numbers on Bering Island, near Kamtschatka, during the spring of 1883, and a single specimen was obtained on May 5. I afterwards met with it on the mainland of Kamtschatka in the vicinity of Petropaulski, where it breeds.

REMARKS. The color of the mantle is pure bluish slate-gray without any mixture of brownish, of a shade just between the same parts in Larus occidentalis and L. dominicus, being a little lighter than the lightest L. marinus I have seen, and easily distinguishable from the latter by the pureness of the gray.

Characteristic of the wing-pattern is the presence of a welldeveloped 'wedge' on the inner web of the first primary, as distinctive from *marinus*, as well as the absence of a similar wedge on the outer webs of the second to fourth primaries, in which it differs from cachinnans and argentatus. The 'mirror' on the second primary is also peculiar, resembling, however, the pattern of the corresponding quill in L. cachinnans. In the third primary the large white spot at the end of the gray wedge is very characteristic. It may thus be seen, that while the second primary shows less white than in marinus and argentatus, the third has more of the same color than is the case in the latter two species and in *cachinnans*.

Iris of a clear yellowish cream-color. Bill deep gamboge vellow with whitish tip and tomia; an orange red spot on each side of the lower mandible; angle of mouth yellowish flesh-color. Naked eve-ring reddish violet gray. Feet pinkish flesh-color; nails horny black with whitish tips. (From the fresh specimen !)

A more detailed account of the Slate-backed Gull will be given in my report on the birds collected by me on the Commander Islands and in Kamtschatka.

IX. Priocella tenuirostris (Aud.) NOT A BIRD OF BERING SEA OR THE ARCTIC OCEAN.

I feel compelled to correct another mistake in E. W. Nelson's 'Birds of Bering Sea and the Arctic Ocean.' At No. 166 he gives "*Priocella tenuirostris* (Aud.) Ridgw., Slender-billed Fulmar" as occurring in these seas, and says: "There is but a single record of this bird's capture on the coast of Alaska. This was at Kotzebue Sound, whence Mr. Dall secured a single skin during his explorations in the Territory." Under the head of the foregoing species, *Fulmarus glacialis rodgersi*, he passes the following remark: "As we approached the harbor of Ounalaska on September 22, 1881, hundreds of these birds were seen in the ordinary light-colored plumage, which were in company with about an equal number of birds either of the same species or a closely related one of exactly the same size. . . . Mr. Ridgway suggests that the dark-colored birds seen at that time were the slender-billed *Fulmar*."

The bird which Mr. Dall procured was *Puffinus tenuirostris* Temm., and was correctly identified by Professor Baird, as everybody may be convinced by looking at the plate given (Trans. Chicago Acad. Sci., I, 1869, pl. xxxiv, fig. 2, pp. 322, 303). But this bird belongs to a totally different group, the Puffineæ, and is not the same as Audubon's *Procellaria tenuirostris* of of the group Fulmareæ. The claim of the latter species for recognition as belonging to the North American Fauna rests solely upon Audubon's type, said to have been collected by Mr. Townsend off the mouth of the Columbia River and now preserved in the National Museum. As the name *Procellaria tenuirostris* is preoccupied by Temminck in 1828 for the *Puffinus*, Audubon's bird should stand as *Fulmarus glacialoides* (Smith) or *Priocella glacialoides*.*

^{*} The reviewer of Nelson's memoir, in 'The Auk,' 1884, p. 80, correctly quotes this synonym, but seems not to have been aware of the fact, that Dall's bird was something totally different. The error is repeated in Coues's 'Key,' 2d Ed., p. 779.

From this, it is needless to say, that Mr. Ridgway's suggestion did not allude to the Slender-billed Fulmar, but to the Slenderbilled Shearwater. For my own part I think it just as probable that the bird seen was the dark phase of the bird usually known as Procellaria pacifica of Audubon. The latter name is preoccupied by Gmelin's Procellaria pacifica of 1788, and a new one should therefore be provided. I propose to call it Fulmarus glacialis glupischa ('Glupisch' being the name by which the bird is known in the North Pacific). I may add here, that Mr. Nelson is not quite correct either, when asserting that the only known record of this bird having been captured in Alaska is that of the bird obtained by Mr. Dall. F. H. v. Kittlitz secured a specimen at Unalaschka on August 31, 1828. The bird has been recorded by him under the name of Procellaria curilica Pallas, a synonym of Temminck's Procellaria tenuirostris (Denkwürd. einer Reise, I, p. 296). A third specimen is in the museum at Leiden, said to be from Sitka (Schlegel, Mus. P. B., Procell., p. 26 (1863)).

