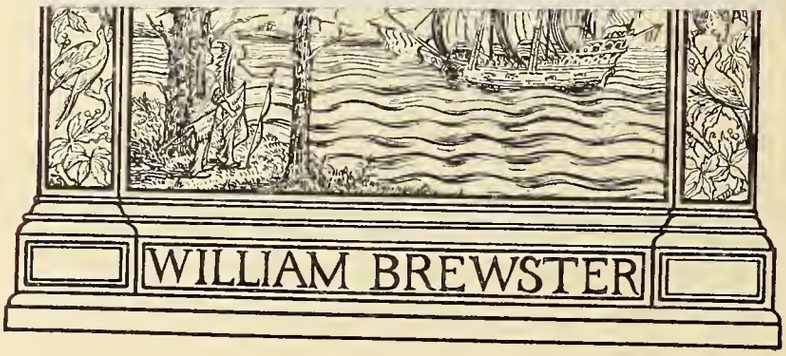

The

Humming Bird

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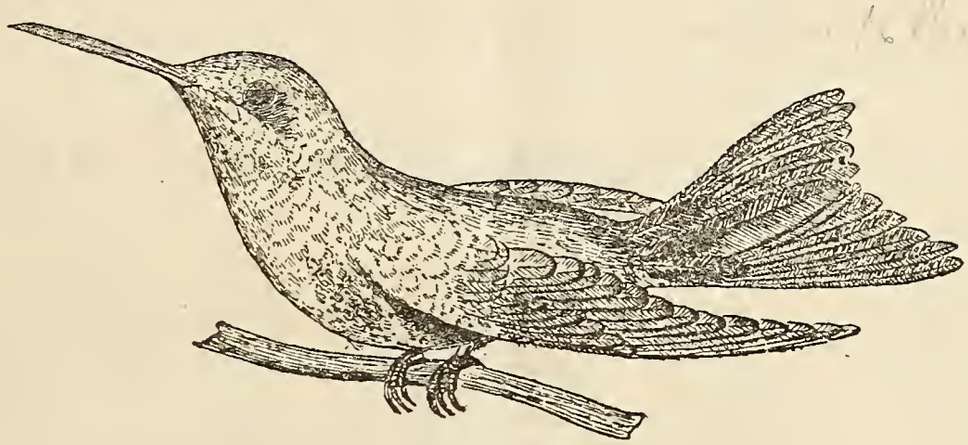

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
Member of the International Jury, Paris, 1889; Member of many scientific societies;
etc. etc. etc. etc.

CONTENTS OF No. 1.—JANUARY 1, 1891.

[ENTERED AT STATIONERS' HALL.]

LIST OF HUMMING BIRDS FOR SALE.

TROCHILIDÆ, Vig. 1825.

		s.
1.	Grypus nœvius, Dum.	5
2.	Eutoxeres condaminei, B. ...	40
3.	— aquila, Bourc.... ...	8
4.	— salvini, Gould. ...	16
5.	— heterurus...	16
6.	Glaucis hirsutus, Gm.	2
7.	— alfinis, Lawr.	3
8.	Threnetes ruckeri, Bourc. ...	16
9.	— cervinicauda, G. ...	10
10.	— antoniæ, Bourc. ...	20
11.	Phæthornis superciliosus, L. ...	4
12.	— longirostris, L. D....	3
13.	— syrmatophorus, ...	15
14.	— eurynome, L. ...	2
15.	— squalidus, Tem. ...	4
16.	— antophilus, B. ...	2
17.	— augusti, Bourc. ...	10
18.	— pretrii, L. Del. ...	5
19.	— yaruqui, Bourc. ...	5
20.	— guyi, Less.	4
21.	— emiliæ, Bourc. ...	4
22.	Pygmornis longuemareusL., ...	10
23.	— adolphi, Gould. ...	5
24.	— griseigularis, G. ...	3
25.	— striigularis, Gould.	3
26.	— pygmæus, Spix. ...	3
27.	Eupetomena macrura, Gm. ...	3
28.	Sphenoproctus pampa, Less. ...	4
29.	— curvipennis ...	12
30.	Campylopterus lazulus, V. ...	2
31.	— hemileucurus...	4
32.	— ensipennis, S.	3
33.	— largipennis. ...	10
34.	— æquatorialis. ...	10
35.	— hyperithrus. ...	50
36.	— rufus, L.... ...	20
37.	Phæochroa cuvieri, Del.	20
38.	Aphantochroa cirrochloris. ...	4
39.	Eugenes fulgens, Sw.	4
40.	Cœligena clemenciæ, L.	4
41.	Lamprolæma rhami, Less. ...	6
42.	Delattria henrici, Less.	12
43.	— viridipallens	5
44.	Oreopyra leucaspis, Gould. ...	30
45.	— calolæma, Salv. ...	26
46.	Lampornis violicauda, Bodd. ...	2
47.	— prevosti, Less. ...	8
48.	— veraguensis, G. ...	20
49.	— gramineus, Gm. ...	3
50.	— aurulentus, Vieill....	20
51.	— mango, Lin.	2
52.	Chalybura buffoni, Less.	2
53.	— cœruleiventris, R. ...	5
54.	— isaurae, Gould. ...	40
55.	Aithurus polytmus, Lin.	10
56.	Topaza pella, Lin.	20
57.	— pyra, Gould....	200
58.	Eulampis jugularis, Lin.	4
59.	— holosericeus, Lin. ...	4
60.	— chlorolæmus.	30
61.	Iolæma schreibersi, Bourc. ...	20
62.	Oreotrochilus chimborazo, B....	10
63.	— pichinchæ, B. ...	5
64.	— estellæ, Laf. ...	100
65.	— leucopleurus. ...	10
66.	Lafresnaya flavicaudata, F. ...	2
67.	— gayi, Bourc.	10
68.	Petasophora serrirostris, V. ...	3
69.	— anais, Less.	2
70.	— iolata, Gould. ...	3
71.	— thalassina, Sw. ...	3
72.	— cyanotis, Bourc. ...	2
73.	— delphinæ, L.... ...	3
74.	— cabanisi, Law. ...	4
75.	Heliodoxa jacula, Gould.... ...	10
76.	— jamesoni, Bourc. ...	20
77.	— otero, Tsch.	16
78.	— splendens, Gould ...	20
79.	— leadbeateri, B.... ...	3
80.	Phæolæma rubinoides, Bourc....	3
81.	— æquatorialis, G. ...	6
82.	Eugenia imperatrix, Gould. ...	100
83.	Clytolæma aurescens, G.	30
84.	— rubinea, Gould. ...	3
85.	Panoplites jardinei, Bourc. ...	20
86.	— flavescens, B.	3
87.	— mathewsit, B.	20
88.	Florisuga mellivora, Lin.... ...	2
89.	— fusca, Vieill.	3
90.	Heliothrix auritus, Gm.	5
91.	— auriculatus, N. ...	5
92.	Heliothrix barroti, Bourc. ...	
93.	Eustephanus galeritus, M. ...	
94.	— fernandensis, K.	30
95.	Chrysolampis moschitus, L. ...	2
96.	Avocettinus eurypterus, L. ...	10
97.	Heliomaster longirostris, V. ...	3
98.	— stuartæ, Law. ...	4
99.	— constanti, Del. ...	20
100.	Lepidolarynx mesoleucus, T. ...	4
101.	Calliperidia furcifer, Shaw. ...	20
102.	Docimastes ensifer, Boiss. ...	4
103.	Patagona gigas, Vieill.	10
104.	Pterophanes temminckii, B. ...	10
105.	Helianthea bonapartei, B. ...	4
106.	— typica, Bp.	3
107.	Calligenia lutetiæ, Del.	10
108.	Diphlogæna, iris, Gould.	100
109.	— hesperus, G. ...	100
110.	Bourcieria torquata, Boiss. ...	2
111.	— fuligidula, Gould. ...	4
112.	— conradi, Bourc. ...	20
113.	— inca, Gould.	100
114.	Eudosia prunelli, Bourc.	5
115.	— wilsoni, Del.	10
116.	Lampropygia cœligena, L. ...	10
117.	Heliotrypha viola, Gould. ...	20
118.	— parzudaki, L. ...	2
119.	Heliangelus clarissæ, Long. ...	2
120.	— micraster, G. ...	100
121.	— strophianus, G. ...	8
122.	— spencii, Bourc. ...	60
123.	— amethysticollis. ...	100
124.	Eriocnemis vestita, Longue. ...	2
125.	— smaragdinipectus.	40
126.	— nigrivestis, B. ...	40
127.	Nunia cupreiventris, Fraser. ...	2
128.	— luciani, Bourc.	3
129.	Threptria aureliæ, Bourc. ...	2
130.	— russata, Gould. ...	8
131.	— lugens, Gould.... ...	20
132.	— derbiana, Del.	60
133.	Engyete alinæ, Bourc.	3
134.	Aglæactis cupreipennis, B. ...	3
135.	— pamela, Laf.	60
136.	— acquatorialis, G. ...	5
137.	Hylonympha macroura, G. ...	50

Green Cloth

LIST OF HUMMING BIRDS FOR SALE—*continued.*

		s.
138.	Thalurania glaucopis, Gin. ...	2
139.	— colombica, B. ...	2
140.	— venusta, ...	4
141.	— furcata, Gm.	4
142.	— furcatoides, G. ...	8
143.	— nigrifasciata, G. ...	6
144.	— refulgens, G.	6
145.	— verticeps, G.	15
146.	— wagleri, L.	50
147.	Hemistephania johannæ, B. ...	20
148.	— ludoviciæ, B. ...	5
149.	— rectirostris. ...	20
150.	Augastes lumachellus, L.... ...	40
151.	— superbus, Vieill. ...	40
152.	Schistes geoffroyi, Bourc. ...	8
153.	Urosticte benjamini, B.	12
154.	Urolampra æneicauda, G. ...	50
155.	Metallura tyrianthina, B. ...	2
156.	— smaragdinicollis, ...	16
157.	— quitensis, Gould. ...	4
158.	Adelomya inornata, G	30
159.	— melanogenys, F.	2
160.	Ramphomicron microrhynchus.	3
161.	— stanleyi, B. ...	10
162.	— heterepogon. ...	4
163.	Eupogonus herrani, Del.	10
164.	— ruficeps, G.	60
165.	Oxypogon guerini, Boiss. ...	4
166.	— lindeni, Parz.	20
167.	Cephalepis delalandii, Vieil....	4
168.	— loddigesi, G. ...	50
169.	Orthorhynchus cristatus. ...	10
170.	— exilis, Gm. ...	10
171.	— ornatus.	10
172.	Klais guimeti, Bourc.	10
173.	— merriti, Law.	10
174.	Daucis abeillei, Del.	5
175.	Microchera albo-coronata. ...	100
176.	— parvirostris, L. ...	100
177.	Telamon delattrei, L.	10
178.	— regulus, Gould.... ...	20
179.	— reginæ, Schreib. ...	50
180.	Paphiosa helenæ, Del.	10
181.	Lophornis magnificus, V. ...	10
182.	— ornatus, L.	6
183.	Polemistria chalybea, V.... ...	40
184.	— verreauxi, B. ...	20
185.	Gouldia langsdorffi, Vieill. ...	20
186.	— melanosternon, G. ...	20
187.	— conversi, Bourc.	6
188.	Prymnacantha popelairii. ...	20
189.	Tilmatura duponti, Less.... ...	10
190.	Discura longicauda,Gm.	16
191.	Steganura underwoodi, L. ...	3
192.	— melananthera, J. ...	10
193.	Cynanthus cyanurus, S.	5
194.	— cœlestis, G.	8
195.	— mocoa, Del.	20
196.	— boliviana, G.	50
197.	Sapho sparganurus, Shaw. ...	60
198.	— phaon, Gould...	40
199.	Lesbia nuna, Less.	40
200.	— amaryllis, Bourc.	4
201.	Lesbia victoriæ, Bourc.	6
202.	— gouldi, Bourc.	4
203.	Heliactin cornuta, Max.	20
204.	Thaumastura cora, Less.... ...	20
205.	Rhodopis vesper, Less.	30
206.	Amalasia henicura, V.	6
207.	— elisæ, Less.	60
208.	Doricha evelynæ, Bourc.	60
209.	— bryanthæ, Law.	20
210.	Calothorax lucifer, Sw.	4
211.	— pulcher, G.	30
212.	Calliphlox amethystinus, G. ...	4
213.	— mitchelli, B.	30
214.	Trochilus colubris, Lin.	2
215.	— alexandri. B.	20
216.	Calypte costæ, Bourc.	40
217.	— annæ, Less.	6
218.	Stellura calliope, Gould.	20
219.	Atthis heloisæ, Less....	16
220.	— elliotti, Ridgw.	12
221.	Selasphorus henshawi, R... ...	10
222.	— rufus, Gm.	5
223.	— scintilla, G.	50
224.	— platycercus, Sw. ...	4
225.	— flammula, S. ...	40
226.	Myrtis fanny, Less.	8
227.	Acestrura mulsanti, B.	3
228.	— heliodori, B.	2
229.	Chætocercus jourdani. B.... ...	40
230.	— rosæ, Bourc	20
231.	— bombus, G.	100
232.	Mellisuga minima, Lin.	10
233.	Phæoptila sordida, G.	20
234.	Cyanomya quadricolor, V. ...	10
235.	— violiceps, G.	20
236.	— cyanocephala, L. ...	10
237.	— franciæ, Bourc. ...	2
238.	— guatemalensis... ...	4
239.	Thaumatias candidus, B.... ...	3
240.	— niveipectus, C. ...	4
241.	— viridiceps, G... ...	12
242.	— brevirostris, L. ...	3
243.	— albiventris, L. ...	5
244.	— linnæi. Bp.	3
245.	— fluviatilis, G... ...	20
246.	Thaumatias maculicauda, G. ...	6
247.	— chionurus, G... ...	12
248.	— cupreiceps, L. ...	20
249.	— nigriventris, L. ...	30
250.	— leucogaster, G. ...	8
251.	Leucochloris albicollis, V. ...	4
252.	Eupherusa eximia, Del.	3
253.	— egregia, Sc.	16
254.	Chrysobronchus virescens. ...	3
255.	— viridissimus....	6
256.	Amazilia cinnamomea, L... ...	15
257.	— dumerilii, L.	20
258.	— leucophæa, R.	20
259.	— yucatanensis, C. ...	40
260.	Pyrrhophæna beryllina, L. ...	5
261.	— devillei, B.... ...	4
262.	— riefferi, B.	2
263.	— viridiventris, R....	5
264.	Saucerottia erythronota, L. ...	2
265.	— feliciæ, Less.... ...	8
266.	— edwardi, Del.... ...	20
267.	— niveiventris, G. ...	20
268.	— cyaneifrons, B. ...	2
269.	— warzeviezi, Cab. ...	5
270.	— sophiæ, Bouré. ...	16
271.	Heliopædica melanotis, Sw. ...	5
272.	Chrysuronia œnone, Less. ...	3
273.	— josephinæ, B. ...	20
274.	— eliciæ, B.	6
275.	— chrysura, L.... ...	40
276.	Hylocharis sapphirina, Gm. ...	4
277.	— cyanea, Vieill... ...	4
278.	Panterpe insignis, Cab.	50
279.	Eucephala grayi, Del.	6
280.	— cœrulea, Vieill. ...	2
281.	Circe latirostris, Sw.	20
282.	Damophila amabilis, G.	5
283.	Julyamia juliæ, Bourc.	3
284.	— feliciana, Less.	3
285.	Sapphironia goudoti, Bourc. ...	2
286.	— cæruleogularis. ...	16
287.	Sporadinus ricordi, d'Orb. ...	30
288.	Chlorolampis canniveti, L. ...	10
289.	— salvini, G.	10
290.	Chlorostilbon melanorhynchus..	8
291.	— hæberlini, R. ...	3
292.	— nitens, Law. ...	3
293.	— angustipennis. ...	4
294.	Chrysomirus atala, Less.... ...	10
295.	— prasinus, Less. ...	10
296.	— igneus, Gould. ...	5
297.	— aureiventris, L. ...	20
298.	Panichlora aliciæ, Bourc.... ...	8
299.	— poortmanni, B. ...	2
300.	— stenura, Cab.... ...	10
301.	Phaethornis consobrinus, Bourc.	10
302.	Campylopterus phainopeplus, Salv.	80
303.	Lampornis dominicus.	25
304.	Lophornis pavoninus, Salv. ...	100
305.	Cynanthus cyanurus, Var with greentail	16
306.	Cynanthus mocoa, Var smaragdinus	20
307.	Thaumatias nigricauda, Elliott.	20
308.	Pyrrhophæna cupreicauda, Salv.	20
309.	Saucerottia erythronota, Var maculicauda	8
310.	Chrysuronia œnone, Var longirostris Berlepsch	4
311.	Hylocharis cyanea viridiventris, Berlepsch	10
312.	Chrysomirus daphne.	10
313.	— comptus, Berlepsch	10
314.	— assimilis, Lawr. ...	10
315.	Panychlora poortmanni euchloris, Berl.	5
316.	Hylocharis lactea, Less.	40
317.	Thalurania eriphile, Less... ...	50
318.	Nunia mosquera, Bourc.	50
319.	Adelomya maculata	10

TO ORNITHOLOGISTS.

FOR SALE.

Fine mounted specimen of *Alca impennis, the Great Awk*, (extinct species). Pedigree from the date of capture, 1836, to this date, will be given to buyer.

Fine male specimen of the exceedingly rare new genus of bird *Reinhardtia ocellata Bp.*, the greatest discovery of the century. Price £50

Fine male specimen of the beautiful bird *Calyptomena Whiteheadi*, n. sp., the second species known of this rare genus, four times larger and more beautiful than *C. Viridis*.

Fine pair, male and female, of the rare Paradise bird. *Semioptera Wallacei*. Price £4.

Fine pair of the magnificent bird of Paradise, *Astrapia nigra*. Price £6.

Pair of *Epimachus maximus*. Price £5.

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Pair of *Paradisea rubra*. Price £2 10s.

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Pair of *Ptilornis paradisca*. Price £2 10s.

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Pair of *Seleucides albus*. Price £4 10s.

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One specimen of *Casuarius edwardi* Price £10.

One specimen of *Apteryx Oweni*. Price £1 10s.

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Ditto ditto stuffed Price £10.

One specimen of *Oreophasis derbianus* Price £8.

Ditto ditto stuffed Price £10.

One specimen of *Argus giganteus*, stuffed Price £5.

One specimen of *Argus grayi*. Price £6.

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One male specimen of *Otidiphaps nobilis*. Price £2 10s.

One specimen of *Hypoleucus carunculatus*. Price £4.

One specimen of *Strigops habroptilus*. Price £1 10s.

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One pair of *Sericulus melinus*. Price £1.

One pair of *Heteralocha gouldi*, female very rare. Price £2 10s.

By pair it means one male and one female.

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Camptolainus labradorius.
Chrysolophus pictus L. Gmel.
Chrysolophus amherstiae Leadb.
Pterocnemia darwini Gould
Dromaius novæ hollandiæ
Sypheotides macqueeni Gr.
Cariama cristata L.
Chunga burmeisteri Hartl.
Palamedea cornuta L.
Ischyornis derbiana Gr.
Aburria carunculata Tem.
Leipoa ocellata Gould
Polyplectron, all the species except hardwieki
Lobiophasis bulweri Sharpe
Alectrophasis cuvieri Tem.
Gennæus nycthemerus L.
Grammatoptilus lineatus Lath.
Hierophasis swinhoei Gould
Diardigallus diardi Tem.
Lophophorus lhuysii Verr.
Calcophasis sclateri Ierd.
Gallus sonnerati Tem.
Creagrius varius Shaw
Sarkidiornis ægyptiaca Gmel.
Ara ararauna L.
Ara militaris L.
Ara hyacinthinus Lath.
Cotinga amabilis Gould
Cotinga cayana L.

TO ENTOMOLOGISTS.

FOR SALE.

One very fine pair, male and female, of *Morpho Godarti* Price £10.

One fine male specimen of the same species. Price £2 10s.

Ditto medium. Price £1.

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Lomaptera albertisi 10s.
— ignipennis 10s.
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— eduardsi 10s.
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Taphrosoma dohrni 10s.
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Psalidognatus boucardi 16s.
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— belti 10s.
— xanthaspis 10s.
— leucaspis 6s.
Pyrodes pulcherrimus 10s.
Calocomus desmaresti 16s.
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— tricolor 10s.
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— celebiana 16s.
— gigas 20s.
— wallacei 20s.
Sagra buqueti 4s.
Amblychila cylindriformis 10s.
Omus Dejeani 20s.
— audouini 8s.
Oxygonia floridula 16s.
— gloriola 12s.
— buckleyi 12s.
— moronensis 8s.
Carabus valdiviae 8s.
— buqueti 8s.
— sybarita 8s.
— elegantissimus 12s.
— castroensis 12s.
— subnitens 12s.
— andestus 12s.
— inexpectatus 16s.
— gloriosus 10s,
— villaricensis 12s.
— hypocrita 20s.
— temucensis 30s.
— darwini 8s.
— bimarginatus 10s.
— chonchicus 12s.
— chiloensis 12s.
— chilensis 10s.
— kraatzianus 20s.
Carabus speciosus 12s.
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— bomplandi 8s.
— robustus 8s.
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— elevatus 8s.
— ventricosus 2s.
— alternatus 2s.
— punctatus 4s.
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— gaujoni 50s.
— feisthameli 30s.
— buckleyi 30s.
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Euchirus longimanus 20s.
Pelidnota burmeisteri 16s.
Proculus goryi 30s.
— mniszecki 10s.
— opacipennis 5s.
Plusiotis resplendens 20s.
— batesi 30s.
Chrysophora chrysochlora 4s.
Chrysina mniszecki 16s.
— adolphi 16s.
Anoplognathus grayi 20s.
— mastersi 10s.
— n. sp. 12s.
Golofa imperator 5s.
Dynastes hercules 16s.
Chalcosoma hesperus 20s.
Mesgasoma thersites 10s.
Aegopsis curvicornis 8s.
Lycomedes reichei 20s.
Prionocalus cacicus 60s.
— atys 60s.
Ancisthrosoma buckleyi 4s.
— rufipes 3s.
Mitrocephala humboldti 20s.
Tetracha klugi 5s.
— bifasciata 5s.
— laminata 5s.
Catoxantha eburnea 20s.
— opulenta 3s.
Goliathus torquatus 20s.
— polyphemus 20s.
Ceratorhina juliae 4s.
— derbyana 8s.
— ruficeps 20s.
Tmesorhina saundersi 5s.
Dymusa cyanea 2s.
Neptunides polychrous 20s.
Ranzenia bertolini 10s.

The Humming Bird.

PREFACE.

THE "HUMMING BIRD" will be a monthly Record of everything new in the *Scientific, Artistic, and Industrial World*, passing from one subject to another, as its Synonym does when he is on the wing, flying from one plant to another in search of food.

At times, it will fly at great distances to see what is going on there and will return as quickly to its native place, as often as necessary.

It will give short notices of all modern travellers, of their new discoveries, new applications of Science in the Industry, and new artistic Creations, keeping the readers well informed of all what happens of interest in this immense World; so as to render this Journal attractive not only to Scientists but also to the General Public.

It will contain a Series of Articles on Natural History, Description of new Species, Notes on the Habits of Animals, Biographies of Men well known in Science, Art, and Industry; Reports on Visits to Museums and Zoological Gardens; Reports of public Sales of Scientific Objects, Works of Art and Curios from all countries, and lastly Reports of scientific, artistic, and industrial Publications of special interest.

It is open to all, and original Notices on Science, Art, and Industry, of interest to the readers of the Journal, will be received with pleasure and inserted in due time.

Every one is free to reproduce or to translate correctly and literally all the notices signed by the Editor, with the only condition that the name of the author shall be given and several copies forwarded to the Office of the Journal.

Authors wishing to have their works reported in the Journal must send two copies.

All communications respecting the Journal should be addressed to the Editor:

225 High Holborn,
London, W.C.,
England.

What is to be seen everywhere in London.

A few days ago I went for a walk from Holborn Viaduct to Regent Street and back by the Strand, and was quite surprised to see in the windows of the best shops of the London Boulevards some strings of six small birds of all colours, some white, some red, some blue, some golden, in fact, all the colours of the rainbow, and which seemed to belong to species quite unknown to me, a naturalist, to whom Ornithology is the favourite study.

I looked hard at them, and you can imagine my surprise when I saw that they were made-up birds from all kinds of feathers, badly made, some badly dyed, and with the most unnatural and grotesque appearances. I said to myself, surely they must be toys for children, and I will buy one dozen or two to give away.

I entered one of these fashionable shops, and asked the price per dozen of the baby toys, calling them that name. As soon as the words escaped my lips, I saw the moment when my life was in danger. "Baby toys!! What do you mean, sir! These are the latest fashion from Paris, and they are worth from six to twenty shillings per dozen!"

"I don't believe it," I said. "It is quite impossible that in cities like London or Paris exist such persons as would make use of such poor things as ornaments for their hats. When I was a boy I saw in Paris many of these toys, called then *Cocottes*, and which were usually sold at a halfpenny a piece. They had an elastic string tied to the centre of the body, and were made to go up and down by pulling the string." I could say no more, being forcibly ejected from the shop.

Really, I had a very bad quarter of an hour after this, coming back to my place quite dejected.

But being rather tenacious in my opinions, I said I must clear that up. So I went to see some friends of mine, great Authorities in science, and great Industrials, to whom I asked if they had seen these multicolor birds, and what they thought of them. Their reply was: "No, we have not seen them, and we don't believe that they exist." So I took them round to have a good view of these novelties. All of them were scandalized to see the objects of their favourite study so absurdly ridiculized. At last one of them said, "Oh! I have it! I know now why these made-up birds have made their appearance this season in London."

It appears that a severe battle has been fought lately against the wearing of beautiful humming birds, and bright birds in general, from sympathy to the poor Innocents. He was right!! This was the true explanation of the appearance of these fancy birds. But, good gracious! Why have they made such poor representatives of Nature? With a little care and good-will they could have made something worth having. Then I would have nothing to say; but having had such a shock when I was ejected from the above-named shop, where I asked the price of these toys, only fit for children, I must say

a few words to the general public, and especially to the fair sex of both worlds, to explain that it will make very little difference to the wingy tribe, if Ladies condemn themselves in not wearing as adorns to their perfections the most brilliant jewels of Creation, such as Humming Birds, blue Creepers, bright Tanagers, wonderful Trogons, and Birds of Paradise, etc., etc., which enhances so harmoniously with their charms. I am a Naturalist of forty years' standing, and have travelled all over America from Cape Horn to California. I have explored thoroughly the United States, Mexico, Central America, part of South America, and what I can warrant is this. In the southern parts of the United States, Mexico, Central America, and in Nicaragua, I have seen thousands and thousands of specimens of various species of Herons, Spoonbills, Ducks, Geese, Tanagers, Sparrows, Swallows, Humming Birds, etc.

In San Andres Tuxtla (Mexico) I have been the witness of the arrival of the swallows (*Hirundo bicolor Vieili*). They invaded a field of sugar-cane belonging to Don Francisco Carrère, a friend of mine, where I was staying at the time. Half an hour before sunset you could see them arrive from all parts of the horizon, meeting in one compact assemblage. When all of them had met at an altitude of about 1,500 feet, they formed a black cloud occupying half of the sky above our heads. A column exactly similar to a waterspout, of several feet's thickness, was seen coming down from the sky to the ground, dispersing in all directions over the fields. This lasted about a quarter of an hour, until they all had taken refuge for the night in the fields of sugar-cane. Well, I do not think I exaggerate when I state that they were at least several hundred thousands occupying nearly half a square mile. When night came, I went with a boy to see if I could get some specimens. We could not see, but we just gave a few knocks with our sticks on the canes, and the result was about fifty victims, which I took home and carefully skinned the next day. These are in the principal Museums of Europe at the present time. They were very fat and a splendid eating. All the men on the plantation feasted on them during their stay, which lasted about one month. In the morning they used to move in the same way as in the evening, but the reverse, forming first a thick column from the field to a height of about 1,500 feet, until they had all assembled. Then they separated in all directions in small bands, and were no more seen until the evening.

At the end of the month the plantations of sugar canes were nearly ruined. Another time when in Playa Vicente (Mexico) I saw another flock of birds passing over my head. They were Sparrow Hawks (*Cerchneis sparveria*). They did not stop in the locality; but their passage nearly lasted half an hour. How many thousands they were! Impossible to tell.

When residing in la Parada, State of Oaxaca (Mexico), I saw again immense numbers of Humming Birds (about ten distinct species), *Arriana Riefferi* Bourc; *Heliopedica melanotis* Sw; *Petasophora thalassina* Sw; *Eugenes fulgens* Sw; *Calothorax cyanopogon* Sw; *Trochilus colubris* L; *Selasphorus platycercus* Sw, etc., etc.

They remained about two months, from October to the end of November. At that time flowers were to be seen in plenty everywhere; especially some myrtle trees, thistles, etc., etc. The boys had a net in two pieces, one and a half yard in circumference each, to which was attached a string about 20 yards long.

They opened one side of the net, the other part remaining on the ground or in the bush. Between the two parts they put flowers of the same kinds as usually visited by the birds. These were so abundant that scarcely five minutes passed without a humming bird coming inside the net to suck the flowers. Then the boy had only to pull the string which he kept in one hand, the two sides of the net joined together, and the bird was a prisoner.

They usually caught from 30 to 40 in the day, which they sold at a *cuartillo* (1½d. dozen) for eating. Being very fat, roasted, it is a repast which Lucullus himself would have enjoyed.

I could mention many other cases of the immense quantity of birds to be seen in America or elsewhere; but I think the above-mentioned cases are sufficient. To resume then. What are about one million or two millions of birds sent annually to Europe; chiefly from Brazil, Trinidad, Colombia, South America and from India, against such number of birds as Nature can boast of.

Even supposing that the fashion would continue for ever, it is my opinion that certain species of Birds are so common that it would take hundreds of years before exhausting them.

If Ladies don't wear feathers as ornaments from sympathy to the poor birds, to be consequent with themselves, they must not eat them neither, and they must not wear any furs for the same reason. Are they prepared to that? But as I said before, Nature is so prolific and such a good Nurse that Ladies can make their mind easy on that point, and continue to use the beautiful birds which harmonize so well with beauty, and refuse to wear such poor imitations of the real thing, as what is to be seen everywhere in London this year.

Besides, it is very probable that in refusing to wear them as ornaments, the result desired will not be obtained, and they would serve of pasture to the numerous birds of prey, and other animals which feast on them all the year round.

As far as my experience goes, the yearly Exportation of Bird Skins is as follows:—

Colombia	200,000
Brazil and Trinidad ...	300,000
Mexico and Central America and South America ...	100,000
Japan	100,000
India	200,000
Africa	100,000
Europe	500,000
Total ...	1,500,000

What is that! Nothing when you think of the 100,000,000 which *are killed* annually for eating purposes. However, I should suggest to Governments to

prohibit partially the killing of birds in certain seasons and totally the destruction of Eggs; as also the killing of all the species of Warblers, and some of the Passeres, which are quite indispensable to Agriculture.

It would be very convenient to make a list of the species which could be killed and those which must be preserved at all costs, and I will help with pleasure to do so.

Even in Europe it is well known that certain species of birds are so numerous that it is a good thing to destroy some to make room for others. Ex. Quails, when coming back from Africa, Crows, Magpies, Blackbirds, Thrushes, etc., etc., etc.

To be continued.

SCIENCE AND ART.

The Mackinley Bill.

The United States of America, a country which can boast of a population over 60 millions after a Century since its independence, must be surely the *Country of the future*; but it is rather astonishing that in the middle of such a prosperity such a bill as the Mackinley one has found so many supporters; but fortunately I hope it has not the majority of the country, because it is a very good thing to be self protecting, but it is better yet to think of *the welfare of all*, instead of *protecting a few individuals only*. Since partial free trade has been established in England, every one can see that the majority of the population cloth and feed better than before, and the principal ports of England have become the principal *Entrepots* of Europe. Every day you can see in the steamers running between England and France, Belgium, and Germany, merchants coming to London to attend the public sales which are daily made at the Docks of all the products of the world, and buying extensively.

Why is this? Of course because the custom duties and dock charges are much lower than in any other ports of Europe.

If there was an increase of duty to-morrow all these goods would go to other ports and England would lose greatly by it. Not only a great profit arises to England from these sales; but all sorts of goods, eatable or otherwise, being introduced in large quantities, the general public profit by it, having many neccessaries of life at a very reasonable price, which was not so some forty years back.

I am sorry to say that the *United States* is the only Country in the world where objects of natural history for scientific purposes pay a custom duty rather high. Not even in *Congo or Gaboon* such a thing exists. *It is free everywhere in all parts of the world* EXCEPTING THE UNITED STATES. I call it a shame and a bad calculation, as every obstacle put in the way of scientific researches must result against the country which make use of them, and I hope that the Government of the United States will repel the said duty as soon as they possibly can. Again with the objects of Art. It is the same.

Do you not see, Citizens of America, that now that you are prosperous and wealthy you are bound to protect Art and Science as well as Industry.

You are forward as an industrial and agricultural Country, but although you have some very good men in Science and in Art you cannot yet struggle successfully against the old World, and it is in your interest to develop and facilitate scientific and artistic studies everywhere, so as to reach perfection in everything, and this can only be done in being very liberal with all what is connected with Science and Art.

You have a great advantage on all the other Countries, being able to make use of the experience of all forerunners; but there are things which only *time* can procure and artistic taste is one of them. It requires a long time to develop fully artistical tastes in a new country, and it is quite time to begin, and I hope that you will take the hint given by an admirer of your great Country. A. B.

The Panama Canal.

By A. Boucard.

The last fall in the prices of the Shares and Bonds of the Panama Canal induces me to say a few words on this great industrial undertaking which will be one of the *marvels of the World* when completed. Suez Canal is nothing compared with the Panama Canal, and although Suez is a magnificent work on all aspects, uniting Europe with the old World of Asia, Panama has a still greater future before it, because *America, from Oregon to Cape Horn and Australia are the Countries of the future.*

Before long these countries will be very thickly populated, very rich, and will be the refuge for several hundred years yet of all courageous families who can scarcely earn enough to live in the old Continent. We can easily see the day when America and Australia will be inhabited all over with a population of *several hundreds of millions.* The Pacific Coast from Oregon to Chili, which is very fertile, is scarcely populated at present; but not many years will pass without a great change is made in that respect. Thence it will prove one of the best customers of the Panama Canal. From Australia, New Zealand, New Caledonia, New Guinea, Japan, etc., etc., they are bound to send their goods by that Canal, because if in several instances it don't shorten much the distance, a great consideration must be taken of the facility of crossing the Pacific Ocean. There is much less danger to life by the Pacific than by the Indian Seas, and the currents are very favourable to navigation either in going or in returning.

I have nothing to say against the actual price of the Shares, because virtually speaking, since the declaration of non-payment of the Coupons to the Bondholders, which are in fact Mortgagees of the Canal and all its accessories, they have lost all their value and I don't see any possibility whatever that they can get anything at any time; but it is not so with the Bonds.

All what exists belongs to them, and I append a Memorandum of the Assets which existed in May, 1890.

In cash	14 millions		
740,000 Bonds, with prime, unsold, in the hands of the Liquidation at 85 frs. ...	62	„	900,000
Remainder of the Shares of the Panama Railroad which have not been mortgaged...	50	„	
	126	„	900,000
			126,900,000
Hotel in Paris valued in June, 1887			2,005,951
		Total	128,905,951 frs.

To this sum of 128,905,951 frs. must be added the evaluation made by the last Society of Engineers, sent in 1890, of all the properties in Panama. They have been estimated at 450,000,000, which gives a total of 578,905,951 francs.

Now I will give a list of the Creditors.

250,000 Bonds of 500 frs. emitted at 437 frs., 50	109,375,000
600,000 Bonds 3 per cent. emitted at 285 frs.	171,000,000
477,387 Bonds 4 per cent. emitted at 333 frs.	158,969,871
438,802 Bonds 6 per eent. emitted at 450 frs.	206,469,000
258,887 Bonds 6 per cent. emitted at 440 frs.	113,910,280
Total	759,724,151 frs.

Besides, there was another issue of Bonds, 6 per cent., payment warranted by a deposit of French Rents, and lastly, an issue of two millions of Bonds, with prime, of which 740,000 remain actually in the hands of the Liquidation. But these two Issues, having a capital deposited which guarantee their repayment, cannot figure as Creditors.

We have then, not taking any account of the 450,000,000 of the Properties situated at Panama (excepting the shares of the Railroad Co.), a capital of 128,905,951 frs., easily realisable against Creditors for the sum of 759,724,151 francs.

Consequently, even if the Society was declared bankrupt, each bond would receive about 17 per cent. on their price of issue, and probably more, because a good many Bonds of all Categories have been reimbursed, and consequently must be deducted from the Creditors. Now, if we take in account the estimated value of the 450,000,000 francs for the property and works made in Panama, the result would be :

Assets	578,905,951	francs
Debts	759,724,151	„

which would permit to repay about 76 per cent. on the price of issue of all Bonds, 5 per cent., 3 per cent., 4 per cent., and 6 per cent. first and second issues.

Therefore the 5 per cent. Bond issued at 437 frs. 50 cent. is worth at least 74 frs. 37½ cents.
the Bond 3 per cent. emitted at 285 frs. is worth ... ... 48 frs. 45 „
the Bond 4 per cent. emitted at 333 frs. is worth ... ... 56 frs. 61 „
the Bond 6 per cent. emitted at 450 frs. is worth ... ... 76 frs. 50 „
the Bond 6 per cent. emitted at 440 frs. is worth ... ... 74 frs. 80 „

Although these sums would recuperate only a very small part of the loss entailed by the original Subscribers, they are very different to the prices pretended to be the actual prices of the said Bonds, viz., to-day, the 16th of December the

Bonds 5 per cent. are quoted 26 frs.
„ 3 per cent. „ „ 19 frs.
„ 4 per cent. „ „ 19 frs. 75 cents.
„ 6 per cent. not quoted at all.

One thing is certain, that if you sent a large order for buying several thousands of these Bonds, I doubt very much if you could get them, even after waiting several weeks or even months for the delivery of same by the broker.

I remember that some months ago myself and friends gave order to buy a few, and we were obliged to wait many weeks before they were delivered to us.

Knowing a great deal about the Panama Canal from its beginning, when I met in Panama, in 1876, the Comité d'Etudes under the direction of the active M. Napoleon Wyse Bonaparte, up to the present time, I would advise all the holders of Bonds to be firm, to keep by them all what they have, and to unite. Then I am sure they could get back a great part of their money, if not all.

Firstly, I suggest to ask from the Liquidator, the repartition of all the bonds, with prime, now laying in the hands of the company, to be divided *a priori* among the Bondholders.

Secondly, to have an assembly where should be discussed the question of selling all the assets in Paris and Panama, either for cash or by exchange of shares at a price satisfactory to both parties, and in case of not appearing such Company to realise as soon as possible all the assets existing in Paris in cash, properties, prizes gained by the 740,000 bonds with prime in the hands of the Liquidator, as also to realise the shares of the Panama Railroad and all properties realisable, and divide the sum resulting of these sales, *a priori* among the Bondholders.

But it would be still better to have a good arrangement with a new Company which can very well give 50 per cent. of the price of issue of the bonds and make a splendid business of it.

If a company should buy the Canal from the Bondholders at that price, which would amount to a little less than 400 millions, it is very probable that they could finish the work with 600 millions. The total cost would be 1,000,000,000 francs (1 milliard).

At that price I have not the least doubt that it would be a very profitable business for the Investors.

The Panama Canal a few years after its opening will give extraordinary results, which will astound even the Shareholders of the Suez Canal.

I know a great many of the Bondholders who would take at once some shares in the new Company, and are quite willing to receive shares of a new Company in payment of their Bonds.

The 11th of February, 1889, a little time after the declaration of the liquidation of the Company, I wrote two similar letters, one to M. de Lesseps, the other to Mr. Brunet, the liquidator.

The former never replied (a rather strange proceeding); the second replied the 14th of February.

Here are these letters:—

"Monsieur,

"Plusieurs de mes amis et moi possédons un grand nombre d'Actions et d'Obligations du Canal Interocéanique et nous sommes de ceux qui ne veulent pas entraver la Compagnie d'aucune manière; c'est dire que nous nous intéressons beaucoup à ce que cette magnifique entreprise puisse se terminer.

Depuis quelque temps, chaque fois que nous nous réunissons, nous causons de cette affaire et nous cherchons une combinaison capable de sauver la situation et nous croyons avoir trouvé un moyen qui permettrait probablement à la Compagnie de se procurer les sommes dont elle a besoin et qui serait probablement accepté par la majorité des Actionnaires et Obligataires.

Il s'agirait de fonder une nouvelle Société d'Actionnaires qui fourniraient à la Compagnie une somme de cent millions.

Le paiement serait fait moitié en espèces, moitié en Actions ou Obligations anciennes à raison de la moitié ou des deux tiers de leur valeur d'émission.

Cette combinaison ferait remonter instantanément les Actions et Obligations de l'ancienne Compagnie si dépréciées en ce moment, et procurerait à la nouvelle Compagnie 50 millions en espèces.

Aussitôt la nouvelle Compagnie formée on émettrait pour un milliard d'Obligations à lots rapportant 3 pour cent. d'intérêt par an et payable de la même manière que pour les Actions nouvelles.

Cette opération rapporterait encore une somme de 400 à 500 millions à la Compagnie et nous ne doutons pas qu'avec ces sommes la Compagnie serait à même de terminer le Canal.

Celles des anciennes Actions ou Obligations qui n'auraient pas servi à souscrire auraient toujours le droit de les échanger pour des nouvelles Obligations à lots aux mêmes conditions que les autres.

Je ne doute pas que tous les anciens Actionnaires et Obligataires accepteraient une combinaison de ce genre; car en réalité il n'y aurait pas de perte réelle pour eux; puisque le capital ancien étant réduit par ce moyen, les bénéfices seraient d'autant plus grands et leur perte actuelle serait largement compensée par de plus forts intérêts à recevoir dans l'avenir.

Le capital définitif tant en Actions qu'en Obligations anciennes se trouverait reduit à 700 millions au lieu de 1,400 millions d'une part et 450 à 550 millions de titres nouveaux, soit 1,200 millions en totalité, ce qui permettrait bien certainement de distribuer de bons dividendes aussitôt que le Canal serait ouvert à la navigation." Agréez, Monsieur, etc., etc.,

A. B.

Réponse de Monsieur Brunet, Liquidateur,

Paris, 14 Février 1889.

Monsieur,

"J'ai reçu la lettre que vous avez bien voulu m'écrire le 11 février.

Je vous remercie de l'idée que vous voulez bien me soumettre, j'en prends bonne note.

Veuillez agréer, Monsieur, l'assurance, etc., etc.,

Le Liquidateur, Par Procuration,

HENRY NAD...(*illegible*).

As I said before, M. de Lesseps did not reply to a similar letter forwarded to him the same day.

Now, I think just the same as on the 11th of February, 1889, except that the combination proposed should apply only to the holders of the Bonds 5 per cent., 3 per cent., 4 per cent., and 6 per cent., who are the only Creditors of the Company.

I think that a new Company, which could agree with the Bondholders about the purchase or exchange of their Bonds at half the value of their issue, would have a great chance to succeed and would be able to open the Canal in about four or five years. It would be of great importance to them to secure, if possible, the services of M. Napoleon Wyse Bonaparte, who is the man for it. It is him who has directed the works of the Comité d'Etudes. He is well acclimated, very active, and much liked in the country. That means a great deal. Besides, I believe that he should consider a great honour to terminate what he begun so well, and really believe by the little that I know of him that he would accept.

Many persons think that the termination of the Panama Canal is nearly impossible in consequence of the great difficulties to be surmounted yet, and that it would be more easy to open the Nicaragua Canal.

This was my idea too in 1878—idea which I expressed in the Geographical Congress of Paris, of which I was a Member, and also Delegate for the Republic of Guatemala; but my principal reason for advocating then the Nicaragua Canal, was not so much because the difficulties are less by that route; but chiefly for humanitary purposes; because I knew, for having resided a certain time in both countries, that fresh meat and all other eatables, especially green vegetables, were more plentiful in Nicaragua than in Panama, and could be the means of saving life; and I knew also that workmen could be had more easily in Nicaragua than in Panama; but now that about half the work is done, I have no doubt that it will cost less to terminate the Panama Canal than to make the Nicaragua one.

I am certain that the same difficulties which have been experienced at the beginning of the works in Panama will be repeated in Nicaragua. It is always a very expensive affair to begin a work of such magnitude.

Now, if anyone can prove to me the contrary, I have no objection whatever to a Nicaragua Canal, and the only thing I ask, is to be able to go once more, either at Panama or at Nicaragua, when this marvel of a Canal joining the Atlantic to the Pacific will be achieved; because, as I said before, it will be one of the Wonders of the 19th Century, and there is no comparison to be made between Suez and Panama.

In Suez, fellahs could be sent to work in any quantity, the country was densely inhabited, nearly everything could be procured from the country or from Europe at moderate prices, and in any quantity; meanwhile, in Panama difficulties of all sorts surround you, and everything had to be created, workmen were very scarce, and had to be paid dear, provisions had to be sent from Europe, etc., etc.

In fact, it is a stupendous undertaking, and no doubt that all Nations ought to help—at least morally—the Company, which will undertake the termination of this magnificent WORK OF ART.

To be continued.

SCIENCE AND INDUSTRY.

Notes on the Genus Pharomacrus or Resplendent Trogon.

By

A. Boucard.

The genus *Pharomacrus* was made by *la Llave* (a Mexican naturalist) in 1801 for the magnificent bird known under the names of Quetzal in Mexico and Central America, *Couroucou resplendissant* in France, *Resplendent Trogon* in England, *Ave del Paraiso* in Spain and America, etc., etc. It is certainly the finest bird of America. It is found from Mexico to Panama. In South America it is represented by other several fine species, but the tail of these species is quite short. Meanwhile in the specimens from Mexico and Guatemala it is common to see male birds with tails measuring over one yard long, and three inches wide. It is well-known that during the reign of Moctezuma, *Emperor of Mexico*, at the time of the Conquest, the feathers of this bird were highly estimated for ornamental purposes, and only the Emperor and his family could make use of them.

What a strange thing to remember this, when four centuries afterwards, these birds are again actively searched for the same purpose, especially for the adornment of the fair sex.

Quezaltenango, a province lying south of Mexico, but now belonging to Guatemala, had no other tribute in time of Montezuma than to send yearly the feathers of one hundred of these birds for the use of the Imperial family of Mexico.

Actually this identical bird forms part of the arms of the Republic of Guatemala, and has also been adopted by that country as effigies for its postal stamps; where it shows splendidly and beautifully as stamp Collectors well know.

Coban, capital of the province of the Alta Vera Paz, in Guatemala, is the locality where many of these birds can be got.

During ten years I have received yearly from that place 600 skins of these birds, for which I paid 28s. 6d. each. I had a constant customer for them, but a sudden fall of 15s. per bird, stopped completely the remittance. That was in the year 1876. Since then very few have been sent, so I hope that they have had time to multiply again. Only males were ordered to be killed. Perhaps for that reason they did not seem to be getting rarer; nevertheless the hunters had sometimes to go to very long distances to get them, and they were glad when they could shoot four or five weekly.

The female of this glorious bird is fine, but nothing to compare with the male, and its value is very little. Hence the reason why I ordered to spare them, and principally also for not destroying this fine species.

Since a few years large consignments have been made from Costa Rica, and even from Nicaragua; but although splendid in colour their tails are not comparable to Mexican and Guatemalan specimens. They are always much shorter and narrower. During my voyage in Costa Rica in 1877, I saw several of these birds, and many were brought to me by the native hunters. In fact, I brought back about 250 with me in London. All of them being alike, I made a variety of this bird, which I described and called *Pharomacrus mocina, Var costaricensis.*—Ornith. Miscell. Part XI., page 21.

In Veragua (Columbia) south of Costa Rica, this species is also found; but the tail is again a little shorter than the Costa Rica specimens.

In Columbia, Venezuela, and Ecuador it is replaced by two other species, *Pharomacrus fulgidus and auriceps*, of which large consigments are made yearly to Paris, where they fetch the wholesale price of 4*s.*, which I consider very cheap for such fine birds.

The tail of these species is rather short and only just remind the splendid tail of *P. Mocina*. Everyone would think that these birds must be very common thousands of specimens being sent yearly to Europe, but it is not so.

They are rather rare and scarcely seen. They inhabit the densest and most savage places of the semi tropical forests, in the barrancas (deep ravines) where it is very difficult to get at them, and it is only due to the active search made by several hundred native hunters that a certain number can be obtained.

The native hunter for the sake of 2*s.* or 4*s.* per bird, which is the sum generally paid, searches everywhere for them; hunting at the same time other birds; especially *Rupicola peruviana*, vulgarly known as Cock of the Rock, and humming birds which are also found in the same localities with these Trogons. Between 1000 and 2000 are secured every year.

They are in great demand for Plumassiers purposes in consequence of their magnificent plumage.

They usually nest in the hollow parts of trees or in the rocks. They lay only two pure white eggs, the size of a small dove, but more rounded, similar to the eggs of Wood Peckers.

The actual wholesale value of these birds is between 15*s.* and 25*s.* for the long tail species, and 4*s.* to 6*s.* for the South American species.

Now I will give a monographic list of these splendid birds of which six species and varieties are known.

CLASS AVES.

Ordo Coccyges.

sub-ordo heterodactylæ.

Fam. Trogonidæ, Sw. 1831.

Pharomachrus De la Llave, 1801.

Calurus, Sw. 1830.

Pharomacrus mocina, La Llave, 1801.

Trogon pavoninus, Temm.—*Trogon paradiseus* Bp. 1826—*Trogon resplendens*, Gould, 1835, *Resplendent Trogon.*

Male:—Head, Neck, and entire Back metallic green, with gold reflections, Wing and tail coverts golden green; some of the wing coverts are nearly

three inches long, pointed, and most handsome, four of the tail coverts are very long; the two central being in very adult males, sometimes nearly four feet long, and three inches wide; the next two nearly as long, and the others much smaller. Wings pure black; tail black, with three internal feathers on each side white, the third edged with black; Breast vinous red, flanks, abdomen and under tail coverts carmine; feet black; bill reddish yellow.

Female:—Head and back bronzy green; rump, wing, and tail coverts, golden green; wings black; tail black, with three internal feathers on each side crossed alternatively with black and white; throat bronzy green; breast and abdomen, dark grey; under tail coverts carmine; feet black; bill black, with a yellow border on the under mandible.

Total length ...	...	5 feet.
Tail ...	...	9 inches.
Wing ...	...	8 „
Leg ...	...	2 „
Bill ...	...	1 „

Native countries:—South Mexico and Guatemala.

Pharomacrus mocina Var costaricensis Boucard, 1879, Ornithological Miscellany, Part XI., page 21.

Male:—Exactly as the preceding species; but less vinous red on the breast and the wing; and the tail coverts are shorter and narrower.

Found in Costa Rica, Nicaragua, and Veragua.

Type in *Museum Boucard.*

To be continued.

An Easy Way of Making One Hundred Pounds Sterling a Year in Collecting Specimens of Natural History at Leisure Time.

The object of this article is to facilitate to every one the means of collecting, preserving and sending home collections of natural history.

By attending exactly to the following instructions, any resident in Europe, excepting France, England, Germany, Belgium, Austria, and other neighbouring Countries which have been well explored; and in Asia, Africa, America, or Oceania, may collect easily in one year specimens worth one hundred pounds sterling.

To obtain this result, it is necessary only to employ Sundays and other holidays in exploring the neighbourhoods of the place of residence, and collect Reptiles, Fishes, Insects, Shells, Seeds, etc., etc.

These scientific excursions will not only be very instructive and amusing; but, at the same time, very favourable to health and interests.

I have never enjoyed better health than during the fifteen years I have been living in America as a Traveller-Naturalist.

I shall now proceed to show that, in one year, it is easy to collect 250 specimens of Reptiles and Fishes, 4,000 Insects, and 1,200 Shells.

Supposing that not more than fifty days can be employed in making collections; this will require as fruit of each day's labour 5 Reptiles, 80 Insects, and 24 Shells.

The success of a collector must be very bad, or the country very poor, if a larger number than the above be not obtained; because in all my voyages, I have always collected easily in one day, 10 Reptiles, 100 Insects, and 30 shells, and sometimes many more.

Reptiles may be sold with facility at one shilling each, the Insects at one pound sterling per hundred, and the Shells at one pound per hundred; so that it would only be necessary to collect very few Crustaceæ, Seeds, bright-coloured Insects, or any thing else, to obtain for them the sum of £33 in order to arrive at the total of £100 for the year. Therefore, if in fifty days you can obtain such a result, it is quite sure that any person who can dispose of all his time, will collect in the year objects of natural history worth £200 or more, especially if he collects also Bird and Mammal Skins.

But, in the first as in the second case, to obtain this result, it is necessary to attend exactly to the following instructions; the value of collections depending chiefly how they are collected as well as their perfect state of preservation.

I invite all persons who intend collecting objects of natural history to come and see me. I will give them all the necessary instructions to facilitate their success, and a few practical lessons, which may be very useful to them. Persons living abroad can write.

REPTILES AND FISHES.

Reptiles are divided in four Orders.

1. Chelonii, or Turtles and Tortoises.
2. Saurii, or Lizards, Camelions, etc.
3. Ophidii, or Snakes.
4. Batracii, or Frogs.

Turtles and Tortoises are to be collected in the sea, the rivers, the lakes, near the water, and in the damp plains.

Other Reptiles must be searched for under stones, bark of decayed trees, on old walls, on branches and trunks of trees, near rivers and on the ground.

They may be taken with the hand or with nippers and put into a bottle with alcohol.

Several species of snakes are venomous; before taking, it will be necessary to strike them one or two blows in the middle of the back-bone with a very flexible stick, taking care not to spoil the skin.

Fish may be caught with fishing rods or nets, in the sea, rivers, lakes, etc., and put immediately in a bottle with alcohol, especially if you are in a hot country, and far from your residence.

When you get back to your house, they should be taken out of the bottles, and cleaned in a linen cloth; then make an incision in the belly of the animal to allow the penetration of the alcohol in the intestines, and put them in a large bottle containing fresh alcohol or any other strong spirit.

To be continued.

Report on the Public Sale of Feathers and Bird Skins, December, 1890.

Fair demand for all kinds of Osprey feathers. Nearly all the lots offered were sold. Short selected declined from 10s. to 15s. per oz. Price steady for the other sorts. Bird skins in general sold badly, especially East India consignments.

Birds without a price affixed were not offered at this month's Sale.

1s. = one shilling = 1 fr. 25 = 1 mark = 25 cents.
1d. = one penny = 10 cent. = 2 ,,

	s.	d.		s.	d.
Long Osprey (per oz. to quality)	15	0	to	18	0
,, ,, inferior	11	0			
Short ,, superior	55	0			
,, ,, selected	66	0			
,, ,, inferior	13	0	,,	38	0
Brown Osprey	1	3	,,	1	6
Red ,, ...	2	1	,,	3	3
Mixed Heron	0	9	,,	1	6
Heron	15	0	,,	20	0
White Paddy, first quality	35	0			
,, ,, second ,, ...	18	0			
Grey Paddy	8	0	,,	14	0
Peacock, neck feathers blue, per lb. ...	2	0	,,		
,, ,, gold	17	6	,,		
,, eyes, bundle of 100	0	1½	,,	0	2¾
Short Osprey, flat skins, each					
Impeyan Pheasant, round skins, each ...	3	0	,,	3	6
Red Argus ,, ,, ...					
Black ,, ,, ,, ...					
Green Japanese do. ,, ...					
Red ,, do. ,, ...					
Bird of Paradise, male ,, ...	15	0	,,		
,, ,, female ,, ...	13	6	,,		
Rifle Bird of Paradise, ,, ...	17	6	,,		
King ,, flat skins ...	1	3	,,	1	7
Green ,, ,, ...	1	9	,,	1	11
Indian Parrots, various, round skins ...	0	0⅝	,,	0	1¼
Birds, various, from India ,, ...	0	0½	,,	0	1
Red Head Manakin, ,, ...					
Blue Creeper, ,, ...					
Green ,, ,, ...					
Starling, ,, ...					
Magpie, ,, ...					
Blue Metallic Merle, ,, ...					
Green ,, ,, ,, ...					
Gaboon Merle, ,, ...					
Ptarmigan, ,, ...					
Cock of Rock, ,, ...					
Indian Crow, ,, ...					
Large Owls, ,, ...					
Medium ,, ,, ...					
Sea Swallow, Medium, ,, ...					
Red Tanager, ,, ...	0	9	,,	0	10
Yellow and Black do. ,, ...	0	7	,,		
Five Coloured Finch ,, ...	0	10	,,	1	0
Tanager, various, ,, ...	0	4	,,	0	8
HUMMING BIRDS, round skins.					
Blue Long Tail, ,, ...					
Green ,, ,, ,, ...					
Large Humming, ,, ...					
Green Golden Humming, large, ,, ..	0	3	,,	0	6
,, ,, ,, small, ,, ...	0	4	,,	0	7
Ruby Humming, ,, ...	0	5	,,	0	8
Female ,, various, ,, ...	0	1½	,,	0	2½
Crested Humming, ,, ...	0	2			
Amethyst ,, ,, ...					

Mr. A. Boucard will be happy to execute Commissions for Gentlemen who cannot attend the Sales.

Rapport sur la vente publique de Plumes et d'Oiseaux à Londres, Décembre 1890.

La demande a été bonne pour les plumes d'aigrettes longues et courtes, et presque tous les lots offerts ont été vendus. Baisse de 10 à 15 francs par once sur l'aigrette crosse courte de premier choix. Prix fermes pour les plumes d'aigrette blanche longue et pour les plumes de hérons divers. Baisse sur tous les Oiseaux en général, et tout particulièrement sur les provenances de l'Inde anglaise.

Les oiseaux non-cotés n'ont pas été offerts à la vente de ce mois.

1s. égale 1 fr. 25 cent., 1 mark = 25 cents.
1d. ,, 10 ,, 2 ,,

	s.	d.		s.	d.
Aigrette blanche longue, l'once ...	15	0	à	18	0
Aigrette blanche longue, inférieure ...	11	0			
,, ,, courte, supérieure ...	55	0			
,, ,, ,, choisie	66	0			
,, ,, ,, inférieure ...	13	0	,,	38	0
,, brune	1	3	,,	1	6
,, rouge	2	1	,,	3	3
Plumes de Hérons divers	0	9	,,	1	6
,, d'Anhinga	15	0	,,	20	0
Marabout blanc, 1re qualité	35	0	,,		
,, ,, 2e ,, ...	18	0	,,		
,, gris	8	0	,,	14	0
Paon, plumes du cou, la livre	2	0	,,		
,, ,, dorées	17	6	,,		
,, (queues)	0	1½	,,	0	2¾
Aigrettes blanches (peaux plates) ...					
Lophophores, peaux rondes, chaque	3	0	,,	3	6
Argus rouge, ,, ...					
,, noir, ,, ...					
Faisan vert du Japon, ,, ...					
,, rouge ,, ,, ...					
Paradis jaune, mâle, ,, ...	15	0	,,		
,, ,, femelle, ,, ...	13	6	,,		
Paradis Gorge d'acier, ,, ...	17	9	,,		
Petit Paradis King, peaux plates ...	1	3	,,	1	7
,, vert et jaune, ,, ...	1	9	,,	1	11
Perruches de l'Inde, peaux rondes ...	0	0⅝	,,	0	1¼
Oiseaux divers de l'Inde, ,, ...	0	0½	,	0	1
Manakin à tête rouge, ,, ...					
Guit guit bleu, ,, ...					
,, vert, ,, ...					
Sansonnets, ,, ...					
Pies, ,, ...					
Merle métallique bleu, ,, ...					
,, ,, vert, ,, ...					
,, ,, du Gabou, ,, ...					
Gelinotte, ,, ...					
Coq de roche, ,, ...					
Pie sanglante, ,, ...					
Chouettes grandes, ,, ...					
,, moyennes, ,, ...					
Sterne moyenne, ,, ...					
Tangara rouge, ,, ...	0	9	,,	0	10
,, noir et jaune, ,, ...	0	7	,,		
Tangara quinticolor, ,, ...	0	10	,,	1	0
,, divers, ,, ...	0	4	,,	0	8
OISEAUX MOUCHES, ,, ...					
King à queue bleue, ,, ...					
Oiseau mouche vert à longue queue ...					
Oiseaux mouches, grands					
,, vert dorés, grands ...	0	3	,,	0	6
,, verts dorés, petits ...	0	4	,,	0	7
Rubis Topazes, ,, ...	0	5	,,	0	8
Oiseaux mouches, femelles diverses ...	0	1½	,,	0	2½
Oiseaux mouches à huppe dorée	0	2			
Clarisse et Parzudaki					

La maison Boucard se charge des commissions d'achat qui lui seront envoyées par les personnes ne pouvant assister aux Ventes.

1	Lot of 100 Hoopooes	...	...	...	Price	£6	0	0
1	,, ,, 50 Wax Wings	...	...	...	...	£3	0	0
1	,, ,, 50 African Humming	...	...	...		£2	0	0
1	,, ,, 100 Blue Creepers	...	...	...	...	£5	0	0
1	,, ,, 50 Green Creepers	...	...	...	...	£2	0	0
1	,, ,, 50 Red Tanagers	...	...	...	...	£2	10	0
1	,, ,, 100 Yellow and Black Tanagers	...	...			£4	0	0
1	,, ,, 50 Five Coloured Tanagers	...	...			£4	0	0
1	,, ,, 100 Tanagers, various	...	...	...		£2	0	0
1	,, ,, 50 Mexican Starlings	...	...	...		£5	0	0
1	,, ,, 100 European Starlings	...	...	...		£2	0	0
1	,, ,, 25 Blue Jays	...	...	...	...	£2	0	0
1	,, ,, 50 Alpine Crows	...	...	...	...	£4	0	0
1	,, ,, 50 Metallic Starlings	...	...	...		£4	0	0
1	,, ,, 50 Large New Guinea Pitta	...	...	...		£8	0	0
1	,, ,, 25 Royal Fly Catchers	...	...	...		£5	0	0
1	,, ,, 50 Fly Catchers, various	...	...	...		£2	0	0
1	,, ,, 50 Yellow-Headed Manakins	...	...			£1	5	0
1	,, ,, 50 Red and Black ditto	...	...	...		£1	5	0
1	,, ,, 20 Goat Suckers	...	...	...	...	£2	0	0
1	,, ,, 100 Swallows	...	...	...	...	£4	0	0
1	,, ,, 10 Bower birds	...	...	...	...	£2	10	0
1	,, ,, 100 Green Humming, all males	...	...			£2	10	0
1	,, ,, 100 Amethyste Humming	...	...	...		£4	0	0
1	,, ,, 100 Large Humming	...	...	...		£2	10	0
1	,, ,, 50 Ruby Topaz Humming	...	...	...		£2	10	0
1	,, ,, 25 Long Blue Tail Humming	...	...	...		£5	0	0
1	,, ,, 10 Fire Tail Humming	...	...	...		£12	0	0
1	,, ,, 50 Long Tail Humming, various	...	...	...		£4	0	0

1	lot de 100 Huppes	...	...	...	...	Prix	150	fr.
1	,, ,, 50 Jaseurs	...	...	...	...	...	75	fr.
1	,, ,, 50 Sui manga	...	...	...	...	...	50	fr.
1	,, ,, 100 Guit guits à tête bleue	...	...			...	125	fr.
1	,, ,, 50 Guit guits verts	...	...	...		...	50	fr.
1	,, ,, 50 Tangaras rouges	...	...	...		62	fr.	50 c.
1	,, ,, 100 Tangaras noirs et jaunes	...				...	100	fr.
1	,, ,, 50 Tangaras, quinticolor	...	...			...	100	fr.
1	,, ,, 100 Tangaras divers	...	...	...		...	50	fr.
1	,, ,, 50 Etourneaux du Mexique	...	...			...	125	fr.
1	,, ,, 100 Sansonnets	...	...	...		...	50	fr.
1	,, ,, 25 Geais	...	...	...	...	...	50	fr.
1	,, ,, 50 Corbeaux des Alpes	...	...			...	100	fr.
1	,, ,, 50 Merles Métalliques bleus	...	...			...	100	fr.
1	,, ,, 50 Grandes Bréves, de la N. Guinée					...	200	fr.
1	,, ,, 25 Gobe mouches royaux	...	...			...	125	fr.
1	,, ,, 50 Gobe mouches divers	...	...			...	50	fr.
1	,, ,, 50 Manakins à tête jaune	...	...			36	fr.	25 c.
1	,, ,, 50 Manakins à tête rouge	...	...			36	fr.	25 c.
1	,, ,, 20 Engoulevents	...	...	...	...	...	50	fr.
1	,, ,, 100 Hirondelles	...	...	...		...	100	fr.
1	,, ,, 10 Oiseaux satinés	...	...	...		62	fr.	50 c.
1	,, ,, 100 Oiseaux mouches Verts, tous mâles					62	fr.	50 c.
1	,, ,, 100 Clarisses et Parzudaki	...	...			...	100	fr.
1	,, ,, 100 Grands Oiseaux mouches divers					62	fr.	50 c.
1	,, ,, 50 Rubis Topazes	...	...	...		62	fr.	50 c.
1	,, ,, 50 Kings	...	...	...	...	...	125	fr.
1	,, ,, 10 Saphos ou Queues de feu	...	...			...	300	fr.
1	,, ,, 50 Oiseaux Mouches à longue queue					...	100	fr.

JUST ARRIVED, DECEMBER, 1890.

1	Lot of 5 Magnificent *Fire back Pheasant*; quite new to *Plumassiers* (A SPLENDID BIRD)	Price	£8	0	0
1	,, ,, 25 Macaws, flat skins		£4	0	0
1	,, ,, 100 Hoopooes	Prix	£6	0	0
1	,, ,, 50 Indian Crows		£7	0	0

TO ARTIFICIAL FLORISTS, JEWELLERS, etc.

BRIGHT INSECTS.

1	Lot of 25,000 Blue beetles	...	...	...	Price	£4	0	0
1	,, ,, 25,000 Green ,, large	...	...	...		£5	0	0
1	,, ,, 25,000 ,, ,, small	...	...	...		£4	0	0
1	,, ,, 25,000 Purple ,,	...	...	...	...	£8	0	0
1	,, ,, 1000 Golden Phaneus	...	...	...		£10	0	0
1	,, ,, 5000 May Bugs.	...	...	...	...	£4	0	0
1	,, ,, 1000 Golden Antichira	...	...	...		£10	0	0
1	,, ,, 1000 Large Green Buprests	...	...	...		£4	0	0
1	,, ,, 1000 Golden Buprests	...	...	...	...	£4	0	0
1	,, ,, 500 Ocellated Buprests	...	...	...		£5	0	0
1	,, ,, 50 Diamond Beetles	...	...	...		£5	0	0
1	,, ,, 500 Brazilian Golden Cacides	...	...	...		£4	0	0
1	,, ,, 500 Butterflies from West Africa in papers					£4	0	0

1	Lot de 25,000 Hoplies bleues	...	...	...	Prix	100	fr.
1	,, ,, 25,000 Grandes Chrysomèles vertes	...	...			125	fr.
1	,, ,, 25,000 Petites ,, ,,	...	...			100	fr.
1	,, ,, 25,000 Chrysomèles violettes	...	...			200	fr.
1	,, ,, 1000 Phaneus dorés	...	...	...	...	250	fr.
1	,, ,, 5000 Hannetons	...	...	...	...	100	fr.
1	,, ,, 1000 Petits Hannetons vert dorés	...	...			250	fr.
1	,, ,, 1000 Grands Buprestes vert dorés	...	...			100	fr.
1	,, ,, 1000 Buprestes dorés	...	...	...	...	100	fr.
1	,, ,, 500 Buprestes ocellés	...	...	...	...	125	fr.
1	,, ,, 50 Chareuçons dorés	...	...	...	...	125	fr.
1	,, ,, 500 Cacides	...	...	...	...	100	fr.
1	,, ,, 500 Papillons d'Afrique	...	...	...		100	fr.

LIST
OF THE
PRICED UTENSILS
NECESSARY FOR COLLECTING
REPTILES, FISHES, INSECTS, SHELLS, etc.

Benzine bottle	...	...	...	...	...	1s. 0d.
Tin box for collecting Insects, from	...	...	...			1s. 6d.
Bottle	...	...	...	...	...	0s. 3d.
Glass tubes or phials, doz.	...	...	...	...		1s. 0d.
Digger	...	...	...	...	...	2s. 6d.
Butterfly nets, from	...	...	...	...		1s. 6d.
Sweeping and water, nets from	...	...	...			2s. 6d.
Umbrella for Insects, from	...	...	...	...		8s. 0d.
Cork in boards, per doz., from	...	...	...			2s. 6d.
Pins for Insects, per thousand, from			...	...		1s. 6d.
Pill boxes, per gross, from	...	...	...	...		4s. 0d.
Corked boxes for Insects, from	...	...	...			1s. 6d.
Wooden box same size	...	...	...	...		1s. 0d.
Boucard's Insecticide, per oz.	...	...	...	...		0s. 6d.
Flax, per pound	...	...	...	...		0s. 6d.
Cotton-wadding, per sheet	...	...	...	...		0s. 6d.
Nippers, from	...	...	...	...	...	1s. 6d.
Fishing rods with accessory, from	...	...	...			2s. 6d.

Other Utensils for collecting Mammals, Birds, etc., are to be obtained at the Naturalist's Agency, 225, High Holborn, London, W. C.

BOUCARD'S INSECTICIDE POWDER

against MITES INSECT LARVÆ etc.

Wholesale and Retail.

—— Success guaranteed ——

This new Powder is of easy use, not dangerous to manipulate, and a good disinfectant against CHOLERA MORBUS and all EPIDEMIC DISEASES.

It destroys immediately all vermine, such as FLEAS, BUGS, MITES, LARVÆ OF DERMESTES, etc.

Sixpence for a trial packet of one ounce. It lasts a long time, a small quantity being necessary each time.

Trades supplied at a liberal discount.

NO HOUSE OUGHT TO BE WITHOUT IT.

Once tried, always used!

COCOA BUTTER.

Guaranteed pure.

Very useful to soften the skin, a preservative against CHAPED HANDS and CHILBLAINS and a remedy for CUTS, BURNS, etc. etc.

Sold in cakes, Sixpence and one shilling.

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The

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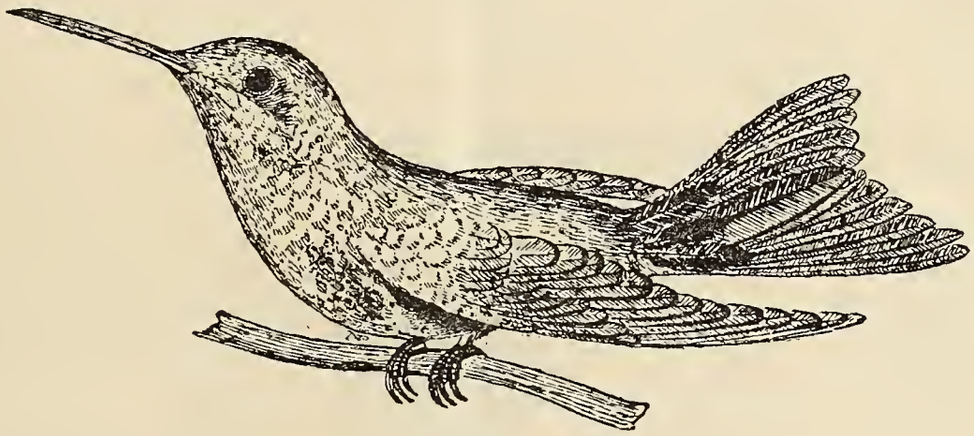

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
Member of the International Jury, Paris, 1889; Member of many scientific societies;
etc. etc. etc. etc.

CONTENTS OF No. 2.—FEBRUARY 1, 1891.

[ENTERED AT STATIONERS' HALL.]

LIST OF HUMMING BIRDS FOR SALE—*continued.*

		s.
138.	Thalurania glaucopis, Gin. ...	2
139.	— colombica, B. ...	2
140.	— venusta, ...	4
141.	— furcata, Gm.	4
142.	— furcatoides, G. ...	8
143.	— nigrifasciata, G. ...	6
144.	— refulgens, G.	6
145.	— verticeps, G.	15
146.	— wagleri, L.	50
147.	Hemistephania johannæ, B. ...	20
148.	— ludoviciæ, B. ...	5
149.	— rectirostris. ...	20
150.	Augastes lumachellus, L.... ...	40
151.	— superbus, Vicill. ...	40
152.	Schistes geoffroyi, Bourc. ...	8
153.	Urosticte benjamini, B.	12
154.	Urolampra æneicauda, G. ...	50
155.	Metallura tyrianthina, B. ...	2
156.	— smaragdinicollis, ...	16
157.	— quitensis, Gould. ...	4
158.	Adelomya inornata, G	30
159.	— melanogenys, F.	2
160.	Ramphomicron microrhynchus.	3
161.	— stanleyi, B. ...	10
162.	— heterepogon. ...	4
163.	Eupogonus herrani, Del.	10
164.	— ruficeps, G.	60
165.	Oxypogon guerini, Boiss. ...	4
166.	— lindeni, Parz.	20
167.	Cephalepis delalandii, Vieil....	4
168.	— loddigesi, G. ...	50
169.	Orthorhynchus cristatus. ...	10
170.	— exilis, Gm. ...	10
171.	— ornatus.	10
172.	Klais guimeti, Bourc.	10
173.	— merriti, Law.	10
174.	Daucis abeillei, Del.	5
175.	Microchera albo-coronata. ...	100
176.	— parvirostris, L. ...	100
177.	Telamon delattrei, L.	10
178.	— regulus, Gould.	20
179.	— reginæ, Schreib. ...	50
180.	Paphiosa helenæ, Del.	10
181.	Lophornis magnificus, V. ...	10
182.	— ornatus, L.	6
183.	Polemistria chalybea, V.... ...	40
184.	— verreauxi, B. ...	20
185.	Gouldia langsdorffi, Vieill. ...	20
186.	— melanosternon, G. ...	20
187.	— conversi, Bourc.	6
188.	Prymnacantha popelairii. ...	20
189.	Tilmatura duponti, Less.... ...	10
190.	Discura longicauda,Gm.	16
191.	Steganura underwoodi, L. ...	3
192.	— melananthera, J. ...	10
193.	Cynanthus cyanurus, S.	5
194.	— cœlestis, G.	8
195.	— mocoa, Del.	20
196.	— boliviana, G.	50
197.	Sapho sparganurus, Shaw. ...	60
198.	— phaon, Gould...	40
199.	Lesbia nuna, Less.	40
200.	— amaryllis, Bourc.... ...	4
201.	Lesbia victoriæ, Bourc.	6
202.	— gouldi, Bourc.	4
203.	Heliactin cornuta, Max.	20
204.	Thaumastura cora, Less.... ...	20
205.	Rhodopis vesper, Less.	30
206.	Amalasia henicura, V.	6
207.	— elisæ, Less.	60
208.	Doricha evelynæ, Bourc.	60
209.	— bryanthæ, Law.	20
210.	Calothorax lucifer, Sw.	4
211.	— pulcher, G.	30
212.	Calliphlox amethystinus, G. ...	4
213.	— mitchelli, B.	30
214.	Trochilus colubris, Lin.	2
215.	— alexandri. B.	20
216.	Calypte costæ, Bourc.	40
217.	— annæ, Less.	6
218.	Stellura calliope, Gould.	20
219.	Atthis heloisæ, Less....	16
220.	— elliotti, Ridgw.	12
221.	Selasphorus henshawi, R... ...	10
222.	— rufus, Gm.	5
223.	— scintilla, G.... ...	50
224.	— platycercus, Sw....	4
225.	— flammula, S. ...	40
226.	Myrtis fanny, Less.	8
227.	Acestrura mulsanti, B.	3
228.	— heliodori, B.	2
229.	Chætocercus jourdani. B.... ...	40
230.	— rosæ, Bourc	20
231.	— bombus, G.	100
232.	Mellisuga minima, Lin.	10
233.	Phæoptila sordida, G.	20
234.	Cyanomya quadricolor, V. ...	10
235.	— violiceps, G.	20
236.	— cyanocephala, L. ...	10
237.	— franciæ, Bourc. ...	2
238.	— guatemalensis... ...	4
239.	Thaumatias candidus, B.... ...	3
240.	— niveipectus, C. ...	4
241.	— viridiceps, G... ...	12
242.	— brevirostris, L. ...	3
243.	— albiventris, L. ...	5
244.	— linnæi. Bp.	3
245.	— fluviatilis, G... ...	20
246.	Thaumatias maculicauda, G. ...	6
247.	— chionurus, G... ...	12
248.	— cupreiceps, L. ...	20
249.	— nigriventris, L. ...	30
250.	— leucogaster, G. ...	8
251.	Leucochloris albicollis, V. ...	4
252.	Eupherusa eximia, Del.	3
253.	— egregia, Sc.	16
254.	Chrysobronchus virescens. ...	3
255.	— viridissimus....	6
256.	Amazilia cinnamomea, L... ...	15
257.	— dumerilii, L.	20
258.	— leucophæa, R.	20
259.	— yucatanensis, C. ...	40
260.	Pyrrhophæna beryllina, L. ...	5
261.	— devillei, B.... ...	4
262.	— riefferi, B.	2
263.	— viridiventris, R....	5
264.	Saucerottia erythronota, L. ...	2
265.	— feliciæ, Less.... ...	8
266.	— edwardi, Del.... ...	20
267.	— niveiventris, G. ...	20
268.	— cyaneifrons, B. ...	2
269.	— warzeviezi, Cab. ...	5
270.	— sophiæ, Bouré. ...	16
271.	Heliopædica melanotis, Sw. ...	5
272.	Chrysuronia œnone, Less. ...	3
273.	— josephinæ, B. ...	20
274.	— eliciæ, B.	6
275.	— chrysura, L.... ...	40
276.	Hylocharis sapphirina, Gm. ...	4
277.	— cyanea, Vieill... ...	4
278.	Panterpe insignis, Cab.	50
279.	Eucephala grayi, Del.	6
280.	— cœrulea, Vieill. ...	2
281.	Circe latirostris, Sw.	20
282.	Damophila amabilis, G.	5
283.	Julyamia juliæ, Bourc.	3
284.	— feliciana, Less.	3
285.	Sapphironia goudoti, Bourc. ...	2
286.	— cæruleogularis. ...	16
287.	Sporadinus ricordi, d'Orb. ...	30
288.	Chlorolampis canniveti, L. ...	10
289.	— salvini, G.	10
290.	Chlorostilbon melanorhynchus..	8
291.	— hæberlini, R. ...	3
292.	— nitens, Law. ...	3
293.	— angustipennis. ...	4
294.	Chrysomirus atala, Less.... ...	10
295.	— prasinus, Less. ...	10
296.	— igneus, Gould. ...	5
297.	— aureiventris, L. ...	20
298.	Panichlora aliciæ, Bourc.... ...	8
299.	— poortmanni. B. ...	2
300.	— stenura, Cab.... ...	10
301.	Phaethornis consobrinus, Bourc.	10
302.	Campylopterus phainopeplus, Salv.	80
303.	Lampornis dominicus.	25
304.	Lophornis pavoninus, Salv. ...	100
305.	Cynanthus cyanurus, Var with greentail	16
306.	Cynanthus mocoa, Var smaragdinus...	20
307.	Thaumatias nigricauda, Elliott.	20
308.	Pyrrhophæna cupreicauda, Salv.	20
309.	Saucerottia erythronota, Var maculicauda	8
310.	Chrysuronia œnone, Var longirostris Berlepsch	4
311.	Hylocharis cyanea viridiventris, Berlepsch	10
312.	Chrysomirus daphne.	10
313.	— comptus, Berlepsch	10
314.	— assimilis, Lawr. ...	10
315.	Panychlora poortmanni euchloris, Berl.	5
316.	Hylocharis lactea, Less.	40
317.	Thalurania eriphile, Less... ...	50
318.	Nunia mosquera, Bourc.	50
319.	Adelomya maculata	10

TO ZOOLOGISTS.