X. ON OLD AND NEW GENERIC NAMES.

The second part of Dr. S. H. Scudder's 'Nomenclator Zoologicus. An alphabetical list of all Generic Names . . . II. Universal Index to Genera in Zoology. Complete List of Generic Names employed in Zoology and Palæntology to the Close of the Year 1879, as contained in the Nomenclatures of Agassiz, Marschall, and Scudder, and in the Zoological Record' (Bulletin No. 19, U. S. Nat. Mus.), is just out. As the title says, it is a compilation of the already existing four 'Nomenclatores Zoologici,' and one might, therefore, confidently expect to find almost all the generic names published up to 1879. Ornithologists, at least, will be rather disappointed, however. A hurried glance through the work made it apparent that the following generic names, applied to *North American* birds, are missing, 21 of which are used in the latest Smithsonian List of North American birds, prepared by Mr. R. Ridgway:

Ajaja, Alle, Aluco (Guerini, 1767), Calcarius, Canace, Catherpes, Chamæa, Ciceronia, Clivicola, Cupidonia, Felivox, Florida, Fregetta, Heteroscelus, Phænopepla, Protonotaria, Psaltriparus, Riparia, Salpinctes, Simorhynchus (Merrem,

[July

1819), Symphemia, Thalassarche, Thalassoica, Thryomanes, Tympanuchus, Xanthocephalus, Xanthura.

Neither time nor space will allow me, on this occasion, to review the whole catalogue of some 80,000 names, but the following list of bird-genera, picked out of the letter E alone, will give an idea of the deficiences: Eleopicus, Elminia, Empidivora, Entomiza, Eomelpusa, Eophona, Eparnetes, Epherusa, Ephippiorhynchus, Epitelarus, Erator, Eremomela, Ericornis, Eridora, Erodiscus, Erythra, Erythrana, Erythrauchoena, Erythrocercus, Erythroena, Erythrolaima, Erythronerpes, Erythropitta, Erythropsar, Erythrotreron, Eucampophaga, Eucapripodus, Euchloridia, Eucichla, Eucnemidia, Eucycla, Eudacnis, Eudyptila, Euetheia, Euhierax, Eulabæa, Euliga, Eulopogon, Eunetta, Euodice, Euphagus, Euptilosus, Eurycercus, Euryzona, Eusphenura, Eustrinx, Euthonyx, Eutolmaëtus, Eutrygon, Exetastes, Exochocichla. The list is by no means complete and diligent search might add several more names.

The high standard of Agassiz's 'Nomenclator' resulted from his collaboration with prominent ornithologists. He had his proofs revised by men like Bonaparte, G. R. Gray, and Strickland, who, by allowing their names to be printed on the titlepages, partook of the responsibility. The same perfection might have been reached by Dr. Scudder, if he had followed a similar course.

Nevertheless, the work will be of very great use to the working ornithologist, who will only have to be careful to remember that he has not got a complete list of all the existing names.

A look through its pages shows the necessity of several changes in our nomenclature.

In the first place, I find that the name *Sthenelus*, which I applied, in 1882, to the Black-necked Swan from South America, was preoccupied. It consequently requires a new one, and I propose in future to call the species *Sthenelides melancorypha*.

Eudocimus Wagler, 1832, will not hold good as the genus-name for the White and Scarlet Ibises, as there is a lepidopterous insect called "*Eudocima* Billb. 1820." It is very doubtful what name will have to replace it. *Guara* was bestowed upon the Scarlet Ibis by Reichenbach in 1851, and *Leucibis* at the same time upon the White Ibis. But in his 'List of Genera' of 1855 G. R. Gray



Stejneger, L. 1884. "Analecta Ornithologica. Second Series." *The Auk* 1, 225–236.

View This Item Online: <u>https://www.biodiversitylibrary.org/item/87797</u> **Permalink:** <u>https://www.biodiversitylibrary.org/partpdf/244924</u>

Holding Institution Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Sponsored by Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Copyright & Reuse

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at https://www.biodiversitylibrary.org.