FOR SALE.

One Specimen of the *Giant Salamander*, from Japan (in spirit). Price £8.

One Female Specimen of *Troglodytes Nige*, skin and skeleton. Price £8.

One pair of the rare *Cervidae*, *Temazate*, from Central America. *Cariacus rufinus*. *Br.* Price £10.

WANTED.

Egg of *Alca Inipennis*.

Fine pair, male and female, *Ornithoptera Victoriae*, *Ornithoptera Durvillei*.

Fine specimen of *Morpho cisseis*.

Several specimens of *Acherontia Styx*, *Satanas*, *medusa*, etc.

TO ORNITHOLOGISTS.

FOR SALE.

Fine mounted specimen of *Alca impennis, the Great Awk*, (extinct species). Pedigree from the date of capture, 1836, to this date, will be given to buyer.

Fine male specimen of the exceedingly rare new genus of bird *Reinhardtia ocellata Bp.*, the greatest discovery of the century. Price £50

Fine male specimen of the beautiful bird *Calyptomena Whiteheadi*, n. sp., the second species known of this rare genus, four times larger and more beautiful than *C. Viridis*.

Fine pair, male and female, of the rare Paradise bird. *Semioptera Wallacei*. Price £4.

Fine pair of the magnificent bird of Paradise, *Astrapia nigra*. Price £6.

Pair of *Epimachus maximus*. Price £5.

Pair of *Paradisea raggiana*. Price £5.

Pair of *Parotia sextacea*. Price £6.

Pair of *Paradisea rubra*. Price £2 10s.

Pair of *Schlegelia willsoni* (*Dyphillodes republica*). Price £4.

Pair of *Lophorina atra*. Price £4.

Pair of *Ptilornis paradisea*. Price £2 10s.

Pair of *Craspedophora magnifica* Price £2 10s.

Pair of *Seleucides albus*. Price £4 10s.

Pair of *Paradigalla carunculata*. Price £5.

One specimen of *Casuarius edwardi* Price £10.

One specimen of *Apteryx Oweni*. Price £1 10s.

One specimen of *Apteryx maxima*. Price £8.

One Pair of *Meleagris ocellata*. Price £6.

One specimen of *Chauna chavaria*. Price £8.

Ditto ditto stuffed Price £10.

One specimen of *Oreophasis derbianus* Price £8.

Ditto ditto stuffed Price £10.

One specimen of *Argus giganteus*, stuffed Price £5.

One specimen of *Argus grayi*. Price £6.

One stuffed specimen of *Chrysolophus amherstiae*. Price £6.

One male specimen of *Otidiphaps nobilis*. Price £2 10s.

One specimen of *Hypoleucus carunculatus*. Price £4.

One specimen of *Strigops habroptilus*. Price £1 10s.

One pair of *Pharomacrus mocina*. Price £2.

One pair of *Pharomacrus costaricensis*. Price £2.

One pair of *Xanthomelus aureus*. Price £10.

One pair of *Sericulus melinus*. Price £1.

One pair of *Heteralocha gouldi*, female very rare. Price £2 10s.

By pair it means one male and one female.

WANTED.

Specimens of:—

Fregilupus varius Bodd.
Camptolainus labradorius.
Chrysolophus pictus L. Gmel.
Chrysolophus amherstiae Leadb.
Pterocnemia darwini Gould
Dromaius novæ hollandiæ
Sypheotides macqueeni Gr.
Cariama cristata L.
Chunga burmeisteri Hartl.
Palamedea cornuta L.
Ischyornis derbiana Gr.
Aburria carunculata Tem.
Leipoa ocellata Gould
Polyplectron, all the species except hardwicki
Lobiophasis bulweri Sharpe
Alectrophasis cuvieri Tem.
Gennæus nycthemerus L.
Grammatoptilus lineatus Lath.
Hierophasis swinhoei Gould
Diardigallus diardi Tem.
Lophophorus lhuysii Verr.
Calcophasis sclateri Ierd.
Gallus sonnerati Tem.
Creagrius varius Shaw
Sarkidiornis ægyptiaca Gmel.
Ara ararauna L.
Ara militaris L.
Ara hyacinthinus Lath.
Cotinga amabilis Gould
Cotinga cayana L.

TO ENTOMOLOGISTS.

FOR SALE.

One very fine pair, male and female, of *Morpho Godarti* Price £10.

One fine male specimen of the same species. Price £2 10s.

Ditto medium. Price £1.

One fine pair, male and female of *Ornithoptera pegasus*. Price £2 10s.

Ditto medium. £1 10s.

Ornithoptera brookiana. 30s.

Pair of *Goliathus Druryi*, very large and very fine. Price £4.

Pair of *Goliathus cacicus*, very fine. £1.

Dicranocephalus bowringi	20s.	Carabus speciosus	12s.
Ceratorhina morgani	20s.	— mochrae	40s.
— hornimani	10s.	— bomplandi	8s.
Heterorhina imperialis	10s.	— robustus	8s.
Lomaptera albertisi	10s.	— tuberculosus	8s.
— ignipennis	10s.	— riffensis	8s.
Steraspis herculana	10s.	— aumonti	8s.
Sternocera pulchra	10s.	Damaster blaptoides	20s.
Catoxantha gigantea	10s.	— fortunei	12s.
— eduardsi	10s.	Haplothorax burchelli	20s.
Psiloptera principalis	10s.	Cychrus angusticollis	4s.
Taphrosoma dohrni	10s.	— elevatus	8s.
Cyphus germari	2s. 6d.	— ventricosus	2s.
— augustus	2s. 6d.	— alternatus	2s.
— nigropunctatus	1s. 6d.	— punctatus	4s.
Eupholus magnificus	3s.	Mormolyce phyllodes	10s.
Psalidognatus boucardi	16s.	— hagenbachi	20s.
— erythrocerus	16s.	— castelnaudi	25s.
Hippocephalus armatus	30s.	Chiasognathus granti	10s.
Derobrachus inæqualis	10s.	— peruvianus	40s.
— brevicollis	10s.	— gaujoni	50s.
Aulacocerus mundus	10s.	— feisthameli	30s.
Mallaspis rhomboderi	4s.	— buckleyi	30s.
— belti	10s.	Macronoxia crinita	5s.
— xanthaspis	10s.	Euchirus longimanus	20s.
— leucaspis	6s.	Pelidnota burmeisteri	16s.
Pyrodes pulcherrimus	10s.	Proculus goryi	30s.
Calocomus desmaresti	16s.	— mniszecki	10s.
Elateropsis lineata	8s.	— opacipennis	5s.
Crioprosopus splendens	10s.	Plusiotis resplendens	20s.
— tricolor	10s.	— batesi	30s.
Batocera victoriana	20s.	Chrysophora chrysochlora	4s.
— celebiana	16s.	Chrysina mniszecki	16s.
— gigas	20s.	— adolphi	16s.
— wallacei	20s.	Anoplognathus grayi	20s.
Sagra buqueti	4s.	— mastersi	10s.
Amblychila cylindriformis	10s.	— n. sp.	12s.
Omus Dejeani	20s.	Golofa imperator	5s.
— audouini	8s.	Dynastes hercules	16s.
Oxygonia floridula	16s.	Chalcosoma hesperus	20s.
— gloriola	12s.	Mesgasoma thersites	10s.
— buckleyi	12s.	Aegopsis curvicornis	8s.
— moronensis	8s.	Lycomedes reichei	20s.
Carabus valdiviae	8s.	Prionocalus cacicus	60s.
— buqueti	8s.	— atys	60s.
— sybarita	8s.	Ancisthrosoma buckleyi	4s.
— elegantissimus	12s.	— rufipes	3s.
— castroensis	12s.	Mitrocephala humboldti	20s.
— subnitens	12s.	Tetracha klugi	5s.
— andestus	12s.	— bifasciata	5s.
— inexpectatus	16s.	— laminata	5s.
— gloriosus	10s,	Catoxantha eburnea	20s.
— villaricensis	12s.	— opulenta	3s.
— hypocrita	20s.	Goliathus torquatus	20s.
— temucensis	30s.	— polyphemus	20s.
— darwini	8s.	Ceratorhina juliae	4s.
— bimarginatus	10s.	— derbyana	8s.
— chonchicus	12s.	— ruficeps	20s.
— chiloensis	12s.	Tmesorhina saundersi	5s.
— chilensis	10s.	Dymusa cyanea	2s.
kraatzianus	20s.	Neptunides polychrous	20s.
		Ranzenia bertolini	10s.

The Humming Bird.

What is to be seen everywhere in London.

(*Continued from page 3.*)

Among the birds which are excessively abundant in Europe, I mentioned *Crows*, *Magpies*, *Blackbirds*, *Quails*, *Thrushes*, etc., all of which belong to species very injurious to Agriculture; although at times they feed also on Larvæ, Chrysalis and Insects, but they only do so when seeds or fruits are scarce.

Everyone has seen immense flocks of *Magpies*, *Crows* and *Blackbirds*. *Thrushes*, although not so abundant in the North of England, are very common in the South of France, Italy, Spain, and in many other Countries; especially during the autumn, when they make a great havoc in the Vineyards and Olive Tree Plantations, reducing sensibly the harvest.

If the opinion of the farmers was asked, I have no doubt that all of them would agree to the destruction of the above-mentioned species of birds.

In some Countries *Thrushes* are so abundant that anyone can bag from 50 to 100 birds in a day by disposing nooses for that effect in the Olive trees or in Vineyards, and this without diminishing their number.

As to *Magpies*, I know several Feather Merchants who, since 1865, receive yearly about 200,000 of these birds for ornamental purposes, and I have not seen any difference in their number in England or in France.

Blackbirds are so common in Spain, that about 200,000 skins are sent annually to Paris, and sold between 1½d. to 2d. each. The flesh of these birds is sold to poor people at about sixpence per dozen, and they say that they are a very good eating.

The same is done with many of the other species collected for their feathers.

Therefore, the only difference that I can see is that many birds are killed for eating purposes only, the feathers being lost by not taking the trouble to make these birds into skins, or because buyers want them as killed, and pay a little more for them; meanwhile the others are killed not only for eating purposes, but also for saving their feathers which are in great demand among the Plumassiers. Hence the advantage of these last on the former, by being useful twice—first by serving as food to poor people, and secondly in being the means to procure work to a large number of persons.

The mention of the *Blackbirds* recalls to my memory a fact of which I have been a witness during a stay of several weeks, January and February, 1880, at SEVILLA, the famous Spanish Capital of *Andalusia*, on which there is a popular saying amongst the Spaniards of "QUIEN NO HA VISTO SEVILLA NO HA VISTO MARAVILLA," which translated literally reads as follows:—*Who hath not seen Sevilla hath not seen a Marvel.*

Near Sevilla, there are some remains of great works made by the Romans when they were masters of that beautiful Country.

The principals are remains of a very magnificent road going from Sevilla to the old Roman City ITALICA; vestiges of an Aqueduct, and lastly the old City itself, which are well worth seeing.

Of course I went there, and was very much interested with what I saw of the Coliseum, Forum, and other ruins. Coming back to town a little before dusk I saw myriads of *Blackbirds* flying in all directions and setling for the night at special appointed places exactly in the same manner as the Mexican swallows (*Hirundo bicolor*) mentioned in Number 1 of this Journal.

For about half an hour I was quite interested with this sight.

The birds had selected a field of Indian Canes as resting place.

Not far off was a small house, where I entered and made the acquaintance of the owner of the Canes. I spoke to him of the sight I had just witnessed, and learnt that the Blackbirds had elected his field of Canes as a permanent domicile. Every morning at daybreak large flocks take their flight and disperse in all directions, always returning at night. They do not assemble in one compact group, as the Swallows, but come or go away in flocks of several hundred.

I stayed at Sevilla during part of January and February. At that time of the year they feed on olives and do great injury to the owners of these trees, eating a very large quantity of the fruits, and there was no end of complaints about them; but the most extraordinary fact about these birds remains to be told, although I cannot guarantee anything about it.

Several reliable persons informed me that the owner of the Indian Cane plantations did a splendid business with these birds in this way.

Everyone knows that *Blackbirds* are very greedy, and I was told that at sunset all these birds are seen moving continually about from one place to another when it is time to retire to their night refuge; but before leaving the Olive trees where they feed, every one of them carries in its beak, and even in its legs, one or two fruits which they have to drop when perching in their favourite resting branch. So next morning, the owner of the Canes had only to fill his basket with the olives brought by the birds, and does a brisk business of it, gathering more fruit than the owner of the Olive trees plantations.

Of course, I only mention it for its worth, as I did not try to verify the fact; but if true it is worth knowing.

At the same place I saw what I considered an interesting way of catching PLOVERS (*Vanellus cristatus*) by means of hooks of the same kind as those employed in fishing. They have loose lines 10 to 12 yards long fixed in the soil at one end, and with a hook baited with worms at the other.

These lines are laid every morning on the ground, in the vast plains which surround Sevilla. Once or

twice a day the owner comes to have a look at them, and very often finds a bird caught to each.

They catch a good many in that way and sell them at a very good price, these birds being very well appreciated by the inhabitants.

I had occasion to taste some, and I declare they were excellent eating.

As I said before, since a few years, the catching of these birds is done largely, and what can it matter if the people of that country eat them, with or without the skin, which is spared for the Plumassiers Trade. I don't see why it should not be done. I prefer many times that birds should be caught, skinned, and the feathers used for ornamental purposes, than to see people breeding purposely *Partridges*, *Pheasants*, and other *Game* Birds for the replacing of those slaughtered at fixed dates by the Owners of Hunting Grounds and their friends.

But for the sake of the sport enjoyed in these hunting parties, which I consider beneficial to health, I don't see why they should be objected to, and the same I think about the birds killed for food and their feathers. I cannot see what serious objections could be made against the use of different species of birds for ornament.

Now I will conclude this Notice with a few remarks worthy of the attention of all. It is that twenty-five years back, *Ostrich*, *Paddy*, *Vulture* and *Osprey feathers*, *Paradise Birds* and a few others were the ones employed by the Plumassiers since immemorial times, and it has always been very fashionable to make use of the ornaments made with the feathers of these birds; but their use was very limited and very expensive. For the same reason this trade was progressing but very slowly, and occupied a very limited number of hands; but since 1865, it is extraordinary to see the progress made in that direction.

Actually in Europe only, over 200,000 persons have found an honourable and lucrative occupation in the feather trade, and millions of pounds sterling are spent annually, either in the purchase of bird-skins, or in the payment of persons employed in this trade.

I know many firms who occupy hundreds of men and women in the manufacture of fancy feathers, ornaments and attires of all descriptions, feather hats, and in the mounting of birds.

This year, in consequence of the move which took place against the wearing of mounted birds on hats and otherwise, a great many of these unfortunate people have not found work, and are suffering greatly from it, and when we consider that we have had a winter unequalled before for its severity and length, you can imagine what harm has been done to these interesting people by raising a war cry against the wearing of bird skins, Feathers, etc.

No doubt it shows how good-hearted are the persons, who, for sympathy for the poor little birds, have agreed in not wearing any of them in future, and myself I would do the same if I thought I was doing a real good to the poor things in taking such a resolution, but as I said before, it is quite a mistake, and I feel much more interested in the well-being of *two hundred thousand of my fellow-creatures*, of whom I know many in particular, and which are deserving the greatest interest for their industry and probity, than for the birds, and I hope that this notice will not have been written in vain.

A. Boucard.

SCIENCE AND ART.

The Panama Canal.

By A. Boucard.

In the preceding number I did not mention the gift of *five thousand millions square yards of land*, made by the Republic of Columbia to the Company of the Panama Canal.

Half of this land is, or ought to be, already in the hands of the Company, the other half to be delivered at the termination of the Canal.

This land is very fertile, and particularly suitable for *Plantains*, *Cacao*, *Coffee*, *Tobacco*, *Indigo*, *Cotton*, *Maize*, and *Sugar-Cane* plantations, whose products can always be sold with a great profit, and I have not the least doubt that the Company which will undertake the termination of the Canal will be able to make some very large profits with it, either by selling or by cultivating a portion of same.

In my opinion, a new Company ought to take the same interest in putting this land in cultivation as in the termination of the Canal, as I am certain that if the two works are carried on together, the greatest revenue will come out from the products of the land and will be the means to pay a very good dividend to the new Shareholders and Bondholders.

Besides, it will be the means of saving life by procuring for the workmen all sorts of vegetables and fruits at moderate prices, which is not so at present. It will have also a great effect on the climate, and will make it healthier.

The Company would also buy several thousand heads of cattle and horses, which are sure to thrive well in the plains which surround Panama, and by that means will be able to supply good food to the workers and make a large profit, even selling at a lower price than the present one; fresh meat being scarce and dear, although it costs nearly nothing to breed and to fatten.

As my experience goes in selling cattle at £2 each, it leaves a very good profit; but of course they could sell better, the actual price being from £6 to £8 each.

I consider all what I have just said of such importance, that if I had the direction of the works, I should begin by putting in cultivation the lands and buying cattle immediately after the formation of the new Company.

It has been calculated by the late Rossignon, a friend of mine, that in two years a revenue of eight million pounds sterling could be made if only one quarter of the property was properly planted with *Sugar-canes*, *Plantains*, *Coffee*, *Cacao*, and *Tobacco*.

All the products of these plantations would find

immediate purchasers in the United States or in Europe, where the demand is constantly increasing.

It may seem *a fancy Revenue these eight millions of pound sterling;* but it is not so. They only represent a revenue of eighty pounds for ten thousand square yards, and our experience tells us that all the Landlords of our acquaintance, in Central America, who have made plantations of these same plants get much more than eighty pounds sterling for each ten thousand yards cultivated. Some of them make a profit of two hundred pounds sterling, and more with Coffee trees cultivated in the same space.

I will also mention that Mines must be very abundant in the state of Panama, as it is well known that before the Conquest Indians made use of gold for all their Ornaments, Idols, and even now, some of these gold Ornaments and Idols found in old graves find their way to Panama where they are sold to Travellers.

I know a gentleman living in Panama who bought so many of these Antiquities, that he had them melted in several large lingots which he forwarded to the United States and to Europe.

This convinces me that very good gold Placers exist in the vicinity of Panama.

But it is better not to rely too much on Mines, when I have shown that very large and sure profits can be made of the land which borders the Canal.

Now that I have made manifest to all that there is every possibility to terminate the Canal in a few years, and to pay a good dividend to all the Share and Bondholders of a new Company, which could buy the Assets existing at less than half the cost, by paying half of the price of the Issue of the Bonds 3, 4, 5, and 6 per cent., the possessors of which are the real Owners of the Canal, and who would probably accept the offer. I must again appeal to all the Bondholders, and tell them that if no Company appears during the year 1891, it only remains for them to ask from the Liquidation that all expenses should be discontinued altogether in Panama, and reduced to the strict necessary in Paris, and realise as well as possible the assets existing, either at Paris or Panama, and divide *à priori* all the sums cashed to that effect.

But meanwhile, the Bondholders could very well claim the distribution of the 740,000 or more Bonds with prime, actually in the hands of the Liquidation, which are their property, and which have nothing to do with the New Company if such appears.

Therefore, I repeat to all the Bondholders, be firm, keep by you all your bonds, and one day or another you will get a better price for them than the price quoted actually on the Paris Bourse, although I am happy to say that, since my first notice was published, a rise of about 50 to 60 per cent. has taken place in the prices of all the Bonds; but this is nothing, and I can see the day when they will be quoted at a very distinct price, nearer their real worth.

If a serious Company understanding well its own interest is willing to purchase at the very moderate price, which I have mentioned before, of 400 millions of francs, each Bondholder would be entitled to receive—firstly, his part of the 740,000 Bonds with prime in the hands of the Liquidation; and secondly, half the price of Issue of their Bonds, which means—

For each Bond 5 per cent.	218 frs. 75 cents.
„ „ 3 „	142 frs. 50 „
„ „ 4 „	166 frs. 50 „
„ „ 6 „	
emitted at 450 frs.	225 frs. 00 „
For each Bond 6 per cent.	
emitted at 440 frs.	220 frs. 00 „

These sums, as I said before, would recuperate only part of the loss undergone by the original Subscribers, who paid double that price and have not received Dividends since January, 1889; but it would be better than 17 to 20 per cent (if so much) that they may expect from the Liquidation after the realisation of all the Assets.

One way or the other, I am quite willing to represent the Bondholders near the Liquidation, and defend their interests if they ask me to do so.

In that case, they can depend that all my acts will be to defend their rights, being certain that even the Liquidation has no right to dispose of the properties without the consent of the Bondholders. I have greatly to reproach to the said Liquidation to work so much in the dark, and not to publish in some leading journal Monthly Reports of what it is doing in favour of the Bondholders.

There is no time to lose, and I appeal strongly to the SIX HUNDRED THOUSAND BONDHOLDERS OF THE PANAMA CANAL to reply to my invitation.

If they do so, I will let them know in the next number of this journal what can be done at once. Meanwhile, a Committee chosen from the principal Bondholders ought to be formed, and meetings promoted for the defence of our mutual interests.

If necessary, I am willing to leave off my house of business in London and go to Paris, where a large room could be let for the meeting of the Committee and the receiving of all Bondholders, who would have free access to the Meetings.

I am so sanguine about the result of this move that I am willing to subscribe *one thousand francs* for the fund of our Defence Committee, and I beg from all *genuine Bondholders* to follow my example, as we require some money if we want to do good work.

The sums subscribed should be deposited at the Bank of France, or any other of the leading Banks of Paris; and monthly accounts of the expenses of the Committee sent to the Subscribers.

My attention has just been drawn on the following notice published in *The Petit Journal of Paris*, on the 29th of December last, which I reproduce hereunder:

"Nous avons déjà dit que M. Wyse, mandataire de la liquidation de la Compagnie de Panama avait pu obtenir du gouvernement colombien la prolongation de la concession du canal moyennant la promesse que la Colombie recevrait 10 millions espèces à payer en cinq ans, plus cinq millions d'actions, plus que la nouvelle Compagnie à constituer pour l'achèvement des travaux prendrait à sa charge l'entretien de la force armée.

Ces conditions sont quelque peu draconiennes. Il est évident que l'appétit du gouvernement colombien a été excité par les promesses que lui ont faites les auteurs de projets qui se sont rendus dans l'isthme et

qui n'ayant pas grand'chose à risquer accordaient tout ce qu'on leur demandait. La Colombie aurait cependant dû comprendre qu'il était de son intérêt bien entendu de faciliter par tous les moyens l'achèvement du canal et non pas de mettre des entraves ou d'augmenter les difficultés déjà considérables que rencontre la constitution d'une Société nouvelle.

C'est, en effet, la Société destinée à se substituer à la Compagnie de Panama qui devra assumer les charges imposées par la Colombie. La liquidation ne peut le faire, elle n'en a pas les moyens.

Jusqu'à présent, le texte du traité passé par M. Wyse n'est pas encore connu du liquidateur, M. Monchicourt, et celui-ci ne veut donner sa ratification que lorsqu'il l'aura sous les yeux. Il lui importe de savoir si les clauses onéreuses imposées par la Colombie sont en corrélation avec les demandes de la liquidation qui veut surtout et avant tout être assurée que le gouvernement colombien mettra à la disposition de la Société d'achèvement les terrains sur le tracé du canal sans que celle-ci ait à faire des expropriations.

Ce point est très important. Diverses questions doivent être réglées en outre par le traité concernant le *Panama railroad* dont la Compagnie est, on le sait, le principal et presque l'unique actionnaire.

Il faut donc attendre que le texte du traité soit arrivé à Paris avant de savoir quelle tournure peuvent prendre les affaires de la liquidation, avant de procéder surtout à la formation d'une Société d'achèvement, ce qui n'est pas, tant s'en faut, la partie la plus aisée de la tâche du liquidateur."

I approve highly of all the observations made by the author of this notice, except in one point, when he says:—*Ces conditions sont quelque peu draconiennes.* (These conditions are somewhat Draconian.)

I object entirely to *somewhat*, being altogether more than *Draconian.*

It is just as much as if the Government of Columbia did not care about the termination of the Canal, and by what I know of *Don Raphael Nuñez, the President of the Republic of Colombia*, and of some other Eminent Colombians, it would never have entered my mind that some obstacles for the termination of the Canal could come from that quarter; and I really believe that the information sent to the *Petit Journal* cannot be relied upon.

Every Colombian well knows that the Canal is of vital importance to them. When finished, it is the beginning of a *new era for that country*, which is destined to attain an importance which could not be thought of a few years back.

Not only is it the interest of Colombia not to put any obstacles in the way of the Canal, but everyone of its inhabitants, *from the President of the Republic to the humblest of the Indians*, ought to make the strongest efforts in helping, either by cash or bodily contributions, to finish this magnificent work, which is sure to attract to their country thousands of families of the old world, and will be the means to make it one of the finest and richest of America.

Even at the cost of half the land of all Colombia as a gift to the New Company, which may undertake the termination of the Canal, they would be still the gainers, but nobody asks so much.

That is why I cannot believe that Colombia ask from a New Company *ten millions of francs, five millions of Shares, and to take at their charge the maintenance of the Army in the State of Panama.* If this was true, it would have been much better for Colombia to say at once to the Representative of the 800,000 Share and Bondholders of the Panama Canal :—"*I know that you have spent already about one milliard, 200 millions of francs, of which the greatest part has remained in this country; that you have made stupendous efforts for the digging of an Inter-oceanic Canal in our country, but I don't care. You have not done it according to Contract, and, therefore, you had better go away, and I will take possession of all that you have done, of all your machinery, houses, properties, etc., and will do what I like with them.*" It would not be very delicate, nor in the interest of Colombia, but it would be plain speaking; better than to put such obstacles as those mentioned by the Correspondent of the *Petit Journal*, which are their equivalent.

I am sure that Columbians know better, and will do all what they can to facilitate means of opening the Canal at an early date, and will morally and financially co-operate to attain this result, which will change entirely the future of their country.

Actually Colombia, although a very large country in size, is thinly inhabited, and very little known, and the financial crisis is actually rather acute; but it cannot last long, and it is not a reason why they should try to make money with the Canal. On the contrary, they must show to the world at large that they know how to appreciate the gigantic efforts made by the Company of the Inter-oceanic Canal by facilitating, by all means, the purchase of all the assets of the Old Company by a New One.

I will say even more, that Colombia being the most interested in the making of the Canal, the best policy which could be pursued by that country would be to make the most strenuous efforts in Europe for the loan of one or two hundred millions of francs, so as to guarantee with that money a minimum dividend of 3 per cent. to the Share and Bondholders of the New Company during all the time of the works; a sum which could be repaid to the Government in annuities after the opening of the Canal.

By so doing, Colombia will prove to all the world that it is not in vain that it is called Colombia, from the great man who re-discovered AMERICA, and it would be quite just to change the name of the Panama Canal into that of COLOMBUS CANAL. It would be a feeble homage rendered to the memory of the Great Navigator and Explorer, Christopher Colomb.

To be continued.

SCIENCE AND INDUSTRY.

The Museum of la Plata and my Idea of a Typical and Practical Museum of Natural History.

I have just received a pamphlet entitled *The Museum of la Plata.* It contains seven plates and one plan, giving a good idea of what is the Museum.

For a Museum whose buildings have only been finished three years ago, it is wonderful to see how well represented are certain branches of Natural History. It is true that the collections of the old Anthropological and Archæological Museum of Buenos Ayres have been translated in it; nevertheless, Mr. Francisco P. Moreno, the Director of the new Museum, must have worked incessantly and diligently since 1887, and can be proud of the results which he has obtained. If it goes on like that in America for a few more years, I can see the day when Students of Natural History will have to go to North or South America to complete their Studies.

PLATE No. I. *represents the outside frontage of the Building*. It consists of two floors and basement. The first floor and basement are three thousand five hundred yards square each, *and not three hundred thousand, as printed, surely by mistake*, page 15. The first floor is divided in fifteen large rooms containing all the Collections. In the basement are the Workshops, general Laboratories, and deposits of Specimens. The second floor, which occupies the central part of the building, contains the Library and Fine Arts.

PLATE II. shows *the general plan of the first and second floors*.

PLATE III., *the Lobby of the Museum*, where are painted sixteen large reproductions of savage Nature and human life in Argentine Republic.

PLATE IV. *Glyptodontes Room*, eight specimens exhibited.

PLATE V. *Megatherium's Room*, showing four remains of these large Mammals.

PLATE VI. *Comparative Anatomy*, showing the skeletons of four *Balaenopterae*, one of them 24 yards long, skeletons of *Orca magellanica*, *Hyperoodon burmeisteri*, *Stenorhynchus leptonyx*, and many others.

PLATE VII. *Anthropological Section*, showing hundreds of specimens of human skeletons and skulls.

PLATE VIII. shows the Workshops where are prepared the skeletons of Cetaceous Animals and other large Mammals.

I am sorry to read, page 30, that passage, *Il est certain que nous n'avons pas encore de laboratoires d'investigations, mais je l'ai répété plusieurs fois le temps qui s'est écoulé depuis la fondation du Musée est fort court et l'on ne peut pas exiger davantage*. Nevertheless, I say that men like *Don Francisco P. Moreno* are an honour to their country, and I congratulate him heartily for all what he has done in so short a time, and I wish him many years of perfect health to enable him to end the installation of the Museum which he has begun so well, and; above all, to open immediately rooms for the use of Students.

I consider this of such importance, that I will give to the readers of this journal my idea of what I consider a typical and practical Museum, small or large.

Supposing that I had a sum of £1,000 at my disposal for the building and furnishing of a Museum, and the purchasing of specimens, I should divide that sum in three parts.

The first would be for the building of the Museum, the second for furnishing same, beginning with rooms for students, and the third for purchases of specimens.

The Museum should be built entirely on a ground floor, about one yard above the level of the grounds surrounding it. It should resemble exactly what is known as a *Roman Villa*, with a yard in the centre, surrounded with galleries. If in a cold country, they should be closed hermetically with glazed windows during the winter. It is these galleries which I should devote to Students—plenty of room and plenty of light.

The Museum proper would consist of four, six, eight, ten, or more rooms, communicating one with another, and lighted with sky-lights, or by large windows on the north side.

The principal entrance should be in the middle of the building, with a large ante-room. On the right, Room No. 1, communicating with the next and the next until the last one should be reached, and from there to the ante-room of the entrance.

The rooms should be about ten to twelve yards long by six to eight wide, and about three and a half high—*not more*,—as no object can be well seen above two yards and a half.

Glazed Cabinets, two yards and a half high, should be disposed along the walls. If the objects for exhibition were not fragile, or enclosed in glass cases, shelves would be sufficient, but the first purchase to make should be a Library, selected according to the importance of the Museum, and working tables, with its accessories of paper, pen and ink, for the Students, all of which could be arranged in the galleries surrounding the central yard, which could be transformed in a garden, with a fountain in the middle.

Access should be gained to these galleries from the ante-room, and only Students should be allowed in.

The Library should be disposed on shelves, or in book cases, along the walls of these galleries, which ought to be at least five yards wide.

With the third part of the money, if it was a small sum, I should purchase only objects of Natural History found in the Country, until I had gathered a fine Collection of all the Mammals, Birds, Reptiles, Fishes, Insects, Shells, etc., representing the local fauna, as also some specimens of all the minerals and flora of the County, attaching a special importance to all the species of animals useful or injurious to Agriculture, and to all the Trees, Plants, and Minerals useful in the alimentation of Man and Beasts, or wanted for Industry. Medicine and Arts.

This should be the beginning of all Museums, and there are no Villages or Towns of 1,000 inhabitants upwards which ought to be without. I should say more, even in the smallest villages, a museum could be created with very little or no money at all.

School-rooms could be used, and the boys and girls taught to collect all sorts of animals and prepare them for the Museum. The only thing wanted is that the Professors should understand the great importance of teaching to all these children the study of animals, plants or minerals, useful or injurious to mankind, how to know them, how to make use of the first and destroy the others.

Supposing that I had been successful, and obtained all what could be had in the Animal, Vegetable and Mineral Kingdoms from the Country where the Museum is, the next move should be to purchase some typical specimens of all the families of Animals, Plants and Minerals which are not found in the Country, after which, if my means allow it, purchase all typical specimens of Genera of Animals, Plants and Minerals found in all the World, and lastly all the species inhabiting this World; but of course this last part of my programme can only be done if money is plentiful; and only Capitals such as London, Paris, Berlin, New York, Vienna, St. Petersburg, etc., or Millionnaires can do that; but what I want to impress on all is this: That it is not necessary to dispose of large sums for the Creation of Museums. It is quite the reverse, and very often it will be found that a small local Museum which has been created by a Scientific man working for love of Science, and with very limited means, is even more useful to the Country people than all the magnificent Museums created at large expenses in the Capitals. Now, supposing I had £100,000 instead of £1,000, I should work exactly in the same manner, the only difference would consist in building two, three, four or more similar houses, devoting one to Mammals and Birds, another to Crustaceæ, Insects and Shells; one to Minerals, one to Botany, one to Fossils since the Creation of the World, etc., etc.; each with its Corresponding Library, and Rooms or Galleries adapted for Students.

A. Boucard.

An Easy Way of Making One Hundred Pounds Sterling a Year in Collecting Specimens of Natural History at Leisure Time.

Continued from page 7.

Leave them in that bottle for a fortnight, then take them out, and clean them a second time. Wrap each specimen separately with a linen cloth, flax, or any other soft substance, and pack them in a tin box well filled with flax to avoid friction among them during the voyage.

Then pour some of the strongest alcohol or spirit you can get, enough to soak them with. The box to be then soldered down.

INSECTS.

Insects are very numerous. Their body is formed of three distinct parts: the head, the thorax, and the abdomen.

They are divided by some authors into nine Orders, by others into eleven and more; but the principal Orders are eight, as follow:

1. Coleoptera, or Insects known vulgarly as May Bugs, Stag beetles, etc.
2. Lepidoptera, or Butterflies and Moths.
3. Orthoptera, or Tits, Earwigs, Grass Hoppers.
3. Hemiptera, or Bugs.
5. Neuroptera, or Dragon Flies,
6. Hymenoptera, or Wasps, Drones, Bees, Ants, etc,
7. Diptera, or Flies, Gad flies, Mosquitos, etc.
8. Parasita, or Lice. etc.

To collect Coleoptera, Orthoptera and Hemiptera. it is necessary to carry several bottles with alcoholic saw dust.

The way to prepare it is to fill up the bottle to the third part with thin saw dust; then pour in a wine glass of alcohol or strong spirit, and shake it together for about five minutes. If you have no alcohol or spirit, you may put in the bottle the same quantity of benzine.

In that bottle can be put all the Insects above mentioned.

On returning from an expedition, take them out of the bottles and pin the Coleoptera through the right elytra (the wings, in form of tweezers, which cover the abdomen are the elytræ), so that the point of the pin may emerge under the thorax, between the second and the third pair of legs. You will take care to use pins adjusted to the size of the Insects.

The Orthoptera and Hemiptera must be pinned on the thorax, and the pin must come out between the two foremost legs.

They must be put with symmetry in corked boxes, taking care to sink deeply the pins to avoid their detachment in the voyage.

These boxes should be put in the sun for a few days and when you see that the Insects are dry, you will pour a small quantity of benzine in the box and paste bands of paper all round. The benzine is to be employed for every object of natural history which can be devoured by Insects.

All boxes containing Insects, Bird Skins, Crustaceæ, etc., must be preserved by pouring benzine into before shutting and pasted with bands of paper. If you have no pins, or corked boxes, send them in the same bottles in which they have been collected. If so, the bottles should be filled up completely with alcoholic saw dust, and some paper pasted round; then, by this means. if the bottles should break during the voyage, the Insects will be preserved.

Lepidoptera, Neuroptera, Hymenoptera and Diptera are collected with the butterfly net.

The specimens collected must be very perfect. The way to kill the Lepidoptera and Neuroptera is to press their thorax between the thumb and finger; this must be done with much care; because if the beautiful colours of the butterflies are spoiled, they are of no value.

They are to be pinned through the thorax and put in corked boxes like the Orthoptera and Hemiptera.

If you have no pins or cork, you can send them enclosed in pieces of paper, the wings shut one on the other and each specimen separately. These pieces of paper should be folded in the form of a triangle and of a size according to the Insect.

When you have two or three hundred specimens, you must pack them in a wooden box in good order, pour a little benzine in it, and paste paper all over the box.

Hymenoptera and Diptera must be pinned in the same way through the thorax and exposed to the sun (or to the heat of a fire a few minutes); this exposition near the fire will kill them. They must absolutely be pinned and sent in corked boxes; because in the bottles, their wings would be damaged.

Insects are to be found everywhere, under stones, moss, bark of decayed trees, in detritus or all matter in decomposition, in mushrooms, flowers, ripe fruits, in water, in dung, in soil, in the caverns, in dead bodies, in dried and rolled leaves, on sand, near the sea, and under seaweeds, in ant's nests on trunks of trees; especially those that have much sap running, on long grass and herbage, in plains, etc., etc., etc.

With an open umbrella lined inside with light linen cloth, and a stout stick, very profitable collections may be made by striking the bushes over the umbrella.

Aquatic Insects must be caught with the landing net. This net is employed for the aquatic Insects and Shells, and also for sweeping the long grasses and herbages in the plains. In that way you can take large quantities of Insects.

MARINE, LAND, AND FRESH WATER SHELLS.

Shells, as indicated by their name, are to be found in the sea, on land, and in fresh water.

Several species have an operculum (it is a small round piece of the same matter of the shell, which is fastened to the body of the animal).

It is used as a door: when he wants to come out, he opens it, and shuts it when he likes; then he is sheltered from birds and insects which are fond of them.

It must be preserved; because it is useful for the recognition of the species.

Marine Shells are to be collected in quantity, dredging the sheltered places as near as possible to the reefs of rocks; the nearer you approach, the more shells you will collect.

On the rocks and in the crevices, you will find many shells.

On the sea shore at the new and full moon, the collector should go and turn the stones and will be amply repaid for his trouble.

After severe gales of wind, many valuable species brought from far away will be found; you must not miss these occasions.

Fresh water shells are to be collected in the rivers, lakes, and ponds; they are found in the mud, on the edge of the rivers or rivulets, and are generally very abundant; they must not be neglected. Small species are as interesting as the largest.

Land Shells are found under stones, in clefts of rocks, under dried leaves, and other vegetable detritus, on trunks, leaves and branches of trees, under decayed trees, moss, etc., etc.; but always in sheltered, warm, and wet spots.

The calcareous mountains, when well forested, are very good places for collecting shells.

They have value only when collected adult and alive.

To know when a shell is adult, whatever may be its size, is when the lip (or the edges of the mouth) are grown round and firm enough to resist the pressure of your finger nail.

Young specimens will be collected when adults cannot be found.

To collect Shells, it is necessary to be provided with a basket with moss or other soft matter; place the shells on it, separating the large from the small species.

When at home, put them in a pail with lukewarm water and cover it; when you see the animals coming out of the shells, draw off quickly the water, taking care none fall down, and pour boiling water enough to cover them; a few minutes after, pour cold water, and then with a pin or needle take out the animals as you would do with the snails used as food.

In doing this delicate operation, take much care not to pierce the shell or break the mouth.

When the animals are out, wash the shells and shake out the water and the interior dirt, and place them on paper to dry; but not to the sun.

When dry, put some cotton in the mouth and paste the operculum on it.

Small species will be packed in glass tubes or small boxes with cotton.

Should they be large, wrap each one separately in paper and pack them in a box with soft substance.

It is useless to clean the very small species.

Others, for their particular forms cannot be cleaned, kill them and put them near an ant's nest; if the ant's come to them they will eat entirely the animals, and the work will be done.

If not, let them dry and pack them with care as the others.

Send a few specimens of each species in a bottle with spirits to study the animals.

SEEDS.

Seeds of all trees, bushes, or plants belonging to the country producing beautiful leaves or handsome flowers are to be collected.

They must be well ripe and dried in shade.

Pack them in small bundles, each species separately.

CRUSTACEÆ.

Crabs, Prawns, Lobsters, etc., are Crustaceæ.

They must be sent in spirit as Reptiles.

Large species can be dried by sun and packed in paper, but they are of less value than if sent in spirit,

ARACHNIDES & MYRIAPODA.

Spiders are Arachnides, Centipeds are Myriapoda; it is necessary to preserve and send them in very strong spirit; otherwise they dissolve in the voyage.

To be continued.

Report on the December Public Sales of Ostrich and Osprey Feathers, Bird Skins, &c.

The sale of Ostrich feathers commenced on the 12th December, and lasted three days.

In all, 2,071 Cases Cape and 2 Cases Egyptian were offered, of which 1,970 Cases of the former sold.

The weight of feathers offered was 33,000 lbs.

The demand was fairly good. There was a decline of 10*s.* to 15*s.* per lb. for the best qualities; but the common sorts sold well at firm rates.

White Boos declined 10*s.* to 15*s.* per lb.; Femina Boos 2*s.* 6*d.* to 5*s.* per lb., and drab Boos about 2*s.* 6*d.* per lb. Long and Medium black were about 10*s.* per lb. lower.

The quantity sold realized £107,000.

The next Sale will take place on the 2nd March.

The price current of Ostrich Feathers is as follows:—

White Primes, 1st., 2nd. and 3rd. from £5 10*s.* to £16 per lb., according to quality.

White Femina, from £5 to £10 10*s.*; Black from 20*s.* to £9.

Drab, 13*s.* 6*d.* to £6 10*s.* Floss, 15*s.* to 40*s.*; Spadonas, 50*s.* to £6; Boos white, 80*s.* to 90*s*; Boos femina, 52*s.* to 65*s.*

Egyptian feathers are worth 10 to 15 per cent less than the prices quoted above.

The sale of Osprey and Peacock Feathers and Bird Skins of all descriptions took place on the 16th January.

Of 379 packages of Osprey feathers offered, 348 packages were sold.

Long Osprey was in advance of 5*s.* to 8*s.* per oz. Short selected was firm, and rather dearer; red, brown, and White and Grey Paddy were steady. Bird Skins in general dull. Female Birds of Paradise declined to 10*s.* 9*d.*

Long Osprey 13*s.* to 25*s.* per oz.; Medium, 29*s.* to 40*s.*; Short, 30*s.* to 42*s.*; Short selected, 52*s.* to 67*s.*; Red, 2*s.* 2*d.* to 4*s.* White Paddy, 20*s.* to 25*s.*; Grey Paddy, 10*s.* to 14*s.* 6*d.*; Impeyan Pheasant, 3*s.* to 5*s.* 6*d.* each; Black Argus, 3*s.* 2*d.* Peacock feathers: Eyes extra fine, 5¼*d.* per bundle; Neck feathers: gold, 14*s.* 6*d.* to 24*s* per lb.; blue and green, 1*s.* 3*d.* to 4*s.* 6*d.*; blue small 10*s.* per lb. Parrots: rosehead, 3*d.* to 3½*d.* each; Parrots, medium, 1*d.* to 1½*d.* Indian Birds, about 1*d.* each; Jungle Fowls, flat skins 2*s.* 4*d.* each. Osprey skins with cross feathers, 1*s.* 10*d.* to 1*s.* 11*d.* each; Japanese Birds between 1½*d.* to 1⅜*d* each, except Small King Fishers, which sold at 5½*d.* and 5¾*d.*; and Wax Wings at 4*d.* and 4¼*d.* Birds of Paradise, male, 12*s.* 6*d.* to 15*s.* 6*d.*; female, 6*s.* to 13*s.* 9*d.*; Many Wires, 25*s.*; Black Round, 20*s.* 6*d.* to 24*s.* 6*d.*; Green Breast Long Tails, 11*s.*; Black, with green breasts, 9*s.*; Rifle Birds, 8*s.* 3*d.* to 10*s.* 3*d.*; Standard Wings, 3*s.* 2*d.*; King Paradise, 1*s.* 7*d.* to 2*s.* 8*d.*; Regent birds, 2*s.* 9*d.* to 4*s.*; Pitta, 1*s.*; Red Tanagers, 9¼*d.*; Orange Tanagers, 6¾*d.*; Bronze King Fishers, 5*d.*; Seven Colored Finches, 11*d.*; Various Finches, 2¼. to 3½*d.*

The next Sale will take place the 6th of March.

Messrs. Boucard. Pottier & Co. will be happy to execute Commissions for Gentlemen who cannot attend the Sale. All Goods intended to be catalogued for the next Sale should be forwarded before the 25th of February.

Report on December and January Public Sales of Postage Stamps.

On December 12th and 13th, Messrs. Phillips, Lea, & Davies held a sale of the celebrated Caillebotte Collection of Envelopes. The total realized was £1,000. The highest prices paid were as follows:—

Baden 1858 stamp to left, rosette with well-defined circle in centre 6 kr. and 12 kr. £10 5*s.*; Ditto 9 kr. and 18 kr. £10 15*s.*; Ditto, same type large size 3 kr, 9 kr. and 12 kr., small size, 6 kr., £12 5*s.*; Ditto, same type, large size, 6 kr., 9 kr. and 18 kr., £11 5s. Finland, 1850, 10 kop. on white wove paper, on bluish wove paper, and on blue pelure paper, £16 10s. Thurn and Taxis (North), 1861, lilac inscription half-sgr. large size, £10. Ditto 1862, inscription same colour as stamp, ½ sgr. 5 shades, 1 sgr. used, 2 sgr. unused and used, and 3 sgr. unused, all large, £10.

A few others, North German Confederation provisionals fetched £16 10*s.*, £21 10s., and £12. Great Britain, Mulready Envelopes 1d. and 2d., £1 12*s.*; Hanover 1857, large, 1 gr. three shades, 1 sgr. unused and used, 2 sgr. two shades, 1 gr. two shades used, 1 sgr., 2 sgr. and 3 sgr., variety with oblique inscription, £18.; etc., etc.

In Mr. Thomas Bull's Sale on December 20th: British Guiana 1851, magenta, realized £2 15*s.*; Ditto 1853, 1 cent red, and 4 cent blue, £2 2*s.*; Cape of Good Hope, wood-block 1*d.* red, fine colour, £2; ten very fine proofs in black of various colonial stamps, £10; New South Wales 3*d.*, orange, on entire original envelope, £4 8*s.*; several United States 1869, 1866 and 1860 realized £3 5*s.*; and £4 15*s.* each, 1866 and 1860.

In the Sale of Messrs. Cheveley & Co., which commenced on Friday at 6 p.m., several Lots realized a good price.

Afghanistan, dated 1288, 1, 2 and 4 annas, 30*s.*; Ditto, 1 anna, 10*s.*; Ditto, 2 and 4 annas, 22*s.*; British East Africa, 1st. issue ½, 1 and 4 annas, all unused, 38*s.*; Cape Wood-blocks, 1*d.* and 4*d.*, 32*s.*, bought by Messrs. Boucard, Pottier & Co.; Cape Woodblock, 1 red, very fine, 32*s.*; several Ceylon 1*s.* 9*d.* green, 21*s.*; another 1*s.* 9*d.* green, fine, 24*s.*; Star perforated, 8*d.*, yellow brown, very fine, 30*s.*; Great Britain 1*d.*, black and pair 2*d.*, both unused, £3 10*s.* Ten unused 1*d.* black Mulready Envelopes, £4 10*s.*; several ditto, by pair, 1*d.* and 2*d.*, 30*s.*; Mulready 2*d.* wrapper and 2*d.* Envelope, unused, 44*s.*; etc., etc.

Messrs. Boucard, Pottier & Co. will be happy to execute Commissions for Gentlemen who cannot attend the Sales.

1	Lot of	100	Hoopooes	...	...	...	Price	£6	0	0	1 lot de	100	Huppes ... ... Prix 150 fr.
1	,,	,,	50	Wax Wings	...	...	...	...	£3	0	0	1 ,, ,,	50	Jaseurs ... ... 75 fr.
1	,,	,,	50	African Humming	...	...	...	£2	0	0	1 ,, ,,	50	Sui manga ... ... 50 fr.
1	,,	,,	100	Blue Creepers	...	...	...	...	£5	0	0	1 ,, ,,	100	Guit guits à tête bleue ... ... 125 fr.
1	,,	,,	50	Green Creepers	...	...	...	...	£2	0	0	1 ,, ,,	50	Guit guits verts ... ... 50 fr.
1	,,	,,	50	Red Tanagers	...	...	...	...	£2	10	0	1 ,, ,,	50	Tangaras rouges ... ... 62 fr. 50 c.
1	,,	,,	100	Yellow and Black Tanagers	...	...	£4	0	0	1 ,, ,,	100	Tangaras noirs et jaunes ... ... 100 fr.
1	,,	,,	50	Five Coloured Tanagers	...	...	£4	0	0	1 ,, ,,	50	Tangaras, quinticolor ... ... 100 fr.
1	,,	,,	100	Tanagers, various	...	...	...	£2	0	0	1 ,, ,,	100	Tangaras divers ... ... 50 fr.
1	,,	,,	50	Mexican Starlings	...	...	...	£5	0	0	1 ,, ,,	50	Etourneaux du Mexique ... ... 125 fr.
1	,,	,,	100	European Starlings	...	...	...	£2	0	0	1 ,, ,,	100	Sansonnets... ... ... 50 fr.
1	,,	,,	25	Blue Jays	...	...	...	...	£2	0	0	1 ,, ,,	25	Geais ... ... 50 fr.
1	,,	,,	50	Alpine Crows	...	...	...	...	£4	0	0	1 ,, ,,	50	Corbeaux des Alpes ... ... 100 fr.
1	,,	,,	50	Metallic Starlings	...	...	...	£4	0	0	1 ,, ,,	50	Merles Métalliques bleus ... ... 100 fr.
1	,,	,,	50	Large New Guinea Pitta	...	...	£8	0	0	1 ,, ,,	50	Grandes Bréves, de la N. Guinée ... 200 fr.
1	,,	,,	25	Royal Fly Catchers	...	...	...	£5	0	0	1 ,, ,,	25	Gobe mouches royaux ... ... 125 fr.
1	,,	,,	50	Fly Catchers, various	...	...	...	£2	0	0	1 ,, ,,	50	Gobe mouches divers ... ... 50 fr.
1	,,	,,	50	Yellow-Headed Manakins	...	...	£1	5	0	1 ,, ,,	50	Manakins à tête jaune ... ... 36 fr. 25 c.
1	,,	,,	50	Red and Black ditto	...	...	...	£1	5	0	1 ,, ,,	50	Manakins à tête rouge ... ... 36 fr. 25 c.
1	,,	,,	20	Goat Suckers	...	...	...	...	£2	0	0	1 ,, ,,	20	Engoulevents ... ... 50 fr.
1	,,	,,	100	Swallows	...	...	...	...	£4	0	0	1 ,, ,,	100	Hirondelles ... ... 100 fr.
1	,,	,,	10	Bower birds	...	...	...	...	£2	10	0	1 ,, ,,	10	Oiseaux satinés ... ... 62 fr. 50 c.
1	,,	,,	100	Green Humming, all males	...	...	£2	10	0	1 ,, ,,	100	Oiseaux mouches Verts, tous mâles 62 fr. 50 c.
1	,,	,,	100	Amethyste Humming	...	...	...	£4	0	0	1 ,, ,,	100	Clarisses et Parzudaki ... ... 100 fr.
1	,,	,,	100	Large Humming	...	...	...	£2	10	0	1 ,, ,,	100	Grands Oiseaux mouches divers 62 fr. 50 c.
1	,,	,,	50	Ruby Topaz Humming	...	...	...	£2	10	0	1 ,, ,,	50	Rubis Topazes ... ... 62 fr. 50 c.
1	,,	,,	25	Long Blue Tail Humming	...	...	£5	0	0	1 ,, ,,	50	Kings ... ... 125 fr.
1	,,	,,	10	Fire Tail Humming	...	...	...	£12	0	0	1 ,, ,,	10	Saphos ou Queues de feu ... ... 300 fr.
1	,,	,,	50	Long Tail Humming, various	...	...	£4	0	0	1 ,, ,,	50	Oiseaux Mouches à longue queue ... 100 fr.

JUST ARRIVED, DECEMBER, 1890.

1	Lot of	5	Magnificent *Fire back Pheasant*; quite new to *Plumassiers* (A SPLENDID BIRD)				Price	£8	0	0	1	,, ,,	100 Hoopooes Price £6 0 0
1	,,	,,	25	Macaws, flat skins					£4	0	0	1	,, ,,	50 Indian Crows £7 0 0

TO ARTIFICIAL FLORISTS, JEWELLERS, etc.

BRIGHT INSECTS.

1	Lot of	25,000	Blue beetles	...	...	...	Price	£4	0	0	1 Lot de	25,000	Hoplies bleues ... ... Prix 100 fr.
1	,,	,,	25,000	Green ,, large	...	...	...	£5	0	0	1 ,, ,,	25,000	Grandes Chrysomèles vertes ... ... 125 fr.
1	,,	,,	25,000	,, ,, small	...	...	...	£4	0	0	1 ,, ,,	25,000	Petites ,, ,, ... 100 fr.
1	,,	,,	25,000	Purple ,,	...	...	...	£8	0	0	1 ,, ,,	25,000	Chrysomèles violettes ... ... 200 fr.
1	,,	,,	1000	Golden Phaneus	...	...	...	£10	0	0	1 ,, ,,	1000	Phaneus dorés ... ... 250 fr.
1	,,	,,	5000	May Bugs.	...	...	...	£4	0	0	1 ,, ,,	5000	Hannetons ... ... 100 fr.
1	,,	,,	1000	Golden Antichira	...	...	...	£10	0	0	1 ,, ,,	1000	Petits Hannetons vert dorés ... ... 250 fr.
1	,,	,,	1000	Large Green Buprests	...	...	£4	0	0	1 ,, ,,	1000	Grands Buprestes vert dorés ... ... 100 fr.
1	,,	,,	1000	Golden Buprests	...	...	...	£4	0	0	1 ,, ,,	1000	Buprestes dorés ... ... 100 fr.
1	,,	,,	500	Ocellated Buprests	...	...	...	£5	0	0	1 ,, ,,	500	Buprestes ocellés ... ... 125 fr.
1	,,	,,	50	Diamond Beetles	...	...	...	£5	0	0	1 ,, ,,	50	Chareuçons dorés ... ... 125 fr.
1	,,	,,	500	Brazilian Golden Cacides	...	...	...	£4	0	0	1 ,, ,,	500	Cacides ... ... 100 fr.
1	,,	,,	500	Butterflies from West Africa in papers				£4	0	0	1 ,, ,,	500	Papillons d'Afrique ... ... 100 fr.

LIST
OF THE
PRICED UTENSILS
NECESSARY FOR COLLECTING
REPTILES, FISHES, INSECTS, SHELLS, etc.

Benzine bottle	1s. 0d.
Tin box for collecting Insects, from	1s. 6d.
Bottle	0s. 3d.
Glass tubes or phials, doz.	1s. 0d.
Digger	2s. 6d.
Butterfly nets, from	1s. 6d.
Sweeping and water, nets from	2s. 6d.
Umbrella for Insects, from	8s. 0d.
Cork in boards, per doz., from	2s. 6d.
Pins for Insects, per thousand, from	1s. 6d.
Pill boxes, per gross, from	4s. 0d.
Corked boxes for Insects, from	1s. 6d.
Wooden box same size	1s. 0d.
Boucard's Insecticide, per oz.	0s. 6d.
Flax, per pound	0s. 6d.
Cotton-wadding, per sheet	0s. 6d.
Nippers, from	1s. 6d.
Fishing rods with accessory, from	2s. 6d.

Other Utensils for collecting Mammals, Birds, etc., are to be obtained at the Naturalist's Agency, 225, High Holborn, London, W. C.

BOUCARD'S INSECTICIDE POWDER

against MITES, INSECT LARVÆ etc.

Wholesale and Retail.

—— Success guaranteed ——

This new Powder is of easy use, not dangerous to manipulate, and a good disinfectant against CHOLERA MORBUS and all EPIDEMIC DISEASES.

It destroys immediately all vermine, such as FLEAS, BUGS, MITES, LARVÆ OF DERMESTES, etc.

Sixpence for a trial packet of one ounce. It lasts a long time, a small quantity being necessary each time.

Trades supplied at a liberal discount.

NO HOUSE OUGHT TO BE WITHOUT IT.

Once tried, always used!

COCOA BUTTER.

Guaranteed pure.

Very useful to soften the skin, a preservative against CHAPED HANDS and CHILBLAINS and a remedy for CUTS, BURNS, etc. etc.

Sold in cakes, Sixpence and one shilling.

TO STAMP COLLECTORS.

FOR SALE.

NEW SOUTH WALES:—
1850, 2d., Sydney View ... ... 20s.
,, ,, ,, ,, on laid paper ... ... 25s.
1854—56, Imperf. 8d. yellow, good margin on 3 sides, fair on 4th ... ... 25s.
CANADA:—
1856, 10d. blue, fine copy ... ... 12s.
MAURITIUS:—
1848, 1d. red, worn plate ... ... 10s.
1859. 2d. blue, Greek border ... ... 15s.
MEXICO:—
1867, Gotic surcharge, 4 reals, rose on lilac, fine copy 10s.
8 real, black on brown, fine copy ... ... 30s.
NATAL:—
1857—58, 1d. buff, fair copy ... ... 18s.
3d. pink, fair copy... ... ... 15s.
6d. green, fair copy ... ... 10s.
NEW ZEALAND:—
6d. brown, pelure paper... ... ... 6s.
1s. green. imperf. Wmk. N.Z. ... ... 7s. 6d.

STAMPS (*continued*).

SOUTH AUSTRALIA:—
1867—71, 3d. Wmk. star surcharged in red fine copy 25s.
VICTORIA:—
1d. red unused ... ... 12s.
1852, 3d. blue (Perforated) ... ... 8s.
1862, 3d. dull lake ... ... 10s.
WESTERN AUSTRALIA:—
1855, 1s. brown uncut 20s
UNITED STATES:—
1869, 90 cents, red and black, fine copy ... ... 15s.

WANTED.

Old collections containing from 500 varieties upwards, to which none have been added since the last 20 years.

Old stamps on their original letter sheet or envelope, especially Colonials and old German states.

Mulready Wrappers and Envelopes.

Old unused English and Colonials.

Old works on stamps.

Proofs of stamps, etc. etc.

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Several Splendid VILLAS, with Beautiful Gardens,
at SAN REMO, the well known Winter Resort,
40 minutes from MONTE CARLO.
Apply at the Office of the Journal.

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JUST ARRIVED.

A large collection of Shells from JAPAN which are to be sold at very moderate prices.

Also Shells from CENTRAL AMERICA, N. AFRICA, NEW GUINEA, etc., etc.

List of these will be published in successive numbers.

FOR SALE.

100,000 *Marine, Fluviatile and Land Shells*, about 20,000 species (collection of Mr. BOUCARD). It contains the celebrated Saunders, Layard, Walpole, and Fritsch collections and many others, and a very large choice of the species collected by Messrs. Wallace, Cuming, Brewer, French, Sallé, Wallis, Bartlett, Chesterton, Buckley, Crossley, Duboulay, Majastre, Planos, Reed, Rebouch, Bland, Gabb, etc., etc., etc., as also all the Shells collected by Mr. Boucard in N. America, Mexico, Central America, Panama, etc., etc.

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FOR SALE.

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1 Lot of 100 *Diptera* from Japan Price 25s.
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1 Lot of 100 *Neuroptera* from Japan Price 35s.
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1 Lot of 200 species of Moths from Japan Price 200s.
1 Lot of 100 *Coleoptera* from Japan, including *Damaster fortunei* and other rare species Price 50s.
1 Lot of 100 species of Shells Price 100s.
1 Lot of 100 *Crustaceæ* from Japan Price 100s.
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1 Lot of 302 *Coleoptera* from Morocco Price 75s.
1 Lot of 100 Butterflies from Guatemala Price 100s.
1 Lot of 100 Butterflies from Venezuela Price 100s.
1 Lot of 100 Moths from Venezuela Price 80s.
1 Lot of *Coleoptera* in spirit from Venezuela, 10 bottles containing thousands of specimens. Price 50s.
1 Lot of 100 Butterflies from West Africa in papers, Papilio, Charaxes, etc. Price 80s.
1 Lot of 100 Butterflies and Moths from India, many fine species of Papilio etc. Price 100s.
1 Lot of 100 Butterflies from Trinidad including a rare species of Morpho Price 80s.
1 Lot of 100 Butterflies from Borneo, containing many rare Papilio, etc. Price 100s.
1 Lot of 100 *Coleoptera* from Brazil Price 20s.

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Modern pottery from Mexico and Central America from 6d.
Statuettes representing the *Indians of Mexico and Guatemala* from 3s.
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Etc., etc., etc.

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February 1, 1891.

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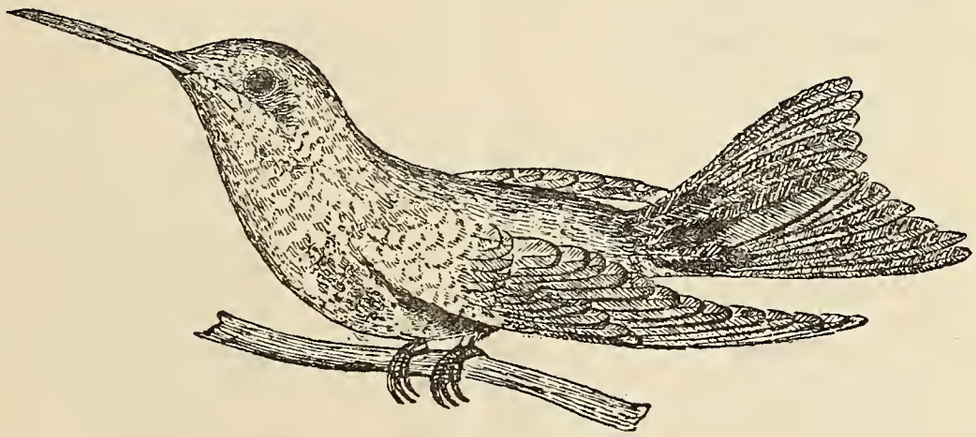

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
Member of the International Jury, Paris, 1889; Member of many scientific societies;
etc. etc. etc. etc.

CONTENTS OF No. 3.—MARCH 1, 1891.

[ENTERED AT STATIONERS' HALL.]

FOR SALE.

Shells.

Private Collection of Mr. Boucard.

LAND FLUVIATELE AND MARINE SHELLS.

Glandinidæ, 1*s.* each. Helicidæ, 6*d.* each. Bulimidæ 1*s.* each. Achatinidæ, 1*s.* each. Cylindrellidæ, 1*s.* 6*d.* each. Clausilidæ, 3*d.* each. Ampularidæ, 6*d.* each. Lymmea, Physa, and Planorbis, 3*d.* each. Cyclostonidæ, 6*d.* each. Helicinidæ, 3*d.* each. Unio, Anodonta, and Ostrea, 6d. each.

Marine Shells—*All the Collection including* Argonauta, Murex, Fusus, Triton, Ranella, Nassa, Oliva, Marginella, Harpa, Terebra, Conus, Strombus, Cypraea, Neritina, Patella, Chiton, Haliotis, Turbo, Venus, Cardium, &c., 6*d.* each.

Can be divided if required.

All applications to be made at the Journal's Office.

List of Parrots for Sale.

PSITTACIDÆ LEACH.

		s.
1	Platycercus pennanti, Lath	8
2	— — mounted	10
3	— adelaidæ, Gould	10
4	— flaviventris Tem.	10
5	— — mounted	12
6	— palliceps, Vig.	10
7	— eximius, Shaw	10
8	Psephotus multicolor, Brown	10
9	— hæmatonotus, Gould ...	10
10	— pulcherrimus, — ...	12
11	Nymphicus cornutus, Gm.	20
12	Barnardius Barnardi, Vig	10
13	— semitorquatus Quoy... ...	12
14	Polytelis barrabandi, Sw.	12
15	— — mounted	14
16	— alexandræ, Gould	12
17	— — mounted	14
18	Aprosmictus erythropterus, Gm. ...	12
18 bis	— — mounted... ...	15
19	— vulneratus, Wagl	16
20	— cyanopygius V.	10
21	— — mounted ...	12
22	— broadbenti	16
23	— dorsalis, Quoy	20
24	Pyrrhulopsis personatus, G. R. Gr. ...	30
25	— tabuensis, Gm.	30
26	Cyanoramphus novoe-zelandiæ, Sparm. ...	6
27	— auriceps, Kuhl	6
28	— pacificus, Forst	20
29	Melopsittacus undulatus, Shaw	4
30	Euphema pulchella, Shaw	6
31	— — mounted	8
32	— chrysogastra, Lath	10
33	— chrysostoma, Kull	10
34	— aurantia, Gould	10
35	Pezoporus formosus, Lath	8
36	— — mounted ...	10
37	Prioniturus flavicans, Cass.	8
38	— platurus, Kuhl	8
39	Urodiscus discurus, V.	20
40	Palæornis eupatria, L.	5
41	— docilis, V.	5
42	Palæornis docilis, mounted	10
43	— torquata, Bodd	5
44	— — mounted	8
45	— bengalensis, Gm.	5
46	— purpureus, Mull	16
47	— schisticeps, Hodgs.	12
48	— columboides, Vig.	14
49	— — mounted ...	16
50	— calthropæ, Lay	20
51	Belocercus longicaudus Bodd	8
52	— fasciatus, Mull	5
53	— javanicus, Osb	8
54	Ara macao, L	20
55	— — mounted	30
56	— chloropterus, G. R. G.	30
57	— ararauna, L., mounted	30
58	— militaris, L.	20
59	— severa, L.	20
60	— nobilis, L, ...	10
61	— hahni, Souancé	20
62	Rhynchopsitta, pachyrhyncha, Sw. ...	50
63	Henicognathus leptorhynchus, King ...	10
64	Conurus cyanolycos, Land	20
65	— icterotis, Mas and S.	20
66	— carolinensis, L., mounted ...	8
67	— chloropterus, Souancé	20
68	— wagleri, G. R. Gr.	5
69	— erythrogenys, Less	20
70	— pavua, Bodd	15
71	— nanday, Desm., mounted ...	20
72	— luteus, Bodd	20
73	— jandaya, Gm.	6
74	— aztec, Souancé	5
75	— pertinax, L.	5
76	— Weddelli Dev.	20
77	— holochlorus, Sclat	20
78	— ocularis, Scl. and Salv. ...	6
79	— petzii, Leihe	8
80	— rhodocephalus, Sclat and Salv...	10
81	— aureus, Gm.	3
82	— — mounted	5
83	— cruentatus, Max	4
84	— — mounted	6
85	— vittatus, Shaw	4
86	— — mounted	6
87	— souancei, Verr	20
88	— leucotis, Licht	5
89	— cyanopterus, Bodd	5
90	— — mounted... ...	8
91	— luciani, Dev.	20
92	— roseifrons, G. R. Gr.	10
93	— callipterus, Man	4
94	— hoffmanni, Cab...	12
95	Bolborhynchus monachus, Bodd ...	10
96	— — mounted ...	12
97	Brotogeris triacula, Hald	8
98	— virescens, Gm.	8
99	— — mounted	10
100	— tuipara, Gm.	4
101	— jugularis, Mull	6
102	— tovi, Gnel	2
103	— chrysosema? Natt.	20
104	Loriculus galgulus, L.	3
105	— — mounted	6
106	— stigmatus, Mul and Sch. ...	8

LIST OF PARROTS FOR SALE.—*(Continued.)*

107	Loriculus vernalis, Sparm.	4
108	— melanopterus, Scop. ...	8
109	— exilis, Schl.	8
110	— aurantii frons	30
111	Licmetulus philippinus, V.	8
112	— — mounted ...	10
113	— regulus, Souancé	8
114	Lorius domicella, L.	12
115	— — mounted	16
116	— erythrothorax	20
117	— tricolor, Steph.	10
118	— — mounted	12
119	— garrulus, L.	12
120	— — mounted	15
121	— ater, Scop.	12
122	— sintillatus, Tem.	12
123	— fuscatus, Bp.	12
124	— chloropterus, Salv.	16
125	Vini fringillaceus, Gm.	20
126	Phigys solitarius, Lath.	30
127	Eos rubra, Gm.	12
128	— — mounted	15
129	— cochinsinensis, Lath.	16
130	— reticulatus, Mul and Schl. ...	16
131	— cardinalis, Hombe and L. ...	50
132	Trichoglossus, hæmatodus, L.	10
133	— rubritorques, Vig and H.	20
134	— novæ hollandiæ, Gm. ...	4
135	— — mounted	6
136	— nigrogularis, G. R. Gr. ...	10
137	— cyanogrammus, Wagl. ...	10
138	— massena, Bp.	6
139	— — mounted ...	10
140	— ornatus, L.	5
141	— chlorolepidotus, Kuhl. ...	4
142	— — mounted	6
143	— flavoviridis ? Sclat. ...	16
144	— meyeri, Schl.	8
145	Ptilosclera versicolor, Vig.	20
146	Glossopsitta concinna, Shaw	4
147	— — mounted ...	6
148	— pusila, Shaw	3
149	— — mounted	5
150	— porphyreocephala, Diet. ...	16
151	— — mounted	20
152	Psiteuteles euteles, Tem.	6
153	— placentis, Tem.	6
154	— muschenbrooki	16
155	Charmosyna papuana, Gm.	12
156	— — mounted ...	16
157	— arfaki, Ver.	20
158	— stellæ	12
159	Muscarinus polychlorus, Scop	8
160	— sinensis, Gm.	8
161	Tanygnathus megalorhynchos, Bodd. ...	16
162	— mulleri, Mull and Sch. ...	5
163	Nestor meridionalis, Gm.	20
164	— productus, Gould	30
165	Dasyptilus pecqueti, Less.	50
166	Vaza nigra, L.	20
167	— vaza, Shaw	20
168	— comorensis, Pet.	20
169	— barkleyi, Newt.	40
170	Geoffroy personatus, Shaw	8
171	Geoffroy rhodops, G. R. Gr.	5
172	— aruensis —	8
173	— cyanicollis, Mull and Sch. ...	6
174	Poiocephalus senegalus, L.	10
175	— — mounted ...	12
176	— Levaillanti	15
177	— — mounted ...	20
178	— meyeri, Rupp.	20
179	— versteri, Finsch.	50
180	Caica melanocephala, L	8
181	— — mounted ...	10
182	— xanthomeria, G. R. Gr.	30
183	— histrio, Bodd	8
184	— amazonina, Desmurs	24
185	— pyrilia, Bp.	16
186	— hæmatotis, Scl. and Salv	6
187	— coccineicollaris, Lawr	12
188	Pionus menstruus, L.	5
189	— sordidus, L.	15
190	— maximiliani, Kuhl	20
191	— senilis, Spix	6
192	— violaceus, Bodd	5
193	Deroptyus accipitrinus, L.	20
194	Chrysotis farinosa, Bodd	10
195	— auripalliata, Less	30
196	— amazonica, L.	12
197	— — mounted	16
198	— panamensis, Cab	10
199	— sallei, Finsch	30
200	— jamaicensis	30
201	— albifrons, Spar	10
202	Triclaria cyanogaster, V.	12
203	Psittacula guianensis, Sw.	6
204	— passerima, L.	2
205	— cœlestis, Less	8
206	— conspicillata, Laf.	2
207	Urochroma cingulata, Scop.	4
208	— purpurata, Gm.	6
209	— surda, Hl.	5
210	Agapornis pullaria, L.	5
211	— — mounted	7
212	Poliopsitta cana, Gm.	8
213	— — mounted	10
214	Cyclopsitta diophthalma, H. and F. ...	6
215	— Bremei	30
216	— desmaresti, Garn	6
217	— coxeni, Gould	10
218	— suavissima, Sclat	20
219	— loxia, Cuv.	20
220	Psittinus incertus, Shaw	4
221	Nasiterna pygmæa, Quoy	20
222	Calopsitta novæ hollandiæ, Gm. ...	8
	— — — mounted ...	10
223	Cacatua alba, Mull, mounted	30
224	— sulphurea, Gm., mounted ...	25
225	Lophocroa leadbeateri, Vig.	12
226	Eolophus roseicapillus, V.	10
227	Licmetis nasicus, Tem.	16
228	Calyptorhynchus banksii, Lath	20
229	— — mounted ...	25
230	Callocephalon galeata, Lath	10
231	— — mounted ...	15
232	Microglossum aterrimum, Gm.	30
233	Strigops habroptilus, G. R. Gr.	30
234	— greyi, G. R. Gr.	30

TO ORNITHOLOGISTS.

FOR SALE.

Fine mounted specimen of *Alca impennis*, *the Great Awk*, (extinct species). Pedigree from the date of capture, 1836, to this date, will be given to buyer.

Fine male specimen of the exceedingly rare new genus of bird *Rcinhardtia ocellata Bp.*, the greatest discovery of the century. Price £50

Fine male specimen of the beautiful bird *Calyptomena Whiteheadi*, n. sp., the second species known of this rare genus, four times larger and more beautiful than *C. Viridis*.

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By pair it means one male and one female.

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Chrysolophus amherstiae Leadb.
Pterocnemia darwini Gould
Dromaius novæ hollandiæ
Sypheotides macqueeni Gr.
Cariama cristata L.
Chunga burmeisteri Hartl.
Palamedea cornuta L.
Ischyornis derbiana Gr.
Aburria carunculata Tem.
Leipoa ocellata Gould
Polyplectron, all the species except hardwicki
Lobiophasis bulweri Sharpe
Alectrophasis cuvieri Tem.
Gennæus nycthemerus L.
Grammatoptilus lineatus Lath.
Hierophasis swinhoei Gould
Diardigallus diardi Tem.
Lophophorus lhuysii Verr.
Calcophasis sclateri Ierd.
Gallus sonnerati Tem.
Creagrius varius Shaw
Sarkidiornis ægyptiaca Gmel.
Ara ararauna L.
Ara militaris L.
Ara hyacinthinus Lath.
Cotinga amabilis Gould
Cotinga cayana L.

TO ENTOMOLOGISTS.

FOR SALE.

One very fine pair, male and female, of *Morpho Godarti* Price £10.
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Calocomus desmaresti	16s.	— mniszecki	10s.
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— wallacei	20s.	Anoplognathus grayi	20s.
Sagra buqueti	4s.	— mastersi	10s.
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— sybarita	8s.	Ancisthrosoma buckleyi	4s.
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— castroensis	12s.	Mitrocephala humboldti	20s.
— subnitens	12s.	Tetracha klugi	5s.
— andestus	12s.	— bifasciata	5s.
— inexpectatus	16s.	— laminata	5s.
— gloriosus	10s,	Catoxantha eburnea	20s.
— villaricensis	12s.	— opulenta	3s.
— hypocrita	20s.	Goliathus torquatus	20s.
— temucensis	30s.	— polyphemus	20s.
— darwini	8s.	Ceratorhina juliae	4s.
— bimarginatus	10s.	— derbyana	8s.
— chonchicus	12s.	— ruficeps	20s.
— chiloensis	12s.	Tmesorhina saundersi	5s.
— chilensis	10s.	Dymusa cyanea	2s.
kraatzianus	20s.	Neptunides polychrous	20s.
		Ranzenia bertolini	10s.

The Humming Bird.

Notes on Rare Species of Humming Birds and Descriptions of Several Supposed New Species in Boucard's Museum.

By A. Boucard.

THRENETES LEUCURUS, L. 1766.

Male.—Head, back, and tail coverts, golden-green; central rectrices, bronzy-green; wings, purple; chin black bordered on each side with a buff line, exactly of the same colour as the throat, which is reddish-buff; lores nearly black, a black line crosses the breast just under the buff of the throat: breast and sides of the abdomen, bronze-green; abdomen, greyish-buff; under tail coverts, bronzy-green margined with pale buff; tail, white, the two central feathers tipped and bordered with blackish-purple; upper mandible, black; lower mandible, flesh colour with black tip.

Total length, $4\frac{1}{2}$ inches; wings, $2\frac{1}{2}$ inches; tail, $1\frac{1}{4}$ inches; bill, $1\frac{1}{8}$ inches.

Habitat, French, Dutch, and British Guiana.

THRENETES CERVINICAUDA, GOULD, 1854.

Male.—Differs from the preceding species by the general colour of the upper surface, which is dark bronzy-green, the lines bordering the chin, white; the abdomen, pale buff, and chiefly by the tail, which is reddish-buff, the two central feathers tipped and bordered externally with purple-black.

Length, the same as *T. leucurus.*

In a box sent from Bogota I was pleased to find a very good series of this species, among which some very adult males, with which I was able to ascertain the distinction between this species and *T. leucurus.* All the specimens received from Bogota are alike, not one of them has the slightest sign of white on the tail feathers.

I think I have some females. It is very much similar to the male, but lighter in colour; the black of the chin is not quite dark, the buff on the chest is lighter; the black band under it is golden, and all the under surface is buff tinged with very few bronzy feathers on the sides; the feathers of the tail, excepting the central rectrices, which are bronzy-green with buff tips, are pale buff with black tips and black borders internally, and more so externally.

THRENETES FRASERI, GOULD, 1861.

Male.—Upper surface, including tail-coverts, golden green, distinguishing the species from Ruckeri, which is metallic dark green, central rectrices bronzy green with white tips; wings blackish purple; chin black; throat and breast buff; abdomen reddish grey; under tail-coverts olive green, margined with buff; In T. ruckeri they are green with a very slight buff margin. Rectrices black, largely tipped with white. In ruckeri they are shorter, wider, bluish dark, and narrowly tipped with white; upper mandible black; lower mandible flesh colour. Total length, $4\frac{1}{2}$ inches; wings, $2\frac{1}{2}$; bill, $1\frac{1}{8}$.

This species is very rare, and inhabits Guatemala. I consider it as valid.

PHÆTORNIS GOUNELLEI, N.SP.

Male.—Head, dark brown; back, bronze green; central rectrices, rather long, bronze green tipped with white; under surface throat and breast, pale buff with black line in the middle of the chin; abdomen, grey; flanks, rufous; all the feathers of the tail, bronze green, black and white in about the same proportions; wings, purple brown; bill, black, curved. Total length, $4\frac{1}{3}$ inches: wing, 2 inches; bill, 1 inch; tail, 2 inches.

This pretty species resembles somewhat *Phætornis pretrei,* for which I took it at first; but after a careful examination, I saw it was quite distinct, and it only resembles that species by the colouring and the form of its tail, which also resembles that of *Phaetornis pretrei* at first sight; but they also differ greatly, all of them being rounded. In fact a new genus could be made with that bird, forming the passage from *Phætornis* to *Pygmornis.*

I have a great pleasure in dedicating this fine species to Monsieur Gounelle, of Paris, the well-known collector of *Hippoceptialus,* who discovered it in Brazilia in the year 1887. He only found this unique specimen. Among others, he also collected specimens of the true *Thalurania eriphile* and *Hylocharis lactea.*

PHÆTHORNIS COLUMBIANUS, N.SP.

Head brownish black, tipped with buff; back bronzy green, edged with buff; upper tail coverts red-buff; line behind the eye and middle of chin white; sides of chin dark rufous, nearly black; breast and flanks buff, very accentuated on flanks; abdomen white; under tail-coverts, buff; rectrices bronze-green at base, black under, tipped and bordered with buff; upper mandibles black; lower mandibles flesh colour to the middle, the rest black; wings purplish brown.

Total length, $5\frac{3}{4}$ inches; bill $1\frac{1}{2}$; wing $2\frac{1}{2}$; tail $2\frac{3}{4}$.

Habitat Columbia.

This new species is allied to *P. syrmatophorus* and finds its proper place between this species and *P. autophilus.* It came in the same lot of birds with *Threnetes cervinicauda.*

PHÆTHORNIS GUIANENSIS, N.SP.

Upper surface, golden, with purple reflections, each feather bordered with black; wings, purple-brown; rectrices, black, tipped with white; line behind the eyes of chin and entire under surface, pale buff; lores, black; centre of chin, white; under tail-coverts, whitish grey, with the centre slightly buff; rectrices, bronze-grey for the two-thirds of its length, then purple-black, edged with pale buff; upper mandible, black; lower mandible, flesh colour, with black tip.

Total length, $6\frac{1}{2}$ inches; wing, $2\frac{1}{2}$; tail, 3 inches; bill $1\frac{1}{2}$.

Habitat Demerara.

I have also one specimen of Trinidad exactly alike, but a little smaller, and seems to be a male or a young female. It must be placed near longirostris.

PHAETHORNIS WHITELYI, N.SP.

Male.—Upper surface bronze green, with yellow reflections; central rectrices of same colour to about two-thirds of its length; then white; wings, purple; the entire under surface, rufous grey; tail, bronze-green, slightly tipped and edged with rufous grey; bill, black; lower mandible, flesh colour, with black tip.

Total length, $5\frac{1}{4}$ inches; wing, $2\frac{1}{4}$; tail, $2\frac{1}{2}$; culmen, $1\frac{1}{8}$.

Habitat, Roraima, B. Guiana.

This species is closely allied to P. bourcieri; but it is easily distinguishable from that species by the colour of the back and also by the colour of the under surface, which is white in P. bourcieri.

I have two specimens sent to me by Mr. Whitely as P. bourcieri.

I have great pleasure in dedicating this new species to Mr. Whitely, junior, its discoverer.

APHANTOCHROA ALEXANDRI, N.SP.

Upper surface, dark green, more brilliant on the rump; forehead, shiny metallic-green; upper tail coverts, metallic green; central rectrices, bronze-green; under surface, shining green with golden reflections, especially on the flanks; middle of the abdomen, dirty white; under tail coverts, bronze green, edged with buff; wings, purple-brown; tail, purple, tipped with buff; bill, black; under mandible, flesh-colour, with black tip; spot under and above eye, pale buff.

Total length, 4 inches; wing, $2\frac{1}{6}$; bill, 1; tail. $1\frac{1}{2}$.

Habitat: Demarara, B. Guinea.

I have dedicated this species to Mr. Alexander, of New York, who dtscovered it in 1878.

FLORISUGA SALLEI, N.SP.

Head and neck, dark shiny green, passing to bronze on nape of neck; white band on neck; rest of upper part, including tail-coverts, golden-bronze; central rectrices, white, with large spot bronzy green at tip and narrow external margin of same colour; chin and breast of metallic-green, with blue reflections; sides of flanks and part of abdomen golden bronze; rest of under parts, including tail-coverts, pure white; tail white, with purple tip, very slightly marked; wings, purple-black; bill, black.

Total length, $4\frac{1}{4}$ inches; wing, $2\frac{1}{2}$; bill, 1; tail, $1\frac{1}{4}$.

Collected by me in South Mexico.

I hane a great pleasure in dedicating this beautiful species, the second known of the Genus, to my intimate friend, Mr. Auguste Sallé, the well-known Mexican explorer.

EUSTEPHANUS BURTONI, N.SP.

Entire head magnificent metallic gold; upper surface, including wing coverts, dark green; tail, bronze-green; under surface, white spotted green; flanks, dark-green, as back; under tail-coverts, white, edged with buff.

Total length, $4\frac{1}{2}$ inches; wing. $2\frac{1}{2}$; tail, $1\frac{5}{8}$; bill, $\frac{5}{8}$.

Habitat: Chili.

This species is very much allied to E. galeritus, but easily distinguishable by the splendid golden colour of the head and the general colour ot the upper surface and flanks, which are bronzy-green in E. galeritus and dark green in E. burtoni.

I dedicate this magnificent new species, the fourth of the Genus, to Mr. Walter Burton, of London, who had the kindness to dispose of it in my favour.

To be continued.

SCIENCE AND INDUSTRY.

Notes on the Genus Pharomacrus or Resplendent Trogon.

BY A. BOUCARD.

(*Continued from page 7.*)

Pharomacrus Mocina, Var costaricensis. Boucard.

Female.—As the preceding species, but a trifle smaller in general size.

Pharomacrus antisianus d'Orbigny, Mag zool, 1837.

Capite viridi, semi cristato; rectricibus tribus externis utrinque albis.

Male.—Head, throat, chest, all the upper surface of the body, wing and tail coverts, deep bronzy green, the green hue prevailing on the lower part of the back: wings, black; under surface of the body and under tail-coverts, deep blood-red; thighs blaek four centre tail feathers black; the three outer ones black at the base and white for the remainder of their length with black shafts; bill, bright yellow.

Total length, $13\frac{1}{2}$ inches; bill, 1; wings, $7\frac{1}{2}$; tail, $7\frac{1}{2}$.

Female,—Head and chest brown, the latter marked with green; wing-coverts and back, reddish green; upper tail coverts, golden green; wings, black; primaries, brownish black, margined with buff, lower part of the abdomen and under tail coverts, light blood-red; tail, black; the three outer feathers on each side toothed on their outer webs and narrowly tipped with greyish-white.

Trogon antisianus d'Orb, 1837.
,, *antisiensis d'Orb.*
Calurus pulchellus Gould.
,, *peruvianus Gould.*
,, *antisianus, Gray and Mitch.*
,, *pulchellus Bonap.*

Habitat, Peru to Columbia.

Pharomacrus fulgidus. Gould, Trog., pl., 24.
Shining Train Bearer.

Mas.—Capite aureo-viridi; rectricibus tribus externis utrinque ad basin nigris per partem apicalem dimidiam albis.

Male.—Face and head, golden bronze; chest, wing-coverts, upper surface of body and upper tail coverts, deep golden green; wings, jet black; tail, black; the apical portion of the three outer feathers on each side, white, with black shafts; under surface very deep blood-red; thighs, black; bill, rich yellow.

Female.—Head, dark brown; chest, brown, washed with green on its upper portion; wing-coverts and back, reddish or bronzy-green; upper tail coverts, golden green; wings, black; primaries, blackish brown, margined with buff; lower part of the abdomen and under tail coverts, light blood-red; tail, black; the three lateral feathers on each side toothed on their external webs and narrowly tipped with greyish white.

Trogon fulgidus Gould, Calurus fulgidus Gray & Mitch.
Habitat Venezuela and Colombia.

Pharomacrus auriceps Gould Trog pl. 25.
" " *Gr. & Mitch Gen. of Bird.*
Golden Headed Train Bearer.

Mas:—Capite splendide aureo-viridi; rostro flavo, cauda in toto nigra.

Male.—The whole of the head, throat, cheeks, and back of the neck goldy-bronze; chest, all the upper surface, wing and tail coverts rich golden green; wings and tail jet black; breast, abdomen and under-tail coverts of the deepest blood-red inclining to crimson; feathers clothing the tarsi, black; bill, yellow; feet, reddish brown.

Total length 15½ inches; bill 1½ inches; wing 8 inches; tail 8 inches.

Female.—Face, chin and head chocolate-brown; chest, upper surface, wing and tail coverts, golden green; wings, brownish black; primaries margined with buff; across the breast a band of brown; abdomen and under tail coverts, blood-red; tail, black; the three outer feathers toothed on their outer webs and slightly tipped with white; bill, blackish-brown;

Trogon (Colurus) auriceps Gould.
Calurus auriceps. Gray & Mitch.
Habitat Colombia.

Pharomacrus auriceps. Var xanthogaster Turati & Salvadori.

Male.—Exactly the same as auriceps; but with yellow chest and abdomen instead of red.

The only two specimens known are the type in Turati Collection, now in the Museum at Milan, the other in Count Berlepsch Collection. They were received by me in two large consignments of Pharomacrus from Bogota (Colombia). I am quite certain that it is only an accidental yellow variety of P. auriceps; nevertheless it is exceedingly rare and very interesting. These were the only two specimens seen amongst several thousand skins which have passed in my hands.

Habitat, Neighbourhoods of Bogota (Columbia).

Pharomacrus pavoninus Spix.
Red-billed Train Bearer

Mas.—Rostro ad basin miniaceo und apicem flaveo; cauda nigra.

Male.—Head and breast glossy green in some specimens, rich golden-green in others; wings and the whole of the upper surface, rich glossy green; upper tail coverts, green, the two centre ones reaching to the the end of the tail, but rarely exceeding it; wings and tail, black; breast and under-tail coverts, rich scarlet; feathers of the thighs and tarsi, black with green reflections; irides, dark red inclining to carmine; feet, ochre yellow; bill, carmine at the base and yellow at the tip.

Female—Head, throat, and chest, dark greyish brown tinged with green; upper part of the abdomen, dark greyish-brown; the lower part and the under-tail coverts, deep scarlet; feathers of the thigh and tarsi, black with green reflections; shoulders and the whole of the upper surface, including the upper-tail coverts, which nearly reach to the end of the tail, rich green; wings, brownish-black, with the outer edges of the feathers, buff; tail feathers, black, the two outer on each side obscurely rayed with greyish-white; upper mandible, dark brown; under mandible, dusky carmine, becoming brown at the point; irides, brown.

Trogon pavoninus. Spix.
" " Gould, P 2 S, 1833.
Calurus pavoninus Sw.
" " *Gray Genera of Birds.*
" " *Bonaparte Comp Avium.*
Tanypeplus pavoninus Cab and Heine.
Pharomacrus pavoninus Sclat and Salv, 1867.

These last descriptions were taken from the magnificent work on the Trogons, *Monograph of the Trogonidæ, Gould, Second Edition.* They agree exactly with the specimens in my collection.

A. B.

Second International Ornithological Congress.

I have just received a personal invitation to the Second Ornithological Congress, to be held at Budapest, on the 17th of May next.

This Congress is under the patronage of
Count Bethlen, Minister of Agriculture, President.
Emeric de Szalay, Ministerial Councillor, Vice President.
Charles Kamermayer, Burgomaster, Vice President.
Dr. Geza Entz, Professor to Polytechnical School, Vice President.
Etienne de Chernel, General Secretary.

The Scientific Committee has for its President, Otto Herman, Esq., Deputy, and Dr. Jules de Madarasz as Secrectary.

Persons wishing to take part in the Congress are requested to arrive not later than the 16th of May.

From the 16th of May, names of Members can be registered and detailed programmes can be had at the Hungarian Committee, National Museum, before and after twelve every day.

Extract of Programme:

17th May, Solemn Opening of Congress and Exhibition.
18th May, Formation of Sections and Committees.
19th " Working of Sections and Committees.
20th " Solemn Meeting of Closing.
From the 21st May, Excursions.

Sections.

I. Systematic III. Anatomy. V. Oology.
II. Biologia IV. Avigeography. VI. Migration.
VII. Economic Ornithology

Dissertations with exact indication of Title and Section, must be declared not later than the 30th of April, to Budapest, National Museum.

SCIENCE AND ART.

The McKinley Bill.

The notice on the McKinley Bill, printed in No. 1 of THE HUMMING BIRD, has attracted a good deal of attention in America, and many letters about it have been received at the office of the Journal. Among them is one which I consider of great interest to the readers of THE HUMMING BIRD. Here it is: —

"New Britain, Conn.,
"Jan. 9th, 1891.

"*Editor of* THE HUMMING BIRD.

"DEAR SIR,—I have this day received a specimen copy of your bright little paper. I note with regret the article on 'The McKinley Bill.' Your correspondent is very evidently misinformed when he states that the United States charge custom duties on objects of science and art. I would call attention to the text of the McKinley Bill: 'Free List' under the letter 'S.'

"'Specimens of natural history, botany and mineralogy when imported for cabinets or as objects of science, and not for sale.'

"Again the 'Free List': 'Philosophical and scientific apparatus . . . . statuary, casts . . . . paintings, drawings and etchings . . . . for the use of any society or institution . . . . for scientific or literary purposes, or for the encouragement of the fine arts, and *not intended for sale*.'

"In the list of dutiable objects, 'Miscellaneous Manufactures' under letter '*P*':

"'Paintings in oil or water-colours and statuary not otherwise provided for in this Act, *ad valorem* 15 per cent.'

"Under the old tariff law, the duty was 30 per cent. We see that the McKinley Bill has actually reduced the duty on works of art for mercantile purposes, admits them free for truly artistic purposes, and also admits objects of natural history free for collections and other than mercantile purposes.

"Nearly all the objections raised against the McKinley tariff laws arise from unfamiliarity with the text of the Bill.

"Trusting you will place this matter in a proper light with your many readers,

"I remain, yours,
"E. M. HULBERT,
"New Britain, Conn.,
"U.S. of N.A."

I am very glad to hear from the honourable correspondent just cited that objects of natural history and works of art will be admitted free for truly scientific and artistic purposes; but I maintain that this is not enough. All objects of Natural History and works of art ought to be free everywhere, and these distinctions between objects for cabinets of science *and not for sale*, will be a source of vexations all along to all parties concerned. How will it be known that the objects sent to America are for scientific cabinets only, or for the trade? It would be much better that it should be altogether free as in England, France, Germany, &c.

THE EDITOR.

The Panama Canal.

Continued from page 12.

Supposing that Columbia should act in the way I have suggested in my preceding notice, it would be only just that a committee composed of eminent Colombians should have a control over the expenditure made until the termination of the Canal, and I don't think that a serious and honest company would object to it.

Help could also come from Europe, principally from *Italy* and *Spain*, which countries are preparing to celebrate in a sumptuous manner the four hundredth anniversary of the discovery of America by Christopher Columbus.

What could be more appropriate for the celebration of such a remarkable event in the history of the world, than a general subscription of all the inhabitants, rich and poor, of these two countries, to be handed to the company for the termination of the *Colombus Canal*.

I have no doubt that if such a general subscription was started by Italy and Spain, all the other countries would unite in the same grand idea, and very likely enough money could be raised for the completion of this wonderful work; especially if the Press of all countries was willing to help, and there are no reasons to have any doubt about it.

Then it could be called truly an INTERNATIONAL WORK, and every subscriber could be proud of having contributed to it.

But if this is to be done, there is no time to lose, and the sooner steps are taken by *Italy* and *Spain* the better it will be; as work must be resumed as soon as possible in the Isthmus, or else the expenses will get beyond the estimates made by the Committee of Engineers sent last year in Panama.

I will call to the attention of the Special Commissions appointed in Italy, Spain, Buenos Ayres, &c., &c., all what precedes, in the hope that they will include in their programme of the celebration of the anniversary of the discovery of America by Christopher Columbus, the subscription mentioned above.

Some days ago I received from France the following circular which I consider of interest to the bondholders.

It is directed by the President of the Paris Central Committee of the Panama Share and Bondholders to the Presidents of the Departmental Committees of France. Here it is:—

Comité Central des Actionnaires et Obligataires de la Compagnie de Panama, 39, rue Taitbout, 39.

Paris, le 12 janvier 1891.

Monsieur le président,

Je vous prie de vouloir bien donner communication à votre comité du projet d'achèvement dont je vous soumets aujourd'hui, d'une façon sommaire, les bases générales, me réservant de compléter, dans le plus bref délai possible, par de nouvelles explications, celles qui vous sont adressées dans cette circulaire.

Après un travail de sept mois consacré à l'étude de ce projet, j'ai la satisfaction de vous annoncer que nous avons obtenu, d'une part, l'appui du gouvernement, et, de l'autre, l'approbation de la Liquidation.

Voici en quelques mots les considérations qui nous ont guidés dans l'élaboration de ce projet.

Soucieux de sauvegarder les intérêts des porteurs de titres, dont nous sommes les représentants et les défenseurs, nous nous sommes préoccupés avant tout de trouver une combinaison qui laissât intacts, dans toute la mesure du possible, leurs droits dans les produits du canal une fois achevé. Pour atteindre ce résultat, il fallait que le capital pût, pour ainsi dire, se rémunérer lui-même sans grever les produits ultérieurs du transit.

En second lieu, on ne pouvait s'arrêter à l'idée de demander directement aux anciens porteurs de nouveaux sacrifices ; la plupart d'entre eux n'auraient vraisemblablement pas répondu à cet appel. Enfin, on ne pouvait pas davantage songer à s'adresser à la généralité du public, sans lui offrir des advantages immédiats et un attrait supérieur à tous ceux qui ont pu le solliciter jusqu'à ce jour.

C'est ce résultat que nous avons obtenu.

Nous inspirant d'un système financier qui, dans un court espace de temps, a permis d'exécuter en Louisiane plus de 600 millions de travaux publics, en offrant aux souscripteurs l'espoir d'un gain immédiat et considérable par une combinaison de loteries successives, nous avons pensé que le même système pourrait être appliqué en France, et avec un succès au moins égal, en considérant l'importance des intérêts engagés dans l'entreprise du Panama, et en tenant compte des ressources financières presque inépuisables de notre pays, ressources dont nous avons eu maintes fois des preuves si éclatantes.

Nous nous sommes donc arrêtés au principe d'une succession de loteries annuelles, de cent millions chacune, et comportant chacune vingt millions de lots ainsi répartis.

Un lot de cinq millions ;
Deux lots de un million ;
Six lots de cinq cent mille francs ;
Cent lots de cent mille francs.

Le résultat net de chacune de ces opérations, défalcation faite du montant des lots et des frais d'émission, sera affecté au payement des travaux au fur et à mesure de leur exécution et jusqu'à leur parfait achèvement.

En souscrivant, ou en faisant souscrire à ces loteries, suivant ses ressources ou ses moyens d'action, chacun des anciens porteurs saura qu'il contribue ainsi à l'achèvement du canal qui restera sa propriété. En même temps, s'il est favorisé par le sort, il courra la chance de gagner des lots d'une importance exceptionnelle et telle qu'aucune loterie au monde n'en a encore jamais offert l'équivalent à aucun public.

Ceux qui, au contraire, n'auront pas été favorisés par le sort auront tout au moins obtenu ce résultat considérable d'assurer l'achèvement du canal et de reconstituer ainsi. à leur seul profit, la fortune qu'ils ont aujourd'hui perdue.

C'est ce qui nous permet de vous dire, Monsieur le Président, qu'il n'y a pas, pour achever Panama, d'autre combinaison que la nôtre.

En effet, ce qui a empêché jusqu'ici et ce qui empêcherait certainement encore tout autre combinaison financière, c'est la nécessité de faire une nouvelle série d'appels à l'épargne publique, sous forme d'actions et d'obligations qu'il faudrait encore rémunérer par un service d'intérêt des plus onéreux. Et chacun sait que dans une affaire qu'il s'agit de relever, les derniers venus imposent toujours à leurs prédécesseurs des conditions qui, sous quelque forme qu'on les déguise, n'en constituent pas moins une surcharge écrasante pour l'ancien capital.

Au contraire, le caractère vraiment unique de notre combinaison, caractère qui suffit à démontrer sa supériorité sur tout autre système financier, c'est que sa réalisation est assurée sans qu'il soit nécessaire de demander le moindre sacrifice aux anciens porteurs de titres, et qu'en outre son résultat final sera de restituer à ces porteurs de titres l'intégralité de leur capital primitif. L'argent fourni par les loteries offre, en effet, sur tout autre cet avantage inappréciable d'être donné une fois pour toutes et de ne comporter ni intérêt ni remboursement.

Ce système, d'une simplicité et d'une efficacité démontrées par l'exemple de la Louisiane qui, nous le répétons, en a retiré une somme de six cents millions, réussira en France comme il a réussi dans un simple Etat de l'Amérique du Nord. Nous en avons pour garants les puissants concours qui nous sont acquis pour sa mise en œuvre et son fonctionnement.

Nous nous sommes d'abord assuré l'appui du gouvernement, qui demandera aux Chambres en notre nom, l'autorisation nécessaire pour une opération financière de cette nature. En second lieu, nous avons garanti d'avance, par le groupement et la collaboration de nos premières maisons de crédit, le service régulier de nos loteries.

Le détail de ces opérations fera l'objet d'une circulaire qui vous sera très prochainement adressée et dont la présente lettre ne fait que résumer les traits principaux.

Si nous avons cru devoir, monsieur le président, vous adresser ces explications préliminaires, c'est que nous avons tenu à bien établir, dans notre intérêt commun, que ce projet, dont nous nous occupons depuis plus de sept mois, au mon du comité central et des comités régionaux, est notre propriété exclusive, et que nous avons à la fois le droit et le devoir de le revendiquer hautement en notre nom collectif.

Cette idée que nous émettons aujourd'hui, maintenant que nous l'avons entourée de toutes les garanties qui vont lui assurer le succès, nous appartient en propre, et j'entends, dans notre intérêt commun, qu'étant le fruit du travail élaboré par le mandataire des comités régionaux de France, elle reste la propriété de ces derniers, dont les pouvoirs ont été dévolus à cet effet au comité central et à son président.

Enfin, monsieur le président, je vous informe en même temps que, se ralliant aux conclusions de la commission d'études, qui a posé les bases du projet d'achêvement et fait dans son rapport les évaluations des travaux, la nouvelle Compagnie s'assurera des contrats à forfait, offrant les garanties les plus sérieuses.

Dans le choix des personnes chargées de cette mission, il faut à tout prix, et sous peine d'un échec certain auprès de l'opinion publique, éviter de retomber dans les errements du passé.

Il est nécessaire de bien montrer aux malheureuses victimes d'une catastrophe sans précédent que les noms compromis dans les fautes de l'ancienne administration ne pourraient en aucun cas se retrouver à la tête de l'entreprise nouvelle. Pour fermer de suite la porte à des compétitions dangereuses, et dont nous ne voulons à aucun prix, il est indispensable de bien établir ce principe de l'exclusion formelle de toute personnalité ayant contribué, à un titre quelconque, au lamentable résultat de la première entreprise. C'est ce principe qui fait la base de nos négociations pour nous assurer des concours d'une valeur et d'une honnêteté éprouvées, négociations dont nous sommes heureux de pouvoir vous garantir d'avance le succès.

Je borne là, pour aujourd'hui, monsieur le président, ces explications préliminaires qui seront complétées dans quelques jours ; et je vous prie de vouloir bien me répondre immédiatement, au nom de votre comité, que vous vous ralliez à la combinaison élaborée par le comité central et par son président, tant en leur nom qu'au nom des comités régionaux de France.

Si sommaires que soient les explications qui précèdent, vous en dégagerez aisément la ligne de conduite qui nous est imposée par les circonstances et dans laquelle je ne saurais trop vous engager à entrer immédiatement.

C'est du Parlement, auquel le gouvernement va soumettre notre projet, que va dépendre, dans quelques jours, la réalisation de nos légitimes espérances. C'est donc aux membres du Parlement, c'est-à-dire aux sénateurs et députés de votre région, que vous devrez faire connaître votre désir formel de voir aboutir une combinaison qui peut seule sauver notre fortune compromise, et qui ne peut se réaliser sans la sanction préalable de leur vote. Vous recevrez dans la huitaine la formule de la requête que, d'accord avec nous, vous devrez adresser aux représentants de votre département.

Cette manifestation d'un désir unanime sera, aux yeux du Parlement, la démonstration de cette vérité que les comités régionaux de Panama représentent en cette circonstance l'épargne française dans sa généralité la plus réelle et la plus large, et que c'est bien une question d'intérêt national, dans le véritable et plein sens du mot, qui est ici en jeu.

Ce n'est donc pas à une société financière quelconque que le gouvernement sera appelé à concéder la faveur d'une mesure exceptionnelle, mais au pays lui-même, qui a fourni les quatorze cents millions actuellement engloutis dans l'affaire de Panama, et qui lui demande aujourd'hui, par votre voix, de l'aider à reconquérir cette énorme partie de la fortune publique.

Tel est, monsieur le président, votre rôle et celui de votre Comité. Telle est la tâche urgente à laquelle je vous convie, car elle constitue la première et la plus indispensable phase d'une action pour la suite de laquelle nous comptons sur votre actif dévouement et dont une très prochaine circulaire vous apportera incessamment le programme complet.

Recevez, monsieur le président, l'assurance de ma considération la plus distinguée.

Le président du Comité central des actionnaires et obligataires de Panama.

HENNET DE GOUTEL.

Although myself and friends possess large quantities of shares and bonds, we had never heard before of the said Central Committee and branches.

I am very glad that it exists, and will take the liberty to call the attention of the members to the two preceding notices on the Canal, published in THE HUMMING BIRD, parts 1 and 2.

This idea of a lottery seems to me a very good one if the authorisation of the French Government can be had, which is rather doubtful ; but I think that my idea of a general subscription all over the world, especially in Europe, America, Australia, and Japan, which countries are more or less interested in the Canal, has more chance to succeed, if it is properly submitted to the public.

If necessary, a printed receipt of the sums subscribed could be given to each subscriber from one franc upwards, to be repaid with a large bonus by public drawings from the benefits, after payment of dividends to the bondholders and to the shareholders, not exceeding ten per cent for the last. For instance, five francs for each franc subscribed.

In that way all subscribers would have, not only the pleasure to co-operate to one of the most extraordinary works of the nineteenth century, but would receive in a certain time four hundred per cent profit on their original subscription.

This would be philanthropic and profitable business combined together. If these combinations don't succeed there are still some other ways of saving the Canal, and one of them will make the subject of another chapter.

To be continued.

Answers to Correspondents.

Messrs. Boucard, Pottier & Co., in answer to the numerous letters received from the Continent and from America offering Objects of Natural History for sale, remind their Correspondents that their establishment is a Naturalist's Agency, started with the special purpose of serving as intermediary between the collectors and the amateurs. They will be glad to receive in commission all sorts of Objects of Natural History, and will do their utmost to give entire satisfaction to both parties concerned. Rare Objects, either in Curios, Paintings, Works of Art, Natural History in general, sent in commission will be advertised free of charge in the journal.

Lists of desiderata for rare specimens of Natural History, Works of Art, Curios, etc., will also be inserted free of charge.

All communications should be addressed —

NATURALIST'S AGENCY,
225, HIGH HOLBORN, LONDON, W.C.

Obituary.—*Mr. Edmond André*, the well-known Hymenopterist of Beaune, (Côte d'Or, France), died at the end of January ; his Species on the Hymenopteræ of Europe and Algeria is one of the best works on these insects. He leaves a widow and five children.

An Easy Way of Making One Hundred Pounds Sterling a Year.

BIRDS AND MAMMALS.

By Mr. Walter Burton.

In collecting birds, mammals, &c., the first necessary is the gun and its appurtenances, I need not say that it is advisable to purchase these of good quality. I have collected in North Western Australia with a very simple breech-loading walking-stick gun, by Cogswell & Harrison, 410 bore, with paper shells; but should recommend solid-drawn brass rifle shells, which can be reloaded many times. For humming birds a friend of mine has used a ·380 bore "Excel" gun, purchased in New York, of American make, which he found very useful for the purpose, using solid-drawn rifle shells. A 12 bore breech-loading double-barrelled gun, with shells loaded with large and small shot, is the most useful for all-round work, when, if you are after large birds and a small bird turns up, you can perhaps bag it without doing too much harm to its plumage. As for powder, get the best that can be procured in the district in which the collecting is being done. I may mention that Curtis and Harvey's black is the most reliable in my estimation, if it can be got. This I had to pay 5s. per lb. for in Derby, N.W. Australia; but in Sydney for 3s. or 3s. 6d. Be very careful to keep the caps for re-capping the shells, in well closed boxes; a tightly corked bottle in a wooden case is a good way of carrying them, so as to keep the air and damp from them as effectually as possible; even an immersion in water will do no damage to them. I am rather a believer in shot of small size, as a rule, one gets pretty close to the bird before one sees it. For wads, a thick felt one over the powder and a thin cardboard one over the shot is all that is required, unless a great quantity is loaded at one time, when a thin greaseproof wad between the powder and thick wad can be used to prevent the grease from the thick wad soaking into and caking the powder, which reduces its strength and fouls the barrel of the gun. In hot climates it is absolutely necessary to clean the inside of the barrels every evening, as the residue left of the powder dries hard, and it requires a tight fitting piece of tow wrapped around the cleaning rod to dislodge it; vaseline is the very best cleanser and lubricant, a pound tin goes a long way, and, moreover, it is useful in a number of instances in camping out, for softening leather straps, saddles, boots, abrasions of the skin, etc. Particular attention should also be paid to the break-off, the extreme breech of the barrels and the face of the breech piece where the strikers come through, to see that it is well lubricated and free from dirt and grit, as it is important that these parts should fit well. The tools for reloading the shells are a de- and re-capper, a graduated powder and shot measure, a short wad rammer and a resizer, a piece of steel with a hole the size of the shell to drive the empty shells through to the flange in case they should bulge. This is necessary in the case of paper shells as they expand more readily than the brass.

A strong cleaning-rod should be taken, one nearly the size of the bore, by which less tow is required, it is much firmer to grasp and not easily broken. In the manner of carrying the gun there are so many ways, one's experience will tell the best and handiest ways of carrying with the least fatigue. If there are two guns to carry, a sling over the shoulder can be used for one, the other carried ready in the hand. With a pack-horse do not put the gun in the pack in case the horse should knock against a tree or rock or the pack be dislodged, when, perhaps, some irreparable damage may be done. In riding on horseback the butt should be rested on the thigh, the barrels pointing upward, or laid across the saddle in front in open country; if travelling by waggon, the spare guns should be placed in their respective cases, and the one to be used carried in the hand. Do not rest a gun upright against a tree in the forest or lay it on the ground, as it is so easy to overlook it, and perhaps lose a lot of time hunting after it; lay it on top of a dead bush, or, if convenient, across the trunk of a tree, as it is then more easily seen than when standing upright. If travelling by canoe, spare guns should be packed away in the driest place; the one in use laid so that it will not fall down or be trodden upon. In a permanent camp, or one in which a long stay is made, some natural forks of branches can be stuck in the ground inside the tent in which to lay them like a gun-rack, or two straight sticks with loops tied at intervals.

To be a good shot the principal things are plenty of practice and a liking for shooting. As a rule collectors are not good shots in a sporting sense, for if a collector sees a good bird sitting he will shoot it without risking the chance of losing it by making it fly, and in forests very few flying shots are to be had, and powder and shot are not to be recklessly thrown away; still some little skill with the gun and rifle is very useful in an emergency. I have found sometimes a great difficulty in finding the birds I have shot which have dropped into the grass or undergrowth, the colours of the birds in many instances assimilating with those of the vegetation among which it has fallen. If you have a dead bird lay it on the place where the other was seen to fall and so accustom the eye to the look of the bird in that situation, this I have found a great help. I have also found it awkward to carry the birds after they are shot, to keep them clean and in good condition, the best way I know of for small birds is to pass a needle with thread through the nostrils, tie the thread into a loop and pass a short stick through the loop and carry them in the hand: large birds may be carried in the hand by the legs; as soon as the bird is shot a little cotton-wool should be thrust into the throat to prevent any saliva running from out the bill, notes should now be taken of the colours of the soft parts such as the eyes, cere, bill, legs, feet, toes, claws and any bare skin as a help to the mounter who eventually stuffs the birds as well as the naturalists who describe them. A small note book can be conveniently carried in a pouch fastened to the belt; these notes can be copied out in the evening after work, with anything of interest observed of the birds, habits, etc., in this manner:—

No. 1. Name of bird. Sex. Length. Colours of soft parts. Remarks. Locality. Date.

(To be continued.)

Report on the two last Public Sales of Natural History Specimens at Stevens'.

In November Sale, lot 90, *Ornithoptera durvillana* realized £2 2 0; lot 109, *Morpho centralis*, fetched 16*s*; *Morpho Alexandrowna* 24*s*; *Morpho Achhillides* 16*s*.; lot 119, *Morpho sp.* sold at 15*s*.; lot 66, a splendid series of *Carabus from Chili* realized £12. It was bought by Messrs Boucard, Potter & Co. Lot 220, *Moths from China* 30*s*.; lots 283 to 286 inclusive, a small collection of birds from Gaboon was bought by Messrs. Boucard, Potter & Co. for 47*s*.

In January Sale some very rare species of Butterflies were offered, and a very good collection of Cetonidae which sold at very fair prices.

Goliathus abbosignatus, Kirby, was knocked down at £5 15 0; lot 58, 21 Cetonidae, including *D. wallichi*; *bowringi bertoloni*, *nireus*, *moryani*, *derbiana*, *homimani* and others 40*s*.; all the other lots of Cetonidae were sold from 7*s*. to 35*s*. each; lot 100 A, two very fine Owls under glass shades realized 9 guineas; lot 101 A, one specimen of *Frilled Bustard* 45*s*.; lot 103 A, *Three Armadillos* in Case 50*s*.; Lot 105 A, pair of *Common Pheasants* with young, in case, 2 guineas. Several lots of *Goliathus D'ruryi* imperfect fetched 20*s*. and 21*s*.; *Ornithoptera Durvillana* 30*s*.; two large collections of Darjeeling *Butterflies and Moths* were knocked down at £4 10*s*. and 5 guineas; *Ornithoptera priamus* 14*s*.; *Ornithoptera hippolythus* 15*s*.; several pairs of *Charaxes pyrrhus were sold at* 10*s*.; *Charaxes euryalus* £1 12 6 *Stichopthalma howqua* from North China 16*s*.; *Morpho anaxibia female*, 24*s*.; *Morpho ega* female, 18*s*.; *Agrias claudia* female, 2 guineas; *Agrias amydon* male, 2 guineas; *Agrias phalcidion* male. 50*s*.; *Ornithoptera plateni*, £2 18 0; *Ornithoptera rufficollis* 20*s*.; *Morpho cisseis* 3 guineas, (Boucard, Pottier & Co.); *Morpho Centralis*, 12*s*.; *Morpho achillides*, 15*s*.; *Papilio telegonus*, 21*s*.; *Papilio penelope*, 22*s*.; *Papilio blumei*, 26*s*.; *Papilio daedalus* 14*s*.; *Papilio deiphontes*, 16*s*.; *Papilio evan*, 16*s*.; *Teniopalpus imperialis female*, £1 15 0; *Charaxes imperialis*, 26*s*.; *Charaxes ameliæ*, 17*s*.; *Sphynx Moth* from North-east Sumatra fetched £3 10 0; a unique British specimen of *Cuculia abrotana* taken in Devonshire fetched the nice sum of 18*s*.

There was a large attendance and the competition for some of the best lots was very keen.

Report on January and February Public Sales of Postage Stamps.

At Mr. Thomas Bull's sale on January 9th and 10th several lots realised good prices.

Bahamas, imperf., 1*d*., 22*s*.; Canada, 12*d*. black, surcharged, "Specimen," 26*s*.; Ceylon, imperf., 4*d*., rose 90*s*. New Brunswick, 1*s*., violet, unused, one corner of margin a little cut, 95*s*. Barbadoes, provisional, 1*d*. on half 5*s*., 36*s*. Cape of Good Hope, wood block, 1*d*.; red grand copy, 45*s*.; India, ½ anna, red, grand copy, 115*s*.

On Saturday, January 24th, Mr. W. Hadlow held his first sale at Tottenham, the best lots realised fair prizes. Vancouver Island, 10*c*., blue, imperf., 22*s*.; Brazil, 180 R, slanting figures, 25*s*.; Canada, 6*d*., purple black, perf., 30*s*.; ditto, 6*d*., green, fine margins, 16*s*.; ditto, 10*d*., blue fine pair on original paper, 25*s*. Messrs. Boucard, Pottier and Co.

Ceylon, imperf., 8*d*., fine margins, 90*s*.; ditto, 9*d*., brown violet, 30*s*. Great Britain, Mulready, 2*d*., blue, with 2*d*. blue, no lines attached, 40*s*.; ditto, £5 orange, 29*s*.; India, long rect., service postage, 2 annas, splendid copy, 24*s*. New South Wales, 5*s*., imperf.; fine margins, 30*s*. Prince Edward Isle, 2*d*., rose, a fine pair, unused, 30*s*. Queensland, 6*d*., emerald green, no W'mark, thin wove paper, 5*s*. Tuscany, 6, crazie red, 57*s*. 6*d*. Virgin Isles, 1*d*., green on buff, imperf., 27*s*. Western Australia, 6*d*., bronze, good copy, 21*s*.

Messrs. Cheveley and Co. started their sixteenth sale on Friday, February 13th. Below we give a few prices. Columbia (1861), 5*c*. yellow, unused and used, 10*s*. United States (1851), splendid pair of 5c. imperf., 18*s*. Victoria, beaded oval, 6*d*., orange, perf., sli, cut, 29*s*. West Australia, 6*d*., green, unused, 14*s*. Tasmania, 3*d*., red-brown, imperf., unused, 65*s*. Costa Rica, 10 pesos, black, unused, 20*s*. New Zealand, 4*d*., yellow, no watermark, a pair unused, and original gum, perf., 32*s*. New South Wales, 1*d*. and 3*d*., 26*s*. British East Africa, first issue, pair of 4 annas, used, 32*s*. Suez Canal, 20c., used, original (guaranteed), 77*s*. 6*d*.

Messrs. Boucard, Pottier and Co, will be happy to execute commissions for gentlemen who cannot attend the sales.

Bird Skins, and Feather Sales.

There was no Feather and Bird Skin Sale this month.

The next Sale will take place on the 6th of March.

FOR SALE.—Insects Coleoptera.

Private Collection of Mr. Boucard.

Cicindelidæ, including types of Oxygonia, Boucardi Chev, Cicindela costaricensis and others, 2*s*. each. Carabidæ, including many types, 1*s*. each. Dytiscidæ, 6*d*. each. Staphylinidæ, 3*d*. each.

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1 Lot of 100 Hoopoces	Price £6	0	0	1 lot de 100 Huppes	Prix 150 fr
1 ,, ,, 50 Wax Wings	£3	0	0	1 ,, ,, 50 Jaseurs	75 fr.
1 ,, ,, 50 African Humming	£2	0	0	1 ,, ,, 50 Sui manga	50 fr.
1 ,, ,, 100 Blue Creepers	£5	0	0	1 ,, ,, 100 Guit guits à tête bleue	125 fr.
1 ,, ,, 50 Green Creepers	£2	0	0	1 ,, ,, 50 Guit guits verts	50 fr.
1 ,, ,, 50 Red Tanagers	£2	10	0	1 ,, ,, 50 Tangaras rouges	62 fr. 50 c.
1 ,, ,, 100 Yellow and Black Tanagers	£4	0	0	1 ,, ,, 100 Tangaras noirs et jaunes	100 fr.
1 ,, ,, 50 Five Coloured Tanagers	£4	0	0	1 ,, ,, 50 Tangaras, quinticolor	100 fr.
1 ,, ,, 100 Tanagers, various	£2	0	0	1 ,, ,, 100 Tangaras divers	50 fr.
1 ,, ,, 50 Mexican Starlings	£5	0	0	1 ,, ,, 50 Etourneaux du Mexique	125 fr.
1 ,, ,, 100 European Starlings	£2	0	0	1 ,, ,, 100 Sansonnets...	50 fr.
1 ,, ,, 25 Blue Jays...	£2	0	0	1 ,, ,, 25 Geais	50 fr.
1 ,, ,, 50 Alpine Crows	£4	0	0	1 ,, ,, 50 Corbeaux des Alpes	100 fr.
1 ,, ,, 50 Metallic Starlings	£4	0	0	1 ,, ,, 50 Merles Métalliques bleus	100 fr.
1 ,, ,, 50 Large New Guinea Pitta	£8	0	0	1 ,, ,, 50 Grandes Bréves, de la N. Guinée ...	200 fr.
1 ,, ,, 25 Royal Fly Catchers	£5	0	0	1 ,, ,, 25 Gobe mouches royaux	125 fr.
1 ,, ,, 50 Fly Catchers, various	£2	0	0	1 ,, ,, 50 Gobe mouches divers	50 fr.
1 ,, ,, 50 Yellow-Headed Manakins	£1	5	0	1 ,, ,, 50 Manakins à tête jaune	36 fr. 25 c.
1 ,, ,, 50 Red and Black ditto	£1	5	0	1 ,, ,, 50 Manakins à tête rouge	36 fr. 25 c.
1 ,, ,, 20 Goat Suckers	£2	0	0	1 ,, ,, 20 Engoulevents	50 fr.
1 ,, ,, 100 Swallows	£4	0	0	1 ,, ,, 100 Hirondelles	100 fr.
1 ,, ,, 10 Bower birds	£2	10	0	1 ,, ,, 10 Oiseaux satinés	62 fr. 50 c.
1 ,, ,, 100 Green Humming, all males	£2	10	0	1 ,, ,, 100 Oiseaux mouches Verts, tous mâles	62 fr. 50 c.
1 ,, ,, 100 Amethyste Humming	£4	0	0	1 ,, ,, 100 Clarisses et Parzudaki	100 fr.
1 ,, ,, 100 Large Humming	£2	10	0	1 ,, ,, 100 Grands Oiseaux mouches divers	62 fr. 50 c.
1 ,, ,, 50 Ruby Topaz Humming	£2	10	0	1 ,, ,, 50 Rubis Topazes	62 fr. 50 c.
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1 ,, ,, 25,000 Green ,, large	£5	0	0	1 ,, ,, 25,000 Grandes Chrysomèles vertes	125 fr.
1 ,, ,, 25,000 ,, ,, small	£4	0	0	1 ,, ,, 25,000 Petites ,, ,, ...	100 fr.
1 ,, ,, 25,000 Purple ,, ...	£8	0	0	1 ,, ,, 25,000 Chrysomèles violettes	200 fr.
1 ,, ,, 1000 Golden Phaneus	£10	0	0	1 ,, ,, 1000 Phaneus dorés	250 fr.
1 ,, ,, 5000 May Bugs.	£4	0	0	1 ,, ,, 5000 Hannetons	100 fr.
1 ,, ,, 1000 Golden Antichira	£10	0	0	1 ,, ,, 1000 Petits Hannetons vert dorés	250 fr.
1 ,, ,, 1000 Large Green Buprests	£4	0	0	1 ,, ,, 1000 Grands Buprestes vert dorés	100 fr.
1 ,, ,, 1000 Golden Buprests	£4	0	0	1 ,, ,, 1000 Buprestes dorés	100 fr.
1 ,, ,, 500 Ocellated Buprests	£5	0	0	1 ,, ,, 500 Buprestes ocellés	125 fr.
1 ,, ,, 50 Diamond Beetles	£5	0	0	1 ,, ,, 50 Chareuçons dorés	125 fr.
1 ,, ,, 500 Brazilian Golden Cacides	£4	0	0	1 ,, ,, 500 Cacides	100 fr.
1 ,, ,, 500 Butterflies from West Africa in papers	£4	0	0	1 ,, ,, 500 Papillons d'Afrique	100 fr.

LIST
OF THE
PRICED UTENSILS
NECESSARY FOR COLLECTING
REPTILES, FISHES, INSECTS, SHELLS, etc.

Benzine bottle	1s. 0d.
Tin box for collecting Insects, from	1s. 6d.
Bottle	0s. 3d.
Glass tubes or phials, doz.	1s. 0d.
Digger	2s. 6d.
Butterfly nets, from	1s. 6d.
Sweeping and water, nets from	2s. 6d.
Umbrella for Insects, from	8s. 0d.
Cork in boards, per doz., from	2s. 6d.
Pins for Insects, per thousand, from	1s. 6d.
Pill boxes, per gross, from	4s. 0d.
Corked boxes for Insects, from	1s. 6d.
Wooden box same size	1s. 0d.
Boucard's Insecticide, per oz.	0s. 6d.
Flax, per pound	0s. 6d.
Cotton-wadding, per sheet	0s. 6d.
Nippers, from	1s. 6d.
Fishing rods with accessory, from	2s. 6d.

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British Guiana, 1 cent. on 1 dollar, 1 cent. on 2 dollars, 1 cent. on 3 dollars, 1 cent on four dollars...	4	0
Canada, 3d. oblong, unused	6	0
Cape of Good Hope, 1857, fine pair of 1s. green ...	12	0
Denmark, 1853, 16 Skill. lilac, roul, fine copy ...	10	0
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Ditto, £1, wmk. anchor, bluish paper	8	0
India, 1854, 4 annas, blue and red, uncut	2	6
Madeira, 1868, 100 black and lilac	15	0
Mexico, 1867, Gothic surcharge, 4 reals, rose on lilac, fine copy	10	0
Ditto, 8 reals, black on brown...	30	0
Natal, 1857, 1d. buff, fine copy	30	0
,, ,, 3d. pink ,, ,, ...	25	0
,, ,, 6d. green, fair copy	10	0
New Zealand, 6d. brown, pelure paper	6	0
Ditto, 1s. green, pelure paper	12	6

STAMPS (*continued*).

Pacific Steam Navigation Company, 2 reals, rose, unused	10	0
South Australia, 1859, 1s. yellow, roul	3	6
Straits Settlements, 1867, 12 cents. red and green, fine used copy	20	0
Ditto, 1872, 5 cents. plum	1	3
United States, 1851, 5 cents. brown, fine unused copy	50	0
Ditto, 5 cents. brown, perf., with projections... ...	7	0
Victoria, 1862, 3d. lake	10	0
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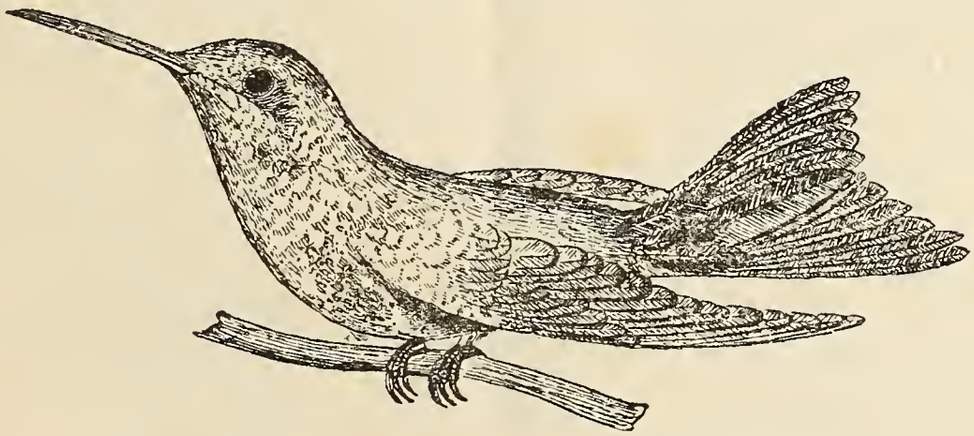

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
Member of the International Jury, Paris, 1889; Member of many scientific societies;
etc. etc. etc. etc.

CONTENTS OF No. 4.—APRIL 1, 1891.

[ENTERED AT STATIONERS' HALL.]

List of Parrots for Sale.

PSITTACIDÆ LEACH.

		s.
1	Platycercus pennanti, Lath	8
2	— — mounted	10
3	— adelaidæ, Gould	10
4	— flaviventris Tem.	10
5	— — mounted	12
6	— palliceps, Vig.	10
7	— eximius, Shaw	10
8	Psephotus multicolor, Brown	10
9	— hæmatonotus, Gould ...	10
10	— pulcherrimus, — ...	12
11	Nymphicus cornutus, Gm.	20
12	Barnardius Barnardi, Vig	10
13	— semitorquatus Quoy... ...	12
14	Polytelis barrabandi, Sw.	12
15	— — mounted	14
16	— alexandræ, Gould	12
17	— — mounted	14
18	Aprosmictus erythropterus, Gm. ...	12
18 bis	— — mounted	15
19	— vulnèratus, Wagl	16
20	— cyanopygius V.	10
21	— — mounted ...	12
22	— broadbenti	16
23	— dorsalis, Quoy	20
24	Pyrrhulopsis personatus, G. R. Gr. ...	30
25	— tabuensis, Gm.	30
26	Cyanoramphus novoe-zelandiæ, Sparm. ...	6
27	— auriceps, Kuhl	6
28	— pacificus, Forst	20
29	Melopsittacus undulatus, Shaw	4
30	Euphema pulchella, Shaw	6
31	— — mounted	8
32	— chrysogastra, Lath	10
33	— chrysostoma, Kull	10
34	— aurantia, Gould	10
35	Pezoporus formosus, Lath	8
36	— — mounted ...	10
37	Prioniturus flavicans, Cass.	8
38	— platurus, Kuhl	8
39	Urodiscus discurus, V.	20
40	Palæornis eupatria, L.	5
41	— docilis, V.	5
42	— docilis, mounted	10
43	Palæornis torquata, Bodd	5
44	— — mounted	8
45	— bengalensis, Gm.	5
46	— purpureus, Mull	16
47	— schisticeps, Hodgs.	12
48	— columboides, Vig.	14
49	— — mounted ...	16
50	— calthropæ, Lay	20
51	Belocercus longicaudus Bodd	8
52	— fasciatus, Mull	5
53	— javanicus, Osb	8
54	Ara macao, L	20
55	— — mounted	30
56	— chloropterus, G. R. G.	30
57	— ararauna, L., mounted	30
58	— militaris, L.	20
59	— severa, L.	20
60	— nobilis, L, ...	10
61	— hahni, Souancé	20
62	Rhynchopsitta, pachyrhyncha, Sw. ...	50
63	Henicognathus leptorhynchus, King ...	10
64	Conurus cyanolycos, Land	20
65	— icterotis, Mas and S.	20
66	— carolinensis, L., mounted ...	8
67	— chloropterus, Souancé	20
68	— wagleri, G. R. Gr.	5
69	— erythrogenys, Less	20
70	— pavua, Bodd	15
71	— nanday, Desm., mounted ...	20
72	— luteus, Bodd	20
73	— jandaya, Gm.	6
74	— aztec, Souancé	5
75	— pertinax, L.	5
76	— Weddelli Dev.	20
77	— holochlorus, Sclat	20
78	— ocularis, Scl. and Salv. ...	6
79	— petzii, Leihe	8
80	— rhodocephalus, Sclat and Salv...	10
81	— aureus, Gm.	3
82	— — mounted	5
83	— cruentatus, Max	4
84	— — mounted	6
85	— vittatus, Shaw	4
86	— — mounted	6
87	— souancei, Verr	20
88	— leucotis, Licht	5
89	— cyanopterus, Bodd	5
90	— — mounted... ...	8
91	— luciani, Dev.	20
92	— roseifrons, G. R. Gr.	10
93	— callipterus, Man	4
94	— hoffmanni, Cab...	12
95	Bolborhynchus monachus, Bodd ...	10
96	— — mounted ...	12
97	Brotogeris triacula, Hald	8
98	— virescens, Gm.	8
99	— — mounted	10
100	— tuipara, Gm.	4
101	— jugularis, Mull	6
102	— tovi, Gnel	2
103	— chrysosema? Natt.	20
104	Loriculus galgulus, L.	3
105	— — mounted	6
106	— stigmatus Mul and Sch. ...	8

LIST OF PARROTS FOR SALE.—*(Continued.)*

		s.
107	Loriculus vernalis, Sparm.	4
108	— melanopterus, Scop. ...	8
109	— exilis, Schl.	8
110	— aurantii frons	30
111	Licmetulus philippinus, V.	8
112	— — mounted ...	10
113	— regulus, Souancé	8
114	Lorius domicella, L.	12
115	— — mounted	16
116	— erythrothorax	20
117	— tricolor, Steph.	10
118	— — mounted	12
119	— garrulus, L.	12
120	— — mounted	15
121	— ater, Scop.	12
122	— sintillatus, Tem.	12
123	— fuscatus, Bp.	12
124	— chloropterus, Salv.	16
125	Vini fringillaceus, Gm.	20
126	Phigys solitarius, Lath.	30
127	Eos rubra, Gm.	12
128	— — mounted	15
129	— cochinsinensis, Lath.	16
130	— reticulatus, Mul and Schl. ...	16
131	— cardinalis, Hombe and L. ...	50
132	Trichoglossus, hæmatodus, L.	10
133	— rubritorques, Vig and H.	20
134	— novæ hollandiæ, Gm. ...	4
135	— — mounted	6
136	— nigrogularis, G. R. Gr. ...	10
137	— cyanogrammus, Wagl. ...	10
138	— massena, Bp.	6
139	— — mounted ...	10
140	— ornatus, L.	5
141	— chlorolepidotus, Kuhl. ...	4
142	— — mounted	6
143	— flavoviridis ? Sclat. ...	16
144	— meyeri, Schl.	8
145	Ptilosclera versicolor, Vig.	20
146	Glossopsitta concinna, Shaw	4
147	— — mounted ...	6
148	— pusila, Shaw	3
149	— — mounted	5
150	— porphyreocephala, Diet. ...	16
151	— — mounted	20
152	Psiteuteles euteles, Tem.	6
153	— placentis, Tem.	6
154	— muschenbrooki	16
155	Charmosyna papuana, Gm.	12
156	— — mounted ...	16
157	— arfaki, Ver.	20
158	— stellæ	12
159	Muscarinus polychlorus, Scop	8
160	— sinensis, Gm.	8
161	Tanygnathus megalorhynchos, Bodd. ...	16
162	— mulleri, Mull and Sch. ...	5
163	Nestor meridionalis, Gm.	20
164	— productus, Gould	30
165	Dasyptilus pecqueti, Less.	50
166	Vaza nigra, L.	20
167	— vaza, Shaw	20
168	— comorensis, Pet.	20
169	— barkleyi, Newt.	40
170	Geoffroy personatus, Shaw	8
171	Geoffroy rhodops, G. R. Gr.	5
172	— aruensis —	8
173	— cyanicollis, Mull and Sch. ...	6
174	Poiocephalus senegalus, L.	10
175	— — mounted ...	12
176	— Levaillanti	15
177	— — mounted ...	20
178	— meyeri, Rupp.	20
179	— versteri, Finsch.	50
180	Caica melanocephala, L	8
181	— — mounted ...	10
182	— xanthomeria, G. R. Gr.	30
183	— histrio, Bodd	8
184	— amazonina, Desmurs	24
185	— pyrilia, Bp.	16
186	— hæmatotis, Scl. and Salv	6
187	— coccineicollaris, Lawr	12
188	Pionus menstruus, L.	5
189	— sordidus, L.	15
190	— maximiliani, Kuhl	20
191	— senilis, Spix	6
192	— violaceus, Bodd	5
193	Deroptyus accipitrinus, L.	20
194	Chrysotis farinosa, Bodd	10
195	— auripalliata, Less	30
196	— amazonica, L.	12
197	— — mounted	16
198	— panamensis, Cab	10
199	— sallei, Finsch	30
200	— jamaicensis	30
201	— albifrons, Spar	10
202	Triclaria cyanogaster, V.	12
203	Psittacula guianensis, Sw.	6
204	— passerima, L.	2
205	— cœlestis, Less	
206	— conspicillata, Laf.	2
207	Urochroma cingulata, Scop.	4
208	— purpurata, Gm.	6
209	— surda, Hl.	5
210	Agapornis pullaria, L.	5
211	— — mounted	7
212	Poliopsitta cana, Gm.	8
213	— — mounted	10
214	Cyclopsitta diophthalma, H. and F. ...	6
215	— Bremei	30
216	— desmaresti, Garn	6
217	— coxeni, Gould	10
218	— suavissima, Sclat	20
219	— loxia, Cuv.	20
220	Psittinus incertus, Shaw	4
221	Nasiterna pygmæa, Quoy	20
222	Calopsitta novæ hollandiæ, Gm. ...	8
	— — — mounted ...	10
223	Cacatua alba, Mull, mounted	30
224	— sulphurea, Gm., mounted ...	25
225	Lophocroa leadbeateri, Vig.	12
226	Eolophus roseicapillus, V.	10
227	Licmetis nasicus, Tem.	16
228	Calyptorhynchus banksii, Lath	20
229	— — mounted ...	25
230	Callocephalon galeata, Lath	10
231	— — mounted ...	15
232	Microglossum aterrimum, Gm.	30
233	Strigops habroptilus, G. R. Gr.	30
234	— greyi, G. R. Gr.	30

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Private Collection of Mr. Boucard.

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LIST OF DESIDERATA OF PHANÆI.

Achilles Bohem,	Guayaquil.
Bitias Har.,	Mexico.
Charon Har.,	Guayaquil.
Columbi, Mc L., female, Hastifer Germ., male,	Brazil.
Foveolatus Har.,	Guayaquil.
Horus Waterh. Reiche,	Brazil.
Melibœus Blanch,	Chiquitos.
Mirabilis Har.,	Brazil.
Noctis Bates,	Colombia and Nicaragua, etc.
Perseus Har.,	Colombia.
Pteroderus Reiche in litt,	Uruguay.
Rhadamanthus Har.,	Brazil.
Rosalia Fabr., ?	America.
Tepanensis Bates,	Tepan.
Thalassinus Perty,	Brazil.

Steinheili Har., male and female. Guatemalensis Har., male. Beltianus, male. Scutifer, Bates, male and female. Lunaris, Tasch, male. Actæon, Erichs, male and female. Bispinus, Bates. Cadmus, Har. Dejeani, Har., female. Lautus, Macleay, male. Silenus, Cast, male and female. Spinifer, Cast, male and female.

List of Pittidae for Sale.

	s.
Pitta strepitans, Australia	5
— maxima, N. Guinea	10
— brachyura Malacca	8
— bengalensis, India	8
— elegans, Malacca	10
— cyanurus, Java	16
— arcuata, Borneo	30
— granatina, Borneo	8
— erythrogaster, Philippines	10
— mackloti, N. Guinea	10
— rosenbergi, N. Guinea	30
— novæ guineæ, N. Guinea	10
— mulleri, Borneo	10
— cucullata, India	8
— — Var, Malacca	8
— coerulea, Malacca	16
Philepitta castanea, Madagascar	12

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The Humming Bird.

Notes on Rare Species of Humming Birds and Descriptions of Several Supposed New Species in Boucard's Museum.

By A. Boucard.

Continued from page 17.

LAMPORNIS OBSCURA, N.SP.

LAMPORNIS VIOLICAUDA VAR BOUCARD, P.Z.S., 1879, P. 178.

Male.—Upper surface, purplish black, lighter on the rump; tail-coverts and central tail feathers, black; lateral tail feathers, metallic purple with tip and external edge of each feather dark blue; chin and breast, black, with a line of lustrous purplish black feathers commencing at the angle of the bill and passing down the sides of the neck; abdomen, black in centre, paler on sides, as in *L. violicauda;* under tail-coverts, purplish black; bill and feet, black.

Length, 4 inches, 2 lines; bill, 9 lines; wings, 2 inches, 6; tail, 1-5.

Habitat, Brasilia.

EULAMPIS CHLOROLÆMUS, GOULD.

SERICOTES CHLOROLÆMUS REICH, 1853.

EULAMPIS CHLOROLÆMUS BONAP, 1854.

ANTHRACOTHORAX CHLOROLÆMUS, REICH, 1855.

LAMPORNIS CHLOROLÆMUS, CAB & HEIN, 1860.

Male.—Upper surface, dark green with a large golden tinge on the rump; upper tail-coverts, bright green in the centre, with several bright blue feathers on each side; tail, bright purple blue, the two central feathers of same colour with greenish reflections; throat, very dark metallic grass green; breast, very dark purple blue, extending over the belly; abdomen, black in the centre, greenish black on the sides; under tail-coverts, bright purple blue, as breast, with green base; wings, steel black; feet and bill, black.

Length, $4\frac{5}{8}$; wing, $2\frac{1}{2}$; tail, $1\frac{1}{2}$; bill, $\frac{7}{8}$.

Habitat, Trinidad.

This species, which has been considered by many authors as a synonym of *L. holosericeus*, is quite distinct of that species, and easily distinguishable by the colour of the throat, which is of a very distinct green, and also by its blue breast in its entirety, and not a patch as in *C. holosericeus.* I am of opinion that it is a very good and valid species.

I have several specimens of this very rare species.

LAFRESNAYA CINEREORUFA, N.SP.

Sex (?).—Head, golden green; back, grey, with base of feathers black; slight rufous reflection on rump; upper tail-coverts grey; central tail feathers pale rufous for three thirds of their length, then dark grey with black tips; wings, steel black; under surface rufous, with sides and abdomen greyish; under tail-coverts rufous, with tips golden green; feet, flesh colour; bill, black.

Length, $4\frac{1}{2}$; wing, $1\frac{7}{8}$; tail, $1\frac{7}{8}$; bill, 1 inch.

Habitat, Colombia.

This species is quite distinct of *Lafresnaya flavicauda*, to which it is somewhat allied. The unique specimen from which the above description is taken came in a large consignment of Bogota birds sent to Paris in 1888. The colour of its plumage is quite extraordinary.

PETASOPHORA CORRUSCANS, GOULD, 1846.

POLYTMUS CORRUSCANS, GRAY.

COLIBRI CORRUSCANS, BP., 1850.

PRAXILLA CORRUSCANS, REICH, 1855.

PETASOPHORA CORRUSCANS, ELLIOTT, 1879.

Male.—Upper surface, shining grass green; line under the eye and ear coverts, shining blue; tail, bronze green, with a sub-terminal blackish bar; chin and centre of breast, shining blue; throat, metallic pink, green at base; abdomen and flanks, shining grass green; under tail-coverts, green, with edges and base buff; tail, shining green, with blue reflections, and sub-terminal bar steel blue; wings, purplish brown; feet and bill, black.

Length, $4\frac{6}{8}$; wing, 3; tail, 2; bill, $1\frac{1}{8}$.

Habitat, Colombia.

I have received two specimens of this rare bird in a large collection sent from Bogota, and after a careful examination, I have come to the conclusion, that it is only our old friend, *P. anais* accidentally coloured. I think this accidental colouring is due to a chemical action produced by humidity and zinc. I am nearly certain about it, because the two specimens which I have were found in similar circumstances, and I believe the same can be said of the other two specimens known. They were packed with many others at Bogota in tin cases, before quite dry, and the result was that when they arrived to Paris one third of the contents of the boxes were injured by dampness, so much so, that some claims for damages were made to the Maritime Company which brought them over from Columbia to Paris, alleging that they had got wet by sea water. I saw them at the time and eventually I bought some of them. I was called by a friend of mine, who asked my opinion, which I gave. I said that the damage was produced by having packed the skins in the cases before they were quite dry, and that in consequence of being hermetically shut up, the damp settled at bottom of cases and destroyed entirely a good number of skins. Those which were at top and centre of cases were very slightly injured by moisture. On each side of the cases some specimens were so firmly attached to the zinc that in pulling them away they came to pieces. Nearly all of these were altered in colours; the metallic green of *Chlorostilbon* and *Panychlora* was darker and reddish, the metallic rubi colour of *Chrysolampis moschitus* was darker too, and so forth with others.

At the time I thought little of these changes in colours, and I did not take the trouble to keep these specimens as I did not see any scientific interest in

them. It is in these damaged cases that I found the specimens of *P. corruscans* which are now in my possession; one of them has less pink than the other.

It would be very interesting if the opinion of a competent chemist could be obtained on this matter.

Chrysolampis Moschitus, Linné, 1766.

I have three varieties of this well known South American species found abundantly in Trinidad, Venezuela, Colombia, Guiana and Brazil. All of them are adult males; the first has a perfectly white chin, the remainder of the throat being topaz as in the specimens of the species; the second has a topaz breast lined on each side with a broad white margin from the bill to the breast; and the third has the four external feathers of the tail on the left side all white with rufous tips; on the other side, the two feathers next to central ones are white three-thirds of their length with large rufous spot at tips, the third and the two central feathers are totally rufous as in the specimens of that species and the last is white with rufous tip.

The two first specimens are from Colombia, the third from Brazil. This last one has also white feathers on back and three feathers on each wing white.

Lepidolarynx mesoleucus, Tem.

One adult male specimen agreeing exactly with the description of this well known species; but having a very short bill, $\frac{6}{8}$ inch, instead of $1\frac{1}{8}$ inches which is the usual length for that species.

It came from Brazil.

Helianthea eos, Gould, 1848.
Mellisuga eos, Gray.
Hypochrysia eos, Reich, 1853.
Calligenia eos, Muls.

Male.—Forehead metallic dark green; head, metallic green with the appearance of jet black; back shining green, golden on the rump; tail coverts golden bronze: the four central tail feathers, buff to the half of their length, the remainder metallic bronze, the others buff edged with bronze; chin and breast, shining dark green; throat, metallic purple blue; abdomen and flanks, fiery metallic bronze; under tail-coverts and tail, buff, each feather edged externally with a greenish bronze tip; wing-coverts, bronze, wings, purple; secondaries buff; bill black.

Length, $5\frac{2}{8}$; wing, 4; tail, $1\frac{6}{8}$ bill $1\frac{2}{8}$.

Female.—Upper surface, metallic dark green, coppery on the rump; tail-coverts, bronze colour; throat, buff; chest, metallic green; flanks and abdomen, bronze colour, rufous in the centre.

Habitat, Merida (Venezuela).

I have received several specimens, both sexes of of this magnificent species.

Helianthea typica, Less, 1838.

Male.—One specimen of that species all black, having the gular spot and the tail coverts, metallic silvery green.

I found it in a large collection of Humming Birds sent from Bogota.

Bourcieria wilsoni, Delatt & Bourcier, 1846.

One specimen of this species, with the throat metallic purple, intermixed with metallic green.

Habitat. Ecuador.

Heliangelus henrici, n. sp.

Male.—Forehead, luminous dark green; upper surface and tail coverts golden green; medium rectrices, bronzy-green as in *H. Clarissæ*, lateral ones, steel black as in *H. strophianus*; wings, purplish brown; chin and lores, black; throat, metallic violet with purple reflections, beneath which is a narrow band of shining grass green, succeeded by a wide white band crossing all the chest; abdomen and flanks, shining grass green; under tail-coverts, golden grey edged with white; bill short as *H. strophianus*.

Length, $4\frac{1}{8}$; wing, $2\frac{1}{2}$; tail, $1\frac{1}{2}$; bill, $\frac{1}{2}$.

Habitat, Ecuador.

I have only one specimen of this fine species, which was given to me by Mr. Henry Whitely, and I have much pleasure in dedicating the same to him. It must be placed between *H. clarissae* and *H. strophianus*.

Thalurania eriphile, Less.

Male.—Head and throat, metallic emerald green, with metallic blue patch on the head; back of head, upper surface upper and under tail-coverts, bronzy green; shoulders, breast and abdomen, metallic purple blue; wing, purplish-brown; tail, steel black: bill, black.

Length, $4\frac{2}{8}$; wing, $2\frac{1}{2}$; tail, 2; bill, 1.

Habitat, Brasilia.

The specimens in my collection were collected by Mr. Gounelle.

Thalurania verticeps Gould, 1851.

This species which has been united by Mr Elliott to the above species is quite distinct; it is smaller and the colour of the shoulders and abdomen is of a very different metallic steel blue quite different of the purple-blue of *T. eriphile;* the metallic emerald-green of the throat extends much more on the breast than in *T. eriphile;* the under tail-coverts are blue edged with grey. In T. eriphile they are shining grey.

I think that Mr. Elliott had not a true T. eriphile in his collection when he united both species. In my opinion it is a very good species.

I have many specimens of T. verticeps collected by Mr. Buckley and others.

Thalurania colombica, Bourc and Muls.

I have in my Collection one male specimen of this species with tail and wing-coverts dark steel blue; forehead, silvery-purple; back, grey with golden reflections; throat, silvery-green; breast and abdomen, silvery-blue; flanks, grey; under tail-coverts, white with steel blue tips; wing, purple-brown; feet, fleshy colour; bill, black.

Length $3\frac{6}{8}$; wing, 2; tail, $1\frac{6}{8}$; bill $\frac{5}{8}$.

Came in a lot of birds from Bogota and may be another illustration of discolouring, produced by dampness and zinc; although the skin is in very good condition.

To be continued.

Description of a Supposed New Species of Parrot in Boucard's Museum.

By A. Boucard.

In looking over my collection of parrots I found two specimens of a species of Pionus, marked P. maximiliani, but which I believe to be quite distinct. One of them has been for a long time in the collection of the late T. C. Eyton. It was collected in Bolivia by Mr. Thomas Bridges, the other was collected at Corrientes (Argentine Republic) by Mr. Flamant. I believe that it is justly due to the late T. Bridges, the first discoverer of this species, that it should bear his name. So I have called it *Pionus bridgesi*, as a feeble homage to the memory of this excellent collector.

Pionus bridgesi, n. sp.

Male.—Head, neck, cheeks, and lores, grass green edged with purple-blue; back, breast, abdomen, wing, and tail coverts, yellowish-green; tail, deep grass green; chin, rose-purple; throat, purple with rosy reflections; under tail coverts, crimson; tail, showy green, red at base; feet, black; bill, upper mandible, black with yellow tip; under mandible, yellow.

Length, 12 inches; wing, 8; tail, 4½.

Habitat, Bolivia and Argentine Republic.

The principal difference between this species and P. maximiliani is that this last species is of a deeper grass colour all over, and that the colour of the throat is bluish-purple.

Notes on the Crowned Superb Warbler, Malurus coronatus, Gould.

Native Name: GERIAL.

This exceedingly rare and most lovely little bird I first had the pleasure of procuring on the banks of the Fitzroy River, North Western Australia, in 1886, near Maclarty's crossing, where I found it tolerably plentiful. In its habits it did not materially differ from the other members of the genus except that it was always seen in the bamboo-like grass growing from three to eight feet high in patches here and there bordering the river, never more than a few yards from the edge of the water. The adult males, as in the other species of the genus, were the most difficult of approach, keeping to the bottom of the reeds and those the most dense. The females and young males being bolder showed themselves more frequently at the edges of the clumps of grass, but I rarely, if ever, saw them creep to the tops. Their call is similar to the Maluri in general, but more harsh, much louder and sustained for a longer period. One young male which I was watching and which was assuming the lilac features of the crown, whistled beautifully and with a ventriloquial effect, beginning low at first, which seemed to come from another bird at a distance, and then bursting out into full song, similar to our Wren *Troglodytus parvula*, and, like it, very loud for such a tiny bird.

The species cannot be confounded with any other member of the genus, its far greater size and marked character in the colouring of its plumage at all ages preclude the possibility of a mistake. The beautiful lilac crown of the adult male, with its oblong patch of black feathers in the centre, lores, cheeks, ear coverts, and nape of the neck forming an uninterrupted stripe from one side of the bill to the other of intense black; the light brown colouring of the back, the white throat and breast and buffy flanks, renders it a very easy species to determine. The young male has the crown dull greyish-brown and no trace of the black spot in the centre, the black ear coverts and nape not so pure, the other parts as in the adult. The female has the crown dull grey, the centre having a few obscure brown feathers in place of the black spot, the ear coverts reddish-brown. The legs and feet in all ages and sexes are brownish-flesh colour, bill black, irides dark brown; the colour of their tails, too, are the same, being of a light greenish-blue, all the feathers (except the two central ones) tipped, and the outer one on each side edged with white. The tail of the female has a rather more greenish hue than in the male, but scarcely perceptible.

When I have been following them along the steep banks of the river where it is difficult to get far enough away from them to avoid damaging their plumage with the charge of dust shot from such a small gun as a ·410 gauge on account of the thickness of the undergrowth and the uprooted trees torn from their hold in the banks by the heavy floods of the rainy season, their roots and branches interlocked in those of the trees still standing, intertwined with powerful creepers gnarled and twisted in some places like ships' cables, forming a barrier that has to be climbed or crept under with the ground at an angle of 60 degs., soft and pliable, affording no hold to the feet except where some grass has grown or in some unevenness of the ground, where a slip will send the birds in hiding, I have seen them sometimes fly out over the water into a tree which has had the earth washed away from its roots and fallen over into the river, where they will hop about amongst the branches with tail erect and then creep back into the dense grass, where it was no easy matter to find them; but by waiting at a thin part of the patch of grass where they were likely to pass on their way up or down the river, was the way in which I got most of the specimens. The beautiful crown of the male is not to be discerned until after a little practice, but when once accustomed to is never forgotten; it is a splendid colour and shows to advantage in its surroundings when erected. They were mostly seen in parties of from five to seven in number; sometimes only a pair, very seldom singly, the old male generally leading the little flock. The only other species of the genus observed at this camp was the *M. cruentatus*, which Professor Ramsay, of the Australian Museum, believed to be distinct, and has bestowed the name of *Malurus cruentatus boweri*. This and the *coronatus* seemed to be at variance, and I have repeatedly, by imitating the call of *cruentatus*, brought forth the male *coronutus* to do battle with the supposed intruder on his domain.

Length from point of bill to upper tail coverts: male, 3·8; female, 3·7; male (juv.), 3·7. Bill on culmen, ·45. Wings from carpal joint, fifth feather longest, 2·2. Tail, from end of upper tail coverts, male, 2·2; female, 2·1; male juv., 2·45. Tarsi, ·93. These two species with *M. lamberti* were the only members of the genus that were procured in this collecting trip, in which I accompanied the late Thomas Henry Bourger-Bower as naturalist, who, to my great sorrow and distress, contracted the malarial fever, which turned to typhoid, and culminated in his death at Palmerston, Port Darwin, Northern Territory, on December 23rd, 1886. Scientific naturalists and society at large have to regret the loss of such a practical and zealous collector and gentleman and myself the loss of a true friend.

"The Lord alone did lead him."

WALTER BURTON.

A Visit to the Gardens of the Zoological Society of London.

A few days ago I went and spent a few hours in the gardens of the Zoological Society of London, and I was happy to see how Londoners and others continue to patronise the said gardens, which shows their good sense.

It is really a magnificent institution, and it is easy to see that everything is done in such good style that it can only prosper more and more every day. Everything is in best order, and there is an infinite number of rare animals from all parts of the world to be seen. No one can go there without being interested in all what he sees.

My compliments to Doctor Philip Lutley Sclater, Secretary of the Zoological Society; to Mr. Bartlett, Superintendent of the Gardens, and to all those who are under their direction.

A very useful Guide to the Gardens, sold at the moderate price of sixpence, is indispensable to all those who really want to see in detail all the zoological treasures quartered in the Gardens.

In the Western Aviary can be admired the extraordinary SATIN BOWER BIRDS (*Ptilonorhynchus violaceus*), which are constantly seen in search of materials of all descriptions for the construction of their nest, with a sort of gallery around it, where they disport themselves like school boys in vacation.

The LAUGHING KINGFISHER (*Dacelo giganteus*), the largest species known of that family, is also an interesting bird to observe and hear when it laughs.

Another very interesting species of bird is the CROWNED PIGEON (*Goura coronata*), one of the most magnificent birds to be seen. It is originary from New Guinea, and is among other allied species, one of the largest of pigeons known.

Then we have the Cranes and Storks of all descriptions and sizes, among which the extraordinary MARABOUT (*Leptoptilus crumeniferus*) with its enormous pouch; the different species of *Emeus* and *Rhea*, the *Pelicans*, the *Eagles* and *Owls*, the magnificent collection of *Parrots*, containing many of the rarest species, the *Hornbills*, the large series of rare *Pheasants*, *Tragopans*, and *Monals*, *Ducks* and *Swans*, *Ostriches*, the *Australian Cassowary*, the *Apteryx*, and lastly the large Aviary, where are located an immense number of small bright tropical birds, doves, and another with many species of British birds.

In Mammals, the Monkeys' House attracts always a great deal of attention, and it is sometimes difficult to effectuate an entrance.

Actually there are several rare species, amongst which are two *Chimpanzees*. These large monkeys, which natives of Africa call Idlers, saying: "You not speak, because not want to work." These last are housed in what used to be the old Reptiles' House.

The Lions' House is also one of the places where the public is always numerous, especially at feeding time.

One never tires to admire these magnificent animals, justly called the Kings of the Desert, and also the *Royal Tigers*, another noble animal. The many species of *Leopards*, and the *Puma*, are also a great attraction. The *Antelopes* and *Deers* are very interesting to look at; the different species of *Bears*, the *Rhinoceros*, *Hippopotamus*, *Giraffes*, *Elephants*, *Zebrae*, Brazilian *Tapirs*, *Beavers*, *Sea Lions* and, many others too long to enumerate. Then there is the Reptile's House, which is a real palace, and lastly, the Aquarium and Insectorium.

It is impossible to pass a few hours better than those passed in the Gardens of the Zoological Society, where everything is interesting. Health and knowledge is acquired in going there, and I hope that this sensible taste for live animals will continue to accrue every day. By going as many times as you can in the year you will contribute to increase the resources of the Society. which has no other ambition than to make it as perfect and as interesting as possible to the general public. All the money received from the visitors is spent in ameliorations of all sorts, in purchasing rare animals, and in the expenses of the undertaking, all for the benefit of the public. Actually, the Society is in parley for the purchase of two very rare species of Pheasants brought over to England from Thibet per Mr. Antwerp E. Platt. One is the excessively rare *Lophophorus l'Huysei*, and the other is *Crossoptilon thibetanum*, two species never brought to Europe before. I hope the Society will be able to secure them.

A. B.

British Museum (Zoological Department.)

The celebrated Professor Thomas Salvadori of Turin (Italy) has been working every day since the last five months, at the large and fine collection of Psittacidae of the British Museum. His work is nearly completed and the Volume containing descriptions of all the Parrots known will shortly appear. I have no doubt that it will be very complete and very interesting to all Ornithologists, Professor Salvadori having done this work *con amore*.

Professor Ernst Hartett of the Museum of Francfurt-on-Main (Germany), the well known scientific Traveller in Sumatra, India, and Africa, has also been

here several weeks and has been working at the British Museum.

Indubitably many other Scientists among the Ornithologists and others have been studying and working at the British Museum lately, and this shows how appreciated are by all the splendid Collections gathered in this Museum ; but unfortunately I hear from all sides that the accommodation for scientific workers is very limited.

This shows that I was right when I say page 13 of the *Humming Bird* that in building a Museum, rooms and library for the use of Students should be the first thing to think of.

If there was sufficient accommodation for Students with its correspondent attendance, I have no doubt that hundreds of Scientists would be seen every day at work in the laboratories of the British Museum and I hope the day is not far off when this wish of many will be realized.

A. B.

Royal Aquarium.

The ordinary general meeting of the Royal Aquarium was held on the 4th of March, under the presidency of Captain Molesworth, R.N., the Chairman and General Manager of the Company.

It was rather a stormy meeting in consequence of the division existing between the Directors. Much was said on either side, but it would have been much better if half of what was said had been kept to themselves. It is not satisfactory to hear Directors of one same Company charging one another of deeds resulting against the welfare of the Institution. I shall not go into details about all what was said at the Meeting as every leading Journal of the Metropolis has published minutely the report of same ; but I was quite surprised that none of the reporters assisting at the meeting have said a word about several speeches made by many of the independent shareholders. One of them, *Mr. F. Stroud*, gave a very good acccount of what is going on at the Aquarium since Captain Molesworth is one of the Directors and Chairman. He said that the reports were always very promising ; but the fact was that for one reason or another, now in consequence of the fogs, at other times in consequence of the Italian and Spanish Exhibitions or for other causes, the dividend for the Shareholders was always small ; although we are told every year that there will be a fine dividend for the next.

He spoke also of some very valuable properties that we have close to the Aquarium which are in a very delapidated state and could be let at a high rent if properly repaired. He concluded by saying that he thought that the Shareholders ought to give another chance to Captain Molesworth ; but it should be understood between him and the Shareholders that if in six months time, he could not give us a better dividend than the last, that he should resign. These remarks were very well received by the Shareholders present at the Meeting. Myself, an original Shareholder of eighty shares, said that we had a splendid property which well managed ought to pay us a dividend not of two or five per cent ; but 10, 15, 20, 30 and possibly 50 per cent. as many other institutions of the same class had done ; but up to the present time we have had yearly all sorts of promises about very good dividends ; but up to this time we never have had the legal 5 per cent. interest of our money. I said that I assisted at the meeting when Captain Molesworth was first elected a Director and that I thought he might be a good Director and a perfect gentleman ; but did not think he was the proper manager for such an Institution as the Royal Aquarium.

After a few more remarks from other Shareholders the meeting terminated rather abruptly. A gentleman proposed a vote of thanks for the Chairman, but the meeting was virtually ended when this was done.

Well now, I repeat what I said at the meeting. We have a magnificent property in the Royal Aquarium which could give us excellent dividends if managed by a competent person and the least that Captain Molesworth ought to do is to look for a manager accustomed to that sort of business to assist him and entrust him the management of the Society as soon as he has given proof of his abilities in managing the Royal Aquarium in such a way that enables the Company to pay at least 5 per cent. dividend to the Shareholders. Short of this, I think that the Shareholders will not rest long satisfied with what has been done and is still done at the present time. They want *good dividends* and *no more promises*.

A. Boucard.

The Panama Canal.

On the 21st of February last there was a debate on the Nicaragua Canal Bill in the Senate at Washington. Being very important that the bondholders of the Panama Canal Co. should be acquainted with all what occurs in America about the Interoceanic Canal of Nicaragua, I reproduce here the telegraphic message sent by Reuter to the leading journals of Europe :—

The Nicaragua Canal.

Washington, Feb. 21. – During the debate on the Nicaragua Canal Bill, Senator Davis, of Minnesota, opposed the passing of the measure in a speech in which he declared that the Bill virtually proposed a subsidy of 100,000,000 dollars for the building of a work lying outside the national domain and traversing a foreign country. The means by which it was proposed to construct the canal Mr. Davis described as objectionable, and said that if the canal was to be made the work should be done by the American Government in its sovereign capacity through its own corps of engineers. He regarded it as most unfortunate that the treaty concluded with Nicaragua in 1884, providing for the construction of the canal by the United States, has been withdrawn. In his opinion, the question was not embarrassed by any complications under the Clayton-Bulwer Treaty, because he considered that that treaty had been abrogated by the action of Great Britain. The American people, however, were not crying out for the canal, neither was Great Britain nor any other Power, by

assuming a menacing attitude, rendering its construction necessary. Mr. Davis doubted whether it was feasible to construct and maintain the canal on account of the frequency of earthquakes in Central America. Senator Edmunds, of Vermont, replying to the latter part of Mr. Davis's speech, pointed out that railroads and waterworks had been constructed in spite of the earthquakes, and that ancient masonry was still standing within fifteen miles of Naples. No public work that was deemed useful should, he maintained, ever be discarded on account of a possible cataclysm of nature. Mr. Edmunds also defended the Bill generally. The Senate ultimately adjourned without having come to any decision regarding the Bill.

All what precedes shows how important it is for the United States the opening of an Interoceanic canal shortening the distance between the States of California and New York.

It is quite a mistake to believe that the Nicaragua Canal can be made with the sum asked for to the Senate of United States, viz., 100,000,000 dollars.

The same difficulties and the same expenses will be encountered there as with the Panama Canal, and I consider it very cheap if it could be terminated with twice that sum, and I think that if a canal is to be opened at all it would be much preferable for United States to buy, either in cash or otherwise, from the Panama Canal Company all the assets existing, at a reasonable price, and terminate the said canal. It would cost them much less and could be concluded much quicker.

Besides, the position of Panama is unique, and it would be very easy to make of that country an independent State, under the control of the Government of the United States, much more easy, in fact, than in Nicaragua, where it confines with two district Republics, having their capitals near the canal. Meanwhile in Colombia the capital Bogota is at a considerable distance, and probably it would be easier for the Government of United States to come to an understanding with that country than with Central America.

As a proof of what I say, I remember that during my last trip to Colon and Panama in 1876 and 1877, I spoke with many of the railway authorities, and many times I was told by them that in selecting Panama for the construction of the Interoceanic Railway, it was, because in the opinion of the best engineers of the epoch if a canal was to be made at any future time Panama was the only place where it could be made, and I believe that even now there exists a sort of agreement between the Panama Railway Company and the Colombian authorities that no canal can be made by any others than by the Panama Railway Company sixty leagues above or under the line of the railway. This clause was the chief reason why the Exploring Interoceanic Canal Company, under the direction of General Turr, sent an expedition to explore the Darien, which is just outside the limits claimed by the Panama Railway Company.

Seeing the impossibility of digging the Interoceanic Canal in the isthmus of Darien, Baron de Lesseps had to buy the Panama Railway Company with its privileges to the American Society which owned it, and it was considered by all a masterful stroke of business at the time.

Many of the directors of the said Company are alive, and can very well substantiate what I say, and, furthermore, tell to their countrymen that no one did interfere with them during all the time of their management. In fact, they were as the real owners of Panama, to the point of not receiving any other money than American gold in payment for transit of passengers and goods, and acting in everything entirely as they liked.

Panama is the proper place for the *Colombus Canal*, and, notwithstanding all what is done elsewhere, I have not the least doubt that the canal will be opened there one day or another.

To be continued.

Answers to Correspondents.

Messrs. Boucard, Pottier & Co., in answer to the numerous letters received from the Continent and from America offering Objects of Natural History for sale, remind their Correspondents that their establishment is a Naturalist's Agency, started with the special purpose of serving as intermediary between the collectors and the amateurs. They will be glad to receive in commission all sorts of Objects of Natural History, and will do their utmost to give entire satisfaction to both parties concerned. Rare Objects, either in Curios, Paintings, Works of Art, Natural History in general, sent in commission will be advertised free of charge in the journal.

Lists of desiderata for rare specimens of Natural History, Works of Art, Curios, etc., will also be inserted free of charge.

All communications should be addressed —

NATURALIST'S AGENCY,
225, HIGH HOLBORN, LONDON, W.C.

Books and Journals Received.

North American Fauna, Nos. 3 and 4, two very interesting pamphlets on mammals and birds found in North America.

Rivista italiana di Scienze naturali. Le Nov Latin, international scientific Lingua, by Dr. Daniel Rosa.

The Antigua Observer.

The Canadian Entomologist.

The Naturalist's Gazette.

Willing's British and Irish Press Guide, a very useful book.

With thanks,
A. B.

Obituary.—*Charles Anatole Maingonnat*, the 21st of February, aged 54. Charles Anatole Maingonnat of Paris, a very old friend of mine, was a pupil of Messrs. Jules and Edward Verreaux, Brothers, the firm who had travellers in all parts of the world, and supplied so many museums during a number of years with rare or new species collected everywhere. Under such masters, Charles Anatole Maingonnat became a very skilful taxidermist. He studied anatomy and sculpture. He always used to make a

model of the objects which he had to stuff, and he acquired great ability in modelling animals and birds. I possess several works made by him, which I consider excessively good. Many of the specimens of mammals and birds exhibited by the Republic of Guatemala, and by myself at the International Paris Exhibition of 1889, were prepared in his workshop. The French Government awarded him a silver medal, and the Republic of Guatemala awarded him a gold medal, and two silver medals for his assistants. He was ailing for some time, but his family and friends never thought the end was so near. He leaves a widow and two children, to whom we address all our sympathies.

An Easy Way of Making One Hundred Pounds Sterling a Year.

BIRDS AND MAMMALS.

By Mr. Walter Burton.

If a powerful billed bird, such as a cockatoo, is wounded lay the barrel of the gun across the neck, and press the bird to the ground with the hand until dead, this also in the case of herons, which are dangerous if only winged; eagles if wounded require careful handling, lay the barrel across the neck with one hand, holding the feet with the other, and press them with the knee to the ground, this will kill the bird without damaging the plumage, and beware of the claws of hawks and owls, they are exceedingly sharp and poisonous.

I now come to the process of skinning and "making up" the birds into skins, premising my description with the remark that if it is possible to get a lesson from a professional taxidermist before starting it will be found a great help, but to those so situated that they cannot profit by this instruction I hope I can make myself understood in the manner in which I explain the process, it is exactly the way in which I work myself. and in which I have had a life-long experience, some thousands of birds having been through my hands in England and abroad, and for which I have gained much praise from scientific naturalists. To proceed, the tools requisite for the proper "making up" of the skins, the most useful next to the knife or scalpel is a pair of straight scissor-forceps, such as are used by surgeons for polypus of the nose, about seven inches long, a scalpel for small, a knife for large birds, two pairs of scissors, large and small, a pair of spring tweezers, needles, cotton, thread, pins, cottonwool, tow, arsenical soap and some pine boxwood sawdust as used by jewellers, and ground alum for large birds, any of these instruments of course can be duplicated for a very lengthened stay.

The easiest bird to commence practice with here in England is the common starling, having a good tough skin of his own; unpractised fingers will not be so liable to injure as with a more tender skinned bird.

Remove the cotton-wool that was pushed into the throat when shot, and break the wing bones as close to the body as possible, lay the bird on a table or anything that is about that height, sometimes I have skinned the bird laid on my knee whilst sitting on the ground, take the length on a rule marked in inches and tenths from tip of bill to end of tail-feathers; with the bill pointing to the left, part the feathers of the breast with the left thumb and forefinger, and make an incision with the knife from near the top of the keel of the breast bone to near the anus, part the skin from the body by pushing with the handle of the knife, holding the skin by the left forefinger on both sides until the legs are exposed to view, cut through the joint first seen on either side and skin round the back a little further, using some of the sawdust dusted on the body and feathers round the opening, then push the skin over the breast when the broken wings will be seen, cut through both and through the neck close to the body, using plenty of the sawdust to soak up and prevent any moisture from the body soiling the feathers, then the body can be removed altogether by skinning down the back, and cutting off at the base of the tail, not too close to the root of the tail-feathers, lay the body aside for the present, skin the thigh, and clean the thigh bone of all flesh, the easiest way is to cut through the thinnest part, cutting the sinews and stripping up to the joint where first cut through, and cut the joint and flesh right away, brush a little arsenical soap on the bone and skin, and wrap around the bone enough cotton-wool to make up to the size of the flesh taken away and return the leg to its normal position, repeat with the other, then with the wings, skin down to the first joint from the body and cut away the flesh, tie a piece of cotton on each stump of bone, and return the wings to their proper places after brushing a little soap on the bone, take hold of the neck in the right hand and strip down the skin with the left forefinger and thumb until the base of the skull appears; then come the ears, which dig out with the point of the knife, taking care not to cut the skin. Skin on until the eyes are reached, being extremely careful not to cut the eyelid, which is a great detriment to the look of the skin when finished, or to cut into the eyeball, which take out with the handle of the knife. Skin right down to the bill, and cut the base of the skull right away, but not the joint of the mandibles, which just miss, then with the scissors cut the flesh from between the lower mandible with the tongue right to the top of the skull, when all the flesh and brains will come away together. Then with a brush cover with arsenical soap and turn right side out, the feathers will look rather rough at first, but with a little shaking and manipulating the feathers will all come into their right places. Take the two ends of the cotton which were tied to the stumps of the wing bones and tie them together, leaving the natural width of the back. Between the cotton and the skin of the back place a small piece of cotton wool, which gives a nice level back to the skin. With the scissor-forceps take a piece of cotton-wool, about the size of the eye taken out, and insert up the neck through the skull into the orbital space, then with a piece of cotton-wool or tow somewhere about the size of the original body and neck, with the scissor-forceps fill out the neck and body, making the neck rather short. A good plan where practicable is to have a bird in the flesh lying before you, and so make the skin as near like it as possible. Then with a needle and cotton proceed to sew up the incision first made, beginning at the vent and finishing off at the breast, a few stitches will suffice, and the two edges of the skin need not be drawn close together, as the feathers will cover the open space. Then arrange the feathers of the breast with spring

tweezers, and pricking up the feathers with a needle, tie the legs together, crossed, turn the bird on its breast, and regulate the feathers of the back with the spring tweezers, placing the wing-coverts in their proper places. Make a cylinder of paper, the size of the bird, to keep the wings in position and the feathers from being rough, push the skin in head-foremost, seeing that all the feathers are in place as it goes in; now is the time to finish with the original body taken out, it is necessary in cases where both sexes of birds do not differ in outward appearance that dissection is resorted to to find out their individual sex, in fact, in all cases it is as well that this should be done, as young males are usually very much like females, and females will sometimes assume the plumage of the male; the testes in the male are found at the middle of the back, appearing as two little white, black, or black and white specks, the ovaries in the female in the same place, but on the left-hand side like a small bunch of grapes, in the breeding season these organs are very much larger, in the females the egg with shell will sometimes be found; when this is done the body may finally be disposed of, either thrown away or relegated to the pot if good for eating, as the process of skinning does not at all interfere with its use for gastronomic purposes; a small label should be tied to the leg of the skin with the sex marked on one side, and a number corresponding to the journal on the other; then put away to dry. I may mention here that care is necessary to keep the feathers, especially the small feathers of the head and neck as smooth as is possible, which through the skin being turned inside out are sometimes very rough.

(To be continued.)

Reports on the March Public Sale of Ostrich and Osprey Feathers, Bird Skins, etc.

The sale of Ostrich feathers lasted two days.

In all, 1405 cases Cape were offered and 1334 cases sold.

There was an advance of about ten per cent. all round.

The quantity sold realized £72,000.

The next sales are fixed for Monday, 13th of April. Last receiving day, 21st March.

White Primes, 1st, 2nd and 3rd, were sold from £6 to £16 according to quality.

White Femina from £6 5 0 to £11 10 0.; black from 20*s.* to £8.; Drab, 12*s.* 6*d.* to £6 10*s.*; Floss, 18*s.* to 50*s.*; Spadonas, 50*s.* to £6 15.; Boos white, 50*s.* to 92*s.* 6*d.*; Boos femina and Drabs, 35*s.* to 65*s.*

The sale of Osprey, Peacock feathers and Bird Skins took place on the 6th of March. There was a good attendance and a great competition for good qualities of Long and Short Osprey feathers. Red and Brown Herons were steady, Birds of Paradise increased 2*s.* per skin for good quality. Bird Skins were very dull. Long Osprey, 19*s.* to 27*s.* per oz.; Medium, 22*s.* to 29*s.*; Short selected, 61*s.* to £5.; White Paddy, 16*s.* 6*d.* to 25*s.*; Grey Paddy, 12*s.* to 14*s.*; Peacock feathers, Eyes, 2½*d.* to 5*d.* per bundle; Impeyan Pheasant fetched 6*s.*, Red Argus Pheasants, 2*s.* 2*d.*; Parrots, various, 1*d.* to 2*d.*; Indian birds, various, about 1*d.* each; Birds of Paradise, Male, 14*s.* to 16*s.*; females, 11*s.* to 14*s.* 3*d.*; many wires, 19*s.* 6*d.*; green and king birds of paradise, 1*s.* 6*d.* to 1*s.* 9*d.*; Regents, 3s. 6*d.*; Red Tanagers, 8¾*d.*; Blue Creepers, 6¼*d.*; Orange Tanagers, 6*d.*; Seven Colored Finches, 10¼*d.*; Various Finches, 2*d.* to 4*d.*

Messrs. Boucard, Pottier & Co. will be happy to execute commissions for gentlemen who cannot attend the sales.

Reports on February and March Public Sales of Postage Stamps.

Messrs. Cheveley & Co. continued their sixteenth sale on Saturday, February 14th, which consisted of a very fine collection of English stamps, collected by Mr. Westoby. Some varieties reached very good prices, a list of which we give hereunder.

Great Britain, 1*d.* black, V.R. unused, £6 15.; 1½*d.* Lilac Rose, block of four, unused, 35*s.*; 3*d.*, small letters, plate 3, with secret mark, unused and imperf., with original gum, £38.; 1*d.* red, Archer Roulette, unused, 65*s.*; 1*s.* Octagon, unused, original gum, 48*s.* 4*d.*, no letters, small garter carmine on blue, unused, very rare, 60*s.* 4*d.* small letters, plate 4, imperf., unused, original gum, 44*s.* 9*d.* small letters, plate 3, with hair lines in angles, used, £15.

Messrs. Cheveley & Co. lightning like held their seventeenth sale on Saturday, March 7th, the best lots realized good prices.

Cape of Good Hope woodblock, error, mended at one corner, £26 10. Woodblock 1*d.*, red, 26*s.* Confederate States, Charlestown, entire envelope, 5 cents on white, used, 32*s.* Same on yellow paper, used, one corner off, 25*s.* Same on gold paper, used, flaps all cut off, 27*s* 6*d.* Knoxville, entire envelope, 5 c., dull sap green on cream wove paper, used, 50*s.*, the same on pale green, fancy paper, used, 46*s.*; two shades of same on very thin bluish wove paper, both unused, 23*s.* Lynchburg, entire envelope, 5 c., black, used, the stamp had been cut out and then replaced, 50*s.* Dominican Republic (1865) value reading downwards ½ rl. pale green, fine, 72*s.* 6*d.*; same issue, 1 rl. straw, £6 10. Great Britain, 10*d.* brown, and strip of four 1*d.* red on blue paper, imperf., all unused and original gum, 13*s.* (B. P. & Co.) Hanover: 10 gr. green (two shades), 38*s.* India, 2 a. green, a fine used specimen, 40*s.* Mauritius: large fillet, 2*d.* blue (mended). £5 5*s.* Naples: ½ tornese, Arms, slightly mended, £4. Arms ½ grano and 50 grani, 27*s.* New Brunswick, 1*s.* violet, fine copy, but poor margin, £4 17 6. Newfoundland, 6*d.* vermilion, 20*s*; ditto but pen cancelled, 14*s.* New South Wales, laureated, 8*d.* yellow, 34*s.* New Zealand "N.Z." wmk. 1*d.* vermillion unused 16*s.* Oldenburg, 1*st* issue, complete set, 18s. Prussia, entire envelope. 7s. gr. vermillion, small size, used, rare, 55*s.* Schleswig Holstein: 1st issue, 1 sch. blue, (two shades) and 2 sch, rose, all unused, 46s. United States, 1869, 15, 24, 30 and 90 c., 27*s.*; 1851, 5 c., imperf., very fine, unsevered pair, 15s. Victoria "Registered Stamp, rouletted, 32*s.*

Messrs. Boucard, Pottier & Co., will be happy to execute commissions for gentlemen who cannot attend the Sales.

1	Lot of	100	Hoopooes	...	...	...	Price	£6	0 0
1	,,	,,	50	Wax Wings	...	...	...	...	£3	0 0
1	,,	,,	50	African Humming	...	...	...	...	£2	0 0
1	,,	,,	100	Blue Creepers	...	...	...	...	£5	0 0
1	,,	,,	50	Green Creepers	...	...	...	...	£2	0 0
1	,,	,,	50	Red Tanagers	...	...	...	...	£2	10 0
1	,,	,,	100	Yellow and Black Tanagers	...	...	...	...	£4	0 0
1	,,	,,	50	Five Coloured Tanagers	...	...	...	...	£4	0 0
1	,,	,,	100	Tanagers, various	...	...	...	...	£2	0 0
1	,,	,,	50	Mexican Starlings	...	...	...	...	£5	0 0
1	,,	,,	100	European Starlings	...	...	...	...	£2	0 0
1	,,	,,	25	Blue Jays	...	...	...	...	...	£2	0 0
1	,,	,,	50	Alpine Crows	...	...	...	...	£4	0 0
1	,,	,,	50	Metallic Starlings	...	...	...	...	£4	0 0
1	,,	,,	50	Large New Guinea Pitta	...	...	...	...	£8	0 0
1	,,	,,	25	Royal Fly Catchers	...	...	...	...	£5	0 0
1	,,	,,	50	Fly Catchers, various	...	...	...	...	£2	0 0
1	,,	,,	50	Yellow-Headed Manakins	...	...	...	...	£1	5 0
1	,,	,,	50	Red and Black ditto	...	...	...	...	£1	5 0
1	,,	,,	20	Goat Suckers	...	...	...	...	£2	0 0
1	,,	,,	100	Swallows	...	...	...	...	£4	0 0
1	,,	,,	10	Bower birds	...	...	...	...	£2	10 0
1	,,	,,	100	Green Humming, all males	...	...	...	...	£2	10 0
1	,,	,,	100	Amethyste Humming	...	...	...	...	£4	0 0
1	,,	,,	100	Large Humming	...	...	...	...	£2	10 0
1	,,	,,	50	Ruby Topaz Humming	...	...	...	...	£2	10 0
1	,,	,,	25	Long Blue Tail Humming	...	...	...	...	£5	0 0
1	,,	,,	10	Fire Tail Humming	...	...	...	...	£12	0 0
1	,,	,,	50	Long Tail Humming, various	...	...	...	...	£4	0 0

1	lot de	100	Huppes	...	...	...	...	Prix	150 fr.
1	,,	,,	50	Jaseurs	...	...	...	...	...	75 fr.
1	,,	,,	50	Sui manga	...	...	...	...	...	50 fr.
1	,,	,,	100	Guit guits à tête bleue	...	...	...	...	125 fr.
1	,,	,,	50	Guit guits verts	...	...	...	...	50 fr.
1	,,	,,	50	Tangaras rouges	...	...	...	62 fr. 50 c.
1	,,	,,	100	Tangaras noirs et jaunes	...	...	...	100 fr.
1	,,	,,	50	Tangaras, quinticolor	...	...	...	100 fr.
1	,,	,,	100	Tangaras divers	...	...	...	...	50 fr.
1	,,	,,	50	Etourneaux du Mexique	...	...	...	125 fr.
1	,,	,,	100	Sansonnets	...	...	...	...	...	50 fr.
1	,,	,,	25	Geais	...	...	...	...	...	50 fr.
1	,,	,,	50	Corbeaux des Alpes	...	...	...	100 fr.
1	,,	,,	50	Merles Métalliques bleus	...	...	...	100 fr.
1	,,	,,	50	Grandes Bréves, de la N. Guinée	...	200 fr.
1	,,	,,	25	Gobe mouches royaux	...	...	...	125 fr.
1	,,	,,	50	Gobe mouches divers	...	...	...	50 fr.
1	,,	,,	50	Manakins à tête jaune	...	...	36 fr. 25 c.
1	,,	,,	50	Manakins à tête rouge	...	...	36 fr. 25 c.
1	,,	,,	20	Engoulevents	...	...	...	...	50 fr.
1	,,	,,	100	Hirondelles	...	...	...	...	100 fr.
1	,,	,,	10	Oiseaux satinés	...	...	...	62 fr. 50 c.
1	,,	,,	100	Oiseaux mouches Verts, tous mâles	62 fr. 50 c.
1	,,	,,	100	Clarisses et Parzudaki	...	...	...	100 fr.
1	,,	,,	100	Grands Oiseaux mouches divers	62 fr. 50 c.
1	,,	,,	50	Rubis Topazes	...	...	...	62 fr. 50 c.
1	,,	,,	50	Kings	...	...	...	...	...	125 fr.
1	,,	,,	10	Saphos ou Queues de feu	...	...	...	300 fr.
1	,,	,,	50	Oiseaux Mouches à longue queue	...	100 fr.

JUST ARRIVED, DECEMBER, 1890.

1	Lot of	5	Magnificent *Fire back Pheasant*; quite new to *Plumassiers* (A Splendid Bird)	Price	£8	0 0
1	,,	,,	25	Macaws, flat skins	£4	0 0
1	,,	,,	100	Hoopooes	Price	£6	0 0
1	,,	,,	50	Indian Crows	£7	0 0

TO ARTIFICIAL FLORISTS, JEWELLERS, etc.

BRIGHT INSECTS.

1	Lot of	25,000	Blue beetles	...	...	...	Price	£4	0 0
1	,,	,,	25,000	Green ,, large	...	...	...	£5	0 0
1	,,	,,	25,000	,, ,, small	...	...	...	£4	0 0
1	,,	,,	25,000	Purple ,,	...	...	...	...	£8	0 0
1	,,	,,	1000	Golden Phaneus	...	...	...	£10	0 0
1	,,	,,	5000	May Bugs.	...	...	...	...	£4	0 0
1	,,	,,	1000	Golden Antichira	...	...	...	£10	0 0
1	,,	,,	1000	Large Green Buprests	...	...	...	£4	0 0
1	,,	,,	1000	Golden Buprests	...	...	...	£4	0 0
1	,,	,,	500	Ocellated Buprests	...	...	...	£5	0 0
1	,,	,,	50	Diamond Beetles	...	...	...	£5	0 0
1	,,	,,	500	Brazilian Golden Cacides	...	...	£4	0 0
1	,,	,,	500	Butterflies from West Africa in papers	£4	0 0

1	Lot de	25,000	Hoplies bleues	...	...	...	Prix	100 fr.
1	,,	,,	25,000	Grandes Chrysomèles vertes	...	...	125 fr.
1	,,	,,	25,000	Petites ,, ,,	...	...	100 fr.
1	,,	,,	25,000	Chrysomèles violettes	...	...	200 fr.
1	,,	,,	1000	Phaneus dorés	...	...	...	...	250 fr.
1	,,	,,	5000	Hannetons	...	...	...	...	100 fr.
1	,,	,,	1000	Petits Hannetons vert dorés	...	...	250 fr.
1	,,	,,	1000	Grands Buprestes vert dorés	...	...	100 fr.
1	,,	,,	1000	Buprestes dorés	...	...	...	...	100 fr.
1	,,	,,	500	Buprestes ocellés	...	...	...	...	125 fr.
1	,,	,,	50	Chareuçons dorés	...	...	...	...	125 fr.
1	,,	,,	500	Cacides	...	...	...	...	...	100 fr.
1	,,	,,	500	Papillons d'Afrique	...	...	...	100 fr.

LIST
OF THE
PRICED UTENSILS
NECESSARY FOR COLLECTING
REPTILES, FISHES, INSECTS, SHELLS, etc.

Benzine bottle	1s. 0d.
Tin box for collecting Insects, from	1s. 6d.
Bottle	0s. 3d.
Glass tubes or phials, doz.	1s. 0d.
Digger	2s. 6d.
Butterfly nets, from	1s. 6d.
Sweeping and water, nets from	2s. 6d.
Umbrella for Insects, from	8s. 0d.
Cork in boards, per doz., from	2s. 6d.
Pins for Insects, per thousand, from	1s. 6d.
Pill boxes, per gross, from	4s. 0d.
Corked boxes for Insects, from	1s. 6d.
Wooden box same size	1s. 0d.
Boucard's Insecticide, per oz.	0s. 6d.
Flax, per pound	0s. 6d.
Cotton-wadding, per sheet	0s. 6d.
Nippers, from	1s. 6d.
Fishing rods with accessory, from	2s. 6d.

Other Utensils for collecting Mammals, Birds, etc., are to be obtained at the Naturalist's Agency, 225, High Holborn, London, W. C.

BOUCARD'S INSECTICIDE POWDER
against Mites, Insect larvæ etc.
Wholesale and Retail.
—— Success guaranteed ——

This new Powder is of easy use, not dangerous to manipulate, and a good disinfectant against Cholera morbus and all Epidemic diseases.

It destroys immediately all vermine, such as Fleas, Bugs, Mites, Larvæ of Dermestes, etc.

Sixpence for a trial packet of one ounce. It lasts a long time, a small quantity being necessary each time.

Trades supplied at a liberal discount.

No House ought to be without it.

Once tried, always used!

COCOA BUTTER.
Guaranteed pure.

Very useful to soften the skin, a preservative against Chaped Hands and Chilblains and a remedy for Cuts, Burns, etc. etc.

Sold in cakes, Sixpence and one shilling.

MONTHLY LIST OF STAMPS.

FOR SALE.

	s.	d.
Brazil, 1843, large figure 60. R fine copy	2	6
British Bechuanaland, 1881, 1d. without surcharge ...		4
,, ,, 2d. do. do. ...		4
,, ,, 1d. with surcharge ...		4
,, ,, 2d. do. ,, ...		4
,, ,, 6d. do. ,, ...	1	0
,, ,, set of 5 for	2	0
British Columbia, 1868, 2 cents. on 3d. brown, unused		9
,, ,, ,, 25 cents. yellow and violet ...	2	3
British Guiana, 1863, 24 cents. green		6
,, 1889, 1 cent. black and purple ...		9
,, ,, 2 cents do. do. ...	1	4
,, ,, do. with red 2		6
,, ,, 8 cents black and purple ...	1	6
set of 4 for	3	10
,, ,, 1 cent on 1 dollar		9
,, ,, 1 do. 2 dollars		9
,, ,, 1 do. 3 do.		9
,, ,, 1 do. 4 do.	1	3
set of 4 for	4	0
British Honduras, 1d. no wmk.	1	9
,, 1s. no wmk	2	6
,, 1s. wmk. CC, and crown	1	6
Canada, 3d. oblong, fine copy	1	0
Cape of Good Hope, 4d. blue triangular, fine copy ...		6
Ceylon, 1857, 2d. green unused 4s., used	1	3
,, 1861, 5d. brown ,, ...	2	6
,, 1864, ½d. lilac, unused 9d., used ...		9
,, ,, 1d. blue, ,, ,, ...		4
,, ,, 5d. green, ,, 3s., ,, ...	1	3
,, ,, 6d. brown, ,, 2s.. ,, ...	1	3
,, ,, 10d. orange-red, ,, 3s., ,, ...	1	3
,, ,, 10d deep mauve ,, 3s., ,, ...	1	0
,, ,, 4d. rose, ,, 4s.. ,, ...	1	9
,, ,, 8d. brown, ,, 6s., ,, ...	2	6
,, ,, 2s. blue, ,, ,, ...	2	0
,, One Rupee Twelve Cents in words on (2 R, 50 cents)	1	6
,, Service Postage, 1d. black and blue	2	6
Costa Rica, set of 5 for		8
Faridhot, set of 37, different	12	6
France. 1852, 10 centimes, buff, fine copy	3	6
Gibraltar, 10 centimes on 1d. unused		6
,, 25 do. on 2d. ,, or used	2	0
,, 25 do. on 2½d. used		4
,, 75 do. on 1s. unused	2	0

STAMPS (*continued*).	s.	d.
Great Britain (1840), 1d. black, fine copy		2
,, (1840), 1d red on bluish paper unused		9
,, 1840, 10d. brown, uncut fine copy ...	2	6
,, do. do. do. unused	15	0
,, 1863, pink, unused	3	6
,, ,, lilac, do.	3	0
,, 1867, 3d. rose, wmk. spray plate 6 unused	5	0
1884, £1, oblong	3	6
,, set of 8 Gov. Parcels	4	0
Grenada, 1881, ½d. black and purple		6
,, ,, 3½ black and lake	1	6
,, ,, ½d. on 2s. orange, black and green ...	1	6
India, 1854, 4 Annas, blue and red, uncut	2	6
,, 1866, 6, a, Provisional lilac and green 1st type	3	6
,, do. do. do. do. do 2nd type	6	0
,, 1882, 12 annas, brown on red		6
New South Wales, 1851, 3d. on blue paper fine copy	5	0
,, 1854, 3d. on white paper	3	6
,, 1856, 6d. square, grey brown imperf. grand copy	3	0
,, 1860, 3d. green, wmk., 3		6
,, ,, 3d. green, wmk., 6	2	0
,, 1864, 2d. blue wmk. single line 2		4
,, ,, do. double line 2	1	0
,, ,, do. double line 5	3	9
New Zealand, 1863, 1s. green fine copy		9
Norway, 1870, 1 Krone, green		6
,, ,, 2 do. carmine		6
Oldenburg, 1859, 1 Gr. black on blue	1	3
Queensland, 1882, £1 green	3	0
,, 6d. yellow, Registered unused	10	0
Russia, 1864, 3 Kopecs, error	1	3
Sierra Leone, 1876, 6d. mauve		6
Siam, 1883, Att, 2 Atts, 4 Atts and 16 Atts and set of 4 used	1	6
South Australia, 1859, 1 yellow, roul	3	6
Tasmania, 1870, 1d. wmk. 10	2	6
,, ,, 2d. wmk. 2	1	0
,, 1882, Fiscal Postals 3d. brown	1	0
Turk's Islands, 1d. dull rose, wmk. star	1	0
Urugay, set of 4, surcharged Official	2	0
Victoria, 1873, 10d. slate	4	0

WANTED.

Old collections containing from 500 varieties upwards, to which none have been added since the last 20 years.

Old stamps on their original letter sheet or envelope, especially Colonials and old German states.

Mulready Wrappers and Envelopes.

Old unused English and Colonials.

Old works on stamps.

Proofs of stamps, etc. etc.

TO ETHNOLOGISTS.

FOR SALE.

Twelve finely carved Arrows and 1 Bow from New Guinea Price 20s.

African Rhinoceros War Club Price 30s.

Three distinct Zulu War Clubs, made of iron wood and very nicely carved Price 30s. each.

Pagaie from New Guinea, made of palm tree Price 30s.

Magnificent Gold Antiquity from Panama, representing what appears to be Musicians, two large figures in the centre and six small ones round. It weighs 6 oz. 187 grammes. It is quite unique, and no Museum in the world possesses anything like it Price £50.

A great variety of American Antiquities, chiefly from Central America, in hardstone, agathe, Idols, Vases, etc. from 5s.

TO MUSEUMS, ETHNOLOGISTS, etc

Modern pottery from Mexico and Central America from 6d.

Statuettes representing the *Indians of Mexico and Guatemala* from 3s.

Hats, Baskets, Mats and various Objects made with pal leaves and various textile plants; from Central America, Madagascar, New Guinea, etc. from 6d.

Samples of *Textile Fibres, Seeds, Gums, Resins, Medicinal Plants, etc.* from Mexico and Central America from 6d.

Old and Modern Coins from Mexico from 1s.

Etc., etc., etc.

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April 1, 1891.

The

Humming Bird

A MONTHLY SCIENTIFIC, ARTISTIC, AND INDUSTRIAL REVIEW.

GUARANTEED CIRCULATION, 5000.

VOL. I., NO. 5. | **May 1, 1891.** | PRICE SIXPENCE.

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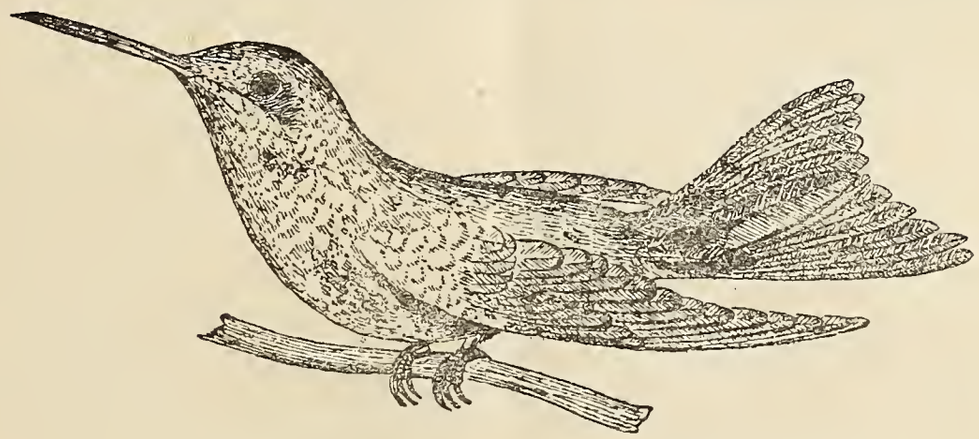

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
Member of the International Jury, Paris, 1889; Member of many scientific societies;
etc. etc. etc. etc.

CONTENTS OF No. 5.—MAY 1, 1891.

[ENTERED AT STATIONERS' HALL.]

FOR SALE.—Shells.

Private Collection of Mr. Boucard.

LAND, FLUVIATILE AND MARINE SHELLS.

Glandinidæ, 1*s.* each. Helicidæ, 6*d.* each. Bulimidæ 1*s.* each. Achatinidæ, 1*s.* each. Chlindrellidæ, 1*s.* 6*d.* each. Clausilidæ, 3*d.* each. Ampularidæ, 6*d.* each. Lymmea, Physa, and Planorbis, 3*d.* each. Cyclostonidæ, 6*d.* each. Helicinidæ, 3*d.* each. Unio, Anodonta, and Ostrea, 6*d.* each.

Marine Shells—*All the Collection including* Argonyuta, Murex, Fusus, Triton, Ranella, Nassa, Oliva, Marginella, Harpa, Terebra, Conus, Strombus, Cypraea, Neritina, Patella, Chiton, Haliotis, Turbo, Venus, Cardium, &c., 6d. each.

Can be divided if required.

All applications to be made at the Journal's Office.

Insects Coleoptera.

Private Collection of Mr. Boucard.

Cicindelidæ, including types of Oxygonia, Boucardi Chev, Cincindela costaricensis and others, 2*s.*each. Carabidæ, including many types, 1*s.* each. Dytiscidæ, 6*d.* each. Staphylinidæ, 3*d.* each.

Pselaphidæ, Gnostidæ, Paussidæ, Scydmaenidæ, Silphidæ, Scaphididæ, Histeridæ, Nitidulidæ, Trogositidæ, Rhyssodidæ, Cucujidæ, Cryptophagidæ, Derodontidæ, Latrididæ, Mycetophagidæ, Dermestidæ Byrrhidæ, Parnidæ, and Heteroceridæ, 3*d.* each.

Lucanidæ and Passalidæ, including many types, 1*s.* each. Copridæ, 6*d.* each. Melolonthidæ, 6*d.* each. Rutelidæ, including all the types of Plusiotis, Chrysina, Heterosternus, 2*s.* each. Scarabæidæ, 1*s.* each. Cetonidæ, 1*s.* each. Buprestidæ, 1*s.* each. Trixagidæ, Monommidæ, Eucnemidæ, and Elateridæ, 6*d.* each. Cebrionidæ. Rhipidoceridæ, Dascillidæ, and Malacodermidæ, 3*d.* each. Cleridæ, 6*d.* each. Lymexilonidæ, Cupesidæ, Ptinidæ, Bostrychidæ, and Cioidæ, 3*d.* each. Tenebrionidæ, 3*d.* each. Nilionidæ, Pythidæ, Melandryidæ, Lagriidæ, Pedilidæ. Anthicinæ, Pyrochroidæ, Mordellidæ, and Rhipidophoridæ, 3*d.* each. Cantharidæ, 6*d.* each. Cephaloidæ, Oedemeridæ, and Mycteridæ, 3*d.* each. Curculionidæ and Scolytidæ, 3*d.* each. Brenthidæ and Anthotribidæ, 6*d.* each. Cerambycidæ, 1*s.* each : Bruchidæ, 3*d.* each. Chrysomelidæ, 3*d.* each. Cassididæ, 6*d.* each. Languridæ and Erotylidæ, 6*d.* each. Tritomidæ and Coccinellidæ, 3*d.* each.

TO ORNITHOLOGISTS.

FOR SALE.

Fine mounted specimen of *Alca impennis, the Great Awk*, (extinct species). Pedigree from the date of capture, 1836, to this date, will be given to buyer.

Fine male specimen of the exceedingly rare new genus of bird *Reinhardtia ocellata Bp.*, the greatest discovery of the century. Price £50

LIST OF DESIDERATA OF PHANÆI.

Achilles Bohem, Guayaquil. Bitias Har., Mexico. Charon Har., Guayaquil. Columbi, Mc L., female, Hastifer Germ., male, Brazil. Foveolatus Har., Guayaquil. Horus Waterh. Reiche, Brazil. Melibœus Blanch, Chiquitos. Mirabilis Har., Brazil. Noctis Bates, Colombia and Nicaragua, etc. Perseus Har., Colombia. Pteroderus Reiche in litt, Uruguay. Rhadamanthus Har., Brazil. Rosalia Fabr.? America, Tepanensis Bates, Tepan. Thalassinus Perty, Brazil.

Steinheili Har., male and female. Guatemalensis, Har., male. Beltianus, male. Scutifer, Bates, male and female. Lunaris, Tasch, male. Actæon, Erichs, male and female. Bispinus, Bates. Cadmus, Har. Dejeani, Har., female. Lautus, Macleay, male. Silenus, Cast, male and female. Spinifer, Cast, male and female.

List of Pittidae for Sale.

Pitta strepitans, Australia, 5*s.*; — maxima, N. Guinea 10*s.*; — brachyura Malacca, 8*s.*; — bengalensis, India, 8*s.*; — elegans, Malacca, 10*s.*; — cyanurus, Java, 16*s.*; — arcuata, Borneo, 30*s.*; — granatina, Borneo, 8*s.*; — erythrogaster, Philippines, 10*s.*; — mackloti, N. Guinea, 10*s.*; — rosenbergi, N. Guinea, 30*s.*; — novæ guineæ, N. Guinea, 10*s.*; — mulleri, Borneo, 10*s.*; — cucullata, India, 8*s.*; — — Var, Malacca, 8*s.*; — coerulea, Malacca 16*s.*; Philepitta castanea, Madagascar, 12*s.*

FOR SALE.—*From Kina Balu* (*Borneo*).

Calyptomena whiteheadi, male, 100s. A magnificent bird, discovered lately by Mr. Whitehead in the interior of Borneo. Many other species from the same collector (magnificent skins).

FOR SALE.

A magnificent bound copy of T. A. Naumann's Naturgeschichte der Vogel Deutschlands, 13 vols. in 4to and 391 coloured plates. Apply at the office of the Journal.

FOR SALE.

Collection of Woods from all parts of the world. 2,000 blocks nicely cut. Manuscript catalogue over 2 vols. Awarded gold medal at International Exhibition. For pricc and particulars apply at the office of the Journal.

Fine group of Harpyornis feeding on a Dendrolagus. Two rare species of mammal and bird, from New Guinea. Price £12. Fourteen species of Carabus from Chili. In the most perfect condition. 23 specimens, at 5s. each.

Books and Journals Received.

Societas entomologica, April 1890, No. 1, edited by Fritz Rühl at Zurich Hottingen.

La Reforma farmaceutica. Director and Editor, Luis R. Guzman. La Guayra (Venezuela).

El Porvenir. Semanario politico y noticioso organo de los Intereses de la Regeneracion. Cartagena (Colombia).

Antiguan Observer, Vol. XLVIII., Nos. 9 and 10.

An account of the former abundance of some species of Birds on New York Island, at the time of their Migration to the South, by George N. Lawrence.

Description of a new subspecies of Cypselidæ of the Genus Chaetura, with a note on the Diablotin, by George N. Lawrence. With thanks,

The Editor.

The Humming Bird.

The McKinley Bill.

I have just received from my correspondent, Mr. John H. Thomson, of New Bedford, Mass., United States, a copy of the New Customs Tariff, known as the McKinley Bill, which took effect since October last.

Considering that Extracts of this Tariff will be of great use to all the readers of this Journal, I have dedicated the whole of this number to the publication of the said Extracts.

The first part, Free List, contains the List of all the Objects not paying duty. The second part, The United States Customs Tariff, contains the List of all the Objects paying duties.

McKINLEY BILL.

Free List.

All the Products mentioned in this List are free.

Acorns, raw	Free
Albumen	,,
Almonds (oil of)	,,
Aloes, crude	,,
Amber or crude Gum	,,
Anatomical Preparations and Skeletons	,,
Animals for breeding or emigration purposes	,,
Antiquities, not for sale	,,
,, for cabinet collections prior to 1700 and not for sale	,,
Arrowroot raw or manufactured	,,
Arsenic	,,
Art (works of) Paintings, the production of American Artists	,,
Art (works of) prior to 1700, not for sale or specially inported for institutions	,,
Asbestos, unmanufactured	,,
Bamboo, Rattan, Reeds, raw	,,
Bananas	,,
Barks, crude	,,
Barrels and Casks of American manufacture returned empty	,,
Beans, medicinal, crude	,,
Bed Feathers and Downs	,,
Beeswax	,,
Birds, Stuffed for Cabinets	,,
Bird Skins	,,
Bitumen, crude	,,
Bones, unmanufactured	,,
Books, printed, bound or manufactured over 20 years	,,
,, printed exclusively in any foreign language	,,
,, and Music for the Blind	,,
,, for Institutions and Societies	,,
Britannia Metal, old	,,
Bulbs and Bulbous Roots, crude	,,
Bullion, Gold and Silver	,,
Cadmium	,,
Camphor, crude	,,
Canary Seed and Weed	,,
Canes and Sticks, rough	Free
Caraway Seed and Oil of ditto	,,
Catgut Strings	,,
Chalk, unmanufactured	,,
Chamomile Flowers	,,
Charcoal	,,
Chemical Apparatus	,,
Chicory Root, unground	,,
Citrons, green, ripe or dried	,,
Clay for manufacture	,,
Cloth, Bolting	,,
Cloves, unground	,,
Coal, Anthracite	,,
Cochineal	,,
Cocoa, crude	,,
Coffee	,,
Cocoanuts and Oil of ditto	,,
Coke	,,
Coral, unmanufactured	,,
Cork Bark or Wood, unmanufactured	,,
Cotton, raw, cotton waste or flocks, rags	,,
Currants of all kinds	,,
Curry and Curry Powder	,,
Dates	,,
Diamonds, rough	,,
Dishs, Glass Plates, rough cut	,,
Dividivi, crude	,,
Drugs, crude	,,
Dyewoods, crude	,,
Effects, Personal or Household of persons arriving in United States, in use over one year.	,,
,, of American Citizens dying abroad	,,
Eggs (Silkworm)	,,
Fashion Plates engraved on steel, copper, or otherwise.	,,
Feathers and Downs of all kinds, crude	,,
Felt, adhesive	,,
Fertilizers, Guanos and Manures	,,
Fibre, Cocoa. crude or dried	,,
Fish, products of American Fisheries, fresh and frozen except salmon for bait	,,
,, Skins	,,
Flowers, natural and dried	,,
Furs, undressed	,,
Glue, stock	,,
Gold, Bullion	,,
Grass, Sisal, China, Ramie, Sea Seed	,,
Guano Manures and Imitations	,,
Gums and Resins, crude	,,
Gutta-percha, crude	,,
Hair of all kinds, raw	,,
Hemp Rags and Seed	,,
Herbs, not edible, crude	,,
Hides, raw, dried, salted, pickled, and Hide Cuttings	,,
Horns, Horn Strips unmanufactured, polished or bored	,,
India rubber, crude	,,
Indigo, real or artificial	,,
Insects, dried crude	,,
Iodine, crude	,,
Istie grass, crude	,,
Ivory, unmanufactured	,,
Jalap	,,

Jet, unmanufactured	Free
Juice, Lemon, Lime, Sour Orange ...	,,
Junk, old	,,
Jute Butts, cuttings, rags for paper ...	,,
Lava, unmanufactured	,,
LEAVES, crude	,,
Leeches	,,
Lemon Juice, oil	,,
,, Peel, not candied	,,
Licorice Root, unground	,,
Lime, Chlorate or Phosphate	,,
,, Juice, pure	,,
Lithographic Stones, not engraved ...	,,
Logwood, crude	,,
Mace and Oil of	,,
Magnesium	,,
Magnets	,,
Manures, Guano and all substitutes ...	,,
MANUSCRIPTS	,,
Mats, Chinese, round, split straw	,,
MEDALS, gold, silver, copper, such as trophies or prizes	,,
MEDICINAL ARTICLES, crude	,,
MEDICINES, CRUDE, ROOTS, AND HERBS ...	,,
Meerschaum, crude or polished, unmanufactured	,,
MINERALS, crude	,,
Mineral Waters (all not artificial) ... ... (bottles are dutiable)	,,
Models of Inventions, unfit for use ...	,,
Molasses	,,
Moss, crude or dried for bedding	,,
Mother of Pearl, rough	,,
Music strings, gut	,,
Mustard Seed, crude	,,
NATURAL HISTORY SPECIMENS, not for sale.	,,
Needles, hand-sewing, darning	,,
Newspapers and Periodicals, unbound ...	,,
Nickel containing less than 2 per cent. copper	,,
Nutmegs	,,
Nuts, Brazil, Cream and Cocoa	,,
Oakum	,,
Oil, Cake, Stone	,,
Oils, Almond, Amber, Ambergris, Anise Aniline, Aspic, Bergamot, Caraway, Cinnnamon, Chamomile, Fennel, Lemon Nut, Olive (not eating) &c. ...	,,
Oils, Spermacetti, Whale and others of American Fisheries	,,
Olives, green or prepared	,,
Onyx, crude	,,
Opium, crude, unadulterated containing 9 per cent. morphia or over	,,
Orange Peel, not preserved	,,
Ottar or Oil of Roses	,,
Oysters, raw	,,
Ozokerite, mineral Wax	,,
Palm Leaf, crude and Fans	,,
Paper Stock, crude of every description ...	,,
Paraffine	,,
Parchment and Vellum	,,
Pearl Ash	,,
Peat Moss	,,
Pebbles, Brazil, unmanufactured	,,
Periodicals, weekly, monthly or quarterly ...	,,
PHILOSPHICAL APPARATUS FOR SOCIETIES	Free
Pine Apples	,,
PLANTS, ORCHIDS, PALMS, TEA PLANTS &c.	,,
Plaster of Paris, unground	,,
Platinum, unmanufactured and Chemical Apparatus	,,
Polishing and Artificial Stones	,,
Potash, crude, carbonate, nitrate, sulphate, cholorate, muriate of	,,
PRECIOUS STONES, uncut	,,
Pumice Stones	,,
Quills, not made up	,,
Quinine, Sulphate and Salts of	,,
Quolts, or Curling Stones	,,
Rags (not woollen)	,,
Ramie, China Grass	,,
Rattans and Reeds, unmanufactured ...	,,
Regalia, Church, etc., specially imported...	,,
Resins, Gum, crude	,,
Sago, crude and Flour	,,
Saltpetre, crude	,,
Sarsaparilla, crude	,,
Sauerkraut	,,
Sausage Skins	,,
Sausages, Bologna and Ger. Frankfurter ...	,,
SCIENTIFIC APPARATUS, specially imported	,,
Seaweed, crude for beds &c.	,,
Seeds, Celery not suitable for gardens ...	,,
,, all Flower or Grass Seeds	,,
,, Anise, Canary, Caraway, Cardamon, Coriander, Cotton, Cummin, Fennel, Eengreek, Hemp Hoarhound, Mustard, Rape, St. John's Bread, Sugar beet, Mangel-wurzel, Sorghum, Bulbs and Bulbous Roots	,,
SHELLS, unmanufactured	,,
Shellac	,,
Silk, raw, waste, Cocoons	,,
Silkworms Eggs	,,
Silver Bullion, Ore, Sweepings, Coins and Medals	,,
Sisal Grass	,,
Skins, all raw, uncured, dry, salted, pickled except Angora Goat and Sheep with the wool on	,,
Soap stocks of all kind	,,
Soda, Chlorate and Nitrate of	,,
Sodium	,,
Spices, Cinnamon and Clove, Ginger Root and Cayenne pepper unground, Cassia, Mace, Nutmegs, Pepper, Piments ...	,,
Stone, Burr, Cliff, Pumice, Rotten, Sand rough, unmanufactured	,,
Sulphur, lac, brimstone, crude	,,
Sulphuric Acid 6 per cent. F. sp. gravity 1,380	,,
Talc, crude	,,
Tapioca, Casssawa	,,
Tar, coal of Pitch and wood	,,
Tartar, crude	,,
Tea, (adulterated liable to seizure) ...	,,
Teeth, natural or unmanufactured ...	,,
Timber, all round, unmanufactured ...	,,
Tin, Ore, Bars, Blocks, Pigs, grain, free after July 1st, 1893	,,
Tobacco Stems	,,

Turpentine, Venice, and Spirits of ... Free
Turtles ... ... „
Types, old ... ... „
Vanilla Beans, crude ... ... „
Vegetable Substances, crude, unmanufactured „
Vegetables for medicine, dyeing, crude ... „
Vellum ... ... „
Wax, Beeswax, Vegetable and Mineral ... „
Whalebone, unmanufactured ... ... „
Whetstones and Hones ... ... „
Willow for hat ornaments ... ... „
Wood, unmanufactured ... ... „

END OF FREE LIST.

McKINLEY BILL.

The United States Customs Tariff.

$1 = 100 cents = 4 shillings. 1 cent = ½d.

Acetate of Lead, brown, 3½c.; white ...5½c. per lb.
Acid, acetic or pyroligneous, not over 1.047 specific gravity, 1½c.; over 1.047, 4c.; boracic, 5c.; citric, 10c.; tannic, 75c.; tartaric, 10c.; chromic, 6c.; sulphuric (oil of vitriol) ... ...¼c. per lb.
Acorns, prepared ... ...1½c. per lb.
Agate balls or marbles, used as toys ...35 per cent.
Alabaster ornaments ... ...25 per cent.
— statuary, the work of a sculptor ...15 „
Albums, autograph, photograph and scrap, 35 „
Alcohol, amylic or fusel oil ... ...10 „
Alcoholic perfumery...$2.00 per gal. and 50 „
— compounds ...$2.00 per gal. and 25 „
Alkalis and all combinations of alkaloids 25 „
Almonds, not shelled, 5c.; shelled ...7½c. per lb.
Aloes, crude, free; not crude ... ...10 per cent.
Alum, alum cake, patent alum, alumina, sulphate of alumina, aluminous cake, and alum in crystals or ground 60c. per 100 lbs.
Aluminium or aluminum unmanufactured 15c. per lb.
Ammonia, carbonate of, 1¾c.; muriate of, ¾c.; sulphate of ... ...½c. per lb.
Aniline colours or dyes, coal tar products 35 per cent.
Animals, horses and mules, if under $150 in value ... ...$30 per hd.
— if $150 in value, or over ... ...30 per cent.
— cattle over 1 year old ... ...$10 per hd.
— cattle, 1 year and under ... ...$2 „
— hogs ... ...$1.50 „
— sheep, 1 year old or over ... ...$1.50 „
— less than 1 year old ... ...75c.
All other animals ... ...20 per cent.
Apples, green or ripe ... ...25c. pr. bus.
— dried, evaporated or prepared, ...2c. per lb.
Arms, muskets and sporting rifles ...25 per cent.
— double barrel, sporting, breech-loading shotguns, not more than $6.00 value ... ... $1.50 each and 35 „
— over $6.00 value and not more than $12.00 value ... $4.00 each and 35 „
— over $12.00 value $6.00 each and 35 „
— single barrel breach-loading shot guns $1.00 each and 35 „
Arms revolving pistols, not more than $1.50 value ... 40 cents each and 35 per cent.
— over $1.50 value ... $1.00 each and 35 „
— side-arms, swords, sword blades ...35 „
Art, worksof, paintings in oil or water colors (frames dutiable according to material); marble, stone, or metal statuary (the work of a alabaster sculptor) ... ...15 „
Asbestos, manufactured ... ...25 „
Bacon and hams ... ...5c. per lb.
Barks, otherwise than crude ... ...10 per cent.
Barley, (bushel of 48 lbs.) ... 30c. per bush.
— malt (bushel of 34 lbs.) ... ...45c. „
— pearled, patent or hulled ... ...2c. per lb.
Barrels and casks, empty... ... ...30 per cent.
Bay rum or water, distilled or compounded ... ... proof $1 per gal.
Beads and bead ornaments of all kinds ...25 per cent.
Beans, edible ... ...25 „
Beef, mutton, and pork ... ...2c. per lb.
Beer, ale and porter in bottles or jugs (no additional duty on the bottles or jugs) ... ...40c. per gal.
— otherwise than in bottles or jugs ...20c. „
Benzine and benzole ... ...20 per cent.
Bicycles, tricyles, &c. (of metal) ... ...45 „
Billiard balls, of ivory, bone or other materials ... ...50 „
Birds, dressed and finished for millinery, 50 „
Biscuits and crackers of all kinds ...20 „
Bismuth, free; salts of bismuth ... ..25 „
Bisque ware, plain white ... ...55 „
— decorated ... ...60 „
Bitumen, manufactured ... ...20 „
Blacking of all kinds and lampblack ...25 „
Bladders, crude, free; manufactured ...25 „
Blue, Berlin, Chinese, Fig, Prussian and Wash ... ...6c. per lb.
Bone games ... ...35 per cent.
Bone, manufactured ... ...30 per cent.
Bonnets, silk, 60 per cent.; straw, grass, &c. 30 „
Books, blank books, pamphlets, engravings, bound or unbound, photographs, etchings, maps, charts, and all printed matter not otherwise specified ... ...25 „
Bottles, empty, common white and coloured glass, holding more than one pint, demijohns, carboys ... ...1c. per lb.
— holding not more than one pint and less than ¼ pint ... ...1½c. „
— holding less than ¼ pint ... 50c. per gross.
Bran and mill feed ... ...20 per cent.
Brass, in bars or pigs, clippings and old, 1½c. per lb.
— manufactured ... ...45 per cent.
Brick, fire-brick not glazed or decorated, $1.25 per ton.
— glazed or decorated ... ...45 per cent
— other than fire-brick and tiles not glazed or decorated ... ...25 „
— glazed or decorated, and all encaustic tiles ... ...45 „
Bristles ... ...10c. per lb.
Britannia ware ... ...45 per cent.
Bronze, unmanufactured... ... ...20 „

Bronze, manufactures of ... ...45per cent.
Brooms of all kinds ... ...40 „
Brushes of all kinds ... ...40 „
Buckwheat (bushel of 48 lbs.) ... 15c. per bush.
— flour ... ...20 per cent.
Bulbs and bulbous roots, not crude ...10 „
Bunting (not weighing over 4 oz. to sq. yd.) 12c. per sq. yd., and 50 „
Butter and substitutes for ... ...6c. per lb.
Buttons, agate ... ...25 per cent.
— barrel ... ... 60c. per lb. and 60 „
— bone, horn, ivory and vegetable ivory, 50 „
— pearl, shell, 2c. per line, button measure of 1-40 inch per gross and 25 „
— shoe, paper mache, &c., value not over 3c. per gross... ... ...1c. per gross.
Calomel and other mercurial medicinal preparations ... ...35 per cent.
Cameos, not set ... ...10 „
— set, as jewelry ... ...50 „
Camphor, refined ... ...4c. per lb.
Candles and tapers ... ...25 per cent.
Canes and sticks, finished with metal heads ... ...45 „
Canvas, for oil cloth, embroidering and sails ... ...50 „
Capers, as pickles... ... ...45 „
Cards, playing, 50c. per pack; show ...35 „
Carpets: Aubusson, Axminster, Chenille, Moquette; Oriental, Berlin, and similar rugs; Saxony, Tournay and Wilton velvet, figured or plain, and all similar carpets 60c. per sq. yd. and 40 „
— Brussels and all similar 44c. per sq. yd. and 40 „
— velvet and tapestry velvet, printed on the warp or otherwise 40c. per sq. yd. and 40 „
— tapestry Brussels, printed on the warp or otherwise 28c. per sq. yd. and 40 „
— treble ingrain, three-ply and all chain Venetian ... 19c. per sq. yd. and 40 „
— wool Dutch and two-ply ingrain 14c. per sq. yd. and 40 „
— druggets and bockings, printed, coloured or otherwise 22c. per sq. yd. and 40 „
— felt carpeting, figured or plain 11c. per sq. yd. and 40 „
— carpets and carpetings of wool, flax, or cotton ... ...50 „
Cartridges and cartridge shells ... ...45 „
Castor beans (bushel of 50 lbs.)... 50c. per bush.
— oil ... ...80c. per gal.
Casts of plaster, the works of a sculptor...15 per cent.
Caviar, fish eggs ... ...30 „
Cement, Portland, Roman, and other hydraulic in bulk... ... 7c. per 100 lbs.
— in packages (weight of package included) ... ... 8c. per 100 lbs.
— all other ... ...20 per cent.
Chalk, prepared, precipitated, French, red, 1c. per lb.
all other preparations ... ...20 per cent.

Cheese of all kinds ... ...6c. per lb.
Chestnuts, 1½c. per lb.; flour of ...2c. „
Chicory root, ground ... ...1½c. „
China clay or kaolin ... ...$3 per ton.
Chloroform ... ...25c. per lb.
Chocolate, confectionery ... . 50 per cent.
— other than confectionery ... ...2c. per lb.
Chromos and chromographs ... ...35 per cent.
Chronometers, box or ship's, and parts of, 10 „
Cider ... ...5c. per gal.
Cigarette paper in any form ... ...70 per cent.
Cigarettes, asthma, prop. preparations ...25 „
Cinnamon, unground, free; ground ...4c. per lb.
Citrons, preserved ... ...35 per cent.
Clays or earths, unmanufactured... $1.50 per ton.
— China clay or kaolin ... ...$3 per ton.
Cloth, bamboo ... ...30 per cent.
— bookbinders, emery ... ...40 „
Cloves, ground ... ...4c. per lb.
Coal, anthracite, free; bituminous ... 75c. per ton.
Coal tar, preparations of, not colours or dyes ... ...20 per cent.
Cocoa, prepared, not confectionery ...2c. per lb.
Cod-liver oil, medicinal ... ...15c. per gal
Coffee, free; substitutes for coffee ...1½c. per lb..
Collodion, 50c. per lb.; rolled ... ...60c. per lb.
— finished 60c. per lb. and ... ...25 per cent.
Cologne water, and alcoholic perfumery $2 per gal. and 50 „
Colouring for brandy and beer ... ...50 „
— for sugar ... ...20 „
Comfits, preserved fruits, jellies ... ...35 „
Confectionery, all sugar candy, chocolate, value not over 12c. per lb.; refined sugars, tinctured, coloured or adulterated ... ...5c. per lb.
— all others, including chocolate ...50 per cent.
Copper, old, 1c. per lb.; manufactures of, 45 „
Coral, manufactured ... ...25 „
Cord, sash, hemp ... ...50 „
Cordage, tarred, 3c.; untarred hemp ...2½c. per lb.
— untarred manilla or Sisal grass ...1½c. „
Cork bark or wood, manufactured ...10 per cent.
— cut into squares or tubes, 10c.; corks, 15c. per lb.
Corn, Indian or maize (bushel of 56 lbs.), 15c per bus.
Cotton, cords, braids, boot, shoe, and corset lacings ... ...35 per cent.
— damasks, gimps, galloons, goring, webbing, braces, suspenders, towels, tracing cloth, and all manufactures of cotton ... ...40 „
— chenille curtains and table covers, edgings, embroideries, insertings, laces, neck rufflings, ruchings, tuckings ... ...60 „
— clothing ready-made and articles of wearing apparel of every description ... ...50 „ if india rubber as component material 50c. per lb. and 50 „
— collars and cuffs, 15c. per doz. and 35 „
— gloves ... ...50 „
— handkerchiefs, unhemmed, cut single, 40 „ hemmed ... ...50 „ hemstitched ... ...60 „

Cotton shirts and drawers, value not over $1.50 per doz. ... ...35 per cent.
value over $1.50 and not over $3 $1 per doz. and 35 „
value over $3 and not over $5 $1.25 per doz. and 40 „
value over $5 and not over $7 $1.50 per doz. and 40 „
value over $7 ... $2 per doz. and 40 „
— stockings, value not over 60c. per doz. ... 20c. per doz. and 20 „
value over 60c. and not over $2 50c. per doz. and 30 „
value over $2 and not over $4 75c. per doz. and 40 „
value over $4 ... $1 per doz. and 40 „
— spool thread ... per doz. spools of 100 yds. 7c.
Cotton thread, yarn, warps, &c., value not over 25c. per lb., 10c. per lb.; value over 25c. and not under 40c. per lb., 18c. per lb.; not under 50c., 23c.; 60c., 28c.; 70c., 33c.; 80c., 38c.; $1, 48c.; over $1,00 ...50 per cent.
— Velvets, velveteens, plushes, corduroys, all pile fabrics, (minimum rate of duty 40 per cent.) If not bleached, dyed, colored, stained, painted or printed ... 10c. per sq. yd. and ... ...20 „
If bleached 12c. per sq. yd. and...20 „
If dyed, colored, stained, printed or painted 14c. per sq. yd. and ...20 „
Crackers and biscuits ... ...20 „
Cutlery.—Pocket knives of all kinds value not over 50c. per doz., 12c. per doz. and ... ...50 „
Value over 50c. and not over $1.50 50c. per doz. and ... ...50 „
Value over $1.50 and not over $3 $1 per doz. and ... ...50 „
Value over $3, $2 per doz. and 50 „
— Razors and blades, value less than $4 per doz. $1 per doz. and ...30 „
Value $4 or more per doz. $1.75c. per doz. and ... ...30 „
— Table knives, forks, steels, butchers', hunting, kitchen, bread, butter, vegetable, fruit, cheese, plumbers', painters' pallette and artists' knives of all sizes, value not over $1 per doz. 10c. per doz. and ...30 „
Value over $1 and not over $2 35c. per doz. and ... ...30 „
Value over $2 and not over $3 40c. per doz. and ... ...30 „
Value over $3 and not over $8 $1 per doz. and 30
Value over $8 $2 per doz. and...30 „
— Carving and cooks' knives and forks of all sizes, value not over $4 per doz. $1 per doz. and ... ...30 „
Value over $4 and not over $8 $2 per doz. and ... ...30 „
Value over $8 and not over $12 $3 per doz. and ... ...30 „

Cutlery—Value over $12 $5 per doz. and 30 per cent.
Diamonds, cut, not set ... ...10 „
— set as jewellery ... ...50 „
— imitation ... ...10 „
Disks, glass plates, cut or ground ...60 „
— cut for lenses ... ...45 „
Drugs, not crude ... ...10 „
Dyewoods, extracts of ... ...⅞c. per lb.
Earthenware, common brown, stoneware and crucibles, not decorated or ornamented ... ...25 per cent.
— china, porcelain, faience, parian, bisque and all manufactures of earthen, stone and crockery ware decorated or ornamented in any manner ... ...60 „
not ornamented or decorated ....45 „
— tiles, plain ... ...25 „
— „ decorated ... ...45 „
Earths or clays, unmanufactured ...$1.50 pr ton
— manufactured ... ...$3.00 „
Eggs ... ...5c. per doz.
Electrotype plates... ... ...25 per cent.
Embroideries, cotton, linen or silk ...60 „
Embroideries, woolen or worsted, 60c. per lb. and ... ...60 „
Gold or other metals ... ...45 „
Emery, grains, 1c. per lb.: ground, ref'd. 1c. per lb.
Cloth ... ...40 per cent.
Scythe stones or whetstones ...20 „
Enamel for watch faces ... ...45 „
Feathers and downs of all kinds dressed, color'd, man'd, ...50 „
Felt: roofing ... ...20 „
carpeting...49¼c. per yard and...40 „
endless or of hair, not woven, 49½c. per yard and ... ...60 „
Fiber, cocoa, not crude ... ...10 „
Figs, green, ripe or dried... ... ...2½c. per lb.
Filberts, 3c. per lb.; shelled ... ...6c. „
Fire-crackers, all, no allowance for tare...8c. „
Fish, pickled, salted, 1c.; smoked, dried, fresh,. ... ...¾c. „
Herrings pickled, salted ½c.: fresh ...¼c. „
Flax, manufactures of ... ...50 per cent.
Oilcloth for floors, stamped, painted or printed, linoleum, corticene, cork carpets and all other oil cloth (except silk) and waterproof cloth, value not over 25c. per sq. yd. ...40 „
over 25c. per sq. yd. 15c. per sq.yd. 30 „
Flour, tapioca, free; wheat ... ...25 „
Buckwheat ... ...20 „
Arrowroot, sago, nut, used as starch, 2c.: rye, ¼c.: rice ...½c. per lb.
Flowers, artificial, of any material ...50 per cent.
bleached ... ...10 „
Fruits, apples, green or ripe ... ...25c. pr. bus.
do. dried, dessicated, evaporated... ... ...2c. per lb.
plums, prunes ... ...2c. per lb.
grapes, barrel of 3 cubic feet ...60c. per bbl.
preserved in sugar, etc ... ...35 per cent.
do. in their own juice ...30 „
Furniture, of wood, finish'd or unfinished.35 „

Furs, dressed but not made up, hatters...20 per cent.
— all articles made of,... ... ...35 „
Games, as toys (except ivory or bone) ...35 „
Gelatine and other similar preparations
value not over 7c. per lb. ...1½c. per lb.
value 7c., not over 30c. per lb. ...25 per cent.
value over 30c. per lb. ... ...30 „
German silver, unmanufactured ... ...25 „
— manufactured ... ...45 „
Ginger-ale, ginger-beer, lemonade, soda
water, etc., bottles not over ¾ pint
(no duty on bottles) ... ...13c. pr. doz.
over ¾ pint and not a pint, (no
duty on bottles) ... ...26c. „
Imported otherwise or in bottles
over 1½ pints, (additional duty on
bottles) ... ...50c. per gal.
root, unground, free ; ground...4c. per lb.
Glass, man'fact's of cut, or uncut. ...60 per cent.
Gloves, kid or other leather, 14 inches in
extreme length or under, duty to
be not less than... ... ...50 per cent.
Ladies' and children's, schmaschen
$1.75 ; lamb $2.25 ; kid $3. per doz. pairs.
Suede and all other leather gloves 50 per cent.
all leather gloves over 14 inches
in length ... ...50 „
men's gloves ... ...50 „
in addition to above rates there
shall be paid on :
all men's gloves ... .$1 per doz.
all lined gloves ... ...$1 „
all pique or prick seam gloves ...50c. „
all embroidered gloves with more
than 5 single strands or cords ...50c. „
N.B.—All gloves represented to
be of a kind or grade below their
actual kind or grade shall pay an
additional duty of $5 per dozen pairs
Glucose or grape sugar ... ...¾c per lb.
Glue, value not over 7c. per lb... ...1½c. ,
value over 7c. and not over 30c.
per lb., 25 per cent : over 30c. per
lb. ... ...30 per cent.
Glycerine, crude, 1¾c. per lb ; refined...4½c. per lb.
Gold, manufactures of, (not jewelry) ...45 per cent.
Grape juice containing not more than 18
per cent, alcohol ... ...60c. per gal.
containing more than 18 p.c. ...$2.50 „
Grapes, (barrel of 3 cubic feet) ... ...60c. per bbl.
Grass, all manufactures of... ... ...30 per cent.
Grease, for soap stock, free : degras ...½c. per lb.
all not otherwise specified... ...20 per cent.
Gum and gum resins, not crude... ...10 „
Gunpowder and all explosives value not
over 20c. per lb... ... ...5c. per lb.
value over 20c. per lb... ...8c. „
Gutta-percha, manufactured ... ...35 per cent.
Hair, all kinds of bristles... ... ...10 „
curled for beds ... ...15 „
human, cleaned ... ...20 „
manufactures of, ...35 „
Hams and bacon... ... ...5c. per lb.
Hats, fur and felt ... ...55 per cent.
Hay .. ..$4,00 pr. ton.
Hemp $25 per ton ; manufactured ...50 per cent.
Herbs, not edible, not crude ... ...10 „
Honey ... ...20c. per gal.
Hops ... ...15c. per lb.
Horn, all manufactures of ... ...30 per cent.
India rubber, manufactures of, ...30 „
Indigo carmined .. ..10c. per lb.
other extracts and paste ... ...¾c. „
Inks of all kinds and ink powders ...30 per cent.
Insect powder, vegetable... ... ...10 „
Insects, dried, not crude... ... ...10 „
Iodine, resublimed ... ...30c. per lb.
salts ... ...25 per cent.
Iron, all manufactures of ... ...45 „
Ivory, manufactures of ... ...40 „
Jellies and jams of all kinds ... ...35 „
Jet, all manufactures of ... ...25 „
Jewelry, real or mock of all kinds ...50 „
Juice, liquorice ... ...5½c. per lb.
— Fruit, not over 18 per cent. alcohol,
60c. ; over 18 per cent ... ...$2.50 pr gal.
Jute, manufactures of, value not over 5c.
per lb. ... ...2c. per lb.
— value over 5c. per lb. ... ...40 per cent.
Kaoline or china clay ... ...$3 per ton
Kerosine oil and residuum of ... ...20 per cent.
Lace, wool, hair, &c., 60c. per lb. and ...60 „
— all other ... ...60 „
Lampblack ... ...25 „
Lard ... ...2c. per lb.
Laths ... ...15c. per 1000 pcs.
Laudanum ... ...40 per cent.
Lava tips for gas burners, plain ... ...55 „
— decorated ... ...60 „
Lead, ore and dross ... ...1½c. per lb.
— pigs, bars, molten, refuse, scrap ...2c. „
— sheets, pipes, shot, glaziers', wire ...2½c. „
— white, red, nitrate, litharge ... ...3c. „
— pencils, 50c. per gross and ... ...30 per cent.
— pencil lead ... ...10 „
manufactures of, ...45 „
Leaf, aluminium, Dutch metal, bronze,
8c. per pack of ... ... 100 leaves.
— silver 75c. ; gold $2. per pack. of 500 leaves.
Leather, belting, sole, scraps, tanned, but
unfinished ... ...10 per cent.
— calf, finished morocco skins, patent,
enameled ... ...20 „
— boots and shoes 25 ; japanned ...30 „
all manufactures of ... ...35 „
Leaves not crude ... ...10 „
Lemon peel, candied ... ...2c. per lb.
Lemons, packages of 1¼ cubic ft. or less,
13c. ; 2½ cubic ft., 25c. ; 5 cubic
ft., 50c. per package ; over 5 cubic
ft. 10c. per cubic ft. extra. On the
boxes and barrels, 30 per cent.
additional. In bulk ... $1.50 per 1,000
Lenses, glass, value $1.50 per gross pairs or less 60 pr. ct.
— spectacles, eye-glasses, with edges
ground or beveled ... ...60 „

Lenses, glass or pebbles, manufactures of 45 per cent.
Licorice root, ground ... ...10 ,,
— juice, paste, or other forms ... ...5½c. per lb.
Lime, including weight of barrel ... 6c. per 100 lbs.
— alcoholic, $2 per gal. and ... ...25 per cent.
Linen, brown, bleached, not less than 100 threads to sq. in. (until Jan. 1, 1894) 35 ,,
— collars and cuffs, whole or part linen 30c. per doz. and ... ...40 ,,
— shirts and wearing apparel, ...55 ,,
— laces, edgings, trimmings, embroideries, &c. ... ...60 ,,
Linoleum, value not over 25c. per sq. yd. ...40 ,,
— over 25c. 15c. per sq. yd. and ...30 ,,
Linseed, (bushel of 56 lbs.) ... ...30c. per bus.
Liqueurs, all kinds, bottles extra 3c. each $2.50 per gal.
Lithographed plates of any material ...25 per cent.
Logwood, not crude ... ...10 ,,
— extracts of ... ...⅞c. per lb.
Lumber, sawed boards, plank, deal, &c. $1 per 1,000
Macaroni and Vermicelli... ... ...2c. per lb.
Magnesia, Acetate, Bromide, Chloride Citrate of ... ...25 per cent.
Malt, barley, bushel of 34 lbs.... ...45c. per bs.
— extracts in casks 20c. : in bottles, ...40c. per gal.
Marble, all kinds in block, rough, squared ... ...65c. per cub. ft.
Veined, sawed, dressed, paving tiles and slabs, minimum thickness 1 in. ... ... $1.10 per cub. ft.
Manufactures ... ...50 per cent.
Marbles, toy, of any composition ...35 ,,
Marmalade ... ...35 ,,
Matches, Friction, all kinds, not over 100 in a box ... ... 10c. per gross boxes.
over 100 in a box ...1c. per 1,000 matches.
Mats, bass, 20 per cent. grass ... ...30 per cent.
Cocoa fibre, rattan ... ...8c. per sq. ft.
Matting, napier, 6c. Cocoa fibre, rattan 12c. per. sq. yd.
Mattresses, according to chief value of material composed. ... ...
Meal, (corn, bushel 48 lbs.) ... ...20c. per bus.
— Oat, 1c. per lb. : rice... ... ...1¼c. per lb.
Meat, extract of, 35c. per lb. : fluid ...15c. per lb.
Meats, all kinds, prepared, preserved, ...25 per cent.
Medicinal preparations ... ...25 per cent.
Alcoholic, 50c. per lb. : with opium... ... ...40 per cent.
(Duty extra on all bottles.)
Meerschaum, pipes ... ...70 per cent.
Mercury or quicksilver, crude, ...10c. per lb.
Metallic mineral substances, crude, ...20 per cent.
Metals of all kinds, unwrought, ... 20 ,,
— all manufactures of ... ...45 ,,
Mica ... ...35 ,,
Microscopes, optical ... ...60 ,,
Milk, fresh, 5c. per gal. ; preserved, condensed, gross weight ... ...3c. per lb.
— sugar of ... ...8c. per lb.
Minerals advanced in condition ... ...20 per cent.
Mineral waters all, and all artificial, in plain. green or coloured glass bottles, 16c. per doz. bottles.
Mineral waters over 1 pint and not over 1 qt., 25c. per doz. bottles.
otherwise than in plain green or coloured bottles, or over 1 qt. ...20c. per gal. (bottles not dutiable).
Mirrors, Glass. See Glass.
Hand, Pocket, or Table, not over 144 sq. in. with or without frames of any material ... ...45 per cent.
Morphia, Morphine, and all salts of ...50. per oz.
Moss, not crude ... ...10c per cent.
— dyed for manufacture of flowers ...50 per cent.
Mother of Pearl manufactures of ...40 per cent.
Mucilages ... ...25 ,,
Muffs, fur ... ...35 ,,
Mushroom spawn, 20 per cent. ; Catsup 45 ,,
Mushrooms, dried, 25 per cent. ; preserved ... ...40 ,,
Music boxes ... ...45 ,,
Strings, metal ... ...45 ,,
Toys ... ...35 ,,
Mustard, ground, preserved ... ...10c. per lb.
French ... ...45 per cent.
Seed, Expressed oil ... ...25 ,,
Mutton, in carcass, dressed ... ...2c. per lb
Nails, cut, iron, steel ... ...1c. per lb
wrought, horseshoe ... ...4c. per lb.
Needles, knitting,... ... ...25 per cent
Crochet, knitting and sewing machine, tape ... ...35 ,,
Nets, webs and seines, flax gill netting of yarn not higher than No. 20. 15c. per lb. and... ... ...35 ,,
finer than No. 20, 20c. per lb. and 45 ,,
Nickel in crude form, containing more than 2 per cent of copper ½c. per lb. on copper ;
Alloys of ... ...10c. per lb
Manufactures of n. o. sp.... ...45 per. cent
Nuts, chestnuts, edible, shelled or unshelled ... ...1½c. per lb
Pea ground, unshelled, 1c. ; shelled ... ...1½c. per lb
Filberts, walnuts, hazel, unshelled, 3c. per lb
... ... shelled, 6c. per lb
Almonds, unshelled, 5c. shelled, 7½c. per lb
Oatmeal, oats, coarsely ground, groats ...1c. per lb
Oats, (bushel of 32 lbs.) ... .. 15c. per bush
Ochre and Ochrey earths, dry ... ...¼c. per lb
— ground in oil... ... ...½c. per lb.
Oil, crude, ...25 per cent.
Oil cloth, value not over 25c. per sq. yd. 40 per. cent.
— value over 25c. per sq. yd., 15c. per sq. yd. & ... ...30 ,,
Oil seed, flaxseed, linseed, poppy seed and others, bushel of 56 lbs ... ...30c. pr bush.
Oils, castor, peppermint, 80c. cod liver ...15c. pr. gal.
Cottonseed ... ...20c. per gal. of 7½ lbs.
Croton, 30c. per lb ; fusel ...10 per cent.
Flaxseed, linseed, poppy seed, 30c. per gal. of 7½ lbs.
Hemp, rape seed... ... ...10c. per gal.
Olive (edible) ... ...35c. per gal.
distilled, essential, expressed, rendered ... ...25 per cent.

Oleomargarine, and substitutes for butter, 6c. per lb.
Onions ... ...40c. pr. bush.
Opera glasses, glass, 60 per cent; metal 45 per cent.
— Shell ... ... 40 ,,
Opium, less than 9 per cent. morphia ...$12. per lb.
prepared for smoking ... ...$12. per lb.
liquid preparations of ... ...40 per cent.
Orange peel, preserved, candied... ...1c. per lb.
Ores, all containing more than 2 per cent.
of copper, in addition on copper, ½c. per lb.
All others containing metal ...20 per cent.
Osier, willow for basketmakers... ...30 ,,
manufactures of ... ...40 ,,
Palm leaf, manufactures of ... ...30 per cent.
Paper stock, unsized 15 : sized, glued ...20 ,,
albumenised, sensitized, surface-coated ; lithograph, photograph, and scrap albums ... ...35 ,,
filtering, silver, tissue-copying, ...8c. per lb. and 15 ,,
Envelopes, 25c. per 1,000 ; cigarette ... ...70 ,,
Plain and manufactures of ...25 ,,
Papier maché, all manufactures ... ...35 ,,
Parasols, silk or alpaca, 55, all other ...45 ,,
Pea nuts. See nuts. Peanut oil ... ...25 ,,
Peas, green in bulk, bbls or sacks, (bush. of 60 lbs) ... ...40c. pr. bush.
prepared, preserved ... ...40 per cent.
split, 50c. per bush. ; dried .. 20c. pr. bush.
in paper or other small packages, 1c. per lb.
Peat, ...10 per cent.
Pebbles, glass, not rough... ... ...60 per cent.
Cut and polished... ... ...45 ,,
Pencils lead ... ...50c. per gross and 30 ,,
Slate, 4c. per gross ; hair... ...40 ,,
Pens, gold, 30 per cent. ; other metallic, 12c. per gro.
Pepper, black, white, ground ... ...4c. per lb.
Cayenne, unground 2½c. : ground, 4c. per lb.
Perfumery, toilet, not alcoholic ... ...50 per cent.
alcoholic, $2.50 per gal. and ...50 ,,
Pewter, all manufactures of ... ...45 per cent.
Phosphorus ... ...20c. per lb.
Pianofortes ... ...45 per cent.
Pickles and sauces, bottles additional ...45 ,,
Pine-apples, preserved ... ...35 ,,
Pins, metallic solid head or other, hair, safety, hat, bonnet, shawl and belt, 30 ,,
Pipes, tobacco, common clay ... ...10c. per gr.
All others, and smokers' articles, 70 per cent.
Plants, all kinds nursery stock, ...20 ,,
Plaster of Paris ; ground, $1.00 per ton ; calcined ... ...$1.75 pr. ton.
Platinum, all manufactures of, ...45 per cent.
Plumbago, free ; stove polish ... ...20 per cent.
Plums, dried, green ... ...2c. per lb.
Preserved in their own juice ...30 per cent
Preserved in sugar or spirits ...35 ,,
(Extra duty on bottles).
Plum pudding ... ...20 per cent.
Pomades, pomatum. See toilet prepara. 50. per cent.
Pork and lard ... ...2c. per lb.
Potash, refined carbon, hydrate, nitra ...1c. per lb.
Potassium, and all acetates of ... ...20 per cent.
Potatoes, (bushel of 60 lbs.) ... ...25c. per bus.
Potatoes Dessicated ... ...45 per cent.
Poultry, live, 3c. dressed ... ...5c. per lb.
prepared ... ...25 per cent.
Precious stones, ; cut not set ... ...10 ,,
Set as Jewelry ... ...50 ,,
Set not as Jewelry ... ...25 ,,
Imitations of, not set ... ...10 ,,
Printed matter ... ...25 ,,
Pulp, all manufactures of... ... ...35 ,,
— for paper makers, except wood ...20 ,,
Pumice, pumice stone, artificial ... ...20 ,,
Putty ... ...1c. per lb,
Quicksilver or mercury (bottles additi'al, 10 per cent.
Quills, toothpicks... ... ...20 ,,
Rags, woolen ... ...10c. per lb.
Raisins ... ...2½c. per lb.
Rape seed, free : oil, gal. of 7½ lbs. ...10c. per gal.
Rattans and reeds, manufactured for chair canes ... ...10 per cent.
Resins, gum, not crude ... ...10 ,,
Rice, ground, granulated, flour, meal No. 12 wire sieve ... ...¼c. per lb.
uncleaned, pulled and not cleaned 1¼c. ,,
cleaned ... ...2c. ,,
Powder, toilet preparation ...50 per cent.
Rope, hemp bale. 50 per cent. ; cotton...40 ,,
— cocoanut, grass, coir, bark ... ...1c ½. per lb.
Rye, bushel of 56 lbs. 10c. per bush.
flour ... ... ½c. per lb.
Sad irons ... ...1 2-10c. ,,
Sage ... ...3c. per lb.
Salmon, dried, smoked, pickled... ...1c. ,,
prepared and preserved ... ...30 per cent.
Salt, in bulk ... ... 8c. per 100 lbs.
in bags, sacks, barrels, &c. ...12c. ,,
Saltpetre, refined or partly ... ...1c. per lb.
Sardines and anchovies.
Boxes 5 x 4 x 3½ in. ... ...10c. each.
½ boxes 5 x 4 1⅝ in. ... ...5c. ,,
¼ boxes 4¾ x 3½ x 1¼ in. ...2½c. ,,
in any other form... ... ...40 per cent.
Sauces (addit'l duty on bottles), ...45 ,,
Sausages excepting Bologna and Ger.
Frankfurter ... ...25 per cent.
Scissors and shears ... ...45 ,,
Sealing wax ... ...20 ,,
Sealskin sacques ... ...35 ,,
Sealskins, raw, free ; dressed, finished ...20 ,,
Seeds, castor, (bushel of 56 lbs.) ...50c. per bus.
Flax, linseed, poppy and all oil seeds (bushel of 56 lbs.) ...30c. ,,
All agricultural, garden and other seeds, except flower and grass...20 per cent.
Celery, suitable for garden ...20 ,,
Sewing machines... ... ...45 ,,
Shell and shells, manufactures of ...40 ,,
Shoddy, woolen ... ...30c. per lb.
Shoes, leather, 25 per cent. ; silk ...60 per cent.
Felt, wholly or partly wool 49½ c. per lb and 60 ,,
India rubber ... ...30 ,,
Horse, mule, ox, of iron or steel, 1 4-5c. per lb.
Shot ... ...2½c. ,,
Show cards, printed, 25 ; metal ... ...45 per cent.
Shrubs, nursery stock ... ...20 ,,

Silk, partially manuf'd from cocoons or waste, carded or combed... ...50c. per lb.
Thrown, viz: singles, tram, organzine, sewing, twist, floss, threads or yarns of every description except spun ... ...30 per cent.
Silk, Spun, skeins, cops, or beams ...35 „
Velvets, plushes, or other pile fabrics exclusive of selvedge (minimum of duty, 50 per cent). less than 75 per cent. weight of silk. $1.50 per lb. and 15 per cent.
75 per cent. or more weight of silk $3.50 per lb. and 15 „
Webbings, elastic or non-elastic, gorings, suspenders, braces, beltings, bindings, braids, galloons fringes, cords, tassels, buttons, ornaments... ... ...50 per cent.
Laces, embroideries, handkerchiefs, rufflings, ruchings ... ...60 „
Ready-made clothing, knit goods, articles of wearing apparel, of every description, not containing india rubber ... ...60 „
if containing india rubber, (except gloves or elastic articles 8c. per oz. and 60 „
All manufacturers of silk or partly silk, chief value (except those containing wool or hair, which shall be classified as manufactures of wool ... ...50 „
Silver laces, epaulets, tassels, galloons ...30 „
— all manufactures of ... ...45 „
Skins, morocco, tanned but unfinished...10 „
— all other, tanned, dressed and finished ... ...20 „
— Waste ... ...10 „
Slate, manufactures of ... ...30 „
Slates, roofing ... ...25 „
Smokers' articles of any material ...70 „
Snuff, of tobacco (int. revenue 6c. lb.) ...50 per lb.
Soap, perfumed, all descriptions of toilet, 15 „
— castile, 1¼c. lb.; all other, ...20 per cent.
Soda ash, crystals, salt. ... ...¼c. per lb.
— sulphate, ...½c. „
— bicarbonate, caustic, hydrate, ...1c. „
— chromate, bichromate, Rochelle salts, 3c. „
— yellow prussiate, 5c. lb.; sulphate, $1.25 per ton.
Sodium, sulphide of ... ...25 per cent.
Spar, all manufactures of... ... ...25 „
Spectacles or eyeglasses and frames or lenses for ... ...60 „
Spelter, blocks, pigs, 1¾c. per lb.; sheets, 2½c. per lb.
— manufactures of ... ...45 per cent.
Spices, all ground or powdered, ...4c. per lb.
Spirits, liquors and liqueurs of all kinds, absinthe, bitters, brandies, cordials, &c. (bottles extra 3c. each) $2.50 per proof gallon.
NOTE.—Minimum for importation, 12 bottles in a case, casks 14 gallons.
— Bay rum, of first proof, and in proportion for greater strength ...$1.50 per gal.
Sponges ... ...20 per cent.
Starch, all kinds of, ...2c. per lb.
Statuary, marble, stone, alabaster, metal, the work of the sculptor only, ...15 per cent.
Stearine ... ...20 „
Steel plates engraved, stereotype, electrotype, &c. except Fashion, for printing... ... ...25 „
— all manufactures of ... ...45 „
Stone, freestone, granite, sandstone, limestone, and all building stone except marble, undressed, ...11c. per cub. ft.
— dressed or polished,... ... ...40 per cent.
Stove polish ... ...20 „
Stoves and plates, iron ... ...1 2-10c. per lb.
Straw, unmanuf'd or manuf'd, ...30 „
Sugar glucose or grape sugar, ...¾c. per lb.
Sugars, all not above No. 16 Dutch standard in colour, on and after April 1, 1891, free; above...5-10c. „
See special provisos in official Tariff.
Sulphur, refined, $8.; Flowers of ...$10. per ton.
Sulphuric acid, not otherwise specified...¼c. per lb.
Sumac, crude, free; ground, 4-10c.; extract, ...7-8c. per lb.
Sweetmeats, all kinds, ...35 per cent.
Talc, prepared ... ...20 per cent.
Tallow, 1c. per lb.; candles ... ...20 „
Tannin or tannic acid ... ...75c. per lb.
Tarter, cream of ... ...6c. „
Tartaric acid ... ...10c. „
Thread, flax, linen, value not over 13c. per lb., 6c. per lb.; over 13c. ...45 per cent.
Timber, hewn, sawed ... ...10 „
— squared, &c.... ... ...½c. per cub. ft.
Tin, ore, bars, blocks, pigs, grain, until July 1, 1893; Free; after July 1, 1893 ... ...4c. per lb.
— manufactures of, ...45 per cent.
Tobacco, leaf, suitable for cigar wrappers, unstemm'd, $2.; stemmed, ...$2.75 per lb.
— all other unmanufactured, unstemmed, 35c.; stemmed, ...50c. „
— manuf'd, all descriptions, (Int. Rev. Tax 6c. per lb). ...40c. „
— cigars, cheroots and Cigarettes of all kinds, including paper cigarettes ... ...$4.50 per lb. and 25 per cent.
— Internal Revenue Tax: on cigars, $3. per 1000; on Cigarettes weighing not over 3 lbs. per 1000, 50c. per 1000; over 3 lbs. $3. per 1000.
NOTE.—Cigars, cheroots and cigarettes cannot be imported in quantities of less than 3000. Single boxes must contain either 25, 50, 100, 200, 250 or 500 each, but not more than 500. Each package of cigarettes must contain 10, 20, 50 or 100.
— Scrap, cuttings, clippings ... ...40c. per lb.
Toilet preparations, all kinds, ...50 per cent.
— soaps... ... ...15c. per lb.

Toys, india rubber ... ...30 per cent.
— all other ... ...35 „
Truffles, prepared, preserved ... ...45 „
Twine, flax or linen ... ...1½c. per lb.
— istle, fibre, manilla, sisal grass, 7-10c. „
Type metal, on lead contained ...1½c. „
Types, new ... ...25 per cent.
Ultramarine blue... ... ...4½c. per lb.
Umber, earths, dry, ¼c.; ground in oil ...½c. „
Umbrellas, parasols and sunshades, covered with silk or alpaca ...55 per cent.
any other material ... ...45 „
Vanilla beans, not crude... ... ...10 „
Varnishes, alcoholic, $1.32 per gal. and 35 „
— not alcoholic... ... ...35 „
Vegetables for medicine, dyeing not crude 10 „
— cabbages ... ... 3c. each.
— onions, 40c.; potatoes... ... 25c. per bush.
— edible, natural, ...25 per cent.
prep'd, presv'd ... ...45 „
Vellum, vellum cloth ... ...40 „
Veneers ... ...20 „
Vermicelli... ... ...2c. per lb.
Vinegar, as per standard... ... ...7½c. per gal.
Vines and cuttings, all kinds, ...20 per cent.
Violins and parts of ... ...35 „
Vitriol, blue, 2c.; green, 3-10c. p. lb.
white, ...25 „
Wall papers, paper hangings ... ...25 „
Walnuts, natural and in the brine ...3c. per lb.
Watches and parts of ... ...25 per cent.
Water colours ... ...30 „
Wax, fish, sealing, shoemakers ... ...20 „
— all manufactures of ... ...25 „
Whalebone, all manufactures of... ...30 „
Wheat, (bushel of 60 lbs). ... ...25c. per bush.
Wheels, or parts of, iron or steel ...2½c. per lb.
Willow, for basket makers' use ... ...30 per cent.
— manufactures of ... ...40 „
Wines, champagne, and all sparkling: (bottles extra, 3c. each), ½ pts, $2.; pints, $4.; quarts... ... ...$8. per doz.
in bottles over 1 qt. in excess of $8. per doz. ... ...$2.50 per gal.
— still wines, viz: clarets, burgundies, &c. &c. and ginger wine, cordial and vermouth in casks ... ...50c. per gal.
in cases of 1 doz. qts. or 2 doz. pints (no duty on bottles) ...$1.60 per case.
— No allowance for leakage or breakage.
Wire, iron or steel covered with cotton, silk or other material, crinoline, corset and hat wire ... ...5c. per lb.
Wood, all manufactures of, ...35 per cent.
Wool, unmanufactured.
CLASS I. Clothing wools, viz: merino, mestiza, metz, metis. Down from Buenos Ayres, New Zealand, Australia, Cape of Good Hope, Russia, Great Britain, Canada, and elsewhere, unwashed ...11c. per lb.
washed 22c. pr. lb.; scoured ...33c. per lb.
Class II. Combing Wools, viz: Leicester, Cotswold, Lincolnshire, Down, Canada; and also camel, goat, alpaca and like hair. Unwashed or washed 12c.; scoured 36c. per lb.
CLASS III. Carpet wools, viz: Danskoi, native South American, Cordova, Valparaiso, native Smyrna, Russian camel's hair, and similar wools from Turkey, Greece, Egypt, Syria and elsewhere (except improved wools) value not over 13 cents per lb., including charges ... ...32 per cent.
over 13c. including charges ...50 „
— wools on the skin, same duty as other wools.
Woolen waste, nails, shobby and top, slubbing, roving, ring, yarn, garnetted and all other wastes ... ...30c. per lb.
— rags, mungo and flocks ... ...10c. per lb.
— yarns, value not over 30c. per lb. 27½c. per lb and 35 per cent.
over 30c. and not over 40c. pr. lb. 33c. per lb. and 35 „
over 40c. per lb. 38½c. per lb. and 40 „
— cloth, shawls and knit goods and all manufactures of every description value not over 30c. pr. lb.... ...33c. pr. lb. and ...40 „
over 30c. and not over 40c. per lb. 38½ c. pr. lb. and ...40 „
over 40c. pr. lb....44c. pr. lb. and 50 „
— blankets, hats, and flannels, value not over 30c. pr. lb, 16½c. pr. lb. and ... ...30 „
over 30c. and not over 40c. pr. lb. 22c. pr. lb. and 35 „
over 40c. and not over 50c. pr. lb. 33c. pr. lb. and 35 „
— blankets and hats, value over 50c. pr. lb. ... ...38½c. per lb. and 40 „
— flannels value over 50c. pr. lb.
— women's & children's dress goods.
— coat linings, Italian cloths, &c. value not over 15c. per sq. yd. 7c. per sq. yd. and 40 „
value over 15c. per sq. yard, 8c. per sq. yd. and 50 „
on all such goods weighing over 4 oz. per sq. yd. 44c. per lb. and 50 „
— clothing ready-made, wearing apparel of every description, felts not woven, plushes, cloaks, dolmans, jackets, talamas, ulsters, &c. 49½c. per lb. and 60 „
— beltings, bindings, braces, braids, buttons, cords, embroideries, fringes, galloons, gimps, gorings, laces, nets, ornaments, suspenders, tassels, trimmings, webbings (elastic or non-elastic), 60c. per lb. and 60 „
Zinc, in blocks or pigs ... ...1¾c. per lb.
in sheets ... ...2½c. „
manufactures of ... ...45 per cent.

THE END.

List of stuffed Birds for Sale.

	s.
Tinamus major, G.	30
Crypturus variegatus, G. ...	15
Otis tarda, L. (cited in Vieillot works)	100
— Tetrax, L.	10
Eupodotis denhami, C.	200
Sypheotis bengalensis, M. ...	50
Afrotis afra, G.	50
Sypheotides macqueeni, G. ...	40
Cariama Cristata L.	100
Psophia crepitans, L.	30
Chauna chavaria, L.	80
Opisthocomus cristatus, L. ...	30
Penelope obscura, V.	30
Ortalida motmot, L.	20
Oreophasis derbiana, G. R. G.	100
Crax alector, L.	50
Polyplectron chincquis ...	40
Phasianus colchicus, L. ...	20
— torquatus T. ...	20
Chrysolophus pictus, male ...	20
— — female ...	15
— amherstiæ, male ...	50
— — female ...	20
Acomus erythropthalmus, R. ...	16
Gallus sonnerati, T.	20
Creagrius varius, S.	20
Ceriornis satyra, E. male ...	20
Meleagris americana, B. ...	80
— ocellata, C. ...	100
Tantalus ibis, L.	25
— religiosus, L. ...	25
Ibis rubra, L.	12
— falcinellus, L.	10
Carphibis spinicollis. J. ...	50
Hagedashia bishagedash, L. ...	25
— *chalcoptera, Vieill, typical* ...	50
Theristicus albicollis „ ...	50
Dromas ardeola, P.	20
Ardea cinerea L.	12
— melanocephala, V. ...	12
— major, L.	12
— purpurea, L.	12
Herodias egretta, G.	12
— garzetta, L.	12
— pealei, B.	12
Florida cœrulea, L.	12
— tricolor, M.	20
Agamia agami, G.	20
Bubulcus ibis, H.	10
— speciosus, India ...	8
Ardeola comata, P.	10
Ardetta minuta, L.	6
— exilis, L.	6
— scapularis	8
Zebrilus undulatus, G. ...	8
— philippensis	8
Butorides virescens, L. ...	10
Botaurus stellaris, L.	12
— lentiginosus	12
Tigrisoma brasiliense, L. ...	12
— tigrinum, G. ...	12

	s.
Nyctiardea europea, S. ...	10
— ardeola	10
Nycthérodius violaceus, L. ...	10
Pilherodius pileatus, B. ...	12
Scopus umbretta, G.	12
Canchroma cocklearia, L. ...	20
Ciconia alba, B.	40
— *maguari*, G.	50
Menanopelargus nigra, L. ...	50
Xenorhynchus indica, L. ...	30
Leptoptilos crumeniferus, C. ...	80
Cranopelargus javanicus, H. ...	80
Platalea leucorodia, L. ...	20
— ajaja, L.	12
Grus cinerea, B.	40
— antigone, male	60
— leucogeranus, P. ...	80
Anthropoides virgo, L. ...	60
Balearica pavonina, L. ...	80
Phœnicopterus antiquorum, T.	50
Phœnicorodias ruber, L. ...	40
Sarkidiornis melanonotus, P. .	40
Plectropterus gambensis, L. ...	50
Anser segetum, G.	20
— brachyrynchus, B. ...	25
— albifrons, G.	50
Marilochen erythropus L. ...	20
— minutus	20
Chen hyperboreus, Pall. ...	80
Branta bernicla, L.	20
Chlamidochen jubata, L. ...	20
Leucopareia leucopsis, B.	20
Rufibrenta ruficollis, P. ...	100
Chloephaga magellanica, G. ...	40
Bernicla leucoptera, G. ...	50
Nettapus madasgariensis G. ...	12
— coromandelicus, L. ...	10
Cygnus olor, G.	50
— nigricollis, G. ...	50
— musicus, B.	50
— minor, P.	50
Chenopis atratus, L.	60
Dendrocygna arcuata, C. ...	10
— major J. ...	10
— viduata, L. ...	10
— autumnalis, L.	10
— mexicana, L. ...	10
Tadorna cornuta, G.	15
Casarca rutila, G.	10
Aix sponsa, L.	12
— galericulata, L.	12
Mareca penelope, L.	12
— americana, G. ...	12
— chiloensis, K.	20
Dafila acuta, L.	12
Poeciloneta bahamensis, L. ...	16
Anas boschas, L.	10
— cristata, G.	16
— *gloscitans*, P.	50
Querquedula cœruleata, L. ...	6
— discors, L. ...	5
— *falcata, G. (type.)*	100
Nethon crecca, L. ...	8
torquata, V. (*type.*) ...	50
formosa, G.	50

	s.
Chaulelasmus strepera, L. ...	10
— marmoratus, T.	10
Marmonetta angustirostris, M.	12
Spatula clypeata, L.	10
Fuligula rufina, V.	16
Fulix rufitorques, B.	16
— marila, L.	10
— *affinis, E. (Labrador.)* ...	50
Aythya ferina, L.	10
— nyroca, G.	8
Bucephala barowi, D. ...	50
— clangula, L. ...	10
— albeola, L.	10
— *histrionica, L.* ...	50
Harelda glacialis, L.	12
Stelleria dispar, S.	50
Somateria *mollissima* L, ...	50
— *spectabilis, L.* ...	60
Oidemia nigra, L.	10
Pelionetta perspicillata, L. ...	40
Melanitta fusca, L.	30
Erismatura leucocephala, S. ...	10
Mergus serrator, L.	15
— merganser, L, ...	16
Lophodytes cucullata, L. ...	20
Mergellus albicollis, L. ...	20
Colymbus glacialis, L. ...	20
— articus, L. ...	40
— septentrionalis, L. ...	20
Podiceps cristatus, L.	10
... rubricollis, L. ...	8
Dytes auritus, L.	8
— cornutus, G.	10
Proctopus nigricollis, S. ...	12
Rollandia leucotis, C. ...	12
Sylbeocyclus minor, L. ...	5
Podiceps carolinensis, L. ...	8
Mormon fratercula, C. ...	16
— grabæ, B, ...	12
— glacialis, L.	20
Utamania torda, L.	12
Cheniscus cirrhatus, G. ...	25
Simorhynchus cristatellus, P.	12
Phaleris nodirostris, P. ...	20
Spheniscus chrysoconus, T. ...	50
Aptenodytes patagonica, P. ...	100
Brachyramphus antiquus, L. ...	16
Uria grylle, L.	6
— troile, L.	10
— brunicki, L.	20
— lachrymans, L.	16
Artica alle, L.	6
Puffinus major, F.	10
— fuliginosus, S. ...	8
— anglorum, C. ...	10
— obscurus, G. ...	20
— cinereus, S.	12
— yelcuanus, A. ...	30
Procellaria pelasgica, L. ...	10
— leucorhoa G. ...	15
Pelagodroma fregata, L. ...	50
Fulmarus glacialis, L ...	30
Cookilaria cooki, G.R. Gr. ...	30
Daption capensis, L. ...	12

LIST OF STUFFED BIRDS FOR SALE.—*(Continued.)*

	s.
Prion magnirostris, G. ...	200
Diomedea exulans, L. ...	100
Thalassarche chlororhynchas, G.	80
Stercorarius parasiticus, L. ...	20
Coprotheres pomarinus, T. ...	25
Megalesthris catarractes, L. ...	10
Larus maximus, L. ...	20
— peyreaudi Vieill, ...	20
— tenuirostris, C.	15
— cirrhocephalus, V. ... (typical sp.)	20
— canus, V.	12
— flavipes, M.	12
— Richardsoni, W. ...	16
— bonapartei, S.	20
Gabianus pacificus, L. ...	30
— marinus, L. ...	20
Clupeilarus fuscus, L. ...	20
Leucus glaucus, B.	30
— leucopterus, F. ...	25
Laroides michaelis, B. ...	16
Adelarus leucopthalmus, L. ...	25
— icthyaetus, P. ...	50
Chroicocephalus ridibundus, L.	8
— capistratus, T. ...	10
Atricilla atricilla, L. ...	8
Melagavia melanocephala, N.	20
Hydrocoloeus minutus, P. ...	20
Pagophila eburnea, G. ...	50
Rissa tridactyla, L. ...	8
Sterna hirundo, L.	8
— *lactea, alba V.* ...	100
— leucopareia, N. ...	10
— nigra, S.	30
— dougalli, M.	16
Gelichelidon anglica, Mont. ...	12
Actochelidon cantiaca, G. ...	10
— affinis, R.	12
— arctica, A.	20
Thalasseus caspiae, P ...	20
— bergi, L.	20
Sternula minuta, L.	6
Hydrochelidon fissipes, L. ...	6
— fuliginosa, G. ...	16
Anous stolidus, L.	10
Naenia inca, L.	40
Rhyncops nigra, L.	12
Phaeton aethereus, L. ...	25
— phænicurus, G. ...	30
— candidus, G. ...	25
Plotus anhinga, L.	10
— levaillanti, L. ...	16
Carbo cormoranus, M. ...	16
— sp. N. Zealand ...	16
— Desmaresti, P. ...	20
— albicollis, ...	16
— gaymardi, L. ...	40
— cristatus, F. (Island)	20
Pelecanus onocrotalus, L. ...	80
— crispus, B.	100
Atagen aquila, L	50
Polyborides radiatus, S. ...	20

	s.
Circus cyaneus, L.	8
— Swainsoni, S.	16
— cinerascens, S.	8
— — S. (black variety)	30
— aeruginosus, L. ...	10
Melierax polyzonus, R. ...	20
Astur palumbarius, L. ...	16
— badius, G....	6
— soloensis, L.	12
— novae hollandiae, G. ...	20
Accipiter nisus, L.	6
— virgatus, B.	16
— cooperi, B.	16
— tinus, L.	8
— badius, Alleon, *Smyrna*	16
Tachytriorchis pterocles, V. ...	40
Buteo jakal, D.	50
— *ferox, G. (Volga).* ...	50
— desertorum, D. ...	20
— lineatus, V. Canada. ...	30
— vulgaris, L.	16
— tachardus, martini, Hard Volga.	30
Archibuteo lagopus, G. ...	25
Busarellus nigricollis, L. ...	20
Urubitinga niger, V.	30
Gypaetus barbatus, S. (very fine specimen)	100
Aquila fulva, L.	60
— *heliaca S.*	100
— *planga, V.*	50
— rapax, C.	50
— naevia, G.	30
Nisaetus bonnelli, C.	80
— pennatus, G. Turkey...	30
Circaetus, gallicus, G. (from Duchess de Berry Coll.) ...	50
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— leucocephalus, L.	80
— *leucoryphus G.* Monts Altai	100
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Haliastur ponticerianus, G. ...	12
Elanoides furcatus, L. ...	25
Nauclerus riocouri, V., typical	60
Milvus regalis, B.	30
— govinda, S.	30
— aegyptus, G.	12
— *aetolius*, V.	30
Rostramus hamatus, V. ...	30
Elanus coeruleus, D.... ...	8
—melanopterus, B. Volga...	16
Gampsonyx swainsoni, V. ...	20
Pernis apivorus, L.	16
Harpagus diodon, T.... ...	20
Ictinia plumbea, G.	8
Microhierax coerulescens, L....	12
Falco communis, G.	12
— pealei, R.	20
— barbarus, L.	16
— lanarius graecus, S. ...	30
— subbuteo, L.	8

	s.
Falco aesalon, L.	8
— aurantius, G.	10
— chicquera, D.	20
— concolor, C. (leg. imper.)	30
— *eleonorae, M.*	30
Hierofalco candicans, G. (Tem. Collection)	80
Hierofalco gyrfalco, L., Norway	50
— — Lapponia	60
— *saker, G.*	20
Cerchneis tinnuncula, L. ...	6
— punctata, T. ...	12
— sparveria, L. ...	5
— tinnunculoides, V.	12
— vespertina, L. ...	12
Pandion haliætus, L. ...	30
Gyps fulvus, occidentalis G. Sardinia	100
Otogyps auricularis, D. ...	100
Neophron percnopterus, L. ...	30
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Catharistes atrata, B.	20
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Polyborus brasiliensis, G. ...	20
Ibycter americanus, B. ...	20
— chimango. V.	10
Bubo turcomanus, E. ...	60
— ascalaphus, S.	40
— *atheniensis A.*	50
— magellanicus, G. ...	25
Scops aldrovandi, B.	8
— leucotis, T.	12
Nyctea scandiaca. L.	40
Surnia ulula, L. Arkangel ...	40
— — N. America. ...	20
Carine noctua, S.	6
— brama, C.	8
— persica, V.	10
Speotypo cunicularia, M. ...	10
Glaucidium passerinum, L. ...	5
— perlatum V. (*type*).	
— { occipitalis, T. ...	40
— { ferruginea, B. ...	10
Asio otus, L.	10
— brachyotus, L.	10
Syrnium aluco, L.	12
— *lapponicum*, R. ...	60
— uralense, P.	50
— nebulosum, T. ...	40
Nyctala tengmalmi, G. ...	10
— acadica, G.	6
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May 1, 1891.

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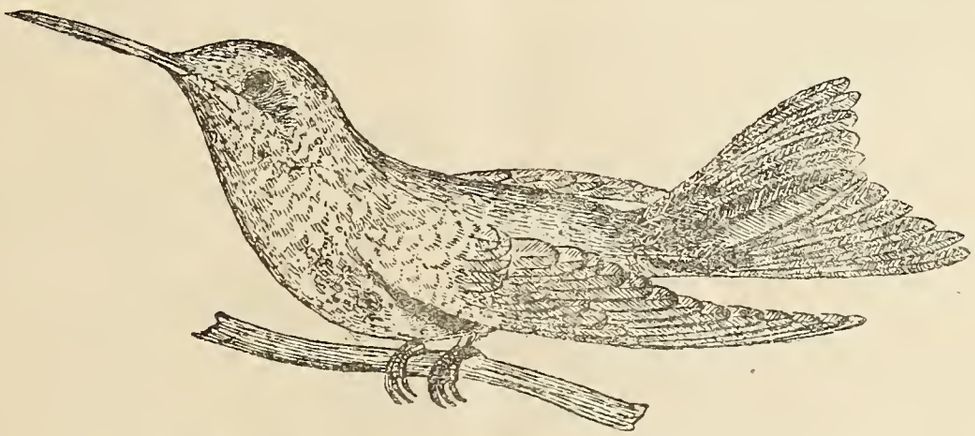

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
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CONTENTS OF No. 6.—JUNE 1, 1891.

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Cotton, Tobacco, Potatoes, Coffee, Tea, Indigo, Cochineal, Silk are all products of nature, and some travellers (mostly naturalists) are those who have been to search for them, sometimes at very remote countries at the cost of their lives, to try their acclimatation in their own country or to make known their value and their goodness.

Much has been done; but the field of explorations is still very large, and many Centuries will pass before it is drained.

Therefore, every one must work boldly and encourage every where these studies which are unhappily too much neglected at the present time.

For that it is necessary that all those, who have zoological riches accumulated, give their duplicates to scientific Institutions or to young and poor amateurs, or dispose of them at very low prices accessible to every one.

It is also necessary that all the Governments should give important prizes and rewards to all those who make new discoveries useful to their country, and encourage by all means the study of this science which is sure to produce fruitful results to the benefit of Humanity.

The Humming Bird.

Notes on Rare Species of Humming Birds and Descriptions of Several Supposed New Species in Boucard's Museum.

By A. Boucard.

Continued from page 18 *and* 26.

HEMISTEPHANIA JOHANNAE BOURC
DORYPHORA JOHANNAE GOULD.

Male.—Forehead, metallic blue, with violet reflections; upper surface, bronze green, golden on neck; upper tail coverts, grayish blue; tail, black with bluish hue; under surface, glossy bluish black, greenish on the flanks; undertail coverts, violet blue; tail, bluish-black with grey tips; bill, black.

Length, $4\frac{1}{8}$; wing, $2\frac{1}{8}$; tail, $1\frac{1}{8}$; bill, $1\frac{1}{8}$.

Habitat, Columbia, Guiana.

Female.—Forehead, metallic green; upper surface, bronze green, coppery on head and neck; upper tail coverts, grayish blue; tail, black, largely tipped with grey underneath; under surface greenish grey; bill, black.

It is this bird which has been described under the name of *D. euphrosinae* by Messrs. Mulsant and Verreaux; but having received a certain number of males and females from Columbia and Guiana I am perfectly satisfied that the name of *H. euphrosinae* must be considered as a synonym of *H. Johannae.*

I have a pair of this species collected in British Guiana by Mr. H. Whitely; the female has a golden grey under surface instead of greenish gray. It may be a question of age.

HEMISTEPHANIA LUDOVICIAE, BOURC AND MULS.

Male.—Forehead, metallic green; crown and nape, coppery green; back, golden green; upper-tail coverts, bluish green; tail, black; under surface golden gray; under-tail coverts, gray with bluish reflections; tail, black, tipped with grey; bill, black; wings, purple.

Total length, $4\frac{1}{4}$; wing, $2\frac{1}{4}$; tail, $1\frac{1}{4}$; bill, $1\frac{1}{8}$.

Habitat, Columbia, Bolivia.

Female.—Forehead, metallic gold; upper surface exactly as the male; under surface, more golden gray than in the male.

A new species could be made with this bird in consequence of the colour of the forehead; but I believe that they are only sexes, and the specimens which have no metallic frontal spot are only young individuals. It would be very interesting that competent naturalists should collect large series of both sexes of this species to elucidate the question of knowing if the two sexes have frontal spots.

Among my specimens of this species, I have one from Merida (Venezuela), and another from Bolivia, collected by the late Buckley. They are exactly the same as the specimens from Columbia. Some have much longer bills than others, and are also larger in size; but none so large as *H. rectirostris* from Ecuador. If, contrary to my expectations, it should prove a different species, I propose the name of ***H. aurifrons*** for it.

BELLONA SUPERBA, N.SP.

Male.—Forehead crest golden green, with the elongated feathers of crest bluish; upper surface, dark grass green, darker on the back; tail, purplish black; throat, dark grey; under surface, purplish black; wings, steel black.

Total length $3\frac{1}{2}$; wing $1\frac{3}{4}$; tail 1; bill $\frac{1}{2}$.

Female.—Forehead, dark green; upper surface, dark golden green, appearing black on neck; chin, grey; rest of under surface, dark grey, nearly black; wing, purplish brown; tail, purplish black; bill and feet, black.

Habitat, St. Vincent.

I have a fine series of this new species, which differs considerably from *Bellona cristata* by the form of the crest, which is pointed as in *B. exilis*, and has not the deep blue colour of *B. cristata.*

LESBIA, BOLIVIANA, N.SP.

Male.—Upper surface, breast and flanks, golden green; throat, metallic golden green; wings, purplish brown; vent, deep buff; under tail coverts, buff, with a very narrow central band golden green; tail, purple black; the six central rectrices black at base, with half their apical metallic golden green; the black is scarcely conspicuous, the two next purple black, with metallic golden tips, and the two outermost ones, purple black, with a scarcely visible golden tip, and the basal third of outer web rufous grey; bill, black.

Total length, $7\frac{3}{8}$; wing, $2\frac{1}{8}$; tail, $5\frac{1}{2}$; bill, $\frac{1}{2}$.

I have only one specimen of this fine species, collected in Bolivia by the late well-known collector, Buckley.

The principal difference between this species and *Lesbia nuna* consists in its golden colour of the throat, and the general colour of the bird, which is golden instead of grass green.

Description of a supposed New Species of Paradise Bird in Boucard's Museum.

By A. Boucard.

I have bought lately several specimens of Paradise Birds, which I took for *Semioptera Wallacei*; but having compared these birds with the specimens which I have in my collection, specimens collected by Mr. Alfred Wallace in Batchian, I was agreeably surprised to see that they were quite different, and now I propose for that new species the name of *Semioptera Gouldi*, as a feeble homage to the memory of him, which I think will rank among the greatest Naturalists of the nineteenth century. I have not the least doubt that if so many eminent Ornithologists exist actually in England, it is in great part due to the great impulse given by the late John Gould to the study of that special branch of Natural History, by the publication of so many splendid works, edited by him during his life. John Gould was not only an eminent naturalist, but also an incomparable artist, and his works will always rank among the best. He was such an enthusiastic ornithologist, that even at death's door he was hard at work at his favourite study, and we may say of him that he died of a noble death as a warrior in the field of battle.

SEMIOPTERA GOULDI, N.SP.

Male.—Forehead, glossy dark purple, with rosy

reflections, a dark, straight, rufous brown tuft over the bill ; lobes and cheeks of same colour, forming in part like a mosaic coronet round the forehead, all the rest of upper part dark brown ; wings and tail, pale brown, especially on external edges ; chin, rufous ; throat and breast, dark metallic green ; the ornamental feathers of breast reaching the legs, two ornamental feathers starting from the primaries, of nearly the same length as wing, very pale brown, nearly white ; lower part of breast and vent, dark brown at base, remainder metallic green ; flanks, abdomen and under-tail coverts, dark rufous ; legs and bill, fleshy colour.

Total length, 11 inches ; wing, $5\frac{3}{4}$; tail, 4 ; bill, $1\frac{1}{2}$.

Female.—Forehead, dark brown, with glossy purple reflections, all the rest of upper and under part reddish brown ; primaries and rectrices yellowish brown.

Length, same as male.

Habitat, one of the islands close to New Guinea ; but I have not been able to ascertain which.

The principal difference between this species and *S. Wallace's*, lies in the colour of the forehead, in its general colour, which is of much darker brown, and in its smaller size.

Poor Rate and General Rate Taxes in the Parishes of St. Giles in the Fields and St. George, Bloomsbury.

I have just received Demand Note of Rates due and payable April 27th, 1891.

From 109 my assessment has been increased to £134. I was so surprised at such increase that I went immediately to the Vestry Offices and inquired from Mr. Henry Hulford, the Collector of Rates for the said Parishes, the reason of such increase in my assessment. With his usual urbanity Mr. Henry Hulford told me that this was the result of the last assessment made for the parish. He asked me what was my rent, and after I told him he said it was quite right, as the assessment was based on the rent paid by leaseholders, that it was the law of the country, and that nothing could be done.

I have to thank Mr. Henry Hulford for the information he gave me, but I must say that I am at a loss to know why the assessment is fixed on the rent paid, and not on the real value of the ground and premises. Everyone knows that some districts of London are increasing in value and others are decreasing.

Well, I think the Parishes of St. Giles in the Fields and St. George is in the latter case for business purposes at least. It is not enough west for the custom of the rich and aristocratic families, and it is not enough east for the wholesale trade as carried in the City. All the rich families have emigrated far West, and South and West Kensington with Piccadilly and Regent Street are the London districts patronized by aristocracy.

In these circumstances it seems than instead of increasing the assessments on properties situated in the Parishes of St. Giles in the Fields and St. George, it should have been the reverse.

Now as to the manner of assessing. It is valued according to the rent actually paid by the leaseholder. The defects of this procedure can immediately be seen.

If you have contracted a lease at a high rent, because you have been made to believe that such part of London was capital for business, proportionally you have to pay very heavy taxes, meanwhile your neighbour, who has an old lease or has been more acute than yourself when letting will pay less than half the taxes than yourself. Is it just?

If on the contrary you have had the good luck to rent some premises at a nominal value, you will scarcely pay any taxes at all. I ask again : Is it just?

Undoubtedly there is something wrong here, and I say that assessments of rates ought to be made uniform for all, taking as basis the *medium value* of all the properties situated in the Parish, and not the actual rent paid by each householder, which is excessive for some and quite the reverse for others.

I can guarantee that the reason of so many failures in business are due to the exhorbitant prices paid for rent and the excessive taxes following suit.

If you start business with money of your own, after a few years struggle all is gone. On the other hand, if you work on credit, you get soon into debts, and the result is failure. Excepting the very few trades which deal in objects of first necessity, all the others earn scarcely enough to pay their rent, taxes and living, and after many years' struggles they are just in the same position as when they began, when not worse.

I think it is quite time that the London County Council should exert itself in procuring the passage of a short Act regarding an equitable and uniform basis of Assessment.

To be continued.

THE PANAMA CANAL.

Continued from pages 5, 12, 22, 30.

Considering the Interoceanic Canal as one of the greatest industrial and scientific work of this Century and the completion of same as of the utmost interest to all Countries, I give below, as published by the well-known *Petit Journal of Paris*, M. Bonaparte Wyse's report on the success of his negociations with the Government of Columbia, for the prorogation of ten years, granted to the Liquidation of the Panama Co., to complete the Canal.

Rapport de M. Bonaparte Wyse sur le Canal de Panama.

Lettre à M. Monchicourt.

Au mois de mars de l'année dernière, à peine nommé au poste qui vous a été confié par la justice, vous avez spontanément fait appel à mon concours dans le but d'essayer de relever l'affaire du Canal Interocéanique dont j'avais été l'initiateur et qui se trouvait fort gravement compromise par des fautes auxquelles j'étais resté étranger.

La première phase du rôle que vous me proposâtes consistait à me charger de négociations d'ordre diplomatique avec la Puissance Souveraine de l'Isthme de Panama et de recherches techniques supplémentaires sur le terrain traversé par le Bosphore artificiel Amé-

ricain dont l'exécution se trouvait si malheureusement suspendue.

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Ayant eu assez de bonheur pour mener à très bon port, à Bogota et dans l'Isthme, les unes et les autres, il faut espérer que le même succès couronnera les démarches à tenter en Europe et aux Etats-Unis pour grouper les immenses intérêts en jeu. En substituant des habitudes d'activité à celles qui semblent vouloir endormir pour quelques mois encore les bonnes volontés latentes, on peut arriver au sauvetage des capitaux engloutis à la légère et empêcher de péricliter définitivement, au grand dommage de l'amour-propre national, un des plus vastes projets de notre époque enfiévrée de progrès. Bien qu'il ne soit pas dans les attributions me concernant ici de m'occuper des mesures à prendre pour que ma réussite presque inattendue en Colombie ne demeure pas stérile, j'estime devoir déclarer que l'heure des résolutions viriles est venue, car je suis fermement convaincu que si des manœuvres souterraines, contre lesquelles il est temps de se prémunir, ne font pas échouer les combinaisons financières entrevues, l'infortuné public, en grande majorité français, si éprouvé par l'ancienne affaire de Panama, pourra retrouver bientôt, par l'achèvement du canal américain, une notable partie de son épargne si étourdiment dissipée.

Paris, le 2 mars 1891.

LUCIEN N. B. WYSE.

NÉGOCIATIONS POUR OBTENIR LA PROROGATION DU CONTRAT SALGAR-WYSE DE 1878.

Le contrat que j'avais signé à Bogota, en 1878, prévoyait bien dans certains cas une prorogation de six ans, et l'ancienne Compagnie du Canal Interocéanique, qui avait succédé conditionnellement aux droits que je représentais alors, avait manœuvré si maladroitement que, bien qu'ayant fait constater d'une manière officielle l'exécution de plus du tiers du Canal, il n'y avait guère à compter sur la bonne volonté du Gouvernement Colombien. Il fallait par suite retourner l'opinion du pays en commençant par celle de son plus influent citoyen, S. E. M. le Dr. Rafael Nunez, président titulaire retiré depuis quelque temps à Carthagène, sa ville natale, pour des raisons de santé et de tactique politique. Je me rendis donc dans cette ancienne métropole des Indes Occidentales, accompagné de mon jeune fils et d'un autre secrétaire, M. Subitte.

L'accueil que je reçus par ordre de M. Nunez fut du meilleur augure. Une canonnière de l'Etat, la *Popa*, vint me chercher à bord du paquebot la *Moselle*, qui avait fait escale spécialement pour moi devant les beaux remparts de la ville. Les voitures du Président en villégiature me conduisirent à une maison préparée à mon intention. Les entrevues que j'eus avec cet homme d'Etat furent très cordiales et je pus l'amener à diminuer les prétentions excessives pour concéder la prorogation qu'il avait fait exprimer à diverses reprises dans son journal *El Porvenir*, en lui prouvant que les Etats-Unis ne cherchaient pas à reprendre pour leur compte l'achèvement du Canal de Panama, en lui démontrant que les immeubles de la Compagnie en liquidation, revenant à la Colombie en cas de caducité, n'avaient de valeur que s'il y avait reprise des travaux et qu'enfin le matériel, comme tous les objets meubles, resteraient la propriété des créanciers-obligataires.

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Cédant malheureusement à des habitudes invétérées dont il est difficile à son âme ondoyante de se départir, M. Nunez fit publier dans son journal des articles fort élogieux pour moi, assez modérés au point de vue des exigences gouvermentales, en même temps que d'autres où il éblouissait ses compatriotes en faisant miroiter à leurs yeux des centaines de millions devant revenir à la Colombie comme héritage de la Compagnie du Canal. Il donna des ordres personnels pour que toute la presse officieuse reproduisit ses derniers articles et fit danser la même sarabande alléchante, surtout devant ses concitoyens de l'intérieur de la République.

Malgré la rapidité de mon voyage (dix jours), en remontant le Magdalena et en franchissant la Cordilière abrupte qui sépare ce large fleuve de la vaste savane élevée de 2,600 mètres où se trouve Bogota, malgré la bonne volonté et l'esprit éclairé de mon ami de vieille date, le président en exercice. S. E. M. le docteur Carlos Holguin, je ne tardai pas à ressentir l'influence du double courant qui avait fini par remonter des rivages de Carthagène aux hauts plateaux de Cundinamarca. Je dus perdre l'espoir, un instant caressé, d'obtenir par décret présidentiel, comme cela était à la rigueur possible, la prorogation de six années prévue au contrat. Il fallut me résigner à passer sous les fourches caudines du congrés, qui allait s'installer (20 juillet).

Obéissant au mot d'ordre, la presse faisait assaut de prétentions exorbitantes. Je fus obligé dès lors et bien à contre-cœur, de faire abstraction de mes vives sympathies pour un pays où je compte de nombreux amis, qui m'a donné de grandes marques d'estime et que depuis longtemps je suis habitué à regarder comme ma seconde patrie. Je publiai un exposé aussi ferme et méthodique que possible de la situation, après quoi je répondis à l'avalanche de millions qu'on demandait en repoussant toute intention d'acheter la prorogation et en réclamant à mon tour environ six millions de piastres pour diverses indemnités auxquelles je prétendais avoir droit ; une partie de cette réclamation, quoique inconnue du public et presque oubliée par le gouvernement, était d'ailleurs liquide et exigible immédiatement.

Il est certain que M. Nunez, auquel on ne saurait nier un esprit fertile en ressources, une adresse consommée dans le maniement des partis et une connaissance approfondie de son pays, fut d'abord favorablement impressionné par les conditions dont on lui faisait part, mais il eut le tort de ne pas vouloir paraître prendre la responsabilité d'en conseiller l'adoption. Cependant il doutait si peu du résultat qu'il prit la peine de vous faire télégraphier (1^er^ septembre), par l'entremise du général Aycardi, gouverneur de Panama, et de M. Ordonez, consul général de Colombie à Paris, que l'affaire de la prorogation était réglée d'une façon équitable. Bien que ce fait ait été nié plus tard, il est néanmoins patent ; du reste, personne ne le mit sérieusement en doute.

Ne recevant d'autres réponses que de courtes phrases sybillines à double entente, les sénateurs, qui étaient moins avancés dans le vote de mon contrat que ne le croyait M. Nunez, n'osaient pas prendre une décision. Le président Holguin, qui seul connaissait bien la question, avait beau leur donner en privé toutes les explications imaginables, ils ne pouvaient se décider à sortir de l'atmosphère d'exagérations bizarres créés surtout par les articles de M. Nunez dans *Le Porvenir* et acceptées comme des oracles par tout le Parlement avec une déférente docilité vraiment surprenante.

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Cet étrange imbroglio menaçait de se prolonger indéfiniment et je pris dès lors la résolution hardie de le faire cesser en provoquant au besoin une crise qui n'était pas sans présenter quelque danger. Je me mis à agiter l'Isthme de Panama au moyen de dépêches un peu alarmantes destinées à secouer la léthargie du pays, d'ailleurs évidemment favorable à la reprise des travaux. Sans aucun doute, il faut attribuer mon succès définitif à ce que, me rendant compte rapidement de la situation exacte, je manœuvrai, en conséquence, avec une décision frisant la témérité.

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Peu de jours après, et pour activer surtout le zèle très refroidi du ministre, je lui renouvelai sur papier timbré la demande de paiement des sommes exigibles dues sans conteste, et le chargé d'affaires de France, auquel j'avais écrit officiellement à ce sujet, voulut bien lui parler ensuite de ma réclamation. Je n'ai jamais cru qu'il soit bon de dissimuler son but ou sa personnalité derrière un écran, et j'ai pour principe que l'attaque est le meilleur des systèmes défensifs.

Je réussis en effet à vaincre de la sorte l'inertie habituelle aux hommes des hauts plateaux, quitte à passer momentanément à leurs yeux pour un diplomate rude et anguleux. J'ai lieu de croire du reste, par les lettres officielles reçues depuis, que les procédés un peu cavaliers dont il m'a fallu user par nécessité me sont déjà pardonnés ; la grandeur du but poursuivi, l'ardeur de mon prosélytisme, qui contraste tellement avec la mollesse reprochée à d'autres individualités, leur a servi sans doute de justification et d'excuse. On paraît faire état en Colombie sur mon concours ultérieur à l'œuvre du canal, comme de mon côté je pense pouvoir compter sur l'estime des habitants de ce beau pays.

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Le 10 décembre au matin j'avais écarté tous dangers pour l'avoir des anciens intéressés de la Compagnie de Panama; le président Holguin lui-même, nonobstant sa bienveillance personnelle accoutumée, commençait à trouver ma résistance excessive et me menaça de dissoudre le Congrès le lendemain si je ne terminais pas promptement mon entente avec son gouvernement. J'avais tenu compte à l'avance de toutes les observations que vous m'aviez fait parvenir antérieurement, et malgré la désinvolture avec laquelle je bataillais, je ne pouvais plus risquer de tout perdre pour une question de forme; aussi, bien que n'ayant pas de câblegramme explicite de vous, je pris sur moi, selon l'avis pressant du chargé d'affaires de France et comme m'y autorisait d'ailleurs le texte même de mes pouvoirs notariés, de signer enfin le traité débattu sans prolonger davantage une situation très tendue et d'autant plus épineuse que le Congrès comptait à peine le nombre de membres exigé par la Constitution pour la validité des décisions. Je me trouvais par suite à la merci du moindre incident venant empêcher la présence d'un député quelconque et du même coup rendre impossible le vote à émettre avant la réunion du nouveau Parlement qui n'a lieu que tous les deux ans. J'apposai donc ma griffe ledit jour à trois heures sur cet important document et le contrat Roldan-Wyse, heureux et indispensable complément de celui Salgar-Wyse, de 1878, fut envoyé séance tenante au Sénat.

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Les débats à la Chambre Haute furent prestement enlevés et, dès le 16 décembre, le contrat de prorogation passait sans modification à la Chambre des représentants où le ministre Roldan, M. le docteur Amador, etc., eurent à le défendre contre les attaques inopinées et téméraires de certains députés froissés dans leur amour-propre de clocher, mais que leur origine et la volonté de leurs mandants devaient faire croire favorables au percement de l'Isthme colombien

Le 20 décembre, la loi n° 107 était finalement votée en troisième débat à la Chambre sans changements d'aucune sorte. Je reçus d'universelles félicitations, même de la part de ceux qui, directement ou non, avaient été hostiles à l'affaire que je poursuivais. Les ministres étrangers, quelque peu étonnés du succès final, télégraphièrent chacun à leur gouvernement respectif les conditions excellentes que j'avais obtenues pour la prorogation. Ce ne fut pourtant que le 26 décembre qu'elle put être soumise à l'approbation définitive du chef de l'Etat. L'exemplaire original de ladite loi (revêtue des sceaux de la nation, portant les signatures authentiques des présidents et secrétaires du Sénat et de la Chambre, approuvée par S. E. le président de la République et contresignée par le ministre des affaires étrangères), fut dûment légalisé par les chefs des diverses légations accréditées auprès du cabinet de Bogota. Il peut faire foi dans tous les pays.

Certaines personnes, peu habituées aux choses hispano-américaines, s'étonneront peut-être que la Colombie ait manifesté des exigences pécuniaires pour permettre l'excavation, à travers son territoire, d'un Canal devant augmenter considérablement son influence parmi les Nations du monde ; mais il y a lieu de rappeler que le percement de l'Isthme de Panama lui imposera certaines charges nouvelles auxquelles les finances assez obérées de cette jeune République ne sauraient faire face utilement sans compensations. D'ailleurs, au point de vue légal pur, il n'est pas douteux que le retard dans l'exécution des engagements de l'ancienne Compagnie donnait à la Nation le droit strict de stipuler certains dédommagements peu soutenables, il est vrai, au point de vue chevaleresque des sentiments moraux. Il est fort probable que les choses ne se seraient pas passées ainsi si l'on avait eu la précaution de demander, en temps opportun, la prorogation prévue au contrat de 1878. Alors que l'ancienne Compagnie était encore debout, l'obtention du second délai de six années eût été plus facile et moins onéreuse. On ne peut donc regretter que le manque de prévision de l'Administration si incohérente qui s'est effrondrée en décembre

1888 et se féliciter de n'avoir pas eu à promettre de payer plus cher pour essayer de réparer ses déplorables erreurs.

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Les suffrages si exceptionnellement chaleureux qu'on a déjà prodigués dans l'isthme tout entier, depuis son arrivée à Colon et à Panama, à l'homme s'obstinant encore à vouloir marier les eaux de l'Atlantique à celles du Pacifique et qui aux yeux des populations de cette partie de l'Amérique après avoir été le chercheur opiniâtre du *secret du détroit*, apparaît comme un des derniers champions de cette idée grandiose, lui ont presque fait oublier toutes ses fatigues. L'accueil vraiment royal, le sympathique et cordial enthousiasme des personnes placées aux premières loges pour se rendre bien compte des difficultés innombrables dont il a fallu triompher afin de permettre la terminaison de la colossale entreprise à laquelle j'ai dévoué tant d'années, est en effet, pour moi une des plus enviables récompenses.

Je me déclarerai entièrement satisfait si mes efforts, secondés par l'opinion publique, servent à préparer la revanche si nécessaire à la bonne renommée française en secouant l'apathie préméditée de personnages que la lumière semble effrayer. Je n'ai pas qualité actuellement pour d'autre rôle, mais je suis persuadé que cela contribuera à hâter l'aurore du jour, à jamais mémorable, où les navires de toutes les nations maritimes pourront franchir l'étroite, mais rude barrière, que la nature interpose encore entre les deux vastes Océans baignant à la fois les côtes de très riches régions, imparfaitement développées, et celles des pays les plus avancés et les plus prospères du globe.

Panama, le 21 janvier 1891.

Études complémentaires techniques.

Pendant que M. Wyse poursuivait les négociations avec le président et les ministres de Colombie, deux ingénieurs qu'il avait emmenés avec lui, MM. Jacquemin et Sosa, s'étaient mis à l'œuvre, sur place, aidés de tout le personnel de la liquidation dans l'isthme, pour procéder à des études complémentaires techniques. Les deux ingénieurs à qui M. Wyse avait confié ces études sont d'ailleurs deux personnalités d'un mérite éprouvé, possédant une expérience consommée du problème à résoudre ainsi que des difficultés provenant des pays chauds et connaissant à fond l'isthme de Panama où ils avaient exécuté de grands travaux.

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L'un d'eux, M. l'ingénieur P. J. Sosa, chevalier de la Légion d'honneur, avait été, avec M. le lieutenant de vaisseau Armand Reclus, notre infatigable compagnon d'exploration au milieu des dangers de la forêt vierge et le plus précieux des collaborateurs dans les expéditions que j'avais commandées pendant plusieurs années au Darien, à San Blas et à Panama ; il avait été ensuite chef du bureau technique de la Compagnie d'exécution du canal dans la période d'études, puis chargé de diverses entreprises locales.

L'autre, M. l'ingénieur E. Jacquemin, sorti le premier de sa promotion de l'École centrale, avait complété sa brillante instruction professionnelle par la pratique acquise en Egypte, en Russie, etc., puis il avait installé avec un coup d'œil magistral les vastes chantiers d'Emperador, de beaucoup les mieux organisés de l'isthme.

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Les observations de mes collaborateurs sont appuyées sur un volumineux dossier technique qui contient des documents absolument nouveaux. Certains détails manquaient encore à la commission d'études lorsqu'elle publia, au mois de mai dernier, ses remarquables conclusions. Elle insistait d'ailleurs sur la nécessité de les obtenir pour fixer divers points. Les récentes recherches effectuées ont conduit à de légères modifications dans l'ensemble du projet et ont amené à constater des diminutions de cube qui ont eu pour résultat de concourir avec diverses simplifications et le rabais de quelques prix unitaires d'application, à des économies assez notables sur le devis général.

Les expériences sur le transport des déblais par l'eau courante, dues surtout à M. l'ingénieur Jacquemin, permettent en outre d'espérer que le massif central pourra être enlevé en cinq ans, y compris la période d'installation. En comptant même six, il résulterait néanmoins de ce chef une nouvelle épargne sur les charges financières calculées pour une durée de huit ans, par suite de la réduction des intérêts intercalaires.

Les appréciations de MM. les ingénieurs Jacquemin et Sosa au sujet du prix de revient pour l'achèvement du Canal de Panama dans des conditions très satisfaisantes se trouvent établies théoriquement dans le rapport ci-dessus, mais il faut remarquer en outre qu'elles s'appuient d'une manière indiscutable sur une longue pratique personnelle locale. Ils ont pu, en effet, en des circonstances cependant fort difficiles et qui vraisemblablement ne se reproduiront plus, réaliser des bénéfices en effectuant plusieurs millions de mètres cubes aux prix indiqués. Ils seraient prêts au besoin à soumissionner aux mêmes conditions. Aucun raisonnement, aucune autorité ne sauraient démontrer d'une façon plus péremptoire la justesse de leurs estimations.

Les prévisions de la commission d'études dictées par une prudence excessive bien naturelle chez des hommes ne connaissant que superficiellement l'isthme américain, ont atteint, pour les terrains à exproprier, six fois la valeur du forfait que j'ai pu obtenir récemment d'un syndicat d'habitants de Panama et de Colon offrant toute garantie. La disproportion ne pouvait être aussi forte pour le prix des terrassements, elle diminue encore pour celui des ouvrages d'art ; à mesure que la compétence générale prend plus d'importance que l'expérience locale, l'écart est moins grand. Du reste, en conservant la marge si forte fixée par la commission pour les frais généraux, dépenses imprévues, intérêts, etc., (plus des deux tiers en sus du prix initial), on doit se considérer comme à l'abri de toute déception et foi entière peut être ajoutée au devis présentés pour les deux variantes proposées, dont une surtout qui offre des conditions, à mon sens, exceptionnellement avantageuses va m'occuper ci-après d'une manière plus spéciale.

En effet, à la suite de mon nouveau séjour dans l'isthme, de l'étude et de la discussion du rapport précité, des résultats obtenus par les derniers sondages

et les recherches prescrites, des observations personnelles faites derechef sur le terrain, je suis amené à recommander en première ligne la variante la plus brillante à la fois, avec un seul bief surélevé d'alimentation constitué au moyen d'un lac central artificiel unique d'environ 9,000 hectares d'étendue, à une altitude ne dépassant jamais la cote + 30, auquel on aurait accès par une écluse de trois écluses accolées, à double sas, réunies en un seul groupe sur chaque versant, l'un à Bohio-Soldado, l'autre à Pedro-Miguel. Les dispositions générales de ce projet de canal, qui se rapproche autant que possible du Bosphore à niveau, c'est-à-dire de l'idéal rêvé, sont résumées dans le tableau ci-après :

Situation des biefs.	Numéros d'ordre des biefs.	Limite des biefs.	Altitude des biefs par rapport au niveau moyen der mers. Minima.	Maxima.	Longueur des biefs.	Numéros des écluses	Hauteur de chute des ecluses géminées.		OBSERVATIONS.
Versant Atlantique ..	1. Partie maritime	Du k. 0,000 au 23,590	0^m00	0^m00	23 k.590				
						1re	8^m	Echelle Atlantique.	Quand le niveau du lac sera à la cote d'étiage (28^m 50) les écluses 3 et 4 fonctioneront avec des chutes de 9^m50 seulement.
Bief de partage	2. Lac (bief supérieur d'alimentation servant à emmagasiner et régulariser les crues).	Du k. 24,350 au 59,100	28,50	30,00	34 k.750	2e	11^m		
						3e	11^m		
						4e	11^m	Echelle Pacifique.	
						5e	11^m		
						6e	De 5 à 11^m		
Versant Pacifique ...	3. Partie maritime	Du k. 59,860 au 75,000	— 3,00	+ 3,00	15,140				

La solution préconisée présente donc toute garantie au point de vue de la sécurité. Elle ressemble beaucoup à celle que M. l'Ingénieur en chef des ponts et chaussées de Lépinay appuya de son savoir professionnel, dès 1879, en prenant pourbase nos travaux, à laquelle je m'associai dès lors comme au plus économique et au meilleur dénouement subsidiaire, que je défendis dans mes livres à diverses reprises et que j'envisageai, il y a déjà près de six ans, comme devant s'imposer fatalement au lieu du canal à niveau, d'ailleurs si désirable, par suite des dépenses exagérées faites par l'ancienne Compagnie, du temps inutilement perdu et des difficultés financières qui en étaient la conséquence. Quelques personnes, dont l'une surtout, sans même connaître le terrain, compensait son manque absolu d'autorité par une agitation tapageuse et une publicité de mauvais aloi, ont bien essayé d'accaparer la priorité de ces propositions et de s'en attribuer le mérite, mais il y a lieu de croire que bonne justice sera faite à cet égard par l'opinion publique et que l'antériorité de nos travaux sera reconnue, proclammée et reviendra à qui de droit.

La réponse au problème est aujourd'hui plus complète, plus précise, les études de la commission et nos recherches complémentaires ayant permis d'écarter la plupart des inconnues qui subsistaient autrefois, jamais le projet de canal interocéanique n'a été étayé sur des bases aussi sérieuses. S'il reste encore des détails à fixer, rien n'empêchera de le faire en cours d'exécution, car si nous pouvons affirmer que la solution est possible au moyen des grandes lignes indiquées, nous ne saurions trop répéter que nous n'avons pas la prétention d'interdire les améliorations, surtout en ce qui concerne les barrages et déversoirs.

Nous espérons même que pendant les deux premières années de l'attaque bien plus urgente du massif central de la Culebra, on aura tout le temps d'en introduire relativement au mode de construction et au meilleur emplacement de ces ouvrages d'art. Nous pensons avoir mis les choses au pis et nous sommes convaincus que l'avenir fera plutôt éprouver des surprises agréables que des déceptions. En d'autres termes, nous prétendons avoir résolu la question d'une manière très acceptable ; mais il peut y en avoir d'autres, encore plus satisfaisantes, que nous n'avons fait qu'entrevoir et dont la réalisation nous sourirait beaucoup, car elles se traduiraient par des économies sensibles et des progrès réels dans les détails de la variante que nous proposons.

De même que nous estimons avoir quelque peu amélioré l'ensemble du projet, cependant si bien élaboré de la commission, il y a lieu de croire que des études poursuivies avec plus de temps et des moyens plus considérables que ceux dont nous disposions, pourraient amener des diminutions dans le devis et d'heureuses innovations dans les procédés à suivre et les difficultés à surmonter.

En ce qui concerne les barrages, qui eux ne seraient jamais couverts par la lame déversante, il est bon de rappeler que M. l'inspecteur général des ponts et chaussées Krantz est d'avis qu'en atteignant 30 mètres de retenue, les barrages en remblai sont plus avantageux que ceux en maçonnerie.

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En outre, M. Wyse cite à l'appui de son dire diverses autorités et un grand nombre d'exemples déjà mis en pratique.

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Les alluvions des eaux limoneuses du Chagres, très suffisantes pour colmater les remblais et assurer

leur étanchéité, n'auront qu'une importance minime sur la capacité de la réserve formée par les barrages. Ce fleuve, d'après diverses autorités, ne charrie pas plus de 40 grammes de matières terreuses par mètre cube et il n'en dépose guère que 30 environ. Le débit annuel étant approximativement de 2 milliards de mètres cubes, le dépôt sédimentaire ne dépassera pas 60,000 tonnes par an qui, à raison de 1.70 de densité moyenne correspondent à 35 ou 36,000 mètres cubes. En admettant même une proportion décuple des troubles charriés, il faudrait donc plusieurs siècles pour que la diminution de la contenance du lac artificiel devint pratiquement appréciable et de ce chef encore il n'y a aucune crainte à concevoir.

L'emplacement choisi pour grouper les trois écluses sur chaque versant présente toutes les facilités désirables, comme les dernières recherches l'ont surabondamment prouvé. Le sol de fondation, pour les écluses extrêmes, y est en moyenne préférable à celui de Pena-Blanca et de Miraflores. La suppression de deux biefs très courts est un avantage marqué au point de vue de la navigation et de la manœuvre. La réunion, en un seul chantier, des ouvrages d'art à construire ne peut que rendre la surveillance plus efficace et moins coûteuse. En outre, du côté Pacifique surtout, cela diminuera assez sensiblement la longueur de la déviation du Panama Rail Road.

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Il s'agit, on le voit, d'un canal à six écluses avec un lac central artificiel unique, déjà préconisé en 1879 et 1886 par M. Wyse comme la meilleure des solutions subsidiaires pouvant donner toutes satisfactions tant pour les facilités du trafic que pour l'économie de l'ensemble du projet.

Quant au programme de réorganisation des travaux, voici ce que dit M. Wyse :

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Nous pensons que pendant la première année on devrait : 1 réparer le matériel à utiliser et les installations existantes ; 2 attaquer la partie supérieure de la grande tranchée. faire les puits, creuser le tunnel et préparer la pose de la conduite pour le transport des déblais ; 3 continuer les études définitives détaillées pour les ouvrages d'art : 4 enfin et surtout exécuter les travaux d'assainissement et d'aménagement nécessaires pour empêcher les dommages occasionnées par les eaux dans les parties déjà excavées.

Pendant la seconde année on devrait : 1 approfondir les travaux d'excavation de la Culebra ; 2 draguer l'extrémité Atlantique du canal et enlever, du côté Pacifique, le seuil restant encore vers le kilomètre 63,500 ; 3 relever de 5 mètres le plan d'eau du Chagres dans le cas où l'on croirait utile d'installer, pendant la saison sèche, les pompes de refoulement, établir les conduites d'alimentation, achever d'installer celle d'évacuation et commencer à la faire fonctionner.

La première année comportera une dépense d'environ 30 millions de francs ; il faut prévoir le double pour la seconde. C'est seulement alors, et une fois toutes les inconnues dégagées, qu'on pourra donner une organisation efficace et permanente aux travaux. Vers cette époque, le crédit de la nouvelle Compagnie sera sans doute entièrement rétabli, et il sera plus facile, par suite, d'obtenir à un taux modéré les capitaux indispensables à la terminaison de l'œuvre.

Les années suivantes devront être consacrées à l'enlèvement du massif central et à la construction des écluses, barrages et déversoirs. Si rien ne vient retarder d'une façon malencontreuse la marche des travaux, il est probable que cinq ans suffiront au percement de l'isthme américain. Quant aux dépenses, elles suivraient vraisemblablement, dans ce cas, une progression annuelle assez régulière de 30 millions.

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Le métré avec plafond du canal à la cote 20 a été calculé de profil en profil avec l'approximation accoutumée, mais pour ne pas affecter une rigueur un peu exagérée quand il s'agit de pareilles masses à remuer, je n'ai voulu tenir compte que des milliers de mètres cubes en forçant toujours à l'unité immédiatement supérieure. Les divisions en trois biefs et les subdivisions de ceux-ci suivant la nature des terrains ont été ramenées aux profils dressés à Panama et vérifiés avec le plus grand soin à diverses reprises.

L'ensemble des terrassements (environ 42 millions de mètres cubes) correspondent à 210 millions de francs, les ouvrages d'art et autres accessoires comportent une dépense de 132 millions, les sommes à valoir, imprévus, divers, etc. (20 o/o des travaux prévus), 68,400,000, les frais généraux (10 o/o) 34,200,000, enfin les forfaits pour expropriations et pour indemnités au gouvernement colombien ensemble 20 millions, en tout 464,600,000 francs auxquels il convient d'ajouter, ainsi que l'indique la commission avec sa prudence habituelle, 29 o/o pour les charges financières (frais d'émission, intérêts), c'est-à-dire près de 136 millions, ce qui forme un total de 599,334,000 francs, soit 600 millions en nombres ronds.

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Et alors M. Wyse donne le devis détaillé et général des ouvrages et des dépenses établi après quatre vérifications minutieuses, que nous pouvons résumer ainsi :

Total des terrassements : 42 millions de mètres cubes au prix moyen de 5 francs le mètre, soit	Fr.	210.000.000
Dépenses des ouvrages d'art		119.000.000
Déviation du chemin de fer		12.000.000
Eclairage électrique		1.000.000
Prévisions de la commission d'études pour imprévus et frais généraux (30 o/o du total des travaux)		102.000.000
Expropriations d'après *forfait convenu et arrêté*		6.000.000
Contrat du gouvernement colombien et subsides militaires		14.000.000
Charges financières (Frais d'émission 5 o/o Intérêts 24 o/o)		134.734.000
Soit en arrondissant	Fr.	600.000.000

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600 millions : tel est le capital maximum reconnu aujourd'hui nécessaire pour l'achèvement si désirable du Canal interocéanique afin de créer à travers l'isthme de Panama, par la submersion partielle des vallées du Chagres et du Rio-Grande, une voie

offrant pleine sécurité aux navires et capable de desservir un trafic très rémunérateur.

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Et M. Wyse conclut ainsi son rapport :

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La durée du transit sera de seize heures environ, dont moitié pour franchir les deux échelles d'écluses. Le lac artificiel formera, dans d'admirables conditions à tous les points de vue, un port intérieur où l'on pourra naviguer à grande vitesse, ce qui fera regagner en partie le temps nécessaire au passage des deux escaliers hydrauliques. Ce sera un véritable bassin à flot de vaste dimension dont l'accès, par une échelle de Neptune monumentale, ne sera guère plus difficile que celui de la plupart des ports à marée fréquentés par le commerce universel.

Les navires auront près de douze heures à rester immergés dans l'eau parfaitement douce des écluses et du lac au grand profit de la propreté de leur carène et par suite de leur marche ultérieure ; ceux à vapeur trouveront des facilités spéciales pour le nettoyage des tubes de chaudières incrustés de dépôts salins à la suite d'une navigation maritime prolongée ainsi que pour le remplissage de leurs appareils générateurs, de tous leurs réservoirs, etc., avec l'eau d'excellente qualité provenant du lac créé. Ce seraient là des avantages sérieux, fort appréciés de tous les marins et de nature à compenser le retard de quelques heures imposé par l'ascension du bâtiment à une côte d'altitude d'ailleurs très modérée.

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Plus tard, on complétera, au fur et à mesure des besoins, certaines améliorations susceptibles d'ajournement au premier rang desquelles il faut compter l'outillage des ports de Colon et de Panama et de quelques autres ouvrages d'importance secondaire dont l'exploitation révélera sans doute l'utilité et qui d'ailleurs constitueraient alors une source de profits non négligeables. Par les considérations sommaires qui précèdent, on peut donc espérer qu'on aura, avant la fin de ce siècle, un revenu suffisant pour assuser des bénéfices raisonnables à la nouvelle Société d'achèvement, tout en prélevant une part proportionnelle progressive pour être distribuée aux anciens intéressés afin de les indemniser, dans la mesure du possible, des sacrifices qu'ils ont faits et de leur apport constitutif si utile.

Si la primitive affaire de Panama a donné des déboires, il ne peut être douteux, pour les esprits réfléchis, que la seconde, profitant des écoles commises, sera des plus brillantes pour les capitaux qui oseront s'y engager. C'est du reste généralement le cas dans les entreprises de très grande envergure : là où les pionniers subissent des déceptions, les ouvriers de la douzième heure récoltent avec aisance des fruits abondants, justifiant ainsi cette parole de l'Evangile : *Les derniers seront les premiers.*

La situation de l'isthme a notablement changé. Panama, les villages de la ligne et Christophe-Colomb ont fait de grands progrès. La région, beaucoup plus cultivée qu'autrefois, s'est assainie ; les déboisements nombreux, les constructions nouvelles, l'asséchement des marais exercent une heureuse influence sur le climat et ces faits ont une importance incontestable.

A peine l'eau potable sera-t-elle répandue avec moins de parcimonie que la ville de Panama gagnera encore énormément au point de vue hygiénique, et deviendra, entre toutes les localités avoisinantes, une des plus agréables à habiter. Quant à celle de Colon-Aspinwal, elle se relèvera bientôt de l'incendie qui l'a dévorée en partie en septembre 1890. Les personnes bien informées ne contestent plus que la santé publique n'y soit notablement améliorée, surtout depuis la catastrophe de 1885, qui a forcé ses édiles à de si indispensables et heureux perfectionnements.

Je m'associe entièrement aux conclusions émises dans le remarquable rapport technique de la commission d'études, en ce qui concerne la nécessité d'une direction unique et le danger que présentent les grandes entreprises. La future administration doit être soucieuse d'esquiver le retour des fautes antérieures, elle doit, elle peut : 1° profiter de l'expérience du passé ; 2° éviter l'imprévoyance fatale qui, au point de vue financier surtout, a amené tant de gaspillages de tous genres ; 3° se débarrasser des influences néfastes qui ont si lourdement pesé sur l'ancienne Compagnie ; 4° se servir par contre du petit nombre d'hommes éprouvés moralement et physiquement qui ont résisté avec énergie au climat de l'isthme et qui ont su se montrer à la hauteur de leur tâche ; 5° suivre systématiquement l'ordre d'exécution des travaux imposés par la nature des lieux, en écartant toutes les mauvaises chances pour ceux moins urgents et plus délicats, au moyen d'études de détails bien menées ; 6° enfin avoir toujours présent à l'esprit qu'un effort aussi gigantesque doit être constamment conduit avec une vigilante sagesse n'excluant pas cependant l'audace des conceptions ou l'adoption des méthodes progressistes.

Or, malgré l'expérience si chèrement payée, c'est là que gît la véritable difficulté, car pour faire marcher une pareille entreprise, il faut surtout savoir diriger, c'est-à-dire *prévoir*, et ils sont peu nombreux ceux qui auront les connaissances spéciales voulues, la pratique suffisante des hommes, des localités et des choses ainsi que la vigueur de corps et d'esprit permettant d'embrasser d'un coup d'œil clair l'ensemble de cette œuvre prodigieuse, honneur de notre époque, et que le dix-neuvième siècle expirant jettera avec orgueil aux générations futures comme le plus bel exemple de vitalité que garde encore notre vieille race lorsqu'elle est soutenue par une pensée humanitaire généreuse, basée sur une idée juste, féconde, utile et destinée à coup sûr aujourd'hui à devenir éminemment productive.

En mer, le 18 février 1891.

LUCIEN N. B. WYSE.

I heartily congratulate Mr. Lucien N. B. Wyse, for the success of his Negotiations with the Colombian Government and I hope that Mr. A. Monchicourt will be as successful in coming to terms with a new Company, willing to undertake the termination of the Canal, and will do his utmost in favour of the hundreds of thousands of the original Share and Bond Holders.

THE EDITOR.

Books received.

Annual Reports of the Fruit Growers' Association and Entomological Society of Ontario, 1890. The first part of this very interesting Volume contains reports on all the fruits grown in Canada and how to make money with them. The second part contains a quantity of woodcuts representing many Insects injurious to Agriculture and how to get rid of them.

The Antigua Observer, two copies of No. 15, 1891.

The Canadian Entomologist, April 1891.

The Kansas City Scientist, April 1891.

Les Odonates du Japon par Mr. de Selys Longchamps. Viaggio di Leonardo Fea in Birmania regioni vicine, Odonates, par M. de Selys Longchamps. Two very interesting pamphlets on Dragon Flies.

Notice bibliographique de M. Edm. de Selys Longchamps, Membre de l'Académie royale des Sciences de Belgique.

Extrait de la Bibliographie académique. In this extract we can see that the venerable zoologist, Baron de Selys Longchamps, during the space of 56 years, 1831—1886, has published 214 pamphlets on Birds, Mammals, and Insects, containing a very large quantity of descriptions of new species and very interesting notes on many. Baron de Selys Longchamps, now in his 78th year, is still working like a young man, and I hope that he will be able to do so yet for a long time.

With thanks,

THE EDITOR.

List of stuffed Birds for Sale.

	s.
Tinamus major, G.	30
Crypturus variegatus, G. ...	15
Otis tarda, L. (cited in Vieillot works)	100
— Tetrax, L.	10
Eupodotis denhami, C.	200
Sypheotis bengalensis, M. ...	50
Afrotis afra, G.	50
Sypheotides macqueeni, G. ...	40
Cariama Cristata L.	100
Psophia crepitans, L.	30
Chauna chavaria, L.	80
Opisthocomus cristatus, L. ...	30
Penelope obscura, V.	30
Ortalida motmot, L.	20
Oreophasis derbiana, G. R. G.	100
Crax alector, L.	50
Polyplectron chincquis ...	40
Phasianus colchicus, L. ...	20
— torquatus T. ...	20
Chrysolophus pictus, male ...	20
— — female ...	15
— amherstiæ, male ...	50
— — female ...	20
Acomus erythropthalmus, R. . .	16
Gallus sonnerati, T.	20
Creagrius varius, S.	20
Ceriornis satyra, E. male ...	20
Meleagris americana, B. ...	80
— ocellata, C.	100
Tantalus ibis, L.	25
— religiosus, L. ...	2
Ibis rubra, L.	12
— falcinellus, L.	10
Carphibis spinicollis. J. ...	50
Hagedashia bishagedash, L. ...	25
— *chalcoptera, Vieill, typical* ...	50
Theristicus albicollis „ ...	50
Dromas ardeola, P.	20
Ardea cinerea L.	12
— melanocephala, V. ...	12
— major, L.	12
— purpurea, L.	12
Herodias egretta, G.	12
— garzetta, L.	12
— pealei, B.	12
Florida cœrulea, L.	12
— tricolor, M.	20
Agamia agami, G.	20
Bubulcus ibis, H.	10
— speciosus, India ...	8
Ardeola comata, P.	10
Ardetta minuta, L.	6
— exilis, L.	6
— scapularis	8
Zebrilus undulatus, G. ...	8
— philippensis	8
Butorides virescens, L. ...	10
Botaurus stellaris, L.	12
— lentiginosus	12
Tigrisoma brasiliense, L. ..	12
— tigrinum, G. ...	12
Nyctiardea europea, S. ...	10
— ardeola	10
Nyctherodius violaceus, L. ...	10
Pilherodius pileatus, B. ...	12
Scopus umbretta, G.	12
Canchroma cocklearia, L. ...	20
Ciconia alba, B.	40
— *maguari*, G.	50
Menanopelargus nigra, L. ...	50
Xenorhynchus indica, L. ...	30
Leptoptilos crumeniferus, C. ...	80
Cranopelargus javanicus, H. ...	80
Platalea leucorodia, L. ...	20
— ajaja, L.	12
Grus cinerea, B.	40
— antigone, male	60
— leucogeranus, P. ...	80
Anthropoides virgo, L. ...	60
Balearica pavonina, L. ...	80
Phœnicopterus antiquorum, T.	50
Phœnicorodias ruber, L. ...	40
Sarkidiornis melanonotus, P. .	40
Plectropterus gambensis, L. ...	50
Anser segetum, G.	20
— brachyrynchus, B. ...	25
— albifrons, G.	50
Marilochen erythropus L. ...	20
— minutus	20
Chen hyperboreus, Pall. ...	80
Branta bernicla, L.	20
Chlamidochen jubata, L. ...	20
Leucopareia leucopsis, B.	20
Rufibrenta ruficollis, P. ...	100
Chloephaga magellanica, G. ...	40
Bernicla leucoptera, G. ...	50
Nettapus madasgariensis G. ...	12
— coromandelicus, L. ...	10
Cygnus olor, G.	50
— nigricollis, G. ...	50
— musicus, B.	50
— minor, P.	50
Chenopis atratus, L.	60
Dendrocygna arcuata, C. ...	10
— major J. ...	10
— viduata, L. ...	10
— autumnalis, L.	10
— mexicana, L. ...	10
Tadorna cornuta, G.	15
Casarca rutila, G.	10
Aix sponsa, L.	12
— galericulata, L.	12
Mareca penelope, L.	12
— americana, G. ...	12
— chiloensis, K.... ...	20
Dafila acuta, L.	12
Poeciloneta bahamensis, L. ...	16
Anas boschas, L.	10
— cristata, G.	16
— *gloscitans*, P.	50
Querquedula cœruleata, L. ...	6
— discors, L. ...	5
— *falcata, G. (type.)*	100
Nethon crecca, L. ...	8
torquata, V. (*type.*) ...	50
formosa, G....	50
Chaulelasmus strepera, L. ...	10
— marmoratus, T.	10
Marmonetta angustirostris, M.	12
Spatula clypeata, L.	10
Fuligula rufina, V.	16
Fulix rufitorques, B.	16
— marila, L.	10
— *affinis, E. (Labrador.)* ...	50
Aythya ferina, L.	10
— nyroca, G.	8
Bucephala barowi, D. ...	50
— clangula, L. ...	10
— albeola, L. ...	10
— *histrionica, L.* ...	50
Harelda glacialis, L.	12
Stelleria dispar, S.	50
Somateria *mollissima* L, ...	50
— *spectabilis, L.* ...	60
Oidemia nigra, L.	10
Pelionetta perspicillata, L. ...	40
Melanitta fusca, L.	30
Erismatura leucocephala, S. ...	10
Mergus serrator, L.	15
— merganser, L, ...	16
Lophodytes cucullata, L. ...	20
Mergellus albicollis, L. ...	20
Colymbus glacialis, L. ...	20
— articus, L. ...	40
— septentrionalis, L. ..	20
Podiceps cristatus, L.	10
... rubricollis, L. ...	8
Dytes auritus, L.	8
— cornutus, G.	10
Proctopus nigricollis, S. ...	12
Rollandia leucotis, C. ...	12
Sylbeocyclus minor, L. ...	5
Podiceps carolinensis, L. ...	8
Mormon fratercula, C. ...	16
— grabæ, B, ...	12
— glacialis, L.	20
Utamania torda, L.	12
Cheniscus cirrhatus, G. ...	25
Simorhynchus cristatellus, P.	12
Phaleris nodirostris, P. ...	20
Spheniscus chrysocomus, T. ...	50
Aptenodytes patagonica, P. ...	100
Brachyramphus antiquus, L. ...	16
Uria grylle, L.	6
— troile, L.	10
— brunicki, L.	20
— lachrymans, L.	16
Artica alle, L.	6
Puffinus major, F.	10
— fuliginosus, S. ...	8
— anglorum, C. ...	10
— obscurus, G. ...	20
— cinereus, S.	12
— yelcuanus, A. ...	30
Procellaria pelasgica, L. ...	10
— leucorhoa G. ...	15
Pelagodroma fregata, L. ...	50
Fulmarus glacialis, L ...	30
Cookilaria cooki, G.R. Gr. ...	30
Daption capensis, L. ...	12

LIST OF STUFFED BIRDS FOR SALE.—*(Continued.)*

	s.
Prion magnirostris, G. ...	200
Diomedea exulans, L. ...	100
Thalassarche chlororhynchas, G.	80
Stercorarius parasiticus, L. ...	20
Coprotheres pomarinus, T. ...	25
Megalesthris catarractes, L. ...	10
Larus maximus, L. ...	20
— peyreaudi Vieill, ...	20
— tenuirostris, C.	15
— cirrhocephalus, V. (typical sp.)	20
— canus, V.	12
— flavipes, M.	12
— Richardsoni, W. ...	16
— bonapartei, S.	20
Gabianus pacificus, L. ...	30
— marinus, L. ...	20
Clupeilarus fuscus, L. ...	20
Leucus glaucus, B.	30
— leucopterus, F. ...	25
Laroides michaelis, B. ..	16
Adelarus leucopthalm ...	25
— icthyaetus, P. ...	50
Chroicocephalus ridibundus, L.	8
— capistratus, T. ...	10
Atricilla atricilla, L. ...	8
Melagavia melanocephala, N.	20
Hydrocoloeus minutus, P. ...	20
Pagophila eburnea, G. ...	50
Rissa tridactyla, L. ...	8
Sterna hirundo, L.	8
— *lactea, alba V.* ...	100
— leucopareia, N. ...	10
— nigra, S.	30
— dougalli, M.	16
Gelichelidon anglica, Mont. ...	12
Actochelidon cantiaca, G. ...	10
— affinis, R.	12
— arctica, A.	20
Thalasseus caspiae, P ...	20
— bergi, L.	20
Sternula minuta, L.	6
Hydrochelidon fissipes, L. ...	6
— fuliginosa, G. ...	16
Anous stolidus, L.	10
Naenia inca, L.	40
Rhyncops nigra, L.	12
Phaeton aethereus, L. ...	25
— phœnicurus, G. ...	30
— candidus, G. ...	25
Plotus anhinga, L.	10
— levaillanti, L. ...	16
Carbo cormoranus, M. ...	16
— sp. N. Zealand ...	16
— Desmaresti, P. ...	20
— albicollis, ...	16
— gaymardi, L. ...	40
— cristatus, F. (Island)	20
Pelecanusonocrotalus, L. ...	80
— crispus, B.	100
Atagen aquila, L	50
Polyborides radiatus, S. ...	20

	s.
Circus cyaneus, L.	8
— Swainsoni, S. ...	16
— cinerascens, S.	8
— — S. (black variety)	30
— aeruginosus, L. ...	10
Melierax polyzonus, R. ...	20
Astur palumbarius, L. ...	16
— badius, G....	6
— soloensis, L.	12
— novae hollandiae, G. ...	20
Accipiter nisus, L.	6
— virgatus, B.	16
— cooperi, B.	16
— tinus, L.	8
— badius, Alleon, *Smyrna*	16
Tachytriorchis pterocles, V. ...	40
Buteo jakal, D.	50
— *ferox, G. (Volga).* ...	50
— desertorum, D. ...	20
— lineatus, V. Canada. ...	30
— vulgaris, L.	16
— tachardus, martini, Hard Volga.	30
Archibuteo lagopus, G. ...	25
Busarellus nigricollis, L. ...	20
Urubitinga niger, V.	30
Gypaetus barbatus, S. (very fine specimen)	100
Aquila fulva, L.	60
— *heliaca S.*	100
— *planga, V.*	50
— rapax, C.	50
— naevia, G.	30
Nisaetus bonnelli, C.	80
— pennatus, G. Turkey...	30
Circaetus, gallicus, G. (from Duchess de Berry Coll.) ...	50
Spilornis, bacha D.	20
Helotarsus ecaudatus, D. ...	60
Haliaetus albicillus, L. ...	80
— leucocephalus, L.	80
— *leucoryphus G.* Monts Altai	100
Gypohierax angolensis, G. ...	100
Haliastur ponticerianus, G. ...	12
Elanoides furcatus, L. ...	25
Nauclerus riocouri, V., typical	60
Milvus regalis, B.	30
— govinda, S.	30
— aegyptus, G.	12
— *aetolius*, V.	30
Rostramus hamatus, V. ...	30
Elanus coeruleus, D.... ...	8
—melanopterus, B. Volga...	16
Gampsonyx swainsoni, V. ...	20
Pernis apivorus, L.	16
Harpagus diodon, T.... ...	20
Ictinia plumbea, G.	8
Microhierax coerulescens, L....	12
Falco communis, G.	12
— pealei, R.	20
— barbarus, L.	16
— lanarius graecus, S. ...	30
— subbuteo, L.	8

	s.
Falco aesalon, L.	8
— aurantius, G.	10
— chicquera, D.	20
— concolor, C. (leg. imper.)	30
— *eleonorae, M.*	30
Hierofalco candicans, G. (Tem. Collection)	80
Hierofalco gyrfalco, L., Norway	50
— — Lapponia	60
— *saker, G.*	20
Cerchneis tinnuncula, L. ...	6
— punctata, T. ...	12
— sparveria, L. ...	5
— tinnunculoides, V.	12
— vespertina, L. ...	12
Pandion haliætus, L. ...	30
Gyps fulvus, occidentalis G. Sardinia	100
Otogyps auricularis, D. ...	100
Neophron percnopterus, L. ...	30
Sarcoramphus gryphus, L. very old male.	200
Cathartes papa, L.	50
Catharistes atrata, B.	20
Oenops aura. L.	20
Polyborus brasiliensis, G. ...	20
Ibycter americanus, B. ...	20
— chimango. V.	10
Bubo turcomanus, E. ...	60
— ascalaphus, S.	40
— *atheniensis A.*	50
— magellanicus, G. ...	25
Scops aldrovandi, B.	8
— leucotis, T.	12
Nyctea scandiaca. L.	40
Surnia ulula, L. Arkangel ...	40
— — N. America. ...	20
Carine noctua, S.	6
— brama, C.	8
— persica, V.	10
Speotypo cunicularia, M. ...	10
Glaucidium passerinum, L. ...	5
— perlatum V. (*type*).	
— { occipitalis, T. ...	40
— { ferruginea, B. ...	10
Asio otus, L.	10
— brachyotus, L.	10
Syrnium aluco, L.	12
— *lapponicum*, R. ...	60
— uralense, P.	50
— nebulosum, T. ...	40
Nyctala tengmalmi, G. ...	10
— acadica, G.	6
Strix flammea, L.	12
— javanica, T.	12

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The

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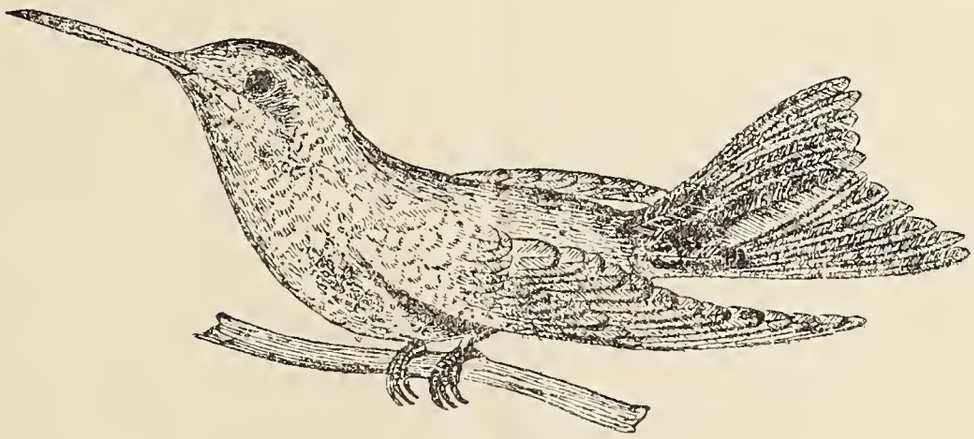

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
Member of the International Jury, Paris, 1889; Member of many scientific societies;
etc. etc. etc. etc.

CONTENTS OF No. 7.—JULY 1, 1891.

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Steinheili Har., male and female. Guatemalensis, Har., male. Beltianus, male· Scutifer, Bates, male and female. Lunaris, Tasch, male. Actæon, Erichs, male and female. Bispinus, Bates. Cadmus, Har. Dejeani, Har., female. Lautus, Macleay, male. Silenus, Cast, male and female. Spinifer, Cast, male and female.

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Much has been done; but the field of explorations is still very large, and many Centuries will pass before it is drained.

Therefore, every one must work boldly and encourage every where these studies which are unhappily too much neglected at the present time.

For that it is necessary that all those, who have zoological riches accumulated, give their duplicates to scientific Institutions or to young and poor amateurs, or dispose of them at very low prices accessible to every one.

It is also necessary that all the Governments should give important prizes and rewards to all those who make new discoveries useful to their country, and encourage by all means the study of this science which is sure to produce fruitful results to the benefit of Humanity.

The Humming Bird.

The Pilgrim Locust. A Remarkable and Sensational Tale published by the Leading Papers of France and reproduced in London.

Daily News, May 19th.

A Scientific Man killed by Locusts.

(from our correspondent.)

PARIS, Monday Night.

Despatches from Algiers announce the death, under peculiarly horrible circumstances of a well-known savant M. Kunckel d'Herculaïs, President of the Entomological Society. M. Kunckel, who was travelling in the district of Teniek el Haad, on a Government mission, went on Saturday to the village of Sidi Eral to see deposits of locusts' eggs which had been reported in the neighbourhood. About eleven o'clock, the weather being fiercely hot, M. Kunckel, overcome by fatigue, lay down under a bush to sleep. He was probably awakened by a flight of locusts which are believed to have come from Chellala. They settled down on the very ground where he was resting, and in such numbers that M. Kunckel was buried in their mass. He got up and struggled forward desparately, against this living flood. He trampled down hundreds, but the swarm grew thicker every moment, and the sky was completely darkened. M. Kunckel set fire to the bushes in order to drive them away, but in vain. His cries were not heard, and at length he fainted and was stifled. About three o'clock in the afternoon the "pilgrims," as the locusts are called, took flight again, and a party of natives found the body of M. Kunckel buried under a heap of locusts. His hair, beard, and necktie were completely devoured."

When I read the above narration in the Paris and London papers, I thought it was something very startling, but I must say truly that I had great doubts about its veracity; as, when residing in Mexico, I have seen many extraordinary passages numbering milliards of these migratory Insects, and never heard of other damages than the complete devastation of all the leaves of trees, plants and grass of the countries visited by this terrible insect, and I was not surprised to hear two days after, that it was all a hoax, and that my friend Kunckel d'Herculais was enjoying a perfect health during all the time that many sensible persons were condoling on his tragic death.

The pilgrim or Migratory Locust (*Acridium migratorium*) is one Insect Orthoptera very similar in appearance to the vulgar locust, but of a much greater size. It is found in all parts of the World; but the chief countries which are visited periodically by myriads of these insects are the United States, Mexico, Central and South America, in America, and Egypt, Algeria, Morocco, and many other African Countries. The head quarters of these Insects in America are Humboldt Prairies, and very likely, in Africa, the Deserts of Sahara or the Soudan.

I remember that in 1877, when travelling from San Francisco (California) to Salt Lake City, all the plains called Humboldt Prairies, situated between Sierra Nevada and Salt Lake, were covered for several hundred miles with young locusts. From morning to night I did not see anything else, and the soil was black with them. In passing, the train crushed immense numbers standing on the rails.

Several years before, when living in *San Andres Tuxtla*, State of Vera Cruz, Mexico, I assisted to an invasion of these Insects. They alighted near the town, and in the space of two days they devoured all the plantations for several miles around, as also all the leaves of trees, bushes and grass, leaving the soil and the trees quite bare with the same appearance as the European Country fields after a severe frost, or in the middle of the winter.

When these formidable invasions take place, the inhabitants fear them as much as the most terrible equinoxial hurricanes or earthqnakes.

Generally the same localities are invaded during two or three years, then these Insects disappear for a certain number of years. I attribute this cause not to a diminution of the Insects, but to a change of itinerary in their emigration trip.

These locusts by their voracity and their number is the most formidable plague to vegetation. They hatch in spring, and the want of food being at once necessary, they begin to devour all the grass and leaves of bushes. This lasts for several weeks until their wings are fully developed.

At that time they have done with all the vegetation of their breeding places, and then take their flight in compact rows by millions and millions, intercepting entirely the light of the sun during their passage. The country where they alight is irrevocably lost. In a very short space of time all traces of vegetation has disappeared and the trees are totally bare of their leaves, while their branches break under the weight of the Insects. Many of them, unable to get sufficient food, dies and their dead bodies, accumulated on the soil, corrupt the air and are the cause of merciless epidemies, such as plague, etc.

For the countries which are invaded by the locusts, they are a cause of ruin, famine and epidemy.

All sorts of methods have been employed up to the present time for the extermination of these redoubtable Insects; but they have been only partially successful and have cost very large sums of money. In Mexico they try to frighten them away by beating drums, by firing guns and fireworks, shouting with all their might, and sometimes they have succeeded and obliged them to alight further away, but at other tîmes, they have not taken the least notice of the noise and have dropped as an hurricane on the plantations surrounding the villages, and destroyed everything.

Immediately after the laying of their eggs they die, and all is quiet again for a little time; but after a few weeks the young hatches and all the country is invaded again with what appears like small black specks jumping about in all directions and devouring all the grass and young leaves which are just coming out again.

The usual thing which the inhabitants generally do

at that time is to dig some ditches of a great length, 3 feet deep by 2 feet wide. Then all of them men, women and children drive them away in the ditches, where they crush them as quickly as they can; but unfortunately it is quite impossible to destroy all.

These young ones, when fully developed, fly away and invade other localities.

Since the last three years, Algeria has been invaded periodically with the locusts, and large sums of money have been granted for their extermination. My friend' Mr. Kunckel d'Herculais, a celebrated entomologist, has been sent by the French Government to study this delicate question on the spot, and I think he has been aiding a great deal the Algerian authorities in trying to exterminate this unwelcome visitor. They have destroyed immense quantities of eggs and insects; but it appears that the actual invasion is of such a magnitude that all the cultures of Algeria and adjacent countries are in great peril of being com pletely destroyed, as in 1867, the year of the faminc brought on by them.

Lately Mr. Brongniart, of Paris, has sent to the Academy of Sciences a very interesting notice on a vegetable parasit (a sort of microscopic mushroom) which he thinks could be applied successfully to the destruction of the locusts.

The author of this remarkable discovery thinks that it should be easy to produce a large quantity of this special parasite, which reduced in powder could be spilt on the ground in the countries menaced by the invasion of the locusts.

No doubt the idea is excellent; but I doubt very much of its efficacity, as it should require such an immense quantity of this parasite. However, I think it would be very interesting to give it a fair trial.

I believe that something more to the point should be to enter in communication with all the countries concerned in this matter, such as Egypt, Algeria, Tripoli, Morocco, Italy, French, Spain and Portugal, and to edict a law protecting efficiently such birds as the Bee Eater, *Merops apiaster*, the Metallic Starling, *Sturnus vulgaris*, and other similar species, which are great eaters of locusts.

Since about 15 years, I don't know how many hundred of thousands of these birds have been killed, either for feeding or industrial purposes, and consequently it means in a short time the extinction of the said species and consequently a further increase of locusts.

In don't think I can err much if I say that by the killing of so many hundred of thousands of these birds during the last 15 years, it is as if several millions of them had been destroyed, and when we remember that a single bird will destroy as many as 200 insects or more per day, especially in the breeding time, what a great auxiliary it should be in such calamitous times as the present. It is milliards of insects which would have been destroyed by these birds if they had been in existence.

Therefore I think it is of the greatest importance to all the countries mentioned above that they should concert themselves at once about the making of a law, taking immediate effects, protecting the said birds.

Meanwhile I will suggest also for immediate use a trial of powerful electric lights posted in front of the places where ditches have been opened and canvass stretched.

If it was possible to attract them by electric light as it is done for all sorts of insects, especially moths, and also birds, it would be easy to destruct immense numbers.

To be continued.

Notes on Rare Species of Humming Birds and Descriptions of Several Supposed New Species in Boucard's Museum.

By A. Boucard.

Continued from page 18 26, *and* 43.

CALLIPHLOX RORAIMÆ, N.SP.

Male. — Upper part, dark bronzy green; throat metallic amethystine red as in *Selasphorus platycercus*, beneath which is a very narrow band of white; breast and flanks, green changing to dark grey on the abdomen; upper and under tail coverts, green; tail, purplish brown; bill and feet, black.

Total length, $3\frac{1}{2}$ in.: wing, $1\frac{2}{8}$; tail, $1\frac{3}{8}$; bill, $\frac{5}{8}$,

Female.—Upper part, bronzy green; throat, white with a central spot metallic amethystine red; beneath which is a greyish band; sides of neck and breast, golden green; flanks abdomen and under tail coverts, rufous; tail purple brown tipped with rufous; bill and feet, black.

Total length, 3 in.; wing. $1\frac{2}{8}$; tail, 1; bill, $\frac{5}{8}$.

We are indebted for this fine new species to the energetic and well known collector Mr. Henry Whitely, who discovered it at Roraima (British Guiana) in 1881. I have also a young male specimen, differing only of the female by the colour of the under part which is green, changing to dark grey on the abdomen, the throat is black, mottled with a few amethystine red feathers, a whitish band crosses the neck.

Science is greatly indebted to Mr. Henry Whitely for so many new species discovered by him in Peru and British Guiana, and I hope that success will crown again his efforts in the new voyage which he has undertaken in the interior of British Guiana.

HYLOCHARIS GUIANENSIS, N. SP.

Male.—Upper surface, flanks and abdomen very dark shining grass green, much darker than in *sapphirina*; chin, rufous; throat, dark sapphirine blue very bright; upper-tail coverts, coppery; wings, purple; under tail coverts, dark rufous; Central rectrices, coppery, lateral ones, shining rufous, edged with black; bill, fleshy color with black tip.

Total length, $3\frac{5}{8}$ in.; wing, 2; tail, $1\frac{3}{8}$; bill $\frac{6}{8}$.

Female.—Upper surface dark metallic grass green; under-tail coverts, coppery; chin rufous; breast, grey spotted with amethystine blue; sides of breast and flanks, grass green; abdomen gray; under-tail coverts gray rufous; rectrices coppery purplish at tip, lateral ones, coppery to the third of their length, then black tipped with a large grey spot.

Total length.—$3\frac{2}{8}$ in,; wing, 2; tail, $1\frac{2}{3}$; bill, $\frac{6}{8}$.

The principal difference between this species and *H. sapphirina* is in the dark color of the upper part

are coppery green, and not reddish bronze, as in *H. sapphirina*.

We are again indebted to Mr. Henry Whitely for the discovery of this beautiful species. The specimens from which I took the above description were collected at River Carimang, Camacusa, and Merume Mounts, British Guiana.

Description of a supposed New Species of Tanager in Boucard's Museum.

By A. Boucard.

RAMPHOCELUS CHRYSOPTERUS, N.SP.

Male.—Upper and underside velvety black; tail and wing, brownish black underside, rump and upper tail coverts magnificent topaz orange; bill, bluish.

Total length, $6\frac{1}{4}$ inches; wing, $3\frac{1}{4}$; tail, 3; bill, $\frac{3}{4}$; Habitat, State of Panama, Columbia.

I have received two males of this magnificent new species. They are exactly alike.

The McKinley Bill and Art.

My attention has just been called to the following paragraph in the *New York Herald.*

AN ART CONGRESS FOR AMERICA.

"NEW YORK. May 16.—The proposal to hold a National Art Congress and Loan Exibition at Washington in December, which was exclusively published in the HERALD, has aroused great public interest, especially as it is believed that as a result of the Congress Government Departments of Art and Architecture will be established, national saloons be formed, and the art duty abolished. The project has been warmly endorsed by the Corcoran Art Gallery of Washington and various Art Associations throughout the country."

I am rather happy to learn that there is some probability that the Art duty will be abolished before long in the United States. In this Journal pages 3 and 20, my readers are aware that I have strongly advocated this measure as one of the best which could be taken by the United States Government, and I make again a strong appeal to that Government for the abolishment of *all duties* not only on *Objects of Art*, but also on all *Scientific Collections* sent to the United States for scientific purposes, either for sale or otherwise. No mistake can be made with *Objects of Natural History for scientific purposes*, and Consignments of Bird Skins, Feathers etc. and for *industrial purposes*. I will say more. In a country like America, the example ought to be given to all the world at large how Custom House duties could be abolished altogether; as I hope to be able to prove in a subsequent notice.

THE EDITOR.

Poor Rate and General Rate Taxes in the Parishes of St. Giles in the Fields and St. George, Bloomsbury.

Continued from page 44.

In consequence of the raising of my assessment from £109 to £134, and 1d. more in the pound for both rates as compared with 1890, I have to pay for the half year, commencing Lady Day to Michaelmas 1891, £4 11s. 1d. in excess of last year, which represents a lump sum of £4,559 3s. 4d. for the half year, taking as an average that 1000 householders have had their assessments increased in the same proportion as mine; but it is very likely that the number of these greatly exceed 1000, as I can see that 1,889 of them voted recently on the Free Library Question, and surely there were many abstentions.

It will be rather interesting for the tax-payers to know how the Vestry of the Parishes of St. Giles in the Fields and St. George will spend the extra respectable sum received by them this year, in consequence of the increase of Assessments.

To be continued.

Notes on the Great Bower-Bird.

CHLAMYDODERA NUCHALIS. *Jard.*

Our Editor thinking my notes on the above species, which are sprinkled through my diary on the different occasions I had the pleasure of meeting with this bird in N.W. Australia, would be of interest to our readers, I take the opportunity of writing all that has come under my observation, regretting that it cannot be so exhaustive as I could wish, but every opportunity I had I made the best I could of, for finding out as much of its habits as possible, the birds generally being very shy and in most instances extremely difficult to approach.

The first notice I took of the bird was on hearing its call which is something like our Jay (*Garrulus glandarius*), very harsh and strident, eventually catching a glimpse of the bird itself flying from some low scrubby bushes into a high gum tree. I followed the bird some distance, it flying from tree to bush and bush to tree, but I failed to procure it; I retraced my steps to where I had first put it up and hunted through the undergrowth in hopes of finding the bower, but without success. By chance some time later, and within 200 yards of our tent, I found a beautifully built bower or playground of this bird; we had repeatedly heard its call, but had not seen the bird, this particular day I was left in camp alone at a place called Yabba-Goody, the others having gone away to find another water hole, as the one we were camped by was rapidly drying up by evaporation under the powerful rays of the sun; it was placed in the centre of a very thick bush or clump of overhanging bushes, the twigs of which the bower was built were most tightly interwoven, or rather packed, at the bottom, the sides overarching but not meeting at the top; the length of the bower itself from end to end of the twigs was three feet, and eighteen inches high. I was very much astonished at the singular way in which it was planned, for eighteen inches from one of the openings and about the width of the bower were strewed pieces of broken white shell, bleached white bones, small white stones and white sticks, all white, at the other opening all was black, pieces of black charcoal and curiously enough a black handled pen-knife not rusted at all in the male, and in the color of the rectrices which

which must have been placed there very recently, no doubt having been lost by someone in the bush, but at some distance from where the bower was placed; inside the bower were stones of different colours mostly white, among which were two small brass cartridge cases quite green with oxidation; the sticks of which the bower was formed were grey in colour; the effect was very striking, and this character ran through the whole of the bowers which we had the good fortune to find. At Mount Anderson I found a bower like the one at Yabba-Goody, but not so large, in about the same situation; the bushes in which it was placed bearing a small dark purple berry which I had found the birds were very fond of, this bower was about 14 inches long, very likely not finished, with a lot of bleached bones and white stones at either end and on either side of these were some pieces of black charcoal and in the centre about half-a-dozen stones, one nearly round an inch and a half long.

On another occasion at a lagoon called Monkey-Jarra I found another bower and heard the birds calling, but they were too shy for me to get within gunshot; this bower, also, had white at one end and black at the other, the birds seemed to have pulled it to pieces, but after a few days it was again made good. In none of the bowers were any feathers seen. I found one bower and I suppose disturbed the foliage too much, for the next day the bird had pulled it all to pieces.

One day, whilst out shooting, I came across a bower and two birds a short distance from camp. As this was the first occasion on which I had seen two birds together near a bower I made up my mind to watch them; the bower was placed, as usual, in the midst of thick bushes, and I placed myself at some distance not far away in a convenient position to see right through the bower. After waiting some few minutes I heard the harsh screech of the bird and looked round the trees to see if I could see it, but no, it was not anywhere there or in the bushes from whence the sound came, but whilst looking up into the high trees round about where I was standing I espied a large nest; this I thought at the time I would get when I had done watching the birds. Happening to glance down at the bower there I saw one of the birds; it had escaped my notice no doubt whilst I was looking up into the trees, it hopped about in and out of the bower picking up a stone and placing it somewhere else with drooping wings and elevating its spread out tail, sometimes hopping on to the branches of the bush, clinging to their sides, very quick in its movements, sometimes getting to the top of the bush to have a look round; hearing the call of another Bower-bird some distance away I looked in the direction and presently saw the bird fly into the gum tree in which I had previously noticed the nest. Here, thought I, is the Bower-bird's nest, I have found it quite easily, what a surprise it will be for them in camp! The bird hopped about in the tree for a time, sometimes close to the nest and with a piece of twig in its bill, then flew down to the bower flying up again into the tree still with the piece of twig. I must have moved through being anxious to see what the bird was going to do, at all events after giving one call it flew away, the other one following from the bower. For three days I spent a good deal of time watching these birds, one would fly down from the tree with a piece of twig in its bill, and after a little manoeuvring the other bird would take the twig, hop about a bit as if looking for a place which wanted filling up, place it in some part of the bower, sometimes apparently not to its entire satisfaction, for it would take it out again and put it somewhere else, then again a good bit of the bower would be pulled to pieces and rearranged, and the stones etc. were always being moved about with many hops and skips and flirting of the tail. I never saw them go straight to the nest, but they were often quite close to it, so I determined to get the nest and see what it contained. I climbed the tree only to find that it was a deserted one from which the birds had flown and with a feather or two of Graucalus melanops, perhaps the builders of the nest. This was a terrible disappointment, but I solaced myself with the thought that I had seen a good deal of their habits.

Male. Length, 16 inches; iris, dark brown becoming lighter round pupil; bill, dark brownish olive, inside of bill orange brightest at swallow; legs and feet dark olive brown lighter at the bottom of each scale on the tarsi.

Female, smaller, length 14·4, description same as male above.

WALTER BURTON.

Collections made in Thibet and Central Asia by Messrs. Bonvalot and Henri d'Orléans.

On Thursday, the 4th of June, the Collections made by Messrs. Bonvalot and Prince Henri d'Orléans in Thibet and Central Asia were exhibited to the public in the Zoological Gallery of the Museum of Natural History in Paris, and will probably remain on view for another month at least.

They are excessively interesting and well worth a visit to Paris for all those who can dispose of several days.

It contains some fine series of Mammals and Bird Skins, a fine Herbarium and a large quantity of Ethnological specimens, Jewels and Curiositics. A great number of photographs taken by Prince Henri d'Orléans during the course of the voyage give a very good idea of all the countries traversed by the bold and successful Explorers. Among the Mammals can be seen a fine specimen of Yak, killed by Prince Henri d'Orléans, two specimens of horses kiangs, a sort of hemione between a horse and a donkey, many species of bears, antilopes, leopards, lynx, etc. Among the birds a large number of pheasants, partridges, hawks, ducks, crows, etc., some quite new to Science. These have just been described and dedicated to the discoverers.

In the Herbarium are also many rare and new species of plants proper to Thibet and China. Many were new for the Museum.

Close to the Herbarium are several dresses of the women (North of Yuman) and many other specimens of wearing apparels, vases, reliquaries, bells and all sorts of curiosities.

The collection of Jewels consist of rings, earrings, silver clasps, turquoise coronets, pearl necklaces, belts, etc. etc.

I understand that all these Collections have been given to the French Government and will be distributed amongst several Museums. WELL DONE!!

This is a noble example, which wealthy people of all countries should imitate. THE EDITOR.

A Visit to the British Museum. Natural History Department.

By A. Boucard.

Last week, I went and spent several hours in the Galleries of the Natural History Department, British Museum, Cromwell Road, South Kensington. My first impression in seeing the building was that it looked rather pretentious in its architecture, for a scientific Museum; but after second thought, I remembered that I was in London, the capital of the British Empire which is rich enough to build Palaces for the exhibition of such scientific treasures as are now in the possession of the British Museum.

That the building erected at South Kensington is a Palace, there is no doubt about it. When inside, the sight of the principal Gallery at the entrance is really grandiose. and it is easy to see how everything has been done to please and interest the general public. What a wonderful change for the best for those who remember how the Collections were crowded in the old building of Great Russell Street. Not only the local is magnificent and well adapted to its purpose; but a great part of the Collections of Mammals, Birds, Insects, Reptiles, Shells etc., have been renovated, so that everything look, fresh and young again. There are magnificent series of Mammals, from the Elephants, Giraffes, Rhinoceros, Chimpanzee, Gorillas and others to Rats and Bats. The same with the Birds. Many of the old and faded specimens been taken away and replaced by fresh ones. There are some fine Series of all the families, and especially so with the Birds of Prey, Parrots, Trogans &c.

The great rarity of the century, the Great Auk or *Alca impennis*, an extinct species, is represented by two fine specimens, one in the general collection of Birds, and another in the splendid collection of British Birds.

Only 80 specimens of the Great Auk exist and several Museums public and private, can boast of several in their collections.

But it will become rarer every day, and some of the new Museums, built recently in several parts of the World and which may become famous in due time, will be content to possess models, as no money will be able to buy original specimens.

The collections of Fossils, Minerals, Shells, Reptiles, Corals, Insects, Sponges, and Plants are also of the greatest interest, and it will be a great boon for the Londoners of all classes, when the Museum will be lighted by electricity and opened in the evenings as its elder brother, the South Kensington Museum.

If this cannot be done, there is no other alternative than to open it on Sundays.

One way or the other. there is no doubt that it will occasion some extra work and expense; but England is rich and can very well afford the extra expenses, by employing special clerks for that purpose, so as not to increase the work of the actual staff.

One of the most interesting innovations to be seen in the actual Museum are the Cases of Birds, disseminated a little everywhere, containing specimens mounted with artistic taste and approaching nature as near as possible.

In some of them can be seen birds flying about as if alive, in others they are nesting or with their young, in others are represented interesting illustrations of Mimicry. All these are greatly appreciated by the public and shows decidedly that a Museum must not be only scientific, but also artistic to be visited by thousands, and as a rule, the general public is more interested with these exhibitions of Birds and Animals in Cases, than with the more scientific collections.

Another of the attractions is the celebrated *Goulds' Collection of Humming Birds*, exhibited on the first floor, on the right.

Many other important Collections, purchased or offered by generous Donators, such as Hewitson's Butterflies, Hume's, Godman Salvin's, Sclater's, and Capt. Shelley and Gould's Birds, and many other important Collections are stored in the Museum, but are not exhibited to the public.

Many of the visitors who go to the British Museum and who admire the fine Collections exhibited in all parts of this magnificent building, thinks that they have seen all, when they have wandered through the Galleries; but it is not so. The Collections exhibited to the public, are nothing when compared with the Scientific Series of Mammals and Bird Skins, Insects, Reptiles and Fishes, Shells and Fossils, Dried Plants, &c., &c., which are stored in the interior of the building and only accessible to Students for scientific purposes.

The Collection of Birds alone consists actually of about 350,000 specimens!! Is it not wonderful! and I believe it is about as rich in all the other Departments.

Now it is time to remember to the Authorities of the British Museum that *Noblesse oblige*, and it is absolutely necessary, if they want to maintain the high standard of development and completion which the Collections have lately attained, and remain first as a Scientific Museum, that they can only do so by being very liberal in the prices given for specimens new to Science or which they have not got, as every day makes it more difficult for travellers and others to obtain specimens suitable for the Collections.

They should never miss the first purchase or pick of good collections containing new and rare species, from whatever source they come; even if they must pay a high price for them.

If they don't do so, these Collections will go somewhere else, and the Natural History Department of the British Museum will not be able to maintain its actual pre-eminence amongst the leading Museums.

To be continued.

An Easy Way of making One Hundred Pounds Sterling a Year in Collecting Specimens of Natural History at Leisure Time.

Continued from pages 7, 15, 23, 32.

In large birds above the size of a thrush it is necessary to skin the wings, this is done from the outside, the skin is cut along the inside of the wing, and all the flesh that can be is removed without separating the shafts of the large wing-feathers from the bone to which they are attached. In most ducks and in birds whose heads are larger than their necks a different method is adopted to the foregoing. In these cases the neck is skinned close up to the head and then cut off, and when turned right side out again a cut is made in the skin from just behind the eye over the ear and a little down the side of the neck as much as will allow the head to be skinned in the usual manner, the skull replaced and the cut neatly sewn up; with long legged birds as flamingoes, herons and such like it is as well to draw the sinews of the legs, this is done by cutting across the ball of the foot and taking up the sinews with a pointed stick or steel point forcibly draw them out, this keeps the horny covering from slipping off, through the decomposition of the muscles, and the bird mounter can get a strong enough wire up to hold the bird firmly upon its legs; thick toed birds such as eagles, vultures, &c., should have the feet cut underneath and the toes skinned, and any sinews cut away and just brushed with arsenical soap and sewn up with a few stitches; birds feathered to their toes should have their legs skinned also, and the flesh that is taken out replaced by tow or cotton-wool wrapped around the bone, taking care that the most is put where the most was taken away.

All this may seem to be rather difficult at first to the beginner in taxidermy, but after a few weeks' practice and attention to the above concise description he will be surprised at the ease with which he will be able to skin and make up the birds, he or she, for amongst the fair sex may be numbered some few expert taxidermists, may experiment upon. I may conclude this article by saying that practice, as in other things, is the only way to make good skins.

In skinning Mammals, the specimen is laid upon its back and an incision made along the median line of the belly, from just behind the forelegs, reaching nearly to the anus; the skin is separated by cutting with the knife between the skin and body; skin as far as possible on either side until the hind legs can be cut through where they join the body, then cut through the root of the tail, turn the skin inside out, and skin down until the fore-legs are reached separating these from the body, leaving the blade-bone attached to the legs; skin on until the base of the ears are come to, which cut through close to the skull. The eyes are now reached, very great care being taken not to cut the eyelid; in specimens of deer the "tear" or lachrymal sinus must be skinned out close to the bone; the mouth comes next, which again cut close to the skull, likewise at the nose and lips. The carcase can now be laid aside. Skin the legs down to the toes and cut away all the flesh from the bones, leaving the ligaments holding the joints together; as each leg-bone is cleaned of flesh, smear with arsenical soap, or in large specimens dust on alum, and make up with tow or cotton-wool to the size of the flesh cut away, and turn right side out; should there be any particles of flesh or fat adhering to the skin these should be cut or scraped away; now with Mammals up to the size of Foxes the tail in nearly every instance can be "slipped," this is done by tying a piece of string to the root of the tail, which hitch on to some convenient tree or post and pass the root of the tail between the two handles of the largest pair of scissors, or two pieces of square wood, with the string on one side and the skin on the other; then with a steady pull the tail, bone, muscles and flesh will slip out whole, leaving the tail attached to the string and the skin a tapered cylinder, down which some alum should be pushed with a stick or wire right to the tip. In larger Mammals with stronger muscles the tail should be slit down from base to tip, all the bones and flesh taken out, alumed and a little tow placed in and sewn up. We come now to the most troublesome and most tedious part of the whole process with which too much care cannot be taken; the flesh from the roots of the ears should be cut off, but not the gristle, and the ears skinned three-parts the way to the tip, nothing being cut away and alumed, the eyelids "split," that is, the knife passed between the inner and outer skin but not right through, the inner skin being left on; the lips and nose also split and all superfluous flesh cut away. After aluming the skin it can be turned right side out, the body partly filled out with tow if small, dried grass if large, and the incision sewn up. The head should now be cut off the carcase, and the skull cleaned of flesh and brains and a label with the number of the specimen attached. In the case of horned animals, when taking the carcase out the skull should be severed from the neck and a Y-shaped incision made from the outside of the skin, the upper angle of the Y beginning at the base of each horn on top of the head and meeting between the ears; the perpendicular line of the Y runs down the back of the neck sufficiently far to allow the base of the skull to be protruded whilst skinning the head; the skin requires to be skinned right off the skull, so that the skull can be cleaned and the skin dried. For flat skins, which are eventually required to be mounted into rugs and for ornamental purposes, the first incision should commence at the one corner of the mouth and continued right down to the tip of the tail, a cut from this line at right angles down the inside of each leg to the toes will allow the whole carcase with head legs and tail attached to be removed, the ears skinned, eyes and lips split, as above, alumed and stretched out to dry, the neatest way being to sew loops of string or hide at intervals of a few inches all round the skin and a peg stuck in the ground at each loop; this should be done in a dry shady place, not in the sun, some dry grass being first placed loosely on the ground to allow the air to circulate to facilitate the drying; the skull should also be saved, where practicable, and a label attached

with a corresponding number to that on the skin. When dry, the skins, which will be stiff and hard, should be rolled or folded up without cracking in as small a compass as possible to be handy for carrying.

Large Reptiles, which are too bulky to send in spirit, require somewhat similar treatment to Mammals, except that the skull cannot be removed in most instances, but should be cleaned whilst the skin is turned inside out and the tongue and eyes removed; the tail cannot be slipped, but must be skinned out. Snakes are preserved in the skin by cutting along the belly from the anus for a short distance towards the head, the body cut right through, taking care not to cut the skin, the two pieces skinned out, the skull being left in, soaped and put to dry with a little stuffing, and when dry the stuffing removed and the skin rolled or folded up without breaking. Small lizards, frogs, snakes, &c., and in some cases birds, can also be brought or sent in spirit, an incision being made in the belly to allow the spirit to penetrate thoroughly; some are also treated in this manner for anatomical research, the viscera in this case being left intact, only the skin being cut.

For carrying the skins of birds on the pack-horse, I can recommend the plan I adopted in Australia, failing a better; the two side packs were tin japanned "uniform" cases, each twenty-eight inches long, eighteen inches wide, and nine inches deep, these were packed previously when starting with powder, shot, and various articles of use in camp, and as they were used so the boxes were filled up with the preserved skins, the heavy portion being placed so as to be the lowest when on the horse, the two pack straps were strapped round each and placed on the hooks of the saddle, a top pack of blankets, tent, or skins or other gear across the top, the side straps over the ends of this, and the surcingle over all passing under the side straps. The packs were always weighed, a spring weighing machine taken for the purpose, that the two side packs should be evenly balanced, to prevent the horse having a sore back, which takes a considerable time to heal in a hot climate. These boxes are also available for waggon or boat, standing a good lot of knocking about and keeping out wet, but they should not be packed with anything damp; they make a first rate table if four forked sticks are driven in the ground, two straight ones laid in the forks and a box on these. I have seen some steel cabin trunks with rounded corners which would be admirable for these purposes.

In packing bird skins for sending or bringing back home, each skin should be separately wrapped up in paper, keeping the feathers as smooth as possible, and the large and small parcels fitted in together, as in most instances the head and tail are small and the body thick. When a town or city is reached and packing cases can be procured, the birds can be unpacked from the tin boxes and repacked in tin lined cases, care being taken that they are thoroughly dry, and soldered down plenty of Camphor or Napthaline being placed among the parcels; if the birds are mostly small, these can be packed in old tin biscuit boxes, the lids being soldered round, then they can be packed n a wooden case for shipment, plain tin boxes could be taken out nested, that is fitting one in the other, and a wooden box to contain the whole when filled out with specimens any spare space being packed with less destructible specimens; please bear in mind that it is not only to keep the specimens free from damp and rough usage, but also from rats, mice and beetle that so much trouble, or rather care is taken with the packing; for I know of nothing so disheartening as to find on the arrival home of the specimens that so much trouble was taken with in the first instance, that they are totally ruined through want of careful packing, in some cases water has got in the specimen quite spoilt, covered with mold, in others rats or mice have formed their nest and brought up their young in the body of some fine specimen, legs and bills gnawn off, the contents of the case chaos; for destructiveness next to the rat are various small beetles and their larvæ; these will eat up every particle of skin, all that is left are the bones and feathers.

In packing skins of Mammals for a long voyage these should be opened out, beaten with a stick and brushed with a stiff brush, folded up in as small a compass as possible, dried and soldered down in tin lined cases after being plentifully sprinkled with paraffin; horns and skulls do not require so much care, wooden cases or crates being sufficient after being brushed over with paraffin.

Should any further particulars be required, I should be pleased to render any assistance in my power through the medium of our Editor.

W. B.

Obituary.

On the 4th of May, at Dijon, Côtes d'Or, France, Henry de La Cuisine, aged 64 years. Henry de La Cuisine died rather suddenly. His last letter to me is dated 16th April, 1891, and he was quite well at that time. Since twenty years, he was one of my best correspondents, and a good friend. He was a very enthusiastic Naturalist, interested in all branches of Natural History; but more especially in Entomology. He made a very fine Collection of Insects, such as *Carabus* and *Cyphus* among *Coleoptera*; *Ornithoptera*, *Papilio* and *Morpho*, among Lepidoptera; *Chrysis* among *Hymenoptera*, &c. Lately he was very interested in the Genus *Acherontia* (*Sphingidæ*). Of these Moths he succeeded in procuring a large number of specimens from all parts of the World. Besides his love for Natural History, Henry de La Cuisine was a splendid artist. No one had more facilities than him for making a beautiful painting, in water colours at a moment's notice. I remember having sent him a very rare specimen of *Morpho* or *Acherontia*, which was returned to me in the shape of a splendid water-colour, three hours after having received the specimen. Henry de La Cuisine was a very learned man, and at the same time quite modest. It is a great loss for Science, and more for his friends.

A. B.

Report on June Public Sales of Feathers and Bird Skins.

Ostrich Feathers.

The auctions commenced 1st inst. and concluded yesterday—they comprised 2,276 cases Cape and 8 Egyptian, of which 2,140 cases Cape, and 6 cases of Egyptian sold.

The weight of feathers offered was 31,000 lbs. against 20,000 lbs. in April

The sales opened quietly and continued with a dull tone throughout, and a general decline in prices was established. No doubt this was on account of the exceptionally bad weather during last month having depressed trade, added to the large quantity brought forward which was in excess of requirements.

White.—The best qualities were not in so much request as the medium, and were about 30s. per lb. lower — seeonds and thirds declined 10s. @ 20s. per lb. Femina were about 10 per cent. lower on the average, and Byocks 20s. @ 30s. per lb. Spadonas White and Light were 10s. @ 20s. per lb. under last sales, and Femina even more — White Boos declined about 15s. per lb., Black butts 10s. and Femina and Drab 5s- @ 7s. 6d. per lb.—Long and medium Black were 15 @ 20 per cent. and best medium about 10 per cent. lower, but ordinary medium and medium and short not much change. Long and medium Drab declined 15s. @ 20s. per lb., except fine lots, which were steady, good medium were about 10s. per lb. lower and medium and short about 5s. easier. Floss sold rather lower than last sales.

The quantity sold realised £102,000.

The remaining Sales are fixed for the following dates :

20th July.	19th October,
7th September.	30th November.

White Primes 1st, 2nd and 3rd	£5 to £14	per lb
White Femina ...	...from £7 to £10	10s. ,,
Black long and medium	... 60s. to £5.	10s. ,,
Drab long and medium	... 40s. to £6.	,,
Floss black medium...	... 35s. to 58s.	6d. ,,
Spadonas white and light	... 60s. to 95s.	,,
Spadonas femina ...	... 25s. to 55s.	,,
Boos white	... 60s. to 67s.	6d. ,,
Boos femina	... 45s. to 55s.	,,
Boos femina and drab	... 27s. 6d. to 35s.	,,

Feathers and Bird Skins.

Long Osprey'	... 13 to 17s. per oz.
Medium Osprey	... 25 to 37s. ,,
Short Osprey	... 39 to 45s. ,,
Selected ditto	... 52 to 70s. ,,
Mixed Heron	... 1s. 6d. to 2s. ,,
Red Heron	... 2s. 9d. to 3s. ,,
Grey Paddy	... 16s. to 20s. ,,
Peacock Neck feathers, blue	... 2s. 9d. to 3s. per lb.
Peacock Neck feathers, gold	... 16s. to 25s. ,,
Peacock tail feathers ...	... 1d a bundle.
Impegan Pheasants ...	... 2s. 11d4. s. 6d. each.
Black Argus	... 2s. 6d. 2s. 11d. ,,
Red Argus	... 1s. 4d. 1s. 10d. ,,
Japanese Pheasants	... 8d. 9d. ,,
Blue Chatterers	... 7s. 6d. ,,
Red and black Tanager ...	1s. 7d.
Yellow and black ditto. ...	1s. 6d. to 1s. 7d.,,
Dark red ditto	9¼d. to 10d. ,,
Red Tanagers	8¼d. to 8¾d. ,,
Orange ,, ...	5d. to 5½d. ,,
Blue Creepers	4¼d. to 5¼d. ,,
Finches, various	1¾d. to 2d. ,,
Ruby Humming	7d. to 7½d. ,,
,, Emerald	3⅛d. to 3⅜d. ,,
Various ditto.	1d. to 2d. ,,
Parrots rose heads	4⅛d. to 5½d. ,,
,, ring necks	1¾d. to 2¾d. ,,
Small Kingfishers	4d. ,,
Jays	3d. to 4d. ,,
Various India and Japan ...	½d. to 4d. ,,

Next sales will take place on the 24th of July.

Just Arrived.

A magnificent collection of Bird Skins from New Guinea, about 200 species, including *Æpypodius bruijni*, *Pitta rosenbergi*, *Xanthomelus aureus*, *Semioptera gouldi*, *Charmosina arfalki*, and others, *Nasiterna various*, &c., &c.

A fine collection of bird skins from Japan, containing *Turdus sibiricus*, male, female and junior, and many other species of Turdidæ ; a fine series of hawks and owls, &c., &c.

A small collection of bird skins from Brazil, containing *Scolopax gigantea* and other good species.

A small collection from Gaboon, containing rare species of Nectarinidæ and others.

A small collection of beetles from Riversdale, S. Africa containing *Manticora Seicheli* and fine species of *Buprestidæ Cetonidæ*, and others.

A very large collection of butterflies and moths from Japan, 500 *species*.

RARE STAMPS FOR SALE.

A fine lot of unused Colonials in very fine condition with original gum.

ONLY ONE OF EACH FOR SALE.

	£	s.	d.
Bahamas, 1859, imperf., no wmk., 1d. lake, fine pair...	5	0	0
,, ,, perf., no wmk., 1d. lake... ...	0	10	0
Barbados, 1852, imperf., on blue paper, 1d. blue	0	15	0
,, ,, ,, ,, 4d. red	1	5	0
,, 1856, ,, on white paper, ½d. green	0	15	0
,, ,, ,, ,, 1s. black, pair	1	10	0
,, 1860, perf., ½d. green, 1d. blue, 4d. red, the three	0	5	0
,, ,, ,, 6d. red, 1s. black, the two	0	7	0
Ceylon, 1861, perf., wmk. star, 9d. brown	1	10	0
,, ,, ,, ,, ,, 2s. blue	1	15	0
Mauritius, 1858. Figure of Britannia, 4d. green ...	3	0	0
St. Vincent, 1861, perf., no wmk., 1d. lake... ...	0	1	0
,, ,, ,, ,, 6d. green ...	0	2	6
,, ,, ,, ,, 1s. purple black	0	12	0
,, ,, ,, ,, 1s. dark blue ...	0	10	0
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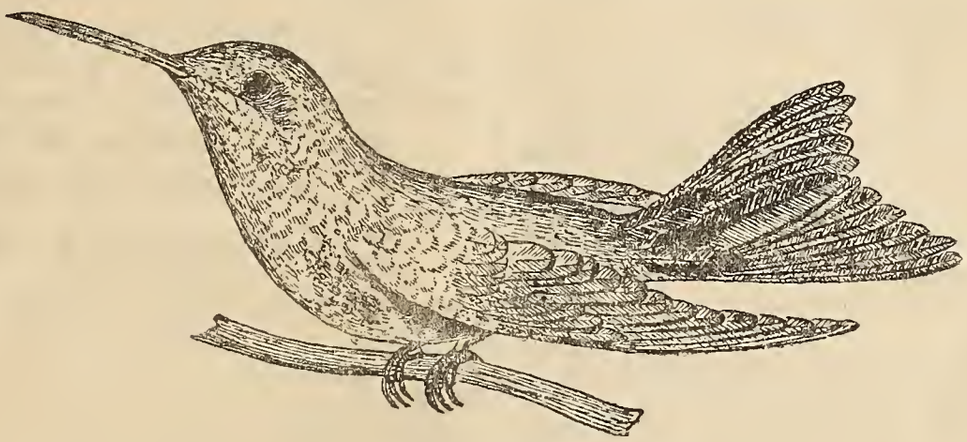

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The Humming Bird.

The Plaintain or Banana Plant.

By A. Boucard.

The Plantain or Banana plant belongs to the family of the Musaceæ. It is found in all tropical countries, and there are many species known, and probably more will be discovered in Central Africa, New Guinea and adjacent Islands.

These plants have scarcely any aerial stem but have shoots from subterraneous root stocks from which emerge stems composed of sheathing leaf-stalks. The leaves are flat and traversed throughout by a thick median rib with simple veins running directly towards it from the margin. The general aspect of the plant is somewhat like a Palm-tree.

The Genus Musa is the type of the family.

The largest species is known under the name of *Musa sapientum*. It has a fruit, which sometimes grows to the length of 12 inches. Each plant produces a bunch containing from twenty to fifty fruits, closely grouped together. It weighs from 25 to 50 pounds and sometimes more. In Central and South America, natives have no other food. They eat them green or ripe; green they boil them and are a good substitute for bread, being very farinaceous. When half ripe they roast them and make a delicious entremets. Ripe they are exquisite raw and also made into sweetmeats.

During my sojourn in Mexico and Central America, I have eaten these fruits raw and cooked in many ways, and I have always found them nice and wholesome. In fact, I have never got tired of them although sometimes taken in excess. I really don't know how the lazy natives of the tropical countries would live without them. The plant bears flowers and fruit only once; but it constantly reproduces new shoots from the subterraneous root stocks, so that once planted, they require very little care to keep in order and are always increasing in number. A few hundred plants are quite sufficient to sustain a whole family. It bears flowers and fruit all the year. In a medium size plantation, there are always plants with flowers and bunches of fruits in all stages of development.

Another very common species is *Musa paradisiaica*, so called from an allusion to an old notion of being the forbidden fruit of Scripture.

The fruits of this species are rather small, only about 3 inches long. They are always eaten ripe, fried or preserved.

In Central aud South America they grow also some other species; such as the Guinea Plantain, probably imported from Africa. It is a small species, delicious to eat crude, when quite ripe.

Each bunch contains from 100 to 200 fruits.

The Manilla plantain, probably *Musa textilis* from Manilla (Philippines), is also another species largely cultivated.

The fruit is internally of a rosy colour, in size it stands between the fruit of *Musa paradisiaica* and *Musa sapientium*. It is eaten crude, boiled, fried or in preserves. All sorts of animals and especially insects, such as Lepidoptera and Coleoptera, are very fond of the ripe fruits, fresh or rotten. Many times I have caught fine species of butterflies and beetles when feeding on them.

Since a few years a large trade of plantain fruits is going on between Mexico, Central and South America and the United States, where these fruits are in great demand, and all shipments are immediately sold at about half-penny a piece wholesale. Some are also sent to Europe; but as far as I can make it out, they are cut too green and they don't ripe well. They are not to be compared with the fruits eaten in their growing places. Besides they are rather expensive; but I have not the least doubt that before long, they will find way to forward some to Europe, so, as to arrive in fine condition, and sold at a moderate price, and a great trade of that fruit will be established between Europe and the tropical countries of the World.

An intoxicating liquor is made with the fruit. It is rather pleasant and has a very distinct taste of all the liquors we know.

Very likely, a very good sugar could also be made with it.

The leaves are employed by the natives for the thatch of their houses.

Besides a tough fibre, capable of being made into thread is extracted from the stems, and lately it has been discovered that a very good printing paper of the finest quality, can be made from them, at a very cheap rate.

The supply of this new material being illimited, very likely it will affect greatly the price of the paper.

Therefore we have here a plant of the greatest utility easy to grow, whose products will sell more and more every day, and I can predict to those who will undertake the cultivation of that plant that they are sure to reap a good and profitable harvest.

A.B.

A Visit to the British Museum. Natural History Department.

Continued from page 55.

The Central Hall.

In the centre of the entrance hall is placed the skeleton of one of the most colossal of animals, the Cachalot or Sperm-whale (*Physeter macrocephalus*) prepared from an animal cast ashore near Thurso, on the north of Scotland, in July, 1863, on the estate of Capt D. Macdonald, by whom it was presented to the Museum. It measures fifty feet in length.

One group, in a case, placed at present near the

entrance to the hall, shows to which a species may become subject, under the influence of domestication, as illustrated by choice examples of the best marked breeds of pigeons, all of which are derived from the wild Rock dove (*Columbia livia*).

One case contains a series of specimens illustrating *albinism*. Another shows examples of the opposite condition, called *melanism*. The bays or alcoves round the hall, five on each side, are devoted to the introductory or elementary morphological collection, designed to teach the most important points in the structure of the principal types of animal and plant life.

This collection is only in its infancy but when completed, it is hoped that it may ultimately serve as a guide for the formation of educational biological museums elsewhere.

The bays on the west side (left hand on entering the hall) are devoted to the Vertebrated Animals. In Nos. 1 and 2 are shown the characters of the Mammalian modifications of this type. The wall-cases of No. 1 are already filled with specimens showing the bony framework of Mammals.

The central case of Bay 1 contains a collection illustrating the principal characters of the teeth in Mammalia. Bay No. 2 contains in its first wall-case illustrations of the outer covering or integument and its modifications in the class of Mammals.

Bay No. 3 is devoted to the class of Birds.

Bays Nos. 4 and 5, show the most important points in the structure of Reptiles and Fishes.

Bays Nos. 6 and 7 will contain illustrations of the articulated classes Cruitacea, Arachnida, Myriopoda, Insecta, Annulosa, Vermes, Mollusca, Echinodermata, Cælenterata, Porifera, Protozoa.

Bays Nos. 8, 9 and 10 will be devoted for the morphology of the vegetable kingdom, the first containing the Cryptogams, the next the Gymnosperms and the Monocotyledons, and the last the Dycotyledons.

This Introductory or Elementary Morphological Collection, which is intended to be an introduction to all the others, is under the immediate supervision of the Director, Professor W. H. Flower.

GALLERY OF BRITISH ZOOLOGY.

At the north end of the Central Hall, on either side of the staircase, is a large room containing a collection of animals of all classes, which are or have been found in the British Isles.

It is excessively interesting and contains very rare and valuable species, amongst which I have already mentioned one specimen of the excessively rare, extinct species of Bird, the Great Auk (*Alca impennis*).

Many are the species of Mammals, Birds, Reptiles, Fishes, Mollusca, etc., exhibited in this room. They are also two cabinets containing a very valuable collection of British Butterflies and Moths, with their larvæ, all of them prepared by Lord Walsingham and presented to the Museum by him in 1887.

This Gallery is one of the great attractions of the Museum. It is greatly appreciated by the Visitors, which clearly shows that the exhibit of local Collections ought to be the beginning of all public Museums.

BIRD GALLERY.

On the ground floor (left hand side), of the Central Hall is the long gallery, extending the entire length of the front of that wing of the building, where is exhibited the collection of stuffed birds.

The wall-cases contain mounted specimens of the principal species, arranged in systematic order, beginning with the Birds of prey and ending with the Penguins.

The various types of the birds of prey are wel represented, from the Condor to the Dwarf Falcon which is not much larger than a sparrow.

Among the rarest species, I have remarked two specimens of the Californian Vulture, one specimen of Sarcoramphus æquatorialis (the type of the species) which I believe to be a young of the Condor or Great Vulture of the Andes; two poor specimens of the rare Secretary bird from South Africa.

Thrasaetus harpya (2), Morphnus guianensis (1), Gypaetus barbatus (1), Hierofalco candicans (6), Hierofalco gyrfalco (1), Syrnium lapponicum (2), one perfectly white specimen of Nictea nivea, or Snow Owl and many others.

Case 18 contains the collection of the splendid Paradise birds; but it is not so good as it ought to be, and being placed in the lower part of Case it shows poorly.

In Case 28 are two specimens of the rare Bornean Crow (*Pityriasis gymnocephalus*); but they are poor specimens.

In Case 29, I was astonished not to see the splendid bird *Calyptomena whiteheadi*, lately discovered in Borneo, by Mr. Whitehead.

Cases 31 and 32 contain the collection of Humming birds; but they are so high that they can scarcely be seen, which is a great pity, these birds, being great favourites with the public.

In Case 32 is one specimen of the rare Bee Eater (*Merops Breweri*).

Case 35 contains a fine series of species of King Fishers, among which, I noticed two specimens of Caridonax fulgidus.

In Case 40 are found the following rare species of Parrots, Ara rubrigenys from Bolivia, Ara glauca, Conurus solstitialis, Psittacus pachyrhynchus, etc., etc.

At the end of the same side of the gallery are placed skeletons of the Dodo and Solitaire, supposed to be gigantic pigeons, with wings too small for flight, cause of their total extermination by the inhabitants of the islands of Mauritius and Rodriguez, in whose islands these birds did thrive.

In the Pavillon, at the further end of the Gallery, are placed the birds known actually as *Ratitæ*, including the Ostriches, Emus, Cassowaries, and Apteryx.

The series of these birds is very fine and very valuable.

The cases on the right hand side of the gallery are occupied by the birds allied to the common Fowl, known as Gallinacæ, Perdicidæ, Columbidæ, etc., and by the wading and swimming birds; among them some rare species of Pheasants, *Crossoptilon thibetanum*, and *mantchuricum*, Lobiophasis bulweri, a very fine male, presented by His Excell. F. F. Usher, Governor of Labuan, Meleagris gallo pavo, fera, and ocellata, Leiopoa ocellata (2), Notiornis mantelli, Balæniceps rex (2), Chauna chavaria, Bustards, Flamingoes with their nest, the Emperor Pingouin, a very rare bird, and lastly the second specimen of the GREAT AUK.

In the middle of the gallery, opposite the cases containing the collection of Pheasants, is one containing two magnificent specimens of the very rare Pheasant discovered a few years ago by Captain Reinhardt, Governor of Tonkin. The female exhibited is the only known specimen of this extraordinary bird.

Many other cases placed in this gallery and in the spaces between the wall-cases contain isolated groups of particular interest, among which are those showing the nesting habits of the best known British birds. The great interest of these groups consists in their absolute truthfulness. When it has been possible, the actual rocks, trees or grass have been preserved, and when these were of a perishable nature they were accurately modelled from nature. The stuffing of the birds is very good, quite artistic and natural, and can serve as example to all Museums.

On the whole, the collection of Birds is very fine, and it is a pity that the Guide of the Bird Gallery is not printed yet. It is to be hoped that the the authorities of the British Museum will give special instructions for its speedy publication.

To be continued.

Inauguration of the Statue of Pierre Belon, the Naturalist.

At Cerans-Foulletourte, near Mans, Sarthe (France), on the 14th June last, was inaugured the statue of the Naturalist *Pierre Belon*, born in that small town in 1517.

Pierre Belon is the author of L'HISTOIRE DE LA NATURE DES OISEAUX, in seven volumes.

The first treats of the anatomy and physiology of birds, the second of the Birds of prey, the third of the Swimming birds, the fourth of the Snipes and allied species, the fifth of the Gallinacæ, the sixth of the Crows and allied species, and the last of the Songsters.

One of the chapters of the first volume is remarkable, that of the Osteology of Birds compared to that of Man.

Pierre Belon figures in opposition one to another, one skeleton of Man to one of Bird, and shows how the bones of both correspond exactly and so well, that they can be designed in the two figures by the same letters, as the angles of similar figures in Geometry. He shows in detail the existing analogy between the wing of Bird, the arm of Man, and the anterior limb of Mammal.

Nearly the same bones are found in the wings of Birds as in the arms of Men or legs of Mammals, the hand being represented in birds by the six small bones, *osselets*, which form the end of the wing.

There is no doubt whatever that Pierre Belon, the ancestor of Buffon, Linné, Lacépéde, Cuvier, Geoffroy St. Hilaire, and many other celebrated Naturalists of the eighteenth and nineteenth centuries, was a man of genius and is the father of the principles of Classification in Ornithology, and I don't see why the modern scientists ignore him completely.

Pierre Belon at first studied Botany, then Medicine. In 1540, he travelled in Germany and Bohemia in company of the celebrated Professor Valerius Cordus. After that, he visited successively Greece, Turkey, Lemnos, Thrace, Macedony, Asia Minor, Chio, Samos, Rhodes, Egypt, Palestine, and Syria.

For that time, it was an extraordinary journey. When back, he published his observations in a remarkable work, which contains curious and interesting accounts on geography, customs, flora and fauna of all the countries visited by him.

Later, when retired at Boulogne, near Paris, and working at a traduction of Dioscoride and Theophraste, he was murdered in 1564 in his forty-seventh year.

What a reward for such a meritorious Scientist!!!

After a little over two centuries, the memory of Pierre Belon has been at last duly honored, and in 1887, a statue of this illustrious man was inaugurated on the place of the Prefecture at Mans, and now another at Foulletourte, his native place.

The bronze statue of Pierre Belon, which has just been inaugurated, is the work of Miss Anaïs Loriot, a native also of Foulletourte, who, without study, and never away from Foulletourte, has produced a work, that masters would not hesitate to sign.

Pierre Belon is represented in a Henry III. costume, cap, doublet and breeches. He has a fine beard and looks more like a Nobleman than a Scientist.

On the socket are engraved these words:

A PIERRE BELON

MÉDECIN, VOYAGEUR NATURALISTE

NÉ EN 1517 AU HAMEAU DE LA SOULTIÈRE

CÉRANS-FOULLETOURTE.

A Giant Land Crab.

In wandering over Kneeling Island the naturalist's attention was immediately attracted by a giant land crab, Birgos, which lived here, feeding upon cocoa-nuts. The crab is, in reality, a close ally of the hermit variety, having, instead of a shell, an abdomen protected by an armour. That such a creature can open a cocoanut, which man finds difficult, even with a hatchet, seems incredible, yet it is a very simple matter for the big crustacean. It begins by tearing away the husk, bit by bit, fibre by fibre, and, what is remarkable, always at the end bearing the two eye-holes. When the husk has been removed, the crab hammers away at the holes with its large claw until an opening is made. But then, one may ask, how can it obtain the meat? The crab solves this by turning around and inserting its long, slender, fifth claw into the orifice, which, being armed with pincers, takes out the meat bit by bit. "I think," says Darwin, "this is as curious a case of instinct as ever I heard of, and likewise of adaptation in structure between two objects apparently so remote from each other in the scheme of nature as a crab and a cocoa-nut tree. The Birgos is diurnal in its habits; but every night it is said to pay a visit to the sea, no doubt for the purpose of moistening its branchiæ. The young are likewise hatched, and live for some time, on the coast. These crabs inhabit deep burrows, which they hollow out beneath the roots of trees, and where they accumulate surprising quantities of the picked fibres of the cocoa-nut husk, on which they rest as in bed. The Malays sometimes take advantage of this, and collect the fibrous mass to use as junk. It has been stated by some authors that the Birgos crawls up the cocoa-nut trees for the purpose of stealing the nuts; I very much doubt the possibility of this. I was told by Mr. Liesk that on these islands the Birgos lives on the nuts which have fallen to the ground. To show the wonderful strength of the front pair of pincers, I may mention that Captain Moresby confined one in a strong tin box, which had held biscuits, the lid being secured with wire; but the crab turned down the edges and escaped. In turning down the edges it actually punched many small holes quite through the tin!"

An Easy Way of making One Hundred Pounds' Sterling a Year in Collecting Specimens of Natural History at Leisure Time.

Continued from pages 7, 15, 23, 32, 56.

FOSSILS.

All petrified objects found in the water or in the earth as Rocks, Shells, Bones, Plants, Animals, etc., are fossils.

They have value when they are beautiful specimens and very complete.

Pack them with paper or soft substance in small boxes.

BRIGHT INSECTS AND SHELLS.

Jewellers, Plumassiers, Florists, Modists and other manufacturers make a great use of them.

They must be collected by hundreds and thousands.

Women and children can be very useful for that purpose.

Put them to dry in the sun and pack them by species, in boxes, in which you pour benzine, and paste strips of paper all over.

The more you collect, the better; because it is easier to sell when you have a large quantity of each species; but take care that they are bright and pretty species. Dull specimens are of no value.

FEATHERS AND BIRD SKINS FOR INDUSTIAL PURPOSES.

Since twenty years a very large trade has been done with all kinds of feathers and bird skins for industrial purposes. Foremost of all are the Ostrich feathers. They are sent chiefly from South Africa, where extensive breeding farms of these birds have been established during the last twenty years.

In last sale, June 5th, 2,140 cases Cape and 6 cases Egyptian were sold and realized the handsome sum of £102,000.

During the last ten years they have tried the farming of Ostriches in Algeria, but for one cause or another, they have not succeeded:

All the young die, but I don't see why a better result could not be obtained. I think it ought to succeed, if an enterprising and competent Naturalist should under take the task, after one or two years of aprenticeship, on South African farms.

A small quantity of Ostrich feathers is also sent yearly from Senegal and other parts of West Africa. This trade is in the hands of Arabs, who gather them in the interior of Africa, where these birds are found wild.

Although these feathers plucked from wild birds are stronger and nearly as fine as these sent from S. Africa, they are not so much in demand and they sell at a lower price.

Next to the Ostrich, Osprey feathers fetch a good price, and the sale is illimited for the best qualities.

There are three varieties of Osprey feathers known in the trade, as Short, Middle and Long Osprey.

The medium price varies between 12 and 60/- per ounce. What is known as Short Selected is about 6 inches long with curved tip. They are the feathers of

Herodias garzetta found all over the world. Middle Osprey is slightly longer with straight tip.

Long Osprey is about 15 inches long, straight at tip. They are taken from *Herodias egretta*, found chiefly in South America.

It is important to kill the birds during spring; because in summer, the tips of the feathers are worn and of much less value.

To this day no attempt has been made to domesticate these birds, as it is done with Ostriches, Pheasants, and many other species of birds, and I am convinced that a serious attempt in that direction would prove very beneficial to the inovator.

Besides the Ospreys the feathers of many other species of Herons such as: *Bubulcus Ibis*, *Ardea cinerea and cocoi*, *Florida cærulea*, *Plotus anhinga*, *etc.*, *etc.*, are also employed by Plumassiers; but the price is much less, ranging from two to six shillings per ounce.

White and Grey Paddy produces also feathers which are sometimes in great demand and fetch a good price. Vulture, Emeus, Rhea or American Ostrich, Peacock, Turkey and other feathers are also useful, especially for the Plumassiers and feather dusters trades. They fetch more or less according to the demand.

Then a very large number of species of Birds are also wanted. Foremost of all, the well-known Birds of Paradise and the Long Tail Trogan.

All of them fetch a price which will repay the trouble of the collector. After these, the species most in demand are the Chatterer, Cock of Rock, blue Macaw and several other species wanted by the Plumassiers and Fishing Tackle Makers.

Then comes at last the immense variety of small birds; such as Tanagers, Blue Creepers, King Fishers, Sea-Swallows, Merles, Starlings, Jays, Waxwings, Humming birds of all descriptions, etc., etc.

The large species of Birds such as Herons, Flamingoes, Pelicans, etc., can be sent in flat skins, the others must be sent in good round skins as if they were for scientific collections, and the better the skins will be prepared, the better they will sell.

Lately very large consignments have been sent from N. Africa, India, Japan and S. America, and the prices have somewhat fallen; but it is probable that a rise will soon take place.

GENERAL REMARKS.

All descriptions of Natural History Collections may be easily sold if they are well collected and arrive in a perfect state of preservation.

They must be sent home frequently and in small portions; for the following reasons.

1. It is easier to sell small than large collections.

2. If the package or preparation has been done badly, your correspondent can forward immediately new instructions which will permit to make the next sending with more success.

It will be very good when collecting to be in relation with a naturalist for the sale of your collections. I make the offer to those who will send me collections well preserved, to sell them on their account or buy them at the prices which I have indicated.

To collect Reptiles, Fish, Insects, and Shells, it is necessary to buy the following utensils.

Benzine, tin boxes for Insects, several bottles, glass tubes or phials, digger, butterfly and other nets, umbrella for collecting Insects, Cork, Pins for Insects, Pill boxes of several sizes, Boucard's Insecticide, flax, cotton, and nippers.

Collect especially Reptiles, Fish, Shells, and among Insects, Coleoptera and Lepidoptera.

Twenty-five specimens of each species of Reptiles, Fish, Crustaceæ, and Arachnides are sufficient.

Coleoptera, Lepidoptera, and Shells fifty specimens of each, and thirty of other Insects.

One thousand seeds of palm trees of each species, and two or three pounds of seeds of all trees, bushes and plants of the country.

Large beetles are not to be pinned; wrap them separately in paper, and dry them in the sun, eight or ten days are sufficient. Then pack them in a box with saw dust, or any soft substance.

Very large species of marine Shells, Reptiles, Fossils, etc., will be sent, only if ordered, to avoid the cost of transport, which in many cases would be more than the value of the object.

One specimen of each species of all the animals collected should have a number attached to it, corresponding to one in a list in which you wil indicate exactly the country where found, the month and the year when collected, the local name, the habits and other particulars of interest.

This list wlll be sent in the same box as the objects.

When you change your residence, change your collecting bottles, in order to send in each only those animals which have been collected in the same place.

Reptiles are abundant in spring and summer; the best season for Insects and Shells is the rainy one; the more it rains, the more Insects and Shells you will find.

Mammals and birds are found abundantly in spring and summer.

Both sexes and youngs of each species must be collected.

Humming-bird and other curious shaped form Nests should also be collected; as well as eggs of all the species.

Small Mammals; such as Bats, Rats, Moles, Shrew-Mouses, etc., should be sent skinned, and also in spirit.

Particular genera of birds not found in Europe should also be sent in spirit. Make an incision in the middle of the belly to allow the spirit to get in.

Now I will conclude with a few words of warning. If you have no taste for *Natural History*, don't attempt to make collections. Before all, if you do, select a well-known Naturalist as Correspondent, otherwise you will not know what to send and the result will be probably a failure.

In all countries, there are objects of Natural History of value or of scientific interest; but it is only the experienced Naturalists who can make out for you, the list of the species wanted, otherwise to acquire experience it will take many years and will cost money.

A. Boucard.

Royal Aquarium.

On Wednesday the 8th day of July, was held an Extraordinary General Meeting of the Society, in the Theatre of the Royal Aquarium.

This meeting was convened at the requisition of welve Shareholders, holding over 5000 Shares.

1st. To consider the present position and management of the Society, its business and affairs.

2nd. To increase the number of Directors from four as at present, to seven or such other number as the Meeting may determine, and for such purpose to repeal or alter any previous Resolution of the Society.

3rd. To elect the additional Directors and to determine in what rotation they shall go out of office.

4th. To call upon Captain Molesworth to resign his present position of Director, and in the event of his so resigning to fill up the vacancy to be thereby created.

5th. To do all such other acts and to pass such Resolutions as may be necessary or expedient to give effect to all orany of the foregoing Resolutions.

The meeting lasted from 2 to 5. It was rather stormy; but eventually Resolutions 2 and 3 were passed by a great majority. Messrs. Henry S. Dominy, Chas. Critchett, and Geo. Moss, were elected Directors. It is to be hoped now, that with such a board of Directors, the affairs of the Society will improve in a manner that will enable the Society to pay *a fair dividend* to the Shareholders; but I am still of the same opinion as before, that it is vital to the Society to secure a *competent Manager* if it can be had. In so doing, the property of the Society will become *a valuable one*, and the Board will secure the approbation and thanks of all the Shareholders.

THE EDITOR.

Review of New Scientific Books.

CATALOGUE OF THE BIRDS IN THE BRITISH MUSEUM VOL. XIX. IN 4to, 484 PAGES, LONDON 1891. *Price* 25 *Shillings*.

This interesting volume, on *Scansores and Coccyges*, contains the families *Ramphastidae, Galbulidae and Bucconidae*, by P. L. Sclater, the families *Indicatoridae, Capitonidae, Cuculidae and Musophagidae*, by G. E. Shelley. In it, are the descriptions of eleven species of Indicatoridæ, one hundred and eleven species of Capitonidæ, fifty-nine of Ramphastidæ, twenty one species of Galbulidæ, forty three species of Bucconidæ, one hundred and sixty species of Cuculidæ, and twenty-five species of Musophagidæ. Twenty-five species are figured in the thirteen coloured plates, ending the volume. They are *Melanobuco aequatorialis, Tricholæma, stigmathorax* and *affine, Barbatula chrysopyga* and *bilineata*, heads of *Cyanops davisoni, ramsayi*, and incognita, *Capito, versicolor, steerii, richardsoni, salvini, granadensis* and *bourcieri*, full birds of *Pteroglossus didymus, Aulacoramphus erythrognathus, calorhynchus, whitelyanus*, and *cyanoloemus, Coccystes caroli* and *hypopinarius Centropus, purpureus*, heads of *Coccysus dominicæ, minor*, and *maynardi*.

CATALOGUE OF THE FOSSIL, BIRDS IN THE BRITISH MUSEUM, by Richard Lydekker, 1 Vol. in 4°, 364 pages 75 Wood Cuts, London 1891, Price 10 Shillings.

This remsrkable volume includes the whole of the extinct birds, known at present (with the exception of those belonging to the suborders Passeres and Picaridæ) from the Tertiaries of Europe, which have received distinct specific names and have been described or figured with sufficient exactness to entitle them to rank as species.

The classification followed is partly that of Prof. Alfred Newton in his article, Ornithology (Encyclopedia britannica) and also that of Professor Huxley, as under :—

ORDO I. CARINATÆ.

Suborder I. PASSERES, Family Corvidæ.

Suborder II. PICARIÆ,

Suborder III. PSITTACI. Families Stringopidæ, Psittacidæ.

Suborder IV. STRIGES. Family Strigidæ.

Suborder V. ACCIPITRES, Families Falconidæ, Serpentariidæ, Cathartidæ.

Suborder VI. STEGANOPODES, Families Pelecanidæ, Phalacrocoracidæ, Odontopterygidae.

Suborder VII. HERODIONES, Families Ardeidæ, Ciconiidæ Plataleidæ.

Suborder VIII. ODONTOGLOSSI, Family Phœnicopteridæ.

Suborder IX. ANSERES, Family Anatidae.

Suborder X. COLUMBÆ, Families Columbidæ, Dididæ, Pteroclidæ.

Suborder XI. GALLINÆ, Families Phasianidæ, Megapodidæ.

Suborder XII. FULICARIDAE, Family Rallidae.

Suborder XIII. ALECTORIDES, Families Gruidae, Otididae.

Suborder XIV. LIMICOLAE, Family Scolopacidæ.

Suborder XV. GAVIÆ, Families Laridae, Aegialornithidæ.

Suborder XVI. TUBINARES, Family Procellariidæ.

Suborder XVII. PYGOPODES, Families Colymbidæ, Alcidæ.

Suborder XVIII. IMPENNES, Family Spheniscidæ.

Suborder XIX ODONTORMÆ, Family Ichthyornithidæ.

Suborder XX. ODONTOLCÆ, Families Enaliornithidæ, Hesperornithidæ.

ORDO II. RATITÆ.

Families Struthionidæ, Aepyornithidæ, Apterygidæ-Dinornithidæ, Casuariidæ, Dromornithidæ, Gastornithidæ.

ORDO III. SAURURÆ.

Family Archæopterygidæ.

All Ornithologists should posess these two volumes.

PROCEEDINGS OF THE ZOOLOGICAL SOCIETY OF LONDON, 1891, Part I, 178 pages of text, 14 black and coloured plates, figuring a new Lizard of the Genus Ctenoblepharis from Chili, new Bornean Land Shells, Anatomy of Anodon and Unio, new Butterflies from tropical South-western Africa, Abramis blicca, Anatomy of Heloderma, Platycercus erythropeplus, male and female, Phrygilus coracinus, and a supposed Jacobson's Organ in the Crocodilia.

TRANSACTIONS OF THE ZOOLOGICAL SOCIETY OF LONDON, Vol. xiii, Parts I. and II.

Part I. contains :—On the Genus *Urothæ* and a new

Genus *Urothoides*, by the Rev. Thomas R. R. Stebbing (Plates I.—XV.). On four new *British Amphipoda*, by the Rev. Thomas R. R. Stebbing (Plates V.—VI.).

Part II.—On the Morphology of a Reptilian bird, *Opisthocomus cristatus*, by W. Th. Parker (Plates VII.—X.).

Contributions to our knowledge of the Antipatharian Corals, by F. Jeffrey Bell (Plates XI.—XII.).

MÉMOIRES DE LA SOCIÉTÉ ZOOLOGIQUE DE FRANCE POUR L'ANNÉE 1891. Tome IV. 1ère et 2ème parties, 208 pages de texte et trois planches noires.

Contents :—*Voyage de la goelette Melita aux Canaries et au Sénégal* 1889—1890, par Ed. Chevreux (Pl. I.).

Voyage de la goelette Melita aux Canaries et au Sénégal 1889—1890.

SPONGIAIRES, (Pl. II.) par E. Topsent.

Voyage de la goelette Melita aux Canaries et au Sénégal, 1889—1890.

MOLLUSQUES TESTACÉS, (Pl. III.) par Ph. Dautzenberg.

Sur le Cerianthus menbranaceus Gmel, par L. Faurot.

Nouveaux faits d'hybridation observés chez les Batraciens amoures, par Héron-Royer.

Note préliminaire sur les Alcyonnaires provenant des campagnes du yacht l'Hirondelle, 1886, 1887, 1888, par Th. Studer.

Revue des derniers systèmes ornithologiques et nouvelle classification proposée pour les Oiseaux, par Alph. Dubois.

Les Oiseaux hybrides rencontrés à l'état sauvage, 2ème partie : Les Palmipèdes par A. Suchetet.

Sur les Helminthes des Primates anthropoides, 1ère Note, *Cestodes* par R. Blanchard.

Coléoptères recueillis aux Açores par Mr. J. de Guerne pendant les campagnes du yacht l'Hirondelle (1887—1888), par Ch. Allaud.

Résultats d'une excursion Zoologique en Algérie, par R. Blanchard.

PRIMO RESOCONTO DEI RISULTADI DELLA INCHIESTA ORNITHOLOGICA IN ITALIA. Parte prima, AVIFAUNA ITALICA, compilato dal Dottore Enrico Hillyer Giglioli, 1 vol. in 4°., 671 pages, Firenze 1889.

PRIMO RESOCONTO DEI RESULTADI DELLA INCHIESTA ORNITHOLOGICA IN ITALIA. Parte seconda, AVIFAUNE LOCALI, compilato dal Dottore Enrico Hillyer Giglioli, 1 vol. in 4°., 663 pages, Firenze 1890.

PRIMO RESOCONTO DEI RESULTADI DELLA INCHIESTA ORNITHOLOGICA IN ITALIA. Parte terza ed ultima, NOTIZIE D INDOLE GENÉRALE, compilato dal Dottore Enrico Hillyer Giglioli, 1 vol. in 4°., 518 pages, Firenze 1891.

These three volumes contain a very large number of scientific and valuable information on the Italian Avifauna. The first volume treats of the systematic classification of all the species of birds found in Italy stationary or accidentally, otherwise with all the vulgar names and observations made by the numerous contributors who have assisted Dr. Giglioli in doing the work.

In Volume II. are stated the results of all the observations made in each province.

Vol. III. contains valuable informations on the migration, nidification, alimentation, etc. of a large quantity of species.

It is quite extraordinary to learn that up to the present, England and France have not published any collective work of that kind, and it is to be hoped that they will soon do so ; as it is useless to remind these countries the importance of such a publication.

THE WEST AMERICAN SCIENTIST VOL. VII. January 1891.

Contents :—*Edwin Wortham Dorham*, (with portrait) by F. W. Goding.

Star Tulips, by Carl Purdy.

Easter Island (with Illustrations).

Ancella-bearing Strata of Oregon, by Aurelius Todd.

A New Raphiomidas, by D. W. Coquillett.

Ice Caves of Washington.

Forest Trees of Oregon, by Prof. Thomas Condon.

The Day Life of the Desert, by C. R. Orcutt.

Californian Lilies, *California Flowers in England*, *California Trees and Flowers* (Illustrated).

THE CANADIAN ENTOMOLOGIST, Vol. XXIII. June, 1891, edited by Rev. C. J. S. Bethune.

Contents :—*Notes on some species of Noctuidæ described by Francis Walker*, by Prof. John B. Smith.

New Rhopalocera and Heterocera, by B. Neumœgen.

A new Butterfly form Lower California, *Pyrgus pelagica*, by A. G. Weeks, jun.

Melanism and Humidity, by T. W. Tutt.

Preparatory stages of Arctia rectilinea, French, by G. H. French.

Two new species of Canadian Pimplinæ, by Wm. Hague Harrington.

Nematus pallidiventris, Fall—A fresh importation, by Rev. Thomas W. Fyles.

Note on Ammophila robusta, by J. M. Aldrich.

A cannibal cricket, by Wm. Brodie.

Note on Amblyopone pallipes, Hald, by W. Hague Harrington.

RECOMMENDATIONS FOR THE PREVENTION OF DAMAGE BY SOME COMMON INSECTS OF THE FARM, THE ORCHARD AND THE GARDEN, by James Fletcher, Entomologist and Botanist to Dominion Experimental Farms, Department of Agriculture, Ottawa, Canada.

This pamphlet of 30 pages is of the greatest interest to Agricultors of all countries ; Part. I. contains very interesting observations on Economic Entomology, preventive and active remedies ; pumps and other apparatus necessary for the application of the remedies.

Part II. contains descriptions of Insects injurious to grain and forage crops, to fruits, roots and vegetables and how to destroy them.

THE KANSAS CITY SCIENTIST, official organ of the Kansas City Academy of Science.

Contents :—*The Mushroom and the Arrow*, by Geo. C. Stealey.

The Probable Origin of the Ore Deposits in the mines of Missouri, by F. C. Meyer.

Scientific value of Fossils, by Edwin Walters.

Drawing in the public schools, by Sid. J. Hare.

Popular Superstitions, by R. B. Trouslot.

The White-Rumped Shrike as a Pet.

Future of the Phonograph.

Government's Expedition to Death Valley.

THE ANTIGUA OBSERVER, Vol. XLVII. No. 20, edited by D. W. Scarville, City of Saint John, Antigua, contains the first part of an extract of a very interesting paper on the Colony of the Leeward Islands by D. Morris, read at the Royal Colonial Institute.

Report on the Public Sale of the Celebrated Collection of Shells formed by the late Sir David W. Barclay and sold by Mr. J. C. Stevens, on Monday the 6th of July and the three following days.

This fine Collection was offered for sale in 1154 Lots, which realized the total sum of £1,050 3s. 6d.

From the beginning, there was a good attendance and a keen competition for some of the best Lots.

Lot 1, Oliva angulata, porphyria, *nobilis*, maura, ponderosa and varieties of tremulina, 11 shells, was sold for £1 6s.; Ancillaria obtusa, rubiginosa, cingulata and australis £1 10s.; two specimens of *Pinnaxia coronata*, 22s.; *Ranella candisata*, 30s.; two specimens of *Scalaria decussata*, 45s.; *Mitra rossæ*, 40s.; *Mitra balteolata, regina and subulata*, 24s.; *Mitra tessellata and regina*, 25s.; *Mitra adansoni type*, 40s.; *Conus malaccanus*, 42s.; *Conus cedo-nulli*, 26s.; *Conus granulatus and dux*, 22s.; *Conus aurisiacus and ammiralis*, 42s.; *Ovulum longirostrum*, 55s.; *Cypræa bicallosa*, 60s.; *Cypræa tessellata and pulchra*, 40s.; *Conus caillaudi*, 45s.; *Conus crosseanus and suturatus*, £3 7s. 6d.; *Conus trigonus and aculeiformis*, 20s.; *Isocardia moltkiana and lamarkii and Chamestrea albida*, 42s.; *Voluta costata*, £3; *Voluta prætexta*, 28s.; *Voluta aulica*, 45s.; *Voluta gracilis*, 40s.; *Strombus thersites*, £2 15s.; *Rostellaria curta*, 35s.; *Harpa rosea and crenata*, 32s.; 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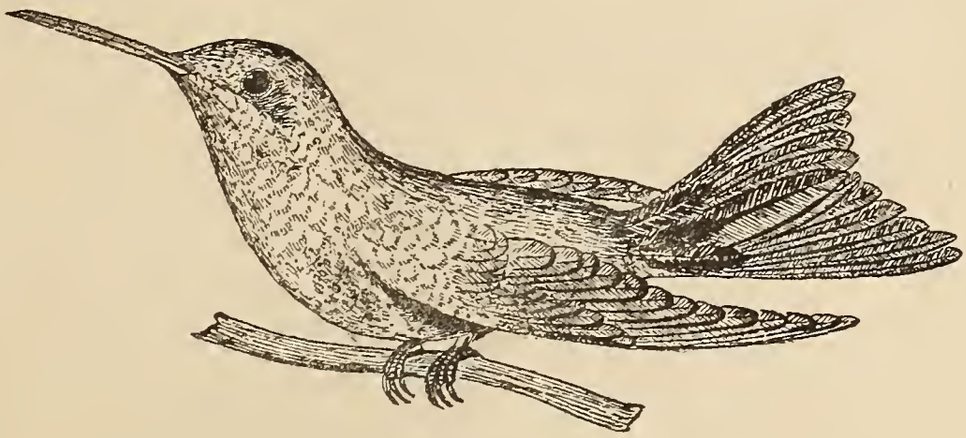

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EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
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— Catalogue of the Tortoises, Crocodiles and Amphisbænians in the Collection of the British

The Humming Bird.

The Pilgrim Locust.

Continued from page 52.

Since the publication of my first notice on the Pilgrim Locust ("Humming Bird," pp. 51-52) great havoc of property has been made by these insects in Algeria, Tunis, and Morocco. The French Parliament has voted large sums of money for their destruction. The Paris Museum of Natural History has sent in Algeria Mr. Brongniart, with the special mission to study the invasion of these insects and the means to destroy them. It appears that Mr. Brongniart has been successful so far in the mission entrusted to him.

He has discovered in a field, covered with dead bodies of locusts, a parasitic mushroom which destroys them, and which develops itself with the same rapidity as these acridian insects.

It is to be hoped that Mr. Brougniart's process of procreating this parasitic mushroom in immense numbers will be successful, and will be the means to check their propagation; but I am still of opinion that an agreement should be entered at once by *France, Italy, Spain, Portugal, and other countries* for the protection of the birds mentioned on page 52, viz.: *Merops apiaster*, or Bee Eater; *Sturnus vulgaris*, or Starling; all species of Crows, and Magpies, Quails, etc.

It is only by employing all the means at their command that this plague will be successfully stopped, or, at least, abated.

Now I don't see why it should not be possible to derive a benefit of such large numbers of insects for industrial purposes.

In this century of wonderful discoveries, when chemistry is such a powerful agent for all purposes, I think it would be quite easy to discover several means of employing the said insects, either as manure, food, etc.

As manure, it is quite an easy thing, and I believe that they have already been used for that purpose, and there are no reasons why it could not be employed with good results for other purposes. It only requires to be analysed by competent chemists, so as to apply it where wanted. As food, it is well known that the negroes and the Arabs of the desert don't consider the coming of the locusts as a plague, but the contrary. They consider them as a *manna* sent to them by the Almighty. They feed largely on them, boiled or fried, and it is a perpetual festival during the time of the invasion. They also make provisions of them for future needs. For that purpose they gather as many as they can, and bake or dry them in the sun. Well dried, they keep for a long time. In America the Indians eat the young and say that they are delicious.

All sorts of animals feed on them, and I have often seen dogs and fowls hunting and devouring them.

Now I will suggest to the industrious *one of my ideas about them*, and it is that I am certain that a very good food for poultry and other birds, and probably also for dogs and other domesticated animals, can be made with them, by gathering as many of the young (and possibly also the mature Insects), drying or baking them, and when so prepared, to reduce them to powderin a special mill, and mix it with farinaceous substances, so as to make a paste easy to keep.

I am satisfied that such a paste would be a very acceptable food for many species of animals, and would pay well to manufacture.

There is an illimited field to explore in that direction; as the Insects could be made into a variety of pastes, by mixing with different farinaceous substances, according to the use required.

Here is a sure remedy which would cost nothing to the Governments, and probably in a few years time the arrival of locusts would be hailed with shouts of joy, instead of shouts of imprecations as at present.

I think that millions of money can be made with this new Industry, and it only requires a small capital. I am quite willing to help with my advice and my share in money, any Society willing to undertake the manufacture of Animal food and all other products, which can be extracted from *locusts*.

It will not be the first time that fortunes will be made with my suggestions. I remember that in 1878, I published a small pamphlet on the Objects exhibited by myself in the Guatemala Section, *Paris International Exhibition* 1878, and in it I called the attention of the public on the seeds of the Coyol Palm Trees, *Bactris viniferas* and other species found in very large quantities in all the tropical countries of Central and South America, and since then, a great trade has been made with these nuts for the excellent quality of their oil which is much used as a condiment, and also for superior soap making.

This reminds me that a Chemist has also made use of locusts for the manufacture of a good soap; but I am not aware if he has been able to get as many of the Insects as he wanted.

Probably the locusts could be used for many other industrial purposes. Surely they must contain some new Acids, susceptible of applications in Industry.

We must always remember that every living being has been created for a special purpose, and it is very likely that some reasons exist for the periodical invasions of locusts, and it would be well that scientific International Commissions should be sent to study these Insects, the countries where they come from, the reasons of these invasions, etc. etc., and the best methods to destroy them, if really injurious; as all Countries are greatly interested in the solution of such problems.

These Insects are to-day invading Tunisia, Algeria and Morocco, but to-morrow they may penetrate on all the Continent, in India, China, Japan, Australia, South Africa, etc., as they have done before; especially in Cyprus, Russia, France and Spain.

In Cyprus, the number of locusts is constantly increasing, and in 1882 they were so abundant that the English Government did all he could to stop that plague by offering from one half-penny to three half pence, per pound of eggs.

From July 1881 to February 1882, 1,329 tons of

eggs were brought to the authorities of the Island. It is impossible to imagine what number of eggs it represent.

Notwithstanding this large destruction of eggs the locusts have not disappeared. Very likely the eggs could also be mixed with farinaceous substances and made into a paste, suitable for animal food, and also used raw for all sorts of Songsters. It ought to be preserved easily.

The increase of locusts in Cyprus is attributed to the destruction of the forests, leaving the soil where such forests existed useless for culture and favourable to the production of Insects. The probable remedy should be in making new forests, by planting as many trees as possible. During the last years Georgia was also invaded by locusts. In the district of Adjeakoor, Lieut.-Colonel Serafinoff had three thousand men with him, with whom he exterminated the Insects in two hundred different places.

In Dagheraman, province of Ellesavetopol, such a large number of locusts arrived in May that it occupied several hundred miles. Five thousand men were requested to fight this formidable invasion. They destroyed about 200,000 pounds of Insects every day.

In 1886 Spain was also invaded by an immense number of locusts. They alighted near Ciudad Real and destroyed all vegetation.

The 12th of August, in the suburb of St. Maria, the sky was darkened during one hour by a throng of locusts, which alighted in that locality. It was resolved to put fire to the invaded fields by means of gazoline. This remedy was effectual; but more than twenty towns and villages lost entirely their crops.

In the province of Cuenca, the territory of fifty-eight villages was invaded by locusts in such numbers that in places they formed a layer one yard thick. A child left alone in the field died stifled under these Insects. The running of trains was interrupted for several hours.

In 1888 the locusts have again appeared in the province of Murcia.

In France, several years back, a large quantity of these Insects in one day destroyed all the vegetation from Saint Denis to Saint Michel-de-Bannières, in Dordogne. When all was devoured they took their flight for unknown regions, leaving misery and ruin after them.

In 1888 they appeared in the suburbs of Figeac. They alighted at Gourdon and Gramat. A large potato field was destroyed in several hours.

Besides the birds mentioned before as natural enemies of the locusts, there are also myriads of wasps, *Ichneumons*, which kill and bury the locusts after introducing their eggs in the bodies of their victims, which in due time will serve of nourishment to their progeniture.

I shall be happy if this poor contribution of mine will help in one way or another to the disappearance of this fearful plague, the cause of so much ruin and misery.

A. Boucard.

The following extract from a letter, dated Rawal Pindi, 25th May, 1891, will be read with interest, says the *British Medical Journal*:—"The Punjab has this year had a terrible visitation of locusts, the worst there has been for many a year. An army, about ten miles wide, of unfledged locusts, was passing through the station for five days. Millions I should say of these insects have been destroyed in the station, so that in many cases the smell from the dead bodies is very bad. The trains have several times been delayed for some hours by the inability to make way over the greasy masses of locusts crushed on the rails."

A Visit to the British Museum. Natural History Department.

Continued from page 55.

CORAL GALLERY.

Parallel with the Bird Gallery, to the north side, is a long narrow gallery, containing the collection of corals, sponges, and allied forms.

Commencing at the eastern end, some of the lowest forms of animal life are exhibited. They belong to the group *Foraminifera*, and for the greater part are so minute that they can only be studied with the microscope. Their structure is illustrated by models and figures. The next divisions are occupied by sponges. Most conspicuous among them is a series showing the variations of the common bath sponge, of which a great trade is done in the Mediterranean, chiefly at Tunis and Tripoli.

Some species are also gathered in Florida and in the West Indies.

Close to the common sponge can be seen some fine specimens of the charming *Euplectella*, or Venus' flower basket, the Japanese *Hyalonema*, or glass rope sponge, Case 3, and the gigantic *Rhapiophora*, or Neptune's goblet. Nearly the whole of the remainder of the gallery is given up to Corals, showing the immense variety of form and colour of these animals, some presenting a marvellous resemblance to vegetable growths. The precious Coral, *Corallium*, usually of a bright red colour, is common in the Mediterranean, where is also found the pink variety, which is more valuable. Opposite Cases 8 and 10 are the Madrepore Corals, amongst which can be seen a large fragment of a reef, entirely formed by a small kind of Madrepore. These reefs, when raised above the surface of the water, constitute the base of thousands of islands in the Indo-Pacific Ocean and West Indies, *one of the marvels of creation.* With time these islands, formed at first exclusively of corals, aided by the action of volcanic submarine eruptions, and also by detritus brought over by maritime currents, acquire a great development.

The small group of animals known as *Polyzoa*, nearly related to Mollusia, are exhibited on two table-cases at the western end of the gallery.

In the corridor which leads from the Bird Gallery into the Fish Gallery, a selection of the most important forms of Batrachians with or without tails, such as Salamanders, Newts, Frogs and Toads, is exhibited.

FISH GALLERY.

The Fish Gallery, which is nearest to the Central Hall, contains stuffed examples and skeletons of all the most remarkable members of the Class.

Cases (1—5), *Percidae*, or Perch family, of which the common Freshwater Perch is the best known example. In Case 5 are the *Mullidae* or Red Mullets. The European Mullet (*Mullus barbatus*) was prized by the ancient Romans above any other fish.

Case 6 contains the *Sparidae* or Sea Breams.

In Case 7 are the *Squamipinnes* or Coral Fishes, inhabitants of the tropical seas and abounding chiefly in the neighbourhood of coral reefs.

In Case 11 are the remarkable Sucking Fishes *Echeneis* which have the spinous dorsal fin modified into an adhesive disk, which occupies the upper side of the head and neck. By means of this disk, these fishes are enabled to attach themselves to any flat surface. When at sea we used to fish sharks and I never saw one taken without several of these fishes attached to its body. as also the Pilot-fish *(Naucrates ductor)* always seen a few yards from the Shark. This last fish is exhibited in Case 12. In Case 13 are exhibited various species of Sword-fishes. A piece of a two-inch plank of a whale boat pierced by a Sword-fish, in which the broken sword still remains, can be seen in the same Case; also a good series of Fishing-frogs *(Lophius)* also called Anglers or Sea-Devils.

Case 14 contains the well-known Stickleback and its curious Nest. It is an inhabitant of the British Isles. In Case 18 are exhibited two very curious species; the Electric Cat-Fish *(Malapterurus)* from tropical Africa, and the Callichtys from British Guiana.

Case 20 contains the *Scombresocidæ*, chiefly marine. The most curious members of this family are the Flying-Fishes *(Exocetus)*, inhabitants of the tropical and sub-tropical seas, where they are constantly seen in large numbers flying over the water. It is one of the most extraordinary sights to be seen. Sometimes they fall on board of vessels, in which case they are immediately secured, cooked and served on the table at meal's time.

In separate table-cases are exhibited several specimens of the rare *Arapaima gigas* from Brazil and Guiana, highly esteemed as an article of food. It is the largest freshwater Teleostean known, exceeding a length of 15 feet and a weight of 400 lb.

In Case 22 are specimens of *Gymnotus electricus*, the electric Eel of South America. The electric shock may be of sufficient strength to temporarily paralyse a man. I have been told that the Indians of Guiana have a very curious way of catching these fishes. They drive a horse in the river where electric Eels are found, and after the discharge of several electric shocks on the horse they easily secure them.

The Eels, *Muræenidæ*, are exhibited in Cases 23 and 24. *Muræna helena*, a Mediterranean species, is the type of the Genus. It attains the length of five feet and upwards, and its smooth skin is beautifully marbled with yellow subangular markings on a rich brown ground. It was highly prized by the ancient Romans, who had special ponds (*vivaria*) built for the fattening of these fishes. They were in the habit of introducing them, in crystal vases, on the table, before being cooked, that the guests might admire their variegated skin.

Vaedius Pollio of Rome, caused his offending slaves to be flung alive in the pond to feed his Muræenæ.

Other fishes worthy of mention are the Globe Fish, *Diodon maculatus*, in Case 25; the Sun fishes, *Orthagoriscus mola and truncatus*, in a separate case; the Polypterus from tropical Africa; also *Protopterus annecteus*, common in tropical Africa; and the most extraordinary Barramanda *(Ceratodus)* from Queensland, known by the name of Burnett or Dawson Salmon. Protopterus lives in shallow waters, which periodically dry up. During the dry season they form a cavity in the mud, the inside of which is lined with a capsule of mucus, and from which they emerge again when the rains refill the pools inhabited by them. The balls of clay containing the fishes in a torpid condition are brought to Europe, where they can be bought at a reasonable price. Put in a basin with lukewarm water, the fish emerge from the ball after a little time, and can be transferred in a proper aquarium.

The series of Sharks and Rays is also very good, and with that of the Lampreys and the Lancelet (*Branchiostoma or Amphioxus*) completes the collection of Fishes exhibited to the Public. It is a very interesting and valuable collection. Unfortunately, I cannot say the same of the collections exhibited in the Insect Gallery, which is close to it. It is true that fears have been entertained that exposure to the light would deteriorate the colours of many of the species; but this is a very poor reason; as I know by experience that if they are properly exhibited, they will not deteriorate quicker than those of Birds, Corals Crustacea, etc., etc., and I call the attention of the Authorities of the British Museum to that part of the Museum which is quite inadequate.

To be continued.

Recommendations for the Prevention of Damage by some Common Insect of the Farm, the Orchard, and the Garden.

By James Fletcher,

Entomologist and Botanist to Dominion Experimental Farms, Ottawa, Canada.

The frequent enquiries for information concerning even the commonest and most injurious enemies of cultivated crops and fruits render it advisable to issue, in concise form for reference, an account of some of the more important of these, together with approved remedies and convenient methods of applying the latter. The insects treated of are those which have

been most frequently enquired about by my correspondents during the last two seasons. Where possible, illustrations are given, so that those concerned may not only know the latest remedies, but at the same time may become familiar with the appearance of their enemies.

Economic Entomology is the name given to a special study of the habits of Insects with the view of finding out and protecting such as are beneficial, and of destroying those which are injurious.

As year by year larger areas of land are brought under cultivation the various injurious insects which attack special crops will become more and more numerous as the cultivation of their favourite food-plant is extended. It is estimated that there is no crop grown which is not diminished by an average of at least one-tenth, by the depredations of insect enemies, and this loss in some years runs up to one-fourth or one-half of the whole crop. Of this loss there is no doubt that a large proportion can be saved by the adoption of simple methods founded on general principles, with which all can easily become acquainted. For the effective use of remedies to destroy injurious insects a certain amount of knowledge of their structure and habits is highly desirable, so that the most appropriate remedy may be adopted, and also that it may be used at the period when the enemy is most susceptible to injury.

The lives of insects are divided into four well marked periods. These are:—1. The egg; 2. The caterpillar or larval stage, during which, as a rule, they are most injurious; 3. The pupa or quiescent stage, in which, except in a few orders, they lie quiet, and are without the power of motion; and 4. The perfect Insect. Some insects are injurious in three of their stages; but the larger number in one only, so that unless we try to know them in all their forms we may lose the best opportunities of destroying them. It is clear that in this warfare the one who possesses this information has a great advantage over those who do not.

Insects may be divided into two classes by the nature of their mouth parts. In the first or larger division, Biting Insects, they are furnished with mandibles or biting jaws, by means of which they consume the substance of their food, as with caterpillars, beetles, etc. In the second class, Sucking Insects, they have instead of mandibles a beak or tube, by means of which they suck up their food in a liquid form from beneath the surface, as with the true bugs, plant-lice and flies. It is evident that with the insects of the first class all that is necessary is to place some poisonous substance on the food-plant, which they will eat together with their food. With the second class, however, this would be useless, for they would push their beaks through the poisonous covering on the outside of their food-plant, and would extract the juices upon which they live from the interior. For this class, therefore, some substance must be used which will kill by mere contact with their bodies. Now, for both of these classes of Insects we have cheap and available remedies, of which I will speak further on.

Remedies for injurious Insects are either Preventive or Active, and must be applied in accordance with the circumstances of the case and the habits of the attacking Insects.

PREVENTIVE REMEDIES.

These are of two kinds:—1. Agricultural; and 2. Deterrent.

1. Agricultural.—These consist chiefly in the adoption of such agricultural methods as:—High Culture, which will stimulate a vigorous and healthy growth of the crop and push it on to maturity as soon as possible; Clean Farming, by which all weeds are kept down and rubbish is prevented from accumulating; Early or late seeding, so that a crop liable to attack is presented to its enemies, at the time they make their appearance, in such a condition that they cannot injure it; Rotation of Crops, by which the insects attracted to a locality by a certain crop will not have, in that place, the same crop to feed on the following year.

2. Deterrent.—Under this head come such operations as painting the trunks of fruit trees with poisonous, alkaline, or other obnoxious washes to keep out borers, by deterring the female insects from depositing their eggs upon the bark; the placing of mechanical contrivances on trees to prevent the ascent of insects, as climbing cut-worms, or the wingless female canker-worm moths, which leave the ground in autumn and spring and crawl up the trunks of trees to lay their eggs.

Destroying or masking the natural odour of some vegetables by scattering amongst them substances possessed of a stronger or disagreeable odour, as gas lime, or carbolic acid.

ACTIVE REMEDIES.

Under this head comes the practising of such methods as may be called generally "hand-picking," or the seeking out of insects in their different stages and destroying them. These methods can be best explained under the several insects for which they are useful. The most important active remedies, however, comprise the application of the various insecticides or poisonous substances which are now so largely used for destroying insects, and which are treated of separately further on. Before passing on to a consideration of these it may be well to devote a few lines to the different methods and apparatus for applying insecticides.

APPARATUS.

Nearly all of the insecticides may be used both as a dry powder and as a wet mixture. In the case of the arsenical poisons it is necessary to mix them with some other substance as a diluent, on account of their caustic action upon tender vegetation, also for convenience of distribution, and to economise the material in use. For dry applications suitable diluents will be found in flour, land-plaster, air-slaked lime, and finely sifted ashes or road-dust. It is of the utmost importance that these should be perfectly dry and in a very fine state of division, so as to mix thoroughly with the insecticide used and to allow of being distributed evenly over the plants as a very fine powder. The proper quantity of the diluents to be used with the

different insecticides will vary with the insects to be treated and the plants to which they are applied.

There are several instruments for distributing dry poisons, such as bellows, insect-guns, dusting-boxes, etc. Any operation requiring the body to be kept for a long time in a stooping posture while walking soon becomes extremely tiresome. It is therefore necessary for field application to devise some means for distributing the poison, so as to waste as little as possible of the material and yet allow the body to be kept in its natural position. This is best done by placing the powder to be distributed in a small bag of very fine muslin (two thicknesses, if necessary), and then tying this to the end of a short stick so that it swings freely. It will be found that by tapping the bag lightly with another stick held in the other hand that the operator can walk erect, and do much better work than by stooping along over his crop with an aching back. Prof. Lintner recommends "a tin box of a convenient size (half a pint), with a cover, and having the bottom covered with wire gauze—the box to be fastened to a stick about three feet long. With this a person can walk along the plants to be dusted, and by gently striking the handle with another small stick the powder can be uniformly distributed with the greatest care." Dry mixtures should be applied when plants are wet with dew or in still weather. It is found by experience, however, that during the spring months, when insecticides are most needed, there are often periods of several days when these conditions do not occur. It therefore becomes necessary to apply the poisons in some other way, so that the material may be evenly distributed over the plants to be protected, and not blown away by the wind. For this purpose mixing with water and spraying is the most convenient plan, and there are a great many kinds of pumps and other appliances for the purpose. After considerable experience I have come to the conclusion that it will repay anyone who has to apply insecticides to go to the expense of procuring a pair of proper bellows for dry mixtures and a force pump for liquid applications. Such make-shift contrivances as ordinary watering cans, whisks, whisps of hay, or bunches of leaves, which are frequently used, actually cost far more in wasted time and materials than would pay for the best special instruments ; added to which, when the work is done it is neither satisfactory nor effective.

PUMPS AND OTHER DISTRIBUTORS.

For dry applications the "Woodason bellows." made by Thomas Woodason, 451, East Cambria Street, Philadelphia, is one of the most highly recommended. It is made in two sizes, which sell at $1 and $2 respectively. The same firm also manufactures the "Woodason atomizer," for the application of a liquid spray upon a small scale. For more extensive operations force pumps of various sizes are necessary. These can be procured at prices ranging from $2 to $5 for small hand pumps. These are obtainable from most of our Canadian seedsmen. Very useful machines are the "Knapsack" sprayers, consisting of a tank of 4 or 5 gallons capacity, with a force-pump and spraying nozzle attached. They are carried on the back, and are very convenient for the treatment of low-growing crops, as cabbages, turnips, etc., as well as for small fruits. Of these the most highly spoken of are the "Galloway Sprayer," manufactured by Albinson and Trusheim, 2,026, Fourteenth Street, Washington, D.C. Cost, $14. Another machine which is highly approved is the "Knapsack," manufactured by the Field Force-pump Co., of Lockport, N.Y., which sells for the same price. An excellent but more expensive machine is the "Eureka," made by Adam Weaber, Vineland, N.J. Cost, $21. All of these are supplied with the "Vermorel" nozzle mentioned further on.

For field work larger machines are necessary, and there are several in the market. The Field Force-pump Co. manufacture for $12 the "Perfection" pump which can be attached to a barrel. This pump has an extra discharge hose by which the poison is kept constantly stirred up in the barrel, a most important thing with Paris Green and London Purple mixtures. Gould's Manufacturing Co., of Seneca Falls, N.Y., also send out a machine which has given great satisfaction, called the "Standard Double-acting Spray Pump." This also may be fitted to the top or side of a barrell, and has two discharge tubes. It costs about $14 complete. The Nixon Nozzle and Machine Co., of Dayton, Ohio, make two machines which are highly praised by all who have tried them. The larger, the "Little Giant," consists of a square metal tank with force-pump, and is mounted on wheels. It can be drawn or pushed by means of a handle and driving wheel ; but for use in an orchard, the tank can be taken off the wheels and mounted in a waggon. Cost, $35. The same company also makes a smaller machine, the "Climax Tripod No. 2," which sells for $15. It is very convenient, and can be taken apart and shipped in a very small box. It can be attached to any kind of vessel or tank by means of brass connections, which are supplied with it, as well as 20 feet of hose and 2 nozzles. I am so frequently asked where pumps and spraying apparatus are to be obtained that I have given the addresses of the above firms who have sent me their catalogues. A good pump, called the "Orchard and Garden Force Pump," is made by W. Robertson, Oakville, Ont. I do not know of any other Canadian firms manufacturing these special forms of apparatus. Anyone intending to buy a spraying outfit would do well to send for catalogues before deciding on purchasing any particular machine, so as to procure the most suitable.

NOZZLES.

Of equal importance with a proper force-pump in the distribution of poisonous applications is a proper nozzle, by means of which the liquid is distributed evenly. Prof. Riley says "the desiderata in a spray nozzle are ready regulation of the volume to be thrown, greatest atomizing power with least tendency to clog ; facility of cleansing, or ready separation of its component parts; cheapness, simplicity and adjustability to any angle."

There are a great many spraying nozzles in the market—some good, some decidedly otherwise. The best of these are the Riley or Cyclone, with

its various modifications, and the Nixon. Prof. J. B. Smith says (Bul. 75, N. J. Ag. Col. Exper't. Station) : — "The Cyclone, with the 'Vermorel' modification for clearing the nozzle of obstructions, is the most widely applicable for spraying low plants and bushes, like cabbages, pumpkins, currants, blackberry and others. This projects a fine spray in an eddy from a central discharge orifice, and makes a perfect and, for a short distance, forcible spray. Fastened to a rod of convenient length, and set at an angle with the rod, all parts of the cabbage can be thoroughly wet in a few seconds. All who have ever used this nozzle are delighted with it. It is manufactured by the Field Force-pump Co., Lockport, N.Y."

The Nixon nozzle is equally valuable for a somewhat different range of work. The stream is projected through a small central nipple against a screen at the end of a brass cylinder, and is broken there into a fine spray, retaining considerable force. This is furnished by the Nixon Nozzle and Machine Co., and is an excellent nozzle for orchard use.

The question of elevating the spray, so as to reach the tops of trees, is merely one of attaching the discharge pipe of the pump to one end of a small brass or rubber tube, bearing the nozzle at the other end, and running it through (or lashing it to the side of) a bamboo or other light pole of the required length. A wedge-shaped washer, cut out of thick sole leather, placed just below the nozzle, will prevent the drip from trickling down the pole upon the operator.

REMEDIES.

For convenience of reference in the latter part of this Bulletin, I append a short statement concerning each of the best known remedies, which will be referred to by the numbers which precede them :—

I. *The Arsenites.*—The best known of thess are Paris Green (Arsenite of copper) and London Purple, (chiefly Arsenite of lime). The former is in more general use in Canada, and from my own experience and that of my correspondents I consider it the safer of the two to use on vegetation. The latter, however, is highly praised by some who have used it, and it will probably be found more useful than Paris Green, on account of the lime it contains, for mixing with Bordeaux mixture and other fungicides for the combined treatment of insects and fungi. Paris green is a sure remedy for all mandibulate or biting insects; but is also very poisonous to man and the domestic animals. Care must, therefore, be taken to keep it out of the reach of children, ignorant people and animals.

If applied too strong to the foliage of plants it is also very destructive. Some plants are much more easily injured by the arsenites than others, it therefore becomes necessary to use them with caution until the quantity that may be applied to a certain plant is known. For apple trees, a mixture containing $\frac{1}{4}$ lb. of Paris green to 50 gallons of water may be used; for plums and cherries about the same strength; but as some varieties are tenderer than others, the effect of the application should be watched and the strength reduced if necessary. For peach trees it should not be used stronger than 1 lb. to 300 gallons of water, and even then there will be considerable risk of injury. Where it is necessary to spray two or three times in the season later applications of the poison should be reduced in strength.

In mixing Paris green it should first be made into a paste with a small quantity of warm water, and the paste subsequently mixed with the larger amount of water required.

In spraying foliage the spray must be forcibly applied, so as to reach every part; but should be shifted from place to place as soon as the liquid begins to drip from the leaves.

To lessen the corrosive injury of the arsenites, Prof. Riley advises the addition of a quart of common flour to every 12 gallons of water. He says (5th Rep., U. S., Entom. Com., p. 33) : "The flour seems to keep the poison from taking effect on the leaf, preventing, to some extent, the corrosive injury which otherwise obtains when the poison is coarsely sprinkled or too strong."

The effects of Paris green, strange as it may seem, are often less severe upon young foliage than upon that which is mature. In applying liquid washes of Paris green and other insecticides it will be found difficult to make them adhere to some plants, such as cabbage, Swede turnips, etc. This difficulty can be overcome by mixing a little soap with the water used. For dry applications, Paris green may be mixed with 100 times its weight of perfectly dry land-plaster, air-slaked lime, flour or sifted wood ashes, etc.

II. *Kerosene Emulsions.*—Next in importance to the arsenites are the emulsions of kerosene. These are particularly valuable against such insects as plant-lice, scale insects and animal parasites. The best formula as recommended by Prof. Riley, is :

Kerosene (coal oil) 2 gallons.
Rain water, 1 gallon.
Soap, $\frac{1}{2}$ lb.

Boil the soap in the water till all is dissolved; then, while boiling hot, turn it into the kerosene, and churn it constantly and forcibly with a syringe or force pump for five minutes, when it will be of a smooth, creamy nature. If the emulsion be perfect it will adhere to the surface of glass without oiliness. As it cools it thickens into a jelly-like mass. This gives the stock emulsion, which must be diluted with nine times its measure of warm water before using on vegetation. The above quantity of 3 gallons of emulsion will make 30 gallons of wash. Insects breathe through small openings along their sides. The effect of kerosene emulsion is to suffocate them, by stopping up these breathing pores.

III. *White Hellebore.*—This is a vegetable poison—the finely powdered roots of *Veratrum album.* It is very useful for the leaf-eating insects of small fruits, especially saw-fly larvæ. Although very poisonous to insects, it can be safely used where the arsenites would be dangerous. It can be applied as a dry powder or as a liquid mixture, 1 oz. to 2 gallons of water.

IV. *Insect Powder, (Pyrethrum, Buhach.)*—This is another vegetable insecticide of special value, from the fact that although it is extremely active in its effects upon nearly all insects, it is practically harmless

to human beings and the higher animals. It is the pulverised flowers of some plants belonging to the genus *Pyrethrum*. It is useful for many household pests, as flies, mosquitoes and wasps, all of which are quickly affected, either by having a small quantity thrown into the air of a room by means of an insect-gun or small bellows, or by a small quantity, (a teaspoonful,) being ignited and allowed to smoulder. It seems to have a marked effect upon the breathing organs of insects. Where practicable, a dry application gives the best results. If mixed with four times its weight of common flour, and then kept in a tightly closed vessel for twenty-four hours, the mixture will kill nearly all caterpillars it is applied to, and in this strength becomes the best remedy for the caterpillar of the Imported Cabbage Butterfly. It can also be used mixed with water, 1 oz. to 2 gallons of water.

V. *Alkaline Washes.*—A wash largely used in Canada is that noted by Prof. Saunders in his "Insects Injurious to Fruits," and consists of "soft soap reduced to the consistence of thick paint by the addition of a strong solution of washing soda in water. If applied during the morning of a warm day this will dry in a few hours, and form a tenacious coating not easily dissolved by rain."

Soap-suds made from whale-oil soap, 1lb. to 8 gallons of water is a useful remedy for the destruction of plant lice.

VI. *Carbolic Acid.*—I have not found this substance so generally useful as I anticipated from its powerful odour. Prof. A. J. Cook, however, has experimented extensively with it and claims that no fruit-grower or lover of shade trees can afford to be ignorant of the Carbolic Acid Emulsion. He says: "I make it just as I do the kerosene emulsion, only stronger, one part of carbolic acid—I use the crude material—to from 5 to 7 parts of the soap solution (1 quart soft soap, or 1 lb. hard soap, in 2 gallons of water) is of the proper strength. This is the best preparation I know of to protect against the apple-tree bark-lice and apple-tree borers."

It is applied to the trunks and larger limbs by means of a stiff brush or cloth about 20 days after the trees blossom.

Carbolic Acid Wash.—Prof. Cook also recommends for radish maggots a preparation made by adding 2 quarts of soft soap to 2 gallons of water, to which, when heated to the boiling point, 1 pint of crude carbolic acid is turned in. For use, one part of this mixture is mixed with 50 of water and sprinkled directly upon the plants once a week from the time they appear above the ground.

Carbolized Plaster.—This is simply one pint of crude carbolic acid well mixed with 50 lbs. land plaster. It is said to be very efficient as a deterrent remedy for flea-beetles.

VII. *Tobacco.*—This has been used for a long time for fumigating greenhouses; but from recent experiments it seems to be worthy of wider application. Prof. J. B. Smith found that a very useful decoction could be made by boiling down 1 lb. of tobacco until 1 pint of liquid contained all that could be extracted from it. This was diluted with 1 gallon of water, and was very effective in killing plant-lice, flea-beetles and other insects.

Tobacco has also been used as a wash for freeing stock of vermin, and is very effective; but is inferior, for this purpose, to kerosene emulsion.

To be continued.

Water Rent.

The 15th of July I received from the collector a notice to pay the rent due to the New River Company for two quarters, "January to July," 1891. I was quite surprised to see that the rent had been increased from £1 8s. to £1 12s. 7d. per quarter, in consequence of the new assessment on Poor Rates and General Rate taxes in the parishes of St. Giles-in-the-Fields and St. George, Bloomsbury. I can see in the notice sent the following paragraph:—"*By the Water Rate Definition Act* (1885) *the annual value is declared to be* (*within the Metropolis only*) the rateable value as *settled by the Local Authority.*"

This is all very well, but what has the water rent to do with the rateable value as settled by the local authority, I should like to know! I always thought, and am still of the same opinion, that water was paid according to quantity required; but it seems that I was all wrong. If any of my readers can tell me why it is that I must pay a higher rent for water, although I don't require more than I have always had, and enlighten me on this subject, I will be very thankful, as I cannot see what the water rent has to do with the assessment settled by the local authorities.

THE EDITOR.

Review of Scientific Books.

THE IBIS, A QUARTERLY JOURNAL OF ORNITHOLOGY. No. XI. July 1891. *Price 6 Shillings.*

This fine work maintains its high reputation amongst the best Ornithological publications. The contents of this part are:—

Ornithological results of an Expedition to the Philippine Islands in 1887 and 1888, by J. B. Steere. (Plates VII.—VIII.)

On the Birds of the Lower Yantsee Basin. Part 1. by F. W. Styan.

Notes on some of the rarer Western Palaeartic Birds, by H. E. Dresser.

On a Collection of Birds from Western Szechuen, by Henry Seebohm.

On British Fossil Birds, by R. Lydekker.

Note on the Collared Petrel *Oestrelata torquata* recently reported to have been killed on the Welsh Coast, by Osbert Salvin.

Remarks on Macgregor Paradise Bird *Cnemophilus Macgregori*, by Ph. L. Sclater.

On the Birds of Madagascar, and their connection with Native Folk-lore, Proverbs and Superstitions, by the Rev. James Sibree,

Diagnoses of new species of Birds from Central East Africa, by R. Bowdler Sharpe.

Notices of recent Ornithological Publications, Letters, Extracts, Notices, etc.

Four species of Birds are figured. They are :—*Ptilocickla basilanica*, *Irena ellae*, male and female, *Oestrelata torquata*, and *Cnemophilus macgregori*, a very curious new genus of Paradise Bird, allied to Xanthomelus.

Proceedings of the Zoological Society of London, 1891, Part II. 131 pages of text, 13 black and coloured plates. Price, 12 Shillings.

The species figured are :—*Otomis jacksoni. New Butterflies from British East Africa*, *Lacerta simonyi*, *New Dragonflies from Ceylon*, *Ammodorcas clarkei-Skull of Ammodorcas clarkei*, *Bathybiaster vexilifer*, *Pimelodus nigribarbis* and *cottoides*, *Otocinclus nigri*, *cauda*, *Chaetostomus cirrhosus*, *Bunocephalus iheringi*, *Trichomycterus minutus* and *New Asiatic Butterflies*.

Bulletin de la Société Zoologique de France, Avril 1891.

The *West American Scientist*, *the Nautilus*, Feuille des jeunes Naturalistes, the Canadian Entomologist, the Kansas City Scientist, etc.

Obituary.

HENRY EDWARDS.

This well-known and highly esteemed entomologist died at his home, in New York City, on the 9th of June, 1891. His death was caused by dropsy and other complicated troubles which affected the heart.

In him the world has lost an earnest devotee to science and art, and those who knew him a kind-hearted, generous, true, and sympathising friend. In his death, entomological science has lost one of its most active and energetic workers, and his loss is deeply felt and deplored by all who knew him, and he has passed out of his earthly domain with the affectionate regret of many grateful and loving friends. Mr. Edwards was born in Ross, Herefordshire, England, August 27th, 1830, and was destined by his father to become a lawyer. After studying for some time without evincing any particular aptitude for the profession, he entered a London counting house, and frequently appeared in amateur theatricals, for which he had much talent. He finally decided, much against the wish of his parents, to adopt the professional stage. In 1853 he embarked for Australia, where he made his first appearance as an actor, and where he passed many prosperous years. From Australia he drifted to Peru and Panama, and in 1867 he reached San Francisco, California. In about 1877 he made his first appearance in the East, at Boston, and finally, in 1879, he came to New York. In 1889-90 he again visited his old home in Australia, from where he returned last year. During all these years he was connected with the stage, until only a short time previous to his decease, when he was compelled to retire on account of his illness. At the time of his death he had just returned from a trip to the Catskill Mountains, where he was staying for his health, and three and a half hours later he entered into rest and the everlasting silence.

As an entomologist Mr. Edwards was world-known, and was considered one of the greatest authorities of the science to which he was attached ever since his boyhood's days. He was chiefly known by his excellent papers on the Pacific Coast Lepidoptera, which contain the descriptions of many new and interesting species from that region. He was also known by his articles on North American *Aegeridae*, of which family he described nearly all our American species. Besides these papers he has also written many other articles on descriptions of new species and transformations of Lepidoptera.

He also edited three volumes of the journal *Papilio*. The last large work he published was his *Bibliographical Catalogue of the described transformations of North American Lepidoptera* ; which is now in the hands of all our working entomologists. Mr. Edwards spent much money for the increase of his collection of Insects, and devoted all his leisure time to his favourite study. His travels afforded him many rare opportunities for collecting material for his collection and writings. The collection consists of about 300,000 specimens of Insects of all the orders from all parts of the globe. It contains the types of all the species he described, about four hundred and fifty, except a few which are in other collections. It also contains a number of Grote's types of Noctuidæ and Pyralidæ, and many of Fish's types of Pterophoridæ, and types of other writers. It contains also the unique pair of *Oniticellus californicus*, and many other uniques, oddities and rareties of considerable value. The collection is one of the largest private collections in the world. His library consists of about five hundred volumes of entomological works, and about double the number of pamphlets, and about two thousand volumes on travel and other topics.

Mr. Edwards belonged to many scientific and other Societies. He was for some time Vice-President of the California Academy of Sciences, Life-member Brooklyn Entomological Society, Member of the Torrey Botanical Club, Players Club of New York, Bohemian Club of San Francisco. Corresponding member of the Boston Natural History Society, Microscopical Society of San Francisco, Natural History Society of San Diego, Belgium Natural History Society, etc.

He leaves a widow who deeply mourns his loss, and we would here add our condolence and sympathy and heart-felt regret to her irreparable bereavement.

Wm. Beutenmuller.

New York, June 15th, 1891.

Henry de la Cuisine, Dijon, Côtes d'Or, whose death I have recorded in the July number of *The Humming Bird*, has left all his valuable collections of Insects to the town of Dijon.

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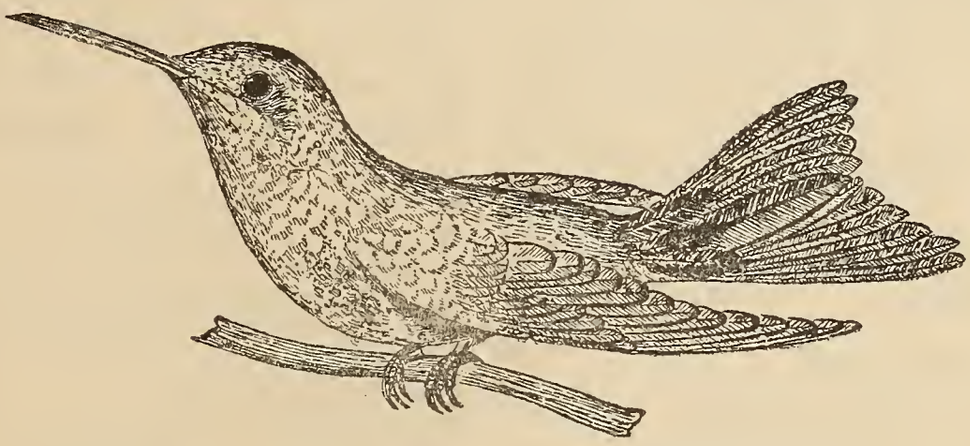

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The Humming Bird.

La Vie Champêtre.

From The Petit Journal, 26th July, 1891.

LA DESTRUCTION DE LA LARVE DU HANNETON.

Tous les insectes de la création (et il y en a près de 300,000 espèces) sont actuellement dans la jubilation ; ils ont chaud et trouvent des victuailles en abondance.

Malheureusement ces victuailles, ce sont nos récoltes qu'ils dévorent à belles dents !

Mais ils ne jubileront pas toujours. Les vers blancs surtout! On ne parle actuellement, en effet, dans le monde agricole, que de l'étonnante découverte de M. Léopold Le Moult, relative à la destruction radicale des larves du hanneton.

On sait que ces larves éclosent en juillet, passent trois ans dans le sol à ronger les racines des arbustes et des plantes et causent à l'agriculture des dégâts incalculables.

Or M. Léopold Le Moult, conducteur des ponts et chaussées à Gorron (Mayenne), s'inspirant des découvertes de M. Pasteur et des expériences récentes de deux savants russes, a conçu l'idée de communiquer aux vers blancs une maladie contagieuse analogue à la muscardine des vers à soie.

Il prend quelques larves malades, momifiées par une sorte de moisissure produite par un champignon microscopique, et les enterre dans un champ, auprès de vers sains. La contagion se propage et tous les vers du champ se trouvent atteints de la même maladie.

C'est l'année dernière que M. Le Moult a commencé ses expériences et j'en ai alors entretenu mes lecteurs.

Cette année, dès le mois de mars, il a pu suivre le développement du champignon parasite sur les vers malades.

Dès les premiers jours d'avril, les moisissures commençaient à devenir abondantes puis vers les derniers jours du mois, autour de chaque ver, la terre était traversée de nombreux filaments dont quelques-uns étaient couverts d'une matière farineuse qui, examinée au microscope, lui a paru composée de *spores* (semences) de champignons.

Pendant que M. Le Moult faisait en petit des essais d'infestation, la nature opérait de son côté, mais bien plus rapidement et bien plus efficacement qu'il ne pouvait le faire, le vent se chargeant de transporter les spores dans toutes les directions.

"Comme nous assistions, dit-il, aux labours faits dans un champ distant de 140 mètres de la prairie où nous avions découvert la maladie, quelle n'a pas été notre surprise de voir la charrue ramener à la surface un nombre considérable de vers momifiés, à tel point que la terre paraissait avoir été récemment chaulée! Or ce champ ne contenait au mois de novembre que des vers absolument sains.

"Les fouilles que nous avons faites dans la prairie ont donc seules pu occasionner une aussi rapide propagation de la maladie, ces travaux ayant eu pour effet de découvrir les spores que le vent a certainement emportées en nombre très considérable et à des distances probablement très grandes.

"Plus tard, en effet, nous avons constaté l'infestation plus ou moins avancée de champs reconnus autrefois comme ne renfermant que des vers sains."

Toutefois, ajoute M. Le Moult, l'action de la nature, si rapide qu'elle soit, ne l'est pas assez pour débarrasser à bref délai l'agriculture française de ce terrible fléau et on doit l'aider dans son action, non seulement en transportant d'un terrain dans un autre des vers momifiés, mais surtout en produisant artificiellement et en grandes quantités les spores du champignon destructeur de façon à pouvoir les expédier dans toute la France.

Il faut souvent se défier de l'enthousiasme des inventeurs, car ils voient tout en beau ; mais voici les observations plus calmes du professeur d'agriculture de la Mayenne, M. Leizour qui confirment complètement les étonnants résultats obtenus par M. Le Moult.

M. Leizour, dans un récent rapport, vient de signaler la disparition presque totale du ver blanc dans l'arrondissement de Mayenne, sous l'influence du champignon découvert par M. Le Moult.

"Nous touchons, dit-il, enfin a la destruction complète de ces larves qui, depuis si longtemps, désolaient les cultivateurs.

"L'œuvre est à peu près accomplie dans tout l'arrondissement de Mayenne, que nous avons récemment parcouru et sur les divers points duquel nous avons eu la satisfaction de constater, en même temps que la présence du champignon destructeur, l'arrêt complet des ravages occasionnés par la larve du hanneton."

Partout cette larve travaillait encore activement il n'y a pas plus de trois semaines, et beaucoup de champs d'orge et de sarrasin ont eu à en souffrir ; puis tout à coup on a vu les récoltes atteintes reverdir ; les vers avaient disparu comme par enchantement ! Cette disparition, attribuée d'abord à une descente provoquée par les pluies et l'abaissement très grand de la température du mois dernier, n'a été, au contraire, que la conséquence de la dissémination du champignon parasite et de la contamination des insectes.

On les trouve aujourd'hui à des profondeurs variables, morts et entourés de la moisissure caractéristique ou mourants et présentant tous les caractères des vers atteints par le bienheureux champignon.

Des essais exécutés en pleine terre à la fin de juin permettent d'affirmer qu'il suffit d'introduire quelques larves malades dans les champs infestés du ver blanc, en ayant soin de les mettre en contact immédiat avec quelques vers sains pour obtenir rapidement la destruction de tous ceux qui existent dans le champ.

On voit que la portée de cette découverte est considérable. Le grand avantage de ce procédé c'est qu'il pourra peut-être s'appliquer à une foule d autres insectes qui causent également de grands ravages dans nos récoltes.

D'après un rapport présenté au Sénat les dégâts causés par les insectes s'élèvent en France à plus de 300 millions de francs. Et tout le monde sait qu'avant de se séparer, les Chambres ont été obligées

de voter un nouveau crédit de 1,500,000 francs pour combattre les sauterelles d'Algérie.

Cette multiplication effrayante des insectes de toute nature vient surtout de l'aveuglement avec lequel on laisse détruire dans nos campagnes les petits oiseaux insectivores, qui seraient pour nous des auxiliaires bien précieux.

Malheureusement, ces petits oiseaux sont excellents à manger. Alors le ventre avant tout! Et on les mange.

Un de nos confrères, M. Mégnien, attribuait récemment à la destruction insensée du gibier et surtout des cailles d'Afrique, la recrudescence du fléau des sauterelles.

Une caille consomme, dit-il, de 50 à 60 grammes de nourriture par jour. Des criquets qui viennent de naître sont du volume d'un grain de chènevis, et il en faut une vingtaine pour faire un gramme; c'est donc un millier de ces insectes qu'une caille détruit dans sa journée; et de 20 à 25,000 pendant la période où le criquet est assez petit pour être absorbé par l'oiseau. Les chasseurs tunisiens qui pour satisfaire la cupidité des marchands de volailles ont embarqué le 8 mai 50,000 cailles pour la France, ont donc empêché l'anéantissement de 150 millions de criquets.

En France, la destruction des petits oiseaux est encore plus acharnée, si c'est possible, et l'on ne peut ouvrir un journal d'agriculture sans y trouver des détails navrants à ce sujet.

Voici entre autres, un mode de destruction très pratiqué en Provence, destruction autorisée même sans permis, sous le fallacieux prétexte que c'est un gagne-pain indispensable pour les localités où on la pratique, et cette sorte de chasse ne s'adresse qu'à des oiseaux insectivores, c'est-à-dire à des petits oiseaux à becs fins.

Je veux parler de la chasse avec des pièges en laiton système des anciennes ratières à ressort. Sur le littoral même et dans l'intérieur des terres, les habitants ont des centaines de ces pièges qu'ils amorcent avec des vers ou des fourmis ailées (arudes en provençal) et les pièges sont tendus plusieurs fois dans les jours de passage; c'est-à-dire que c'est par milliers que ces petits oiseaux sont détruits.

Une guerre d'extermination semblable est pratiquée au printemps le long des ruisseaux et on détruit ainsi avant la chasse des nichées tout entières. Plus tard c'est aux rossignols, puis aux rouges-gorges qu'on s'en prend; et il en échappe fort peu.

Tout cela est profondément regrettable. Il serait bien temps de nous montrer un peu plus intelligents et de faire cesser de tels abus.

UN RURAL.

I agree entirely with the author of the preceeding article, and I will never cease to repeat, that it is quite time that something should be done by ALL GOVERNMENTS for the protection of the songsters, thrushes, etc., which are the most useful auxilliaries of agriculturists.

What he says about France can be applied as well to all Europe. When residing in Italy, I was offered nearly every day, during the season, strings of warblers, redbreasts, and allied species of songsters, at halfpenny a piece; and this was done in countries where those birds are badly wanted for the destruction of several insects, which cause great havoc in the olive-tree plantations. I called the attention of the authorities to the subject, and I believe that a short time after, a law was edicted about it; but I do not know with what effect.

What he says about the destruction of the larvæ of the Maybug (*Melolontha vulgaris*) is also very interesting, and it is possible that a judicious employment of the infested larvæ will be the means of destroying partially or completely the injurious insects.

It is the same procedure employed by Mr. Brongniart and others against the locusts, all of them inspired by the discoveries of the celebrated and well known PASTEUR.

THE EDITOR.

Recommendations for the Prevention of Damage by some Common Insect of the Farm, the Orchard, and the Garden.

BY JAMES FLETCHER,

Entomologist and Botanist to Dominion Experimental Farms, Ottawa, Canada.

(*Continued from page* 73.)

INSECTS INJURIOUS TO GRAIN AND FORAGE CROPS.

1. THE AMERICAN FRIT FLY. (*Oscinis variabilis*, Loew).—This is an insect which has only been recently noticed as a serious crop pest. Its life history has not yet been carefully worked out; but it seems to be very similar to those of the Hessian fly and Wheat-stem Maggot. It is known that as a small yellowish-white maggot, one-twelfth of an inch in length, it attacks severely spring wheat and many grasses at the base of the stem, just beneath the surface of the ground, and also that it passes the winter in the same situation upon winter wheat and grasses, and may be found in the spring as a pale brown pupa one-twelfth of an inch in length.

Remedies.—Until more is known definitely about the number of broods there are of this insect during the year, I would suggest the following: (i) Late sowing of winter-wheat; (ii) Harrowing of stubble soon after the crop is carried, so as to start the volunteer crop quickly, this latter to be ploughed in early in September; (iii) The application of a special fertilizer as a top-dressing when winter wheat is known to be attacked. This will help the injured plants to overcome the injury.

2. GLOVER-SEED MIDGE (*Cecidomyia leguminicola*, Lintner).—The heavy loss from this insect in the clover-seed districts has awakened farmers to the necessity of practising the simple remedy advised by entomologists. This consists of feeding off or cutting clover before the end of June when the larva of the first brood matures and leaves the clover head

to enter the ground and complete its changes. The perfect insects, forming the second brood, emerge from the ground just as the second crop of clover is coming into flower, and the females lay their eggs amongst the forming blossoms. From these eggs hatch minute, pink, legless maggots, which penetrate the pod and destroy the seed. About the time the seed is ripe they leave the clover and enter the ground, to pass the winter and emerge again the next spring just at the same time the clover comes into flower.

3. Hessian Fly (*Cecidomyia destructor*, Say).—Two or three small whitish maggots embedded in the crown of winter wheat, or, in summer, just above the first or second joint. When full grown these maggots harden and turn brown, when they resemble small flax seeds. These change to small smoky-winged gnats, which appear in spring and autumn. The vast losses due to this insect are too well known to farmers, and even then there is no doubt that only a small proportion of the damage is recognised as caused by it.

Remedies.—(i.) Delay sowing winter wheat until after the third week in September, so that it does not come up until after the last brood of the Hessian Fly has disappeared; (ii.) Burn all rubbish from the threshing machine: in this way many of the flax seeds or pupæ will be destroyed as well as many weed seeds; (iii) Harrow the stubble directly the crop is carried, so as to start a volunteer crop for the flies to lay their eggs upon—this latter to be ploughed in early in September; (iv.) Apply special fertilizers in spring to help a weak or injured crop to overcome the injury.

4. The Pea Weevil (*Bruchus pisi*, L.)—A small, brownish-grey, very active beetle, $\frac{1}{5}$ inch long, with two conspicuous black spots on the end of the body, which emerges from seed pease in autumn or in spring, leaving a small round hole. The egg is laid on the young pod and the grub eats its way into the pea, where it passes all its stages, emerging the same autumn or the following spring.

Remedies.—(i). Clean seed. Of great importance is sowing uninfested seed. When weevily pease are sown as seed the beetles emerge soon afterwards, and remain about the fields feeding on the plants until the young pods are formed. It is sometimes alleged that weevily pease are almost as good for seed as sound grain, and that the insect will not thrive in the colder parts of Canada. The use of weevily pease as seed is a great mistake, the germ of a very large proportion being, as a rule, destroyed, and those, which do germinate producing weak plants. Although I have found that extreme cold (below 15° below zero, Fah.) certainly killed the weevils in two samples of pease, it would be a most unjustifiable experiment to introduce infested seed into a district, trusting to the climate to destroy the weevils. In addition to this, the crop grown the first year from the infested seed would certainly be much injured.

(ii.) Bisulphide of Carbon.—When seed is known to be infested there are several ways of destroying the contained insects. The remedy most widely used by seedsmen, who have all the conveniences, is to place the seed to be treated in some close vessel and subject it to the vapour of bisulphide of carbon. This chemical vaporises when exposed to the air, and the vapour is so much heavier than air that it will run down through the mass of any seed upon the top of which it has been placed, and will destroy all contained insects. The quantity required is small, $\frac{1}{4}$ lb. being enough to disinfect 3 cwt. of pease. The method of using it is to place the grain in a perfectly tight bin or barrel, and then pour some of the bisulphide into a shallow vessel and place it on the top, put on the cover and keep it tightly closed for forty-eight hours. The bisulphide does not injure the seed in any way, but it must be used with care, on account of its extreme inflammability. The seed must be emptied out, out of doors, and no light must be brought near it or an explosion will occur.

(iii.) Warm Storage.—If seed pease are stored in a warm room, in bags of canvas or strong paper, during the winter the weevils will emerge and die before the seed is required for sowing.

(iv.) Holding over Seed.—Pease can be held over until the second year after harvesting without injury, and the defective skin can be sorted out before sowing.

(v.) Soaking.—If seed be found to contain weevils at the time of sowing, and it is inconvenient to hold it over, the weevils can be drowned by placing the seed in soak for twelve hours before sowing. It must, however, be sown or dried at once, when taken out of the water.

5. Wheat Midge, "Weevil" (*Diplosis tritici*, Kirby).—Several small reddish maggots, $\frac{1}{8}$ inch long, crowding around the grains of wheat in the ear and causing them to shrivel. Some of these, when full grown, fall to the ground and pass the winter beneath the surface. Others remain in the ears of wheat and are harvested with the grain,

Remedies.—(i.) Burn all rubbish and screenings from the threshing machine, particularly in localities where the midge is prevalent. (ii.) Deep ploughing as soon as the crop is carried.

Wheat-stem Maggot (*Meromyza Americana*, Fitch).—A glassy-green, slender maggot, $\frac{1}{4}$ inch long, which attacks the base of the top joint of barley and wheat, causing the ear to turn white before the rest of the crop is ripe, also occurring in the root-shoots of winter wheat and rye and many grasses, where it passes the winter, to emerge the following spring as an active, yellowish-green fly, $\frac{1}{5}$ inch long, with shining green eyes and three dark stripes down the back.

Remedies.—The same as recommended for No. 1, the American Frit-Fly.

INSECTS INJURIOUS TO FRUITS.

7. Apple Aphis (*Aphis mali*, Fabr.)—During the winter, small, shining black eggs may be found upon the twigs of apple trees. From these eggs, early in spring, emerge green plant-lice, which attack the leaves.

Remedy.—Spray the trees, just before the buds burst, with kerosene emulsion. (Remedy II.)

Apple Worm.—*See* Codling Moth.

8. Beautiful Wood Nymph (*Eudryas grata*, Fabr).—On grape vines may be found, in the month of August, highly coloured caterpillars with the body blue, ringed with orange bands and fine black lines, head orange and the whole body dotted with black

tubercles. These drop to the ground when full grown and turn to rough brown pupæ beneath rubbish or near the surface of the ground. In the following spring the beautiful moth appears. The upper wings are creamy-white and seal-brown; the under wings, deep yellow, bordered with deep brown.

Remedy.—Hand-picking is usually practicable. Where very numerous, spraying with white hellebore or Paris green may be used. (Remedies I. and III.)

Borers (Apple)—*See* Nos. 12 and 25.

9. Canker-Worms (*Anisopteryx vernata*, Peck, and *A. pometararia*, Harris).—There are two kinds of caterpillars which attack apple trees, and which are known as Canker-worms. Of one, the Spring Canker-worm, the wingless female moths appear chiefly in the spring and lay oval pearly-white eggs in irregular masses beneath flakes of bark, etc. Of the other, the Autumn Canker-worm, most of the moths appear late in the season and lay eggs which are flattened at the top and laid regularly in clusters of about 100 or more on the outside of the bark. When full-grown the caterpillars of both are much alike, and are brownish-looking larvæ, about an inch in length. The females of both kinds are spider-like, wingless creatures; but the males are delicate moths, with gauzy gray wings.

Remedy.—There are several mechanical contrivances for keeping the females from ascending the trees to lay their eggs; but none of these can compare for efficacy with spraying the trees in the spring time with Paris green, 1 pound to 200 gallons of water. If this be done immediately after the flowers have fallen both the Canker-worm and other leaf-eating insects, as well as the Codling Moth, will be killed at the same time.

Cherry Slug.—*See* Pear-Tree Slug.

10. Codling Moth.—(*Carpocapsa pomonella*, L.)—This is the destructive Apple-worm so well known to all growers and consumers of apples all over the world. The best remedy is spraying the trees once, immediately after the blossoms fall, with Paris green, at the rate of 1 pound to 200 gallons of water.

Currant-worm, Gooseberry-Worm. *See* Imported Currant Saw-Fly.

11. Fall Web-Worm (*Hypantria cunea*, Drury).—The unsightly webs made by colonies of this insect at the tops of branches upon fruit and shade-trees in the autumn are well known to everyone.

Remedies.—The eggs are laid by the female moth during June, and the webs are generally noticeable in July. From the habit these caterpillars have of always remaining inside the web until a short time before they change to pupæ, an easy way of dealing with this pest is to cut off the web and destroy the contained caterpillars by crushing them under foot. If not attended to before they leave the web, of course, spraying the trees with Paris green will destroy this as well as all other leaf-eating insects.

12. Flat-headed Apple-tree Borer (*Chrysobothris femorata*. Fab.).—During June and July very active bronze beetles, about half an inch in length, may be found laying eggs upon the trunks and large limbs of apple, mountain ash and other trees. These eggs soon hatch into the curious flat-headed or horse-shoe-nail shaped grubs. These, after a time, eat into the trunk and bore broad and flat tunnels, which seriously injure the tree.

Remedy.—Undoubtedly the best remedy for this and all other borers which, as a rule, confine their depredations to a certain part of a tree is of a preventive nature, and consists of applying an alkaline or poisonous wash to the trees just before the time the eggs are usually laid. For this purpose Remedy V. or VI. should be applied in the beginning and at the end of June.

13. Grape-vine Flea-beetle (*Graptodera chalybea*, Illig).—At the time grape-vines are beginning to expand their buds a blue-black flea-beetle, ¼ inch long, is sometimes very abundant and injurious from destroying the buds and undeveloped flower-bunches.

Remedies.—Spraying the vines with Paris green, ¼ lb. to 50 gallons of water, at the time the beetles appear, and clean culture in the autumn, by which all leaves and rubbish are destroyed, amongst which the mature beetles would pass the winter, are the best remedies.

14. Grape-vine Leaf-hopper (*Erythroneura vitis*, Harris).—This insect, generally known by the misleading name of "Thrip," is one of the worst enemies of the grape and ornamental Virginian creeper. Like the last-mentioned insect, it passes the winter in the perfect form beneath rubbish and clods of earth. Clean culture is therefore beneficial. When the insect is abundant its presence is indicated by the white and blotched appearance of the leaves. The most successful treatment is to syringe the vines, as soon as the leaf-hoppers are observed, with kerosine emulsion. (Remedy II.)

15. Imported Currant-borer (*Ægeria tipuliformis*, L).—Early in June a beautiful little fly-like moth, with three bright yellow bands round the body, may be seen darting about among currant bushes. This is one of the most troublesome enemies of the different kinds of currants. In my experience it has been far more injurious to black currants; but in some other parts of Canada it more generally affects the red and white varieties. The eggs are laid at a bud on the young wood, and the caterpillar when hatched eats its way into the cane and destroys the pith. It remains in the wood during the winter, and emerges the next June.

Remedy.—The only remedy is close pruning, and whenever a hollow cane is detected in pruning, the caterpillar must be hunted out and destroyed. Indications of the presence of the borer must also be looked for about the time the flowers are opening, when the leaves of unhealthy shoots have a less healthy appearance.

16. Imported Currant Saw-fly (*Nematus ribesii*, Scop.).—Of all enemies to small fruits, there is not one perhaps which is more persistent than this insect. Soon after the leaves expand, early in May, the perfect insects, which are a little larger than a house-fly, may be seen flying about beneath gooseberry and currant bushes. The eggs are laid in regular rows along the ribs beneath the lower leaves, and soon the well-known "Currant-worms" make their appearance.

Remedies.—There are at least two broods in the season. The caterpillars of the first of these appear

in May, and *for this first brood only* a weak mixture of Paris green (¼ oz. to a pailful of water is sufficient) may be sprayed on the bushes, or a dry mixture of 1 oz. of Paris green to 6 lbs. flour, well mixed together, may be dusted over the bushes after a shower, or when damp with dew. For the second brood of caterpillars, which appears just before the fruit ripens, Paris green must *on no account* be used, owing to its poisonous nature; but instead of it white hellebore, dusted on dry or in water, 1 ox. to a pailful of water.

17. Oyster-Shell Bark - Louse (*Mytilaspis pomorum*, Bouché).—Some might not at first recognise as insects the little roughnesses on the bark of apple trees. Such however they are, and extremely injurious insects too. Their life history is peculiar. About the 1st June minute white mite-like insects, with six legs, emerge from beneath the scales on the bark and for two or three days run about seeking for a suitable place to attach themselves. They then pierce the young bark with their beaks and live on the sap of the tree. They never move from that place again. The waxy scale is gradually secreted, and by August the insect has transformed itself into a scale covering a cluster of eggs. These remain unchanged through the winter, and the young do not hatch again until the next June.

Remedies.—This insect, like many others, thrives most on unhealthy trees. When detected, therefore, measures should be adopted for inducing a vigorous growth, as well as for the removal of the scale insects. Spraying just before the buds open with kerosene emulsion (Remedy II.) will destroy many of the scales—and again at the time the young lice are active, for at this time they are most susceptible to injury. Scrubbing the trunks and branches of young trees with alkaline washes (Remedy V. and VI.) during the winter or early in spring will also keep down the numbers of this pernicious insect.

18. Pear-tree Slug (*Selandria cerasi*, Peck).—In June and August slimy greenish-brown slug-like caterpillars, ½ inch long, occur on the leaves of pear and cherry trees, feeding on the upper surface.

Remedies.—The same as for No. 16.

19. Plum Curculio (*Conotrachelus nenuphar*, Herbst.)—There is perhaps no insect so well known by name as the Plum Curculio. The perfect insect belongs to the family known as snout-beetles, from the shape of the head, which is elongated into a beak. It is a small, rough, grayish beetle about ⅕ inch long. The females lay their eggs in the young fruit of plums and cherries, frequently destroying the whole crop.

Remedies.—The beetles are sluggish in the early morning, and drop from the trees if a sudden jar be given to the trunk. For this purpose a metal spike is driven into the trunk, which is struck sharply with an iron hammer. This gives the sharp jar necessary to dislodge beetles which fall on sheets or into receptacles placed beneath the trees. They are then collected and destroyed.

Of late years abundant evidence has proved the efficacy of spraying the trees, as soon as the fruit has formed, with Paris green, 1 pound to 200 gallons of water, and ten days afterwards a second time with a weaker mixture, 1 pound to 300 gallons. Should heavy rains occur immediately after these sprayings they must be repeated.

20. Raspberry Borer (*Oberea bimaculata*, Oliv).—Towards the end of June the tips of the young shoots of raspberries may frequently be seen to fade and droop. If these be examined there will be found, at the base of the faded portion, two rows of punctures half an inch apart, and between them a small hole leading into the heart of the cane, where one large yellow egg lies embedded. After a few days this egg hatches, and the young grub eats its way down the centre of the stem towards the root. It becomes full grown about August, when it is about ¾ inch long. The perfect insect emerges the next June as a narrow black beetle, with long feelers, and the thorax or middle portion of the body yellow, and bearing three black spots. It also attacks the blackberry.

Remedy.—This is simple, but requires prompt action. The faded shoots are quite conspicuous, and when seen should at once be picked off. They separate from the cane with a light touch, and when removed the girdled portion should be examined, to see that the grub has not hatched and bored down into the stem.

21. Raspberry-cane Maggot (*Anthomya*?).—There is another pest which affects the young wood of raspberries similarly; but does not produce the two rings of punctures. This is the maggot of a small black fly which lays a single egg in the axil of one of the upper leaves. The young maggot bores down the stem until full grown, and then changes to a brown puparium inside the stem.

Remedy.—After a time the young cane turns black at the tip and must be cut down as soon as seen. This is a more injurious pest than the last, where it occurs, because it burrows further down the stem before the indications of its presence are visible.

22. Raspberry Saw-fly (*Selandria rubi*, Harris).—About the time raspberries are in flower the leaves are noticed to be riddled with small holes. On examination this will be found to be the work of a green, bristly caterpillar. From the close resemblance in colour to the leaves on which they feed, these caterpillars are seldom recognized as the cause of the injury. They disappear from the canes before July, and form oval cocoons beneath the ground. From these the perfect insect, a small, dark, four-winged fly, ¼ inch long, appears the next May.

Remedy.—Sprinkle the foliage as soon as the caterpillar's work is detected with white hellebore, 1 oz. in a pailful of water.

23. Raspberry Plume-moth. (*Oxyptilus nigrociliatus*, Zeller).—In June another small caterpillar, somewhat like the last, but with finer bristles and of a paler green colour, may be found injuring the foliage in a very similar manner to the last. This, however, turns to a very beautiful little moth, bronze, dotted with silvery white, which may be found flying about the canes in July.

Remedy.—The same as for No. 22.

24. Red-humped Caterpillar of the Apple (*Oedemasia concinna*, Sm. Ab.).—Late in summer large clusters of voracious waxy-looking, yellow, white and black caterpillars, with their heads and a hump on the fourth ring of the body of a bright red, are sometimes

found on young apple trees, to which, unless they are removed, they are very destructive. Late in autumn they leave the trees and spin close but thin cocoons amongst fallen leaves. The caterpillars remain in these unchanged until the next spring, and the small brown moths emerge during June and July.

Remedy.—These catterpillars are nearly always found on young apple trees within reach from the ground. When this is the case the branch can be cut off and the caterpillars crushed under foot. When too high up for this a spraying with Paris green would dispose of them.

25. Round-headed Apple Tree Borer (*Saperda candida*, Fab.).—This borer nearly always works near the base of the tree it infests. The grub is much thicker than that of the flat-headed borer, and takes three years, instead of one, to complete its changes. The beetle is pale-brown with two white stripes down the body. It is shaped somewhat like No. 15, but is stouter and about ¾ of an inch long.

Remedies.—During the first year the grub lives just beneath the bark in the sap wood, hollowing out a chamber about an inch or more in diameter. The bark becomes discoloured in a characteristic way which is soon recognised. It is also betrayed to the experienced eye by the castings which it pushes out of its burrows. By cutting through the bark the grub can be destroyed. If it has penetrated into the wood it can be killed with a piece of stout wire.

The best remedy, is undoubtedly, a regular treatment every June with deterrent washes. *See* Remedies V. and VI.

26. Tent Caterpillars (*Clisiocampa Americana*, Harris, and *C. disstria*, Hubn.).—The caterpillars, which make the large, unsightly webs too often seen in the forks of branches of fruit and shade trees, hatch in May from rings of eggs which have been on the twigs of the trees all through the winter. They grow rapidly, and the perfect insect, an active brown moth, with two white bands across the wings, comes out in July. These insects are so well known that further description is unnecessary.

Remedies.—Where apple trees are sprayed for coddling moth these caterpillars will also be destroyed. Hand-picking of the eggs in winter, and cutting off the webs when first formed in May, and when, owing to the sparseness of the foliage, they are very conspicuous, are both practical remedies.

INSECTS INJURIOUS TO ROOTS AND VEGETABLES.

27. Cabbage Aphis (*Aphis brassicæ*, L.).—Grey plant-lice are frequently very troublesome during the summer on cabbages, and in August and September on smooth-leaved turnips.

Remedies.—(i.) In years of only moderate attack good results have been obtained by picking off the first clusters of plant-lice by hand and destroying them.

(ii.) The most satisfactory treatment, however, was upon a crop of heavily infested Swedish turnips with kerosene emulsion. This must be applied by means of a force-pump and spray-nozzle, so set that the spray may be thrown under the leaves where the plant-lice congregate.

(iii.) Prof. J. B. Smith recommends very highly whale-oil soap, 1 lb. to 8 gallons of water for all plant-lice.

28. Cabbage Maggot (*Anthomyia brassicæ*, Bouché).—From one to many white maggots attack the roots of young cabbages as soon as pricked out. These are produced from eggs laid by small gray flies, one-third smaller than house flies.

Remedies.—(i.) White hellebore, 2 oz. in a pailful of water, or (ii.) kerosene emulsion (Remedies II. and III.), syringed around the roots, and the earth kept well hoed up to the collar, have proved useful remedies; (iii.) Nitrate of soda, 1 tablespoonful around each plant, is highly recommended.

Cabbage Worm.—*See* Imported Cabbage Butterfly.

29. Colorado Potato Beetle (*Doryphora 10-lineata*, Say).—In reply to frequent enquiries, I would state that for this insect no remedy can compare with Paris green, 1 lb. to 160 gallons of water (=1 oz. to 10 gallons). It is at once the cheapest and easiest applied remedy known.

30. Cucumber Flea-beetle (*Epitrix cucumeris*, Harris).—Very small black flea-beetles, with yellowish legs and feelers and covered with short, silky pubescence which eat a great many small holes in the leaves of cucumbers, potatoes, etc., etc.

Remedies.—These can be easily controlled by dusting Paris green and flour, 1 part to 50 of the diluent (Remedy I), over the plants when the dew is on them.

31. Cut-worms (*Noctuidæ*).—These troublesome pests, which are doubtless the cause of more loss to farmers in the spring months than any other insects, are the caterpillars of a number of different dull-coloured moths which fly at night. The worms are smooth greasy-looking dark caterpillars, ranging from about ½ an inch to 2 inches in length at the time they injure crops. They feed at night and hide during the day time. The eggs of most species are laid in autumn, and the young caterpillars make about a quarter of their growth before winter sets in. They pass the winter in a torpid condition, and are ready in spring to attack the young crops as soon as they come up. The full growth of most species is completed by the first week in July, when the caterpillar forms a cell in the earth and changes to a chrysalis, from which the moth appears about a month later.

Remedies.—(i.) Clean Culture. As the young caterpillars of many species hatch in autumn, the removal of all vegetation from the ground as soon as possible in autumn deprives them of their food supply and also prevents the late-flying moth from laying their eggs in that locality. Fields or gardens which are allowed to become overgrown with weeds or other vegetation late in the autumn are almost sure to be troubled with cut-worms the next spring.

(ii.) Traps.—Large numbers may be destroyed by placing between the rows of an infested crop, or at short distances apart on infested land, bundles of any

succulent weed or other vegetation which has been previously poisoned by dipping it, after tying in bundles, into a strong mixture of Paris green. The cut-worms eat the poisoned plants and bury themselves and die. In hot, dry weather these bundles should be placed out after sun-down, and a shingle may he placed on each to keep it from fading.

(iii.) Banding and Wrapping. *(a.)* It will be found to well repay the trouble and expense to place a band of tin around each cabbage or other plant at the time of setting out. These may very easily be made by taking pieces of tin 6 inches long and 2½ wide and bending them around a spade or broom handle so as to form short tubes. In placing them around a plant the two ends can be sprung apart to admit the plant, and then the tube should be pressed about half an inch into the ground. I have found this a useful means of disposing of empty tomato and other cans. To prepare these easily they need only be thrown into a bonfire, when the tops and bottoms fall off and the sides become unsoldered. The central piece of tin can then be cut down the centre with a pair of shears, and forms two tubes.

(*b.*) Wrapping a piece of paper round the stems of plants when setting them out will also save a great many.

(*c.*) Hand-picking or digging out the cut-worm whenever a plant is seen to be cut off should, of course, always be practised.

Natural Enemies.—There are two enemies which deserve special notice, and, from the service they do, should be known by sight to every cultivator. They are the Fiery Ground-beetle, or Cut-worm Lion (*Calosoma calidum*, Fab.) and the Black Ground Wasp (*Ammophila luctuosa*). Both of these are desperate enemies of cut-worms, the former feeding on them in all of its stages, the latter digging them out and storing its nest with them as food for its young grubs.

32. Imported Cabbage Butterfly (*Pieris rapæ*, L.).—The white butterflies which fly over cabbage beds during summer lay eggs on the leaves, from which are hatched the troublesome cabbage-worms.

Remedies.—The best remedy for this insect is undoubtedly insect powder, diluted with four times its weight of common flour, as directed under Remedy IV.

33. Onion Maggot (*Phorbia ceparum*, Meigen.)—Equalling in destructiveness and more difficult to deal with than the Cabbage and Radish Maggots, is the Onion Maggot.

Remedies.—Rich, well-worked soil and early planting are advised.

(i.) Kerosene emulsion watered along the rows when the onions are found to be infested has proved successful.

(ii.) A sprinkling of gas-lime, sown broadcast over the beds every two weeks, was also found to protect the crops considerably, and was thought to act as a good fertilizer.

Suggestion.—I would suggest the use of Nitrate of Soda, at the rate of 200 lbs. to the acre; this is a valuable fertiliser, and has been found of marked use in checking the ravages of the Cabbage Maggot.

34. Radish Maggot (*Anthomyia radicum*, Bouché).—The most serious pest of radishes is the root maggot. This is the larval form of a small fly closely resembling the fly of the Onion maggot.

Remedies.—Early sowing and the use of new ground are recommended, but are by no means sure remedies. I have obtained the best results from using Prof. A. J. Cook's carbolic wash, Remedy IV. The use of salt and gas lime are also beneficial, but are not infallible remedies.

35. Squash Bug (*Anasa tristis*, De Geer).—Numbers of large, ill-smelling, dark-brown bugs, paler beneath, ⅝ inch long, clustering round squash vines about the end of June and sucking the tops. The eggs are laid on the leaves, and the young are soon found with the full grown bugs.

Remedies.—Constant hand-picking, from the vines when they first appear, and by placing shingles close to the hills beneath which the bugs hide during the day time, are generally effective. Coal oil and plaster scattered amongst the vines will drive away many.

36. Striped Cucumber Beetle (*Diabrotica vittata*, Fab.).—As soon as squash, cucumber or melon plants appear above the ground they are attacked by small, yellow-striped beetles, which, if not noticed, will soon destroy the plants.

Remedies.—Sifting dry ashes and Paris green (1 to 50) over the vines is the best application to protect the vines. Ashes alone are also useful. A remedy much adopted in the United States is described by Dr. C. M. Weed in a Bulletin of the Ohio Agricultural Exper't. Station for September, 1889, and consists of covering the vines with a piece of gauze or cheesecloth, supported by two or three sticks stuck into the ground, and with the edges held down by a handful of earth on each side.

37. Turnip Flea-beetle (*Phyllotreta vittata*, Fab.).—There is, perhaps, no insect better known or more execrated by farmers than "the fly" or flea-beetle of the turnip. The perfect beetles, black, with white marks on the wings, pass the winter beneath rubbish or clods of earth, and appear on various plants of the cress family early in spring. As soon as the young turnips appear they attack the seed leaves, and very frequently destroy the whole crop. The grub state is passed underground on the roots of plants of the cress family.

Remedies.—I have found the most successful treatment of this insect to be the sowing of perfectly dry land plaster or ashes, with 50 parts of which 1 part of Paris green had been mixed (Remedy I.) Other experimenters speak highly of a decoction of waste factory tobacco, 1 lb. in 2 or 3 gallons of water. This latter remedy is useful upon Garden Cress, where Paris green cannot be used. See also remedy for No. 36.

I think that the publication in The Humming Bird of this very valuable and interesting notice, for which I congratulate sincerely the author, Mr. James Fletcher, will be of use to British farmers and others.

The Editor.

A Visit to the British Museum. Natural History Department.

Continued from page 69.

There are no reasons whatever why the Public Collections of Insects should not be as important as the others, especially so when so many thousands of duplicates, quite useless to the students, are stored in the cabinets in the Insect Room, to no purpose whatever. Even if they are to be lost by exposure, which is not the case, it would be very easy to renovate them from time to time at a very small cost.

When it is considered that Insects are represented in nature by hundreds of thousands of species, and their great importance in agriculture, it is my opinion that they ought to be even more fully represented in the public galleries than any of the other sections.

I am certain that extensive collections of all the insects, useful, neutral or injurious to agriculture, would draw a large number of visitors, and what could possibly be more instructive and interesting than such a collection?

Also fine series of as many species of Insects Coleoptera (Beetles), Lepidoptera (Butterflies and Moths), Neuroptera (Dragon-flies), Orthoptera Grass-hoppers, Crickets, etc.), Hymenoptera (Bees, Wasps, etc.), Diptera (Flies), and all other orders, would be a great attraction for the public.

In the last Paris International Exhibition, 1889, I exhibited in the Pavilion of Guatemala a collection of about 8,000 species of American Coleoptera (Beetles), and a few cases of rare and fine species of Butterflies, and, during all the time of the exhibition, thousands of visitors came daily to admire the said collection, and asking me no end of questions about the insects exhibited, showing the interest it had for them.

From this I can conjecture that a really good collection from all parts of the world, including as many of the principal types and fine species as possible of all the orders of insects, should obtain an immense success, providing that the specimens exhibited should be the best of their kind.

It is quite erroneous to believe that the public do not appreciate what is really fine, it is just the reverse.

Actually what is exhibited is really very poor, and it is impossible to have any idea of what insects are with such an exhibition.

During this year I have had the visit of several Entomologists from S. Africa, West Indies, India and other countries, and the first question asked was: "Where is the Public Collection of Insects of the British Museum?" They could not believe that what they saw was the Public Collection.

Of course, I told them that the Scientific Collections were stored in the Insect Room and how they could get an entrance, but that did not satisfy them.

It is a fact that many visitors will delight to go in a public museum where the entrance is free to all, but when it comes to ask for a favour, which they may or may not obtain, they do not like to run that risk, and it happens that they return to their countries with a very false impression of what really are the collections of the British Museum.

REPTILE GALLERY.

In this gallery can be seen a fine collection of stuffed specimens and skeletons of Reptiles, including Crocodiles, Lizards, Snakes and Tortoises. It contains examples of all the forms of general interest.

The series of Crocodilians (cases 1 to 10) is a very good one, it contains nearly all the species known. The true Crocodiles are represented by the African, Indian, Asiatic and Australian species, and the Alligators (with the exception of one species found in China) which are from America.

Case 10 contains a series of Skulls.

Case 11 contains the Order RHYNCOCEPHALIA, of which only one species has survived to our period. It is the *Tatuera* of the Maoris or *Hatteria* of Naturalists.

It is the largest of the reptiles inhabiting New Zealand, but scarcely attains to a length of two feet. It is restricted to a few small islands of the Bay of Plenty, where it lives in holes, feeding on other small animals. An example of this interesting reptile with skeleton and skulls is exhibited.

The Order *Lacertilia*, or Lizards, comprises over 1600 species, many of which are exhibited in cases 11—22, beginning with the *Geckonidæ*, or Geckos, found in almost every part of the globe, between and near the tropics, frequenting houses, rocks and trees. In Vera Cruz, "*Mexico*" they affect particularly the lamp-posts, on which I have collected many at night.

With few exceptions they are nocturnal, and feed largely on insects. They possess the faculty of ascending smooth surfaces, even glass. For this purpose the lower surface of their toes is provided with a series of moveable plates or discs, by the aid of which they adhere to the surface over which they pass.

In cases 11—17 are exhibited the *Varanidae* or Water-Lizards. A few *Varanus griseus*, etc. are terrestrial, but the majority are semi-aquatic. The principal species exhibited are *Varanus giganteus* from N. Australia; *Varanus salvator* from the Indian Archipelago; *Varanus bengalensis* from India and *Varanus niloticus* from tropical Africa.

Case 18 contains the remarkable *Heloderma horridum* from Western Mexico. It is the only lizard whose bite is poisonous. Its teeth are fang-like provided with a deep groove as in some snakes, and the submaxillary gland is enormously developed and secretes the poisonous fluid. Another species *Heloderma suspectum* has been discovered a few years ago. In the same case are exhibited several other rare species of lizards, *Tupinambis teguexim* and *nigropunctatus*, attaining to a length of four feet; the rare *Dracaena guianensis* from Guiana; several specimens of *Amphisbenidae*, worm-like reptiles, *Lacertidae*, lizards proper, *Anguidea* or Blindworms; the *Pseudopus pallasii* or Glass-Snake and many others.

(*To be continued.*)

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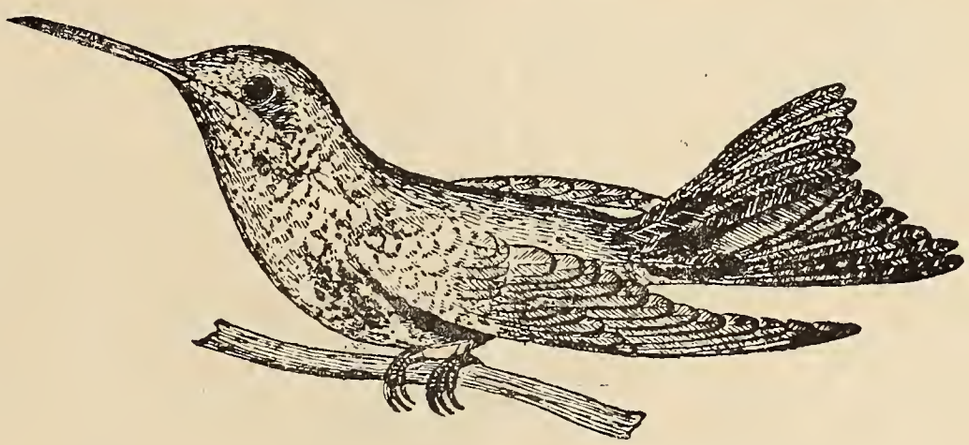

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Crocodiles and alligators are found in all parts of the world, but more especially in the hot climates. They inhabit Africa, Southern Asia, the tropical parts of Australia, North, Central and South America and the West Indies. The Indian crocodile (*Crocodilus porosus*) is very common in the East Indies and in tropical Australia. It grows exceptionally to a length of thirty feet, but the ordinary size of an adult specimen is from twelve to twenty feet.

The African crocodile (*Crocodilus vulgaris*) attains nearly the same size. It was worshipped by the ancient Egyptians, and mummies of these animals are commonly found in that country.

The Gharials (*Gavialis gangeticus*) is abundant in the river Ganges and its tributaries, and attains a length of twenty feet. It is easily recognised by their extremely long and slender snout. It feeds chiefly on fishes, for the capture of which its long and slender snout and sharp teeth are well adapted. Old males have a large cartilaginous hump on the extremity of the snout containing a small cavity for the retention of air, by which means they are enabled to remain under water for a longer time tham females or young.

In the alligators, which, with the exception of one species found in China are all found in America, the fourth lower tooth is received in a pit in the upper jaw, when the mouth is shut. They do not grow to the large size of the true crocodiles. The species most generally known is *A. mississippiensis*, which abounds in the southern parts of North America. It is the species which is bred extensively in domesticity since a few years. Some other species of alligators are also very abundant on the rivers of the Atlantic and Pacific Oceans from Mexico to Argentine Republic and Peru on the Pacific. I have seen large numbers of them on the River Papaloapam in the State of Vera Cruz, "Mexico." The crocodilians differ in many anatomical characters from the true lizards. The organs of their chest and abdomen are separated from each other by a muscular diaphragm, their heart is divided into four cavities as in the higher vertebrates. The ribs are provided with two heads for the articulation with the vertebræ, and with processes directed backwards; and their abdomen is protected by a series of transverse bones. The teeth are implanted in sockets, while in other recent reptiles they are united to the jaws. The tongue is completely adherent to the floor of the mouth. The nostrils are situated close together at the upper side of the extremity of the snout; the eyes and the ears likewise are near to the upper profile of the head, so that the animal can breathe, see and hear whilst its body is immersed in the water, the upper part of the head only being raised above the surface. When it dives, the nostrils are closed by valves, a transparent membrane is drawn over the eye and the ear, which is a horizontal slit, is shut up by a moveable projecting flap of the skin. The limbs are weak, the anterior provided with five, the posterior with four digits, of which three only are armed with claws and which are united together by a more or less developed web. The tail is long, compressed, crested above, very powerful, and admirably adapted for propelllng the body through the water. The back tail and belly are protected by a dermal armour formed of quadrangular shields, of which the dorsal, and in several alligators, also the ventral, contain true bone imbedded in the skin.

The crocodilians are thoroughly aquatic in their habits and the most formidable of all the carnivorous freshwater animals.

They feed chiefly on fish; but large crocodiles attack every animal which they can overpower and which they drown before devouring. They attack man, and many people have been killed and devoured by crocodiles. After having killed their prey they carry it into holes which are supposed to be their abode, and feast upon it until it is entirely devoured.

In the State of Vera Cruz (Mexico) where these animals are very abundant, it is said of alligators that they can live for a considerable time, buried in the dry mud. I don't know how much such an extraordinary fact can be relied upon, but when residing at Tlacotalpan and Cosomaloapam, State of Vera Cruz (Mexico), I was told many times that alligators had been found in dry fields, apparently dead, and that after a more or less prolongated immersion in water they had returned to life. They account for it in this way: In the rainy season, May to September, the fall of rain is sometimes so great that the River

Papaloapam overflows its borders, and the surrounding plains are totally inundated for several weeks, sometimes months; as I have witnessed several times. During that period it is very common to see alligators far away from the bed of the river. This water gradually dries up, and large tracks of land are transformed into lagunas or large pools, which also dry in course of time. The alligators which have gone astray from the river are seen frequently in these lagunas, and are said to bury themselves entirely in the mud before their complete drying up, and remain there until another inundation releases them from their abnormal state of inaction and torpor. It may be for months or even for years; but it is believed by all, that life is not extinct and that they revive when immersed in water for several hours or days. They told me that Indians when ploughing their fields have found many buried that way. Crocodilians lay eggs, about the size of those of turkeys, but they are oblong and have harder shells, they deposit them in holes on the banks of the rivers and ponds. They are good to eat, but not so much appreciated as Iguana or turtle eggs. The flesh of young crocodiles is sometimes eaten by the natives of Mexico.

I have never seen hides made from the large species of Iguanidae found in tropical America, but it is probable that they could be dressed and used for the same purposes as the hides of crocodiles. They are considered a good food, a fact which I can corroborate, as I have breakfasted many times on them. Their eggs, a little larger than those of a pigeon, have soft shells and are considered a luxury.

The two families of snakes, whose skins are dressed for industrial purposes, are the Pythonidae, or Rock Snakes, found in the hottest parts of Africa, Asia and Australia, and the Boidae, or Boas, restricted to the tropical parts of America. All of them attain a very large size, from 12 to 30 feet, and wide in proportion. They climb as well as swim, most of them preferring the neighbourhood of water. In the rainy season I have seen several monster boas caught in Playa Vicente, State of Oaxica, "*Mexico*." I do not remember exactly their length, but their width was 20 inches. One of them was of such an extraordinary size that a real path was perceptible where it passed and it was by following it that it was discovered and captured.

The skins of these snakes can be easily dressed and are much wanted for their softness and the brilliancy of their designs.

Now we come to Fishes whose skins are also employed for industrial purposes, but this industry is yet in its infancy and I have no doubt that before long, many species will be wanted for that purpose.

For the present I can only mention skins of Gadidae, or Cod-fishes, which were exhibited by Norway and Sweden in the Paris International Exhibition of 1889. As a member of the International Jury, Class 43, I had to classify, for prizes, all objects connected with hunting and fishing, and I was much interested with all the products extracted from cod-fishes which I saw in the exhibits of Sweden and Norway. Among them were hides of several species of large fishes, especially cod-fishes. They were soft and strong, and the designs were attractive. I have just heard that a good leather was made with the American White Fish. I call the attention of manufacturers to the above facts, and I advise them to give a good trial to these skins. SUCCESS IS CERTAIN.

A. BOUCARD.

A Visit to the British Museum.

Natural History Department.

Continued from page 82.

In cases 19—21 are the Iguanidae, some of them growing to the length of five feet, and highly esteemed as food. Their eggs are considered a great delicacy. The curious *Phrynosoma*, found in North America and Mexico in sandy places, have the faculty to take the same colours as the sands where it inhabits, which makes it very difficult to detect. This is a particular case of mimicry, but rather common in Reptiles. The Frilled Lizard, *Chlamydosaurus kingi*; the *Draco* Dragon or Flying Lizard; the Moloch, *Moloch horridus*, an extraordinary creature from Australia. It is entirely covered with tubercles and spines, which gives it a most repulsive appearance; but otherwise it is quite harmless.

In case 22 are exhibited the *Chamæleontidae* or Chamæleons, peculiar to Africa, Madagascar, India and Ceylon. The most remarkable part of this animal is the tongue, which is exceedingly long, worm-like, with a club-shaped, viscous end. They shoot it out with incredible rapidity towards insects, which remain attached to it, and are thus caught. They have the faculty of changing colour.

In cases 23—27 is the order OPHIDIA, or Snakes, among which the most remarkable exhibits are the *Pythonidae*, or Rock Snakes; the *Boidae*, or Boas, which attain sometimes a length of 30 feet; the *Elapidae*, Elaps, commonly called Coral Snakes, which are brilliantly coloured, red and black being foremost with them; the *Hydrophidae*, or Sea Snakes; the *Viperidae*, or Vipers, of which the well-known common British Viper is one of the smallest; the *Crotalidae*, or Rattle Snakes, so well known by the rattle at the end of the tail, formed by several horny rings, which the animal shakes when irritated. It is said that each ring means one year of age. When warming itself in the sun, on the sand or small pebbles, it is very difficult to detect, as it always lays on sand or stones of its same colour. It is only when trodden upon that it may be dangerous; but otherwise they remain under stones and are scarcely seen. I have taken quite a large number without any difficulty or risk.

Cases 28—44 contains the series of *Chelonians* or Tortoises and Turtles. About 300 species are known, the principal types being, *Sphargis coriaceus* or Leather Turtle, which is found throughout all the seas of the

tropical and temperate regions, and occasionally on the British coasts. It is the largest living Chelonian known, exceeding a length of six feet. The *Cheloniidae*, or Marine Turtles. These turtles are thoroughly marine animals, their fin-like feet and their light shell rendering them the best swimmers in the class of reptiles. They are found sometimes several hundred miles distant from the shore, where they return periodically to lay from 100 to 200 soft-shelled eggs, which they bury in the sand. The American Indians, who know exactly the time when they lay their eggs, come in numbers, with their wives and children, to gather them. Armed with a pointed stick, they feel the spots where the eggs are supposed to be, and soon discover them. They also secure a large number of turtles and feast on them during many days. *Caretta imbricata*, or Hawk's-bill Turtle, is the species which furnishes the commercial tortoise shell. The finest sort comes from Celebes. Some fine shells are also found in the Gulf of Mexico; the *Trionychidae*, or Fresh-water Turtles; the *Emydidae*, or Fresh-water Tortoises. *Macroclemmys temminchii* is the largest species. Its tail attains a great length, and it is furnished with a crest resembling that of a Crocodile. The Mata-mata, *Chelys fimbriata* of Guiana, also a fresh-water Tortoise, is very remarkable. Its head and neck are fringed with warty appendages, floating in the water like some vegetable growth, whilst the rough boned carapece resembles a stone, an appearance which is of great use to this creature in escaping the observation of its enemies as in alluring to it unsuspicious animals, on which it feeds. Lastly comes the *Testudinidae*, or Land Tortoises, amongst which are included the gigantic Tortoises which were formerly very common in the Mascarene and Galapagos Islands, where they could be captured in any number with the greatest facility. They weigh from 100 to 300 pounds. The large male specimen of *Tertudo elephantina* exhibited weighed 870 pounds. The gigantic Land Tortoise of Abingdon Island, *Testudo abingdoni*, is remarkable for its long neck and its thin shell. That species is supposed to be extinct now.

STAR FISH GALLERY.

The Star Fish Gallery contains a selected series of the animals belonging to the class *Echinodermata*, of which the Star Fishes are one of the best-known types, but which besides includes also the Crinoids, Sea-Urchins and Sea-Cucumbers, or Sea-Slugs.

A small collection of *Vermes*, or Worms, is also exhibited in this Gallery.

Echinoids live on seaweeds and the animals that are found on them. Such as have no teeth, like *Spatangus* (Case 6), use their spout-like mouth to take up the sand and débris on which they move, and from which they extract some nourishment. *Ophiuroids* live on the smaller Foraminifera; *Asteroids* on dead fishes, Oysters and Mollusks; *Holothurians* on shell or coral débris, and the minute organism it contains; and *Crinoids* on small tests of Foraminifera, on Larvæ and on small Crustacea.

Echinoderms move but little; the unstalked Crinoids, if they cannot find stones around which to attach themselves, swim by beating the water with their delicate arms, five being raised and five depressed alternately. They are often of exceedingly bright colours, and are very conspicuous objects. Sometimes they cover themselves over with seaweed, and so hide their brilliancy. The spines of some forms are exceedingly painful to the touch, and the stout plates of some of the *Goniasters* must form admirable organs of protection.

The power of restoring lost or injured parts is one of the most remarkable points in their organisation.

Echinoderms are of great geological age, and were very abundant in earlier periods. Two groups (the Blastoids and Cystids) have completely disappeared, and the Stalked Crinoids are far less common than they used to be. They are found in all seas, and extend to a great depth of the ocean. They are most abundant in tropical seas.

Most Echinoderms lay their eggs in the water where the larvæ are developed and swim about freely; but in a few, the young do not pass through any metamorphosis, the eggs being received in special pouches of the body of the parent, in which they are hatched.

The *Echinoidea*, or Sea-Urchins, are used as food in Italy and other countries. They are eaten raw or cooked.

ECHINODERMATA are classified as follows:—*Crinoidea*, or cup-shaped Echinoderms, of which a fine specimen, *Pentacrinus decorus*, can be seen in Case 7. ASTEROIDEA, or Star Fishes. Of this order, a fine series of *Asterias*, *Acanthaster*, and *Oreaster*, are exhibited.

Ophiuroidea, or Brittle Stars; *Echinoidea*, or Sea-Urchins, in which the rays are not free, as in the Star Fishes, or Brittle Stars, but unite to form a compact spherical heart, or dish-shaped test, covered with spines, which sometimes attain a great length, as shown in the fine example of *Diadema setosa*, from Andamans; and the *Holothurioidea*, or Sea Cucumbers, in which order are exhibited various specimens of the edible *Holothurians*, trepang, or bêche de mer, so highly prized by Chinese.

SHELL GALLERY.

A large gallery has been devoted to the exhibition of Shells, or Mollusca. It constitutes one of the principal divisions of the animal kingdom, and includes such animals as the Octopus, Cuttlefish, Snail, Slug Whelk, Cockle and Oyster.

They may be characterised as soft, cold-blooded animals. Their heart consists of two or more chambers, and is situated on the dorsal side of the animal. It drives the blood into spaces between the various organs of the body. Only the Cephalopods possess internal cartilages, but without osseus end skeleton. In the majority this is compensated by an external hardened shell. This shell may consist of two parts (valves), as in the Oyster, or may be single, as in the Snail. Upon the upper surface of the foot, in many Gastropods, a flat, hard structure, termed the *operculum*, is situated, which, when the animal is retracted, partly or entirely closes the aperture of the shell.

The reproduction of Mollusks is in all cases effected by means of eggs. The number of eggs produced by some bivalves is enormous. The common Oyster is said to produce a million or more, and the American variety ten, or even sixty, times as many. Terrestrial Mollusks are not so prolific. They deposit but very few eggs; but in certain groups, such as the large South American *Bulimi*, and the African *Achatinae*, they are protected by a hardened calcareous shell, and approaches in size a pigeon's egg.

Very little is known about the limits of age of Mollusks. It is very probable that they live for a considerable period. They have the faculty to hibernate in cold climates, and to assume a state of torpidity in tropical countries, closing up the aperture of their shells with a temporary lid or door (epiphragm), in order to resist to the dryness of the atmosphere or to the cold. When the warmth and rain re-appears, they revive, and are seen crawling in every direction.

Mollusca made their appearance on the globe at a very early date, and a large number of fossil forms have been found. The great number are inhabitants of the sea; some are found in rivers and lakes, and others live on land, on mountains, in valleys, forests, etc. Hence their designation as Marine, Fluvatile, or Land Shells.

Case 1 contains the Chepalopods, including the Octopus, Cuttlefish, Squid, Spirula, the Paper and Pearly Nautilus. Case 1E includes the Pteropods, called also Sea Butterflies.

Cases 1E—17D contain the Gastropods, including the *Conidae*, or Cones, one of the most beautiful of families of Shells, of which about 400 species are known. They are beautiful shells, and highly prized by the amateurs. £50 has been paid for a single shell. Next to the Cones come the *Terebridae*, or Auger Shells; the Pteuromatidae, or Slitslips; the *Muricidae*, or Rock Shells; the *Buccinidae*; the *Olividae*, or Olives; the *Harpidae*, or Harps; the *Fasciolaridae*, the *Mitridae*, or Mitras; the *Volutidae*, or Volutes; the *Cassididae*, or Helmet Shells; the *Doliidae*, or Tun Shells; the *Cypreidae*, or Cowry Shells; the *Cyclophoridae* and *Helicinidae*, etc., etc. The Olives, Harps, Mitras, Volutes, and Cowry Shells are highly prized by collectors in consequence of their variety in colour and their beauty.

Cases 12G to 17D includes the *Pulmonata* or Land and Fluviatile Shells; such as *Helicidae*, or Land Snails; *Limacidae*, or Slugs; *Limnœidae*, or Fresh-water Snails, etc. Many species of Helix are usually eaten. About 15,000 species are known.

Cases 17E to 26B includes the PELECYPODA, or Bivalves; such as Venus-Shells, Cockles, Razor Shells, Clams, Piddocks, Ship Worms, Sea and Fresh-water Mussels, and the well-known Oysters, of which many species are known, many of them good to eat, and producing occasionally pearls; but the finest of them are found in *Meleagrina margaritifera*, or Pearl Oyster, which is found abundantly in Ceylon and West Australia. It has a very strong shell, lined with thick layers of mother-of-pearl. Hundreds of tons of these shells are annually imported into Europe, where they sell at a very good price.

It is employed in many industries. The nacre is generally of a pearly-white colour, rarely dark, and occasionally almost black. The pearl is the produce of the effort of the animal to get rid of the irritation caused by a foreign substance between its valves, and by covering it with nacre.

One of the most ancient, and, at the present day, the most important of the pearl fisheries is that carried on in Ceylon. The banks on which the oysters grow are at an average depth of 30 to 60 ft., and extend several miles. The oysters, which should be six or seven years old when collected, are gathered in baskets by divers and hauled up by ropes into hundreds of small boats. The shells are then brought to land and left to die; then they are minutely examined for the pearls, which are either found loose in the shells or embedded in the fleshy parts of the oysters. As many as two million of oysters have been brought ashore in a single day. A small proportion of the oysters contain pearls; in some they are very small (seed, or dust-pearls, as they are called), and very few contain pearls larger than a pea, which are so highly valued. A very fine pearl can be bought at Ceylon for £40. The Chinese obtain pearls artificially from a species of fresh-water Mussel, *Dipsas plicata*. In order to do this, they keep them in tanks and insert between the shell and the animal either small shot or small round pieces of mother-of-pearl, which soon receive regular coatings of nacre, and assume the look of ordinary pearls.

Case 26H and last contains the BRACHIOPODA, which are now considered by some naturalists to be more related to Annelids, or Marine Worms, than to Mollusca. Others maintain that their affinities lie rather with *Polyzoa* and Tunicata, with which they form a distinct class termed *Molluscoida*. As a whole, the collection of shells of the British Museum is one of the most complete known, and contains a large number of types and rarieties. One of the best acquisitions was that of the celebrated collection of the late *Hugh Cuming*, of London.

GALLERY OF CETACEA.

For want of space, the collection of Cetacea has been located in a large room in the basement, which has the disadvantage of not being well lighted; but a better accommodation will be afforded to them when the west front of the building will be erected. The exhibition of Cetacea is limited to the skeletons of the larger species.

On entering, on the left side of the door, near the window is a case containing a stuffed specimen, skeleton, and several skulls of the very curious Fresh-water Dolphin, *Platanista gangetica*, and in the next case the peculiar Dolphin of the river Amazon, *Inia geoffrensis*. Among the other interesting species can be seen the Narwhal or Sea Unicorn. It has only two teeth, which lie horizontally in the upper jaw. In the female, both remain permanently concealed within the bone of the jaw, so that this sex is practically toothless; but in the male, while the right tooth remains similarly concealed and abortive (as shown in the specimen by removal of part of the

bone which covered it), the left is immensely developed, attaining a length equal to that of half the entire of the animal, projecting horizontally from the head in the form of a long, straight, tapering and pointed tusk, spirally grooved on the surface. In some very rare cases both teeth are fully developed, as in the fine skull exhibited near the skeletons.

Most of the largest Cetacea exhibited belong to the group called "Whalebone Whales" in which a series of horny plates called baleen or more familiarly "Whalebone" grow from the palate in place of teeth, and serve to strain the water taken into the mouth from the small marine animals on which these whales subsist. Four distinct types or genera are represented in the collection, the *Balaena* or right whales, of which the well-known *Balaena mysticetus* of the Artic seas is a fine representative. It yields whalebone of the greatest value for commercial purposes; the *Neobalaena* of which very little is known. One skeleton of this remarkable whale of small size (less than 20 feet) from New Zealand and Australia is placed on the left side of the room, near the windows; the *Megaptera* or humpbacks, of which a skeleton is exhibited; the *Balaenoptera*, containing the various species of Rorquals, Fin-whales, Fin-backs and the Finners or Razor-backs, which are found in almost every sea.

Among them is the most gigantic of all animals, *Balaenoptera sibboldi*, which attains the length of 80 feet, and is common in the seas between Scotland and Norway. Almost of equal colossal proportions is the common Rorqual (*Balaenoptera musculus*) found sometimes on the English coast. The complete skeleton, 68 feet long, from the Moray Frith, Scotland, where it was captured in 1882, shows extremely well the osteological characters of this group of whales.

Another species not uncommon on the English coast is the small *Balaenoptera rostrata*, which never reaches 30 feet in length.

Of the family *Physeteridæ*, including the great Sperm-whale or Cachalot (*Physeter macrocephalus*) I have already mentioned the skeleton exhibited in the Central Hall of the Museum.

The order CETACEA is one of the best marked and most natural of all the larger groups of *Mammalia*.

In all essential characters, by which Mammals are distinguished from the other vertebrated animals, such as possessing warm blood, breathing air by means of lungs, bringing forth their young alive, and nourishing them for a time with milk, they agree with the other members of their class; the striking external differences being all in relation to their adaptation to an entirely aquatic mode of life. The animals of this order of Mammalia abound in all known seas and some species, among which *Platanista gangetica* and *Inia geoffrensis* are inhabitants of the larger rivers of Central and South America and Asia.

In size the Cetacea vary much, some of the smaller Dolphins scarcely exceeding four feet in length, while others are the most colossal of all animals.

With some exceptions they are timid, inoffensive animals, active in their movements and very affectionate in their disposition towards one another—especially the mother towards the young, of which there is usually but one, and at most two, at a time. They are generally gregarious, swimming in herds, sometimes amounting to many hundreds, though some species have hitherto only been met either singly or in pairs.

The great commercial value of the oil, which all the Cetacea yield, and the special products useful to man of certain species, as whalebone, spermaceti, etc., cause some to be subject to an unremitting persecution, which has of late greatly diminished their numbers, and threatens some of the most interesting species with total extermination.

The existing members of the order are separated into very distinct suborders, having important differences in their structural characters, and with no transitional or intermediate forms. These are the Toothed Whales or ODONTOCETI, and the Baleen Whales or MYSTACOCETI.

The first suborder, ODONTOCETI, or DELPHINOIDEA, includes the families *Physeteridae Platanistidae* and *Delphinidae*.

The second suborder, MYSTACOCETI or BALAENOIDEA, includes the several genera of Whalebone Whales.

EAST WING.

GROUND FLOOR.

GEOLOGICAL AND PALAEONTOLOGICAL GALLERIES.

The ground floor of this wing consists, as on the other side of the building, of a gallery running west and east the whole length of the wing in front, of a smaller parallel gallery behind it, and leading from the latter, a series of galleries running north and south. The whole of this floor is occupied by the collection of the remains of animals and plants which flourished in geological periods anterior to that in which we are now living. Some of these belong to species still existing upon the earth, but the great majority are extinct.

SOUTH-EAST GALLERY.

VERTEBRATE ANIMALS.

Class I.—MAMMALIA.

The cases in the South-East Gallery are devoted to the exhibition of the remains of animals of the class MAMMALIA, the great proportion of which are only met with as petrifactions, or fossils, in those newer layers known to geologists as the Tertiary and Quaternary deposits, forming the more superficial part of the earth's crust. Earlier traces of such higher class of animals are comparatively rare, but are met with in the Eocene formation, and a very few remains of the lower type, which are extremely small in size, occur in rocks of secondary age. Quite recently (1889) Professor O. C. March has discovered in the "Laramie" formation, in strata of cretaceous age, in Dakato and Wyoming territories, North America, numerous remains of small mammals having close affinities with those previously known and described, from strata of Triassic and Jurassic age.

Many of the mammalia found fossil are extinct, but a very large number belong to forms closely related to, or even identical with, existing terrestrial orders, such as the cat tribe, "lion and tiger," the dog, wolf, seal, bear and hyæna, the rhinoceros, horse, elephant, pig, etc. The deposits which have yielded the largest proportion of these remains are met with in caves and fissures in limestone rocks; in old lake and river valley basins, shell marls and peat deposits, ancient forest beds covered up and submerged, and delta deposits formed in the estuaries of great rivers.

PRIMATES.—*Man and Monkeys.*

In Table Case No. 1 are placed various human remains from Kent's Cavern and other caves; also remains of *Quadrumana*, or Monkeys. In Pier Case No. 2 is placed the fossil human skeleton brought from Guadaloupe, in the West Indies, by Sir Alexander Cochrane, and presented to the Museum by the Lords Commissioners of the Admiralty.

CARNIVORA (*Flesh-eating Animals*).

In Table Case No. 2, Pier Case No. 3, are exhibited the remains of a large number of carnivorous animals, chiefly from caves, representing the Lion, Lynx, Hyæna, Wolf, Fox, Dog, Badger, Glutton, Otter, Weasel and many others. The skull of the Great Sabre-toothed Tiger, *Machaerodus neogaeus*, is very remarkable for the enormous development of the canine teeth.

In Pier Case No. 4 are exhibited the skeleton of the great Cave Bear, *Ursus spelaeus* from the Pleistocene cave deposits of Lozère, France.

In Table Case No. 3 are exhibited remains of the Grizzly Bear (?) *Ursus horribilis*, from caves in England and other countries; also Marine Carnivora (Seals and Walruses), comprising a good series of the tusks of a large extinct Walrus (*Trichechus Huxleyi*), from the red crag of Suffolk.

PROBOSCIDEA (ELEPHANTS).

The cases on the north side of this gallery are nearly entirely devoted to the exhibition of the largest series of the fossil remains of the Elephants, *Mastodon* and *Dinotherium*. This collection of skulls, tusks and models of all the principal forms is very extensive (probably the largest brought together in any museum), and very valuable.

Among the most remarkable fossil remains exhibited in Table Cases No. 5—15A, I will mention the restoration of *Tinoceras ingens* Marsh, extinct herbivorous animal; a fine series of casts, skulls and bones of the *Dinocerata*, presented by Professor Marsh; the incisor teeth, skull, lower jaw, and some limb bones of an animal named *Toxodon*, probably larger than a horse, but having incisor teeth in its jaw. Cast of the skeleton of *Phenacodus primaevus*, Cope, skull and lower jaw of *Rhinocerus leptorhinus* Owen; *R. megalodus*, Cope and other extinct species of Rhinoceros; Cast of the skeleton of *Brontops robustus*; a restoration of the skeleton of *Palaeotherium*, a form between the rhinoceros, tapir and horse.

The deer tribe, *Cervidae* are well represented both by entire skeletons in the centre of the gallery, and also by a fine series of detached heads and antlers of various species upon the pier-cases.

The most remarkable is the gigantic Irish deer, *Megaceros giganteus*, of which remains have been met with, in considerable numbers, in Ireland.

Among *Sirenia* the skeleton of the living Manatee, *Manatus americanus* found in Central and South America, and that of *Rhytina gigas* or Sea-cow are very interesting, as also the fossil remains of *Cetacea*; the restored skeleton of *Scelidotherium leptocephalum*, Owen; and the skeleton of the extinct gigantic Armadillo, *Glyptodon clavipes*, Owen.

AVES (BIRDS).

Among the birds, the *Archaeptoryx macrura* seems to be the oldest fossil bird at present discovered. This remarkable long-tailed bird was obtained from the lithographic stone of Eichstadt, near Solenhofen, in Bavaria. In the same Table Case No. 13 are exhibited twenty-six casts of bones of the extraordinary *Hesperornis regalis*, a large toothed bird, measuring nearly six feet from the extremity of the bill to the end of the toes.

Along with this remarkable form of toothed wingless birds, there is another, named by Professor Marsh *Ichthyornis*, which had well-developed powerful wings aud a strongly kernel sternum. Its jaws were armed with teeth, placed in distint sockets, and its vertebræ, unlike those of other birds, were biconcave, as is the case in a few recent and in many extinct reptiles.

The next oldest birds whose remains are preserved in this case are from the London clay of the Isle of Sheppey.

One of these, *Dasornis londiniensis*, represented by a single imperfect skull, was as large as an ostrich and probably closely related to that bird.

Table Case No. 12 and Wall Cases Nos. 23 and 24 are mostly occupied with remains of the great extinct wingless bird the Moa or *Dinornis* from New Zealand. Professor Owen has described no fewer than eighteen species of these extinct running birds varying in size from three to upwards or ten feet in height, and differing greatly in their relative forms, some being tall and slender and probably swift-footed, like the modern ostritch, whilst others were short and very stout-limbed as in the specimen of *Dinornis elephantopus*, which was undoubtedly a bird of great strength, but very heavy footed.

Five nearly entire skeletons of *Dinornis* are placed in glass-cases P., R., and S.

In the wall-case, between the windows at the south-east corner of the Pavillion are placed a tibia and plaster-casts of other bones, also two entire eggs, many broken pieces, and one plaster cast of an egg, of an extinct wingless bird, named *Aepyornis* (probably much larger than an Ostrich) found in the superficial deposits of the Inland of Madagascar. One of the eggs of this bird measures 3 feet in its longest circumference and 2 feet 6 inches in girth, and its liquid contents equal a little more than two gallons. The size of these eggs, being about four times larger than the egg of the living ostriches, it is probable that the size of this extinct bird was larger in the same proportion. They are much larger in size than the eggs of *Dinornis*.

In the same case may be seen bones of the Dodo (*Didus ineptus*), from Mauritius, and a mounted

skeleton of the Great Auk (*Alca impennis*), from Funk Island.

RFPTILIAN GALLERY.

This gallery is devoted to the exhibition of the remains of fossil Reptilia, which includes the Tortoises and Turtles, Snakes, Lizards, Crocodiles, and a large number of extinct forms. Like the Mammalia, the reptilian class lived both on land and in the water. One group, now extinct, possessed, like the Bats and the Birds, the power of flight.

The remains of these Winged Lizards (*Pterosauria*) are exhibited in Wall Case No. 1, and in Table Cases Nos. 1 and 2. They are exceedingly remarkable. The series of Crocodiles and Land Lizards' skulls and bones is very interesting. The portions of the skeletons of *Scelidosaurus Harrisoni* and *Iguanodon mantelli* is one of the largest of the great extinct land reptiles, some of which certainly rivalled the elephant in bulk. Other very interesting forms exhibited among the carnivorous Reptiles are the Fish-Lizards (*Icthyosaura*), remarkable by their long jaws, which are armed with powerful teeth implanted in groves. The skull had very large orbits, and the eyes were surrounded by a ring of broad bony plates. The hand and foot are modified into fin-like organs, composed of short polygonal bones, arranged in five closely approximated rows, with supernumerary rows of marginal ossicles added.

The largest entire *Icthyosaurus* is from Lyme Regis, and measures 22 feet in height and 8 feet across the expanded paddles, but they often attained a far larger size than this.

The *Chelonia* (Tortoises and Turtles) are exhibited in two wall-cases and three table-cases placed in the West Corridor, which connects the Mammalian with the Reptilian Galleries. In Wall Case 12 are placed the remains of a remarkable extinct Chelonia named *Miolania Oweni*, from Australia.

In Wall Case No. 13 is exhibited the skeleton of the Long-necked Sea-Lizard. *Plesiosaurus*, from the Lias of Lyme, Regis, Dorset.

Another interesting form of Lizard (snake-like in form) is *Bothriceps huxleyi*, from South Africa.

GALLERIES RUNNING NORTH FROM THE REPTILIAN GALLERY.

There are seven galleries running at right angles to the Reptilian Gallery, about 140 feet in length, three of which are forty feet in breadth and four of half that width. The first narrow gallery is occupied by the General Library.

The first wide Gallery is devoted to the exhibition of the Fossil Fishes, and contains thirty two Table-cases and about 260 feet linear of Wall-cases.

Here are exhibited the finest known collection of Fossil Fishes. Lately it has received two splendid additions by the acquisition of the famous collection of the Earl of Enniskilen and that of the late Sir Philip de Malpas Grey-Egerton.

In narrow Gallery No. 7 are displayed the fossils CEPHALOPODA, being the first section of the Invertebrate animals and the highest division of the Molluscan Class. A Table-case is devoted to the PTEROPODA or Wing Shells.

The second of the wide Galleries has thirty two Table-cases and Wall-cases. In it are placed the remaining groups of the Mollusca, viz, the *Gasteropoda*, the *Lamellibranchiata*, and the *Brachiopoda*. It also contains the *Polyzoa*, the *Insecta*, and *Crustacea*, the *Annelida*, and *Echinodermata*.

(*To be continued.*)

"World's Columbian Exposition."

BATIMENT DE L'ADMINISTRATION.

C'est l'opinion d'un bien grand nombre d'architectes que le tableau architectonique de l'Exposition de Chicago excellera toutes les expositions précédentes.

Quoique une telle opinion. pourrait être influencée par l'orgueil patriotique, il est néanmoins certain que l'Exposition offrira beaucoup de points et groupes qui seront au moins nouveaux dans leur genre ; l'on peut dire en même temps que peu d'édifices, tellement magnifiques et d'une telle beauté comme ceux-ci, ont jamais été construits.

Le tableau en général se divise en trois groupes. Les édifices des différents Etats de l'Union et des Gouvernements étrangers se trouveront sur la partie du nord, au milieu des améliorations déjà existantes. Ils sont situés au long de promenades, formant ainsi des groupes pittoresques, ou dessous des arbres ombreux, aux bords des lacs ou à côté de larges pelouses. Le centre de ce groupe principal est formé par le Palais des Arts.

A l'extrémité sud-ouest de ce groupe se trouve, sur une péninsule qui entre au nord de la lagune, mettant de cette manière ce groupe en rapport avec le plus rapproché, dont le centre n'est pas formé par un grand édifice, mais par une grande île boisée, entourée de canaux, aux bords desquels ces bâtiments sont situés. Ceux de ces derniers, qui se trouvent au sud de ce groupe, forment à leur tour une transition au troisième au sud.

Quant aux bâtiments, on peut dire que ce dernier groupe paraît égal au groupe principal, vû qu'il contient les plus importants des édifices internationaux.

Par contraste au groupe central, où la nature prédomine autant que possible dans une telle entreprise, l'architecture est le principe fondamental du groupe plus au nord et supérieur.

L'horticulture vient aider ici, et la proximité de la grande mer méditerranée a servi à créer de grandes voies d'eau, offrant ainsi un nombre de vues splendides.

Pour compléter ce groupe il y faut ajouter une longue jetée promenade et le Casino. C'est ici que la jetée, ayant 1,500 pieds de longueur, s'etendra vers l'est sur le lac, en se ramifiant à son bout en deux branches qui se dirigent au nord et au sud. Sur celle du nord il y a le Casino, d'où, regardant vers la terre, l'on voit le centre de ce groupe principal. Nous voyons de ce point premièrement un grand demi-cercle, formé par des larges courbes de ponts au dessous desquels les eaux du Lac Michigan versent dans le bassin qui se dirige étroitement vers l'ouest, en terminant au fond du terrain de l'Exposition.

Treize colonnes élancées, portant des figures allégoriques qui représentent les treize premiers Etats de l'Union de l'Amérique du Nord, sont placées sur ces ponts.

Au milieu du cercle, dont ces colonnes font partie, se lève dans le bassin une immense statue de la Liberté, tandis que de larges pelouses et plants de fleurs courent autour du bassin vers l'ouest.

Au nord et au sud de ces plants de fleurs il y a, parallèlement au bassin, des larges sentiers, et des deux côtés de ces promenades seront placés quelques-uns des principaux bâtiments internationaux. Au nord, près du côté du lac, l'on voit la façade sud du grand palais des manufactures, vers l'ouest le bâtiment de l'Exposition d'Electricité et derrière, celui des Mines.

Au sud, en face du Palais des Manufactures, se trouve l'Exposition Agricole, en face des autres deux bâtiments, le Palais des Machines.

Placé au centre de l'espace, entre le Palais des Machines et de l'Electricité, on trouve le bâtiment de l'Administration qui forme le milieu et en même temps le couronnement de ce groupe. Les édifices environnants sont tous à peu près de la même hauteur. Le bâtiment de l'Administration est muni d'un dôme gigantesque qui donne au groupe une apparence majestueuse.

Il sera probablement le plus beau et le plus élégant de tous les édifices qui se trouveront à l'Exposition de 1893, vu qu'il sera magnifiquement décoré et en proportion de ses dimensions, le plus dispendieux, La hauteur du bâtiment, qui est situé sur une terasse plus élevée que les autres, sera de 250 pieds. Son grand dôme sera visible de partout, et la vue que l'on jouira d'ici sur tout le terrain de l'Exposition sera magnifique.

Le bâtiment de l'Administration coûtera $650,000. Le plan a été fait par Mr. Richard M. Hunt, de New York, Président de l'Institut Américain des Architectes, qui est en même temps le Président du Conseil des Architectes de l'Exposition Universelle. La construction prendra la forme d'un carré et aura une longueur de 250 pieds. A ses quatre coins l'édifice est sous-divisé en quatre pavillons de 84 pieds chacun. De cette manière restera un espace de 32 pieds au milieu de chaque côté, où se trouvera un grand portail. Le centre du bâtiment entre les pavillons forme une rotonde, au-dessus de laquelle se trouve le dôme. L'ensemble de tout les bâtiments est de style renaissance française. Au rez-de-chaussée prédomine l'ordre dorique, aux coins des quatre pavillons qui auront 65 pieds d'hauteur ressautent des piliers immenses, qui soutiennent des groupes allégoriques en marbre.

Le deuxième étage aussi de 65 pieds d'hauteur, mais d'une circonférence plus petite est la continuation de la rotonde intérieure, et aura 175 pieds carrés de diamètre. Il est entouré d'une colonnade ouverte de colonnes ioniques de 20 pieds de largeur sur 40 pieds de hauteur. La colonnade est séparée aux quatre coins par des pavillons de toits aplatis, pendant que les quatre piliers sont munis de figures sculptées. De larges escaliers donnent accès du terrain uni à la colonnade.

Le dessus de cet étage sert de base au dôme. Une base octogone se lève à une hauteur de 30 pieds et c'est au-dessus d'elle que se soulève le dôme qui est doré, partiellement mêlé d'un bleu foncé, avec des sculptures superbes.

La rotonde est éclairée par le jour qui entre par le sommet du dôme couvert de verre. A chaque coin de la base octogone du dôme il y a des grands aigles sculptés, pendant que les panneaux sont ornés de haut reliefs. Les quatre principaux portails aux côtés ont 50 pieds de largeur et la même hauteur ; les voûtes magnifiquement décorées au-dessus des portails sont en plein cintre. Par dessus les grandes portes, qui se trouvent au bout intérieur des ces portails, sont placées des grandes fenêtres, avec un balcon mettant en rapport les différents pavillons.

La décoration intérieure de l'édifice sera, si c'est possible, encore plus riche que l'extérieur. Les entrées aux différent bureaux se trouvent dans un corridor de 30 pieds de long et de la même largeur, qui sort chaque fois entre deux portails. La communication avec les étages supérieurs est établie par des escaliers tournants et par des ascenseurs. La division de l'édifice en huit parties par les pavillons se trouve aussi dans l'intérieur, où huit arcs correspondent à ceux au-dessus des portails.

Une frise d'une largeur de 27 pieds, décorée de tablettes et d'inscriptions, les premières avec des figures en bas-relief, se trouve sur ces voûtes.

L'étage supérieur de la rotonde est fermé par une corniche richement décorée qui porte un balcon passant tout autour du bâtiment au niveau de la colonnade extérieure.

Au-dessus de ce balcon il y a un second étage de 50 pieds de diamètre, dont le plafond repose sur des pilastres, entre lesquels se trouvent des fenêtres ayant vue sur la colonnade. Le dôme intérieur de 200 pieds de hauteur aura à son couronnement une ouverture de 50 pieds de diamètre qui permettra l'entrée du jour par le dôme extérieur. La rotonde sera magnifiquement décorée.

Les quatre principaux pavillons, de la partie inférieure du bâtiment sont sous-divises chacun en quatre étages qui serviront de bureaux à l'Administration.

Un des pavillons contiendra au niveau du terrain un poste de police et d'incendie, dans un autre il y aura l'ambulance et les chambres pour les médecins et le pharmacien ainsi que le département des affaires étrangères et d'informations. Dans le troisième se trouve le bureau de poste et une banque, et enfin dans le dernier la salle d'attente et un restaurant.

Aux quatre étages seront placés les bureaux du Directeur Général, des différents comités, et le département de la Publicité.

L'on peut dire que c'est quelque chose de particulier, non-seulement de cet édifice mais du plan entier de l'Exposition, que le bâtiment de l'Administration, qui occupe usuellement un rang inférieur, est dans ce cas le bâtiment le plus magnifique, formant le point central du groupe principal.

On se propose d'en faire un bâtiment monumental, le seul de ce genre à l'Exposition.

M. P. Handy,
Chef de Bureau.

Ayme,
Chargé de la Presse étrangère.

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November 1, 1891.

The

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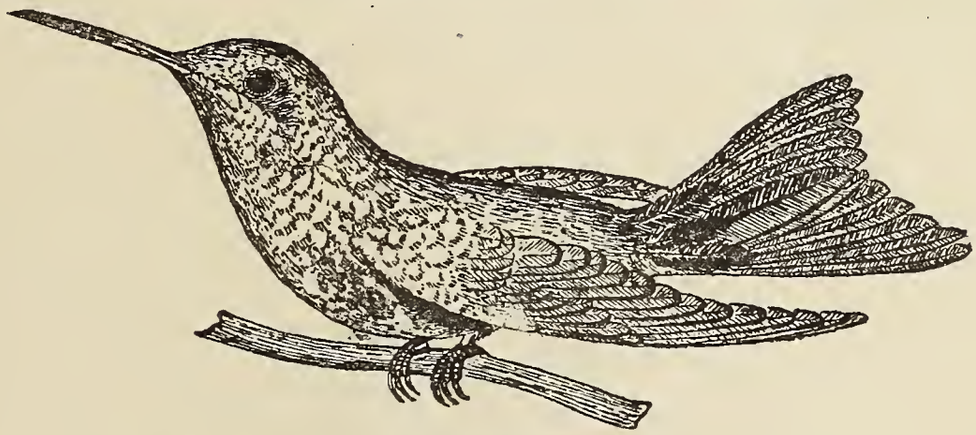

Arinia Boucardi

EDITED UNDER THE DIRECTION

OF

MR. ADOLPHE BOUCARD,

NATURALIST,

Officier d'Académie, 1878; Knight of the Royal Military Order of the Conception, 1881;
Knight Officer of the Royal Order of Cambodje, 1889; Knight Commander of the Royal Order of Isabelle la Catholique, 1882;
Corresponding Member of the Zoological Society, London, 1865;
de la Mission scientifique française au Mexique et dans l'Amérique centrale, 1866; of the Royal Museum of Madrid, 1881;
Commissioner for the Republic of Guatemala in the Paris International Exhibitions of 1878 and 1889;
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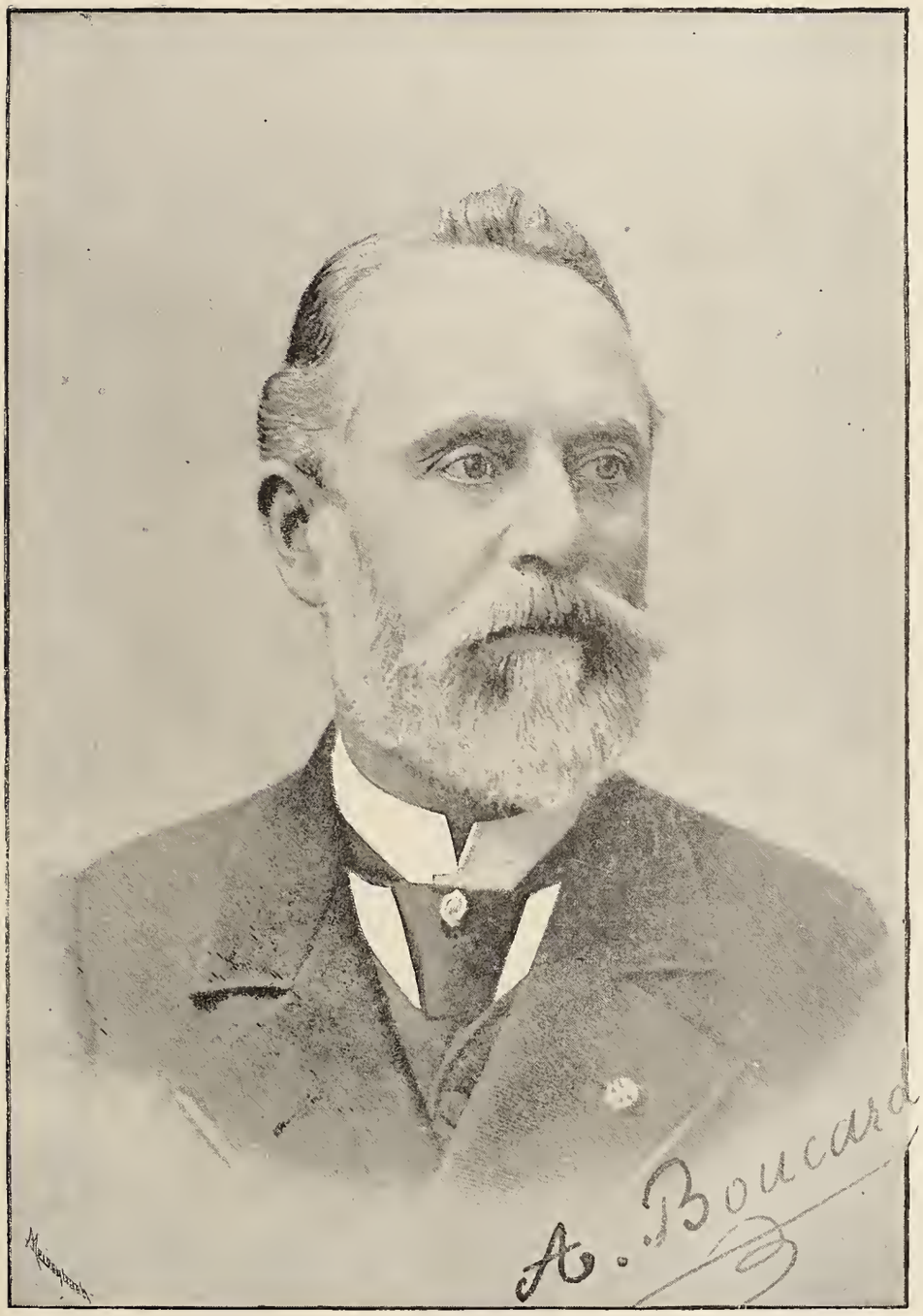
TROLHILIDÆ.

Phæthornis guianensis ...	20
Helianthea eos	50
Bellona superba	30

For remainder of species of Trochilidæ, see *Humming Bird*, No. 1, January, 1891.


A. Boucard

The Humming Bird.

To the Subscribers and Correspondents of the "Humming Bird."

With this number, Volume I. is completed, and I thank heartily all the Correspondents and Subscribers to Vol. I. of the *Humming Bird*, who have patronized this review and have contributed to its succes.

I have done my best to make Vol. I. interesting to all, but I am not quite satisfied yet, and I hope that Vol. II. will surpass it in interest, and I shall not cease in my efforts until I make this review indispensable to all who are interested in SCIENTIFIC, ARTISTIC and INDUSTRIAL matters.

Besides Original notices on ART, SCIENCE and INDUSTRY, Vol. II. will contain the beginning of my GENERA OF BIRDS, on which I am working since 1876, and for which I have assembled extensive collections of Bird skins from all parts of the world during the last thirty years.

In Vol. II. of the *Humming Bird*, I will begin the GENERA OF BIRDS with the complete GENERA OF THE HUMMING-BIRDS.

It will contain a full description of all the generical types and a condensed description of all the species known of each genus, so as to make it quite complete and easy for all to determine the species of that most beautiful and interesting Order of birds. Successively I will continue with the other Orders and Families of birds, one at a time, so that each series will always be complete by itself.

I will not follow any special classification; because my actual opinion is that we cannot boast yet of a satisfactory classification acceptable to all the modern Ornithologists. Perhaps later on, we may arrive to that; but for the present there are as many CLASSIFICATIONS as there are AUTHORS, each of them containing exceptional good things; but not yet quite satisfactory to all.

I conclude, wishing a merry Christmas, a happy New Year, Health and Prosperity to ALL.

A. BOUCARD.

Books Received.

The Antigua Observer; the Kansas City Scientist; the Canadian Entomologist; Sporting Goods Review; the Ibis Vol. III. No. 4; A Handbook of the Destructive Insects of Victoria, with notes on the Methods to be adopted to check and extirpate them, by C. French, F.L.S., F.R.H.S., Government Entomologist. A full report of this interesting volume will be given in successive numbers.

A Visit to the British Museum.

Natural History Department.

Continued from page 89.

PLANTÆ.

This group occupies the whole Eastern side of Gallery No. 10.

The Miocene flora, of Greenland, is well represented by many fine specimens collected by Mr. Edward Whymper, and described by the late Professor O. Heer.

A fine series of Ferns, Conifers and Cycads from the Wealden of Hastings has lately been acquired from the collector, Mr. P. Rufford.

Two fine trunks of coniferous trees, *Cedroxylon*, are placed in the centre of the Gallery.

The series of *Zamia Williamsonia* from the Scarborough Oolites is altogether unique.

The Triassic series is well represented by some large slabs from India containing well preserved leaves of Ferns, the chief of which is known as *Glossopteris*. The collection has numerous specimens of this fern from South Africa and Australia.

In Gallery No. 11 have been arranged in seventeen cases, a series of nine collections of historical and palaeontogical interest, bearing upon the early history of the British Museum and the study of Geology and Palaeontology in England.

It begins with Sir Hans Sloane Collection acquired by purchase for the Nation in 1753.

The next is the Brander Collection, 1766.

The next series to which attention is directed is the Collection of William Smith, L.L.D. This was commenced about the year 1787 and purchased by the Trustees in 1816.

We come next to a collection, the very name of which betrays the antiquity of its origin. It is known as Sowerby's Mineral Conchology. It was purchased by the Trustees in 1861.

Another curious but small series represents the types or figured specimens of König's *Icones Fossilium Sectiles*, prepared by Mr. Charles König, the first keeper of the Mineral and Geological Department.

A far more important collection is that known as the Gilbertson's Collection. It was purchased for the British Museum in 1841.

Next comes the Searles Wood Crag Collection, presented by Mr. S. V. Wood to the British Museum in January, 1856, and a supplementary collection was given by Mrs. Searles V. Wood in 1885.

The next Palaeontographical Collection is of nearly equal antiquity and fully of equal merit. It is the Eocene Molluscan Collection formed by the late Frederik E. Edwards, Esq., about the year 1835, and was continually being added to until a few years before his death, which happened in 1875. It was acquired by the Nation, by purchase in 1873.

The last collection is that of a Naturalist who devoted his entire life to the study and illustration of a single class of organisms, namely the *Brachiopoda*.

It was formed by the late Thomas Davidson, Esq., between the years 1837 and 1886.

His collection, both of recent and fossil Brachiopoda, together with all Dr. Davidson's original drawings, his numerous books and pamphlets were bequeathed by him to the British Museum through his son, William Davidson, Esq., in February, 1886.

By his direction the entire collection of recent and fossil species are to be kept together in one series for the convenience of reference for all men of science who may wish to consult the same.

STAIRCASE.

On the first landing of the monumental staircase facing the centre of the hall is placed the seated marble statue of the celebrated Naturalist CHARLES DARWIN (1809-1882) to whose labours the study of natural history owes so vast an impulse. The statue was executed by Sir J. E. Boehm, R.A., as part of the "Darwin Memorial" raised by public subscription.

Above the first landing the staircase divides into two flights, each leading to one of the corridors which flank the west and east sides of the Hall, and by which access is gained to the galleries of the first floor. At the southern end of these corridors a staircase from each, raised on an arch which spans the hall, join to form a central flight leading to the second floor. On the landing at the top of this flight is placed a marble statue, by Chantrey, of Sir Joseph Banks (1743-1820), the magnificent patron of science and scientific men, who for forty one years presided over the Royal Society and was an active Trustee of the Museum. His splendid botanical collections are preserved in the adjoining gallery; but his unrivalled library of works on natural history, also bequeathed to the Museum, remains in the old building at Bloomsbury.

The west corridor contains a portion of that very interesting collection of British birds with their nests, which have not found room in the Bird Gallery on the ground-floor. The specimens placed here belongs mostly to the Perching or Passerine Order. It is excessively good and very instructive and much appreciated by the general public.

On the opposite side, "east corridor," is placed the fine collection of Humming Birds, "*Trochilidæ*" formed and mounted by the late Mr. John Gould, one of the most celebrated Naturalists of this century, and purchased for the Museum after his death in 1881.

John Gould commenced the study of this family of birds some forty years ago. The difficulties of obtaining new and rare species from countries previously untrodden by the collector were greater than they are in the present time; but the energy and enthusiasm of John Gould overcame all obstacles; he lost no opportunity of acquiring at any cost, species not represented in his collection, he incited, by high rewards, travellers to go specially in search of rare or unknown species; and after the lapse of twenty years he had succeeded in bringing together a series far exceeding in variety of forms his own expectation or that of Ornithologists generally. He commenced the publication of a great work "the Monograph of the Trochilidæ," which finally extended to five volumes in folio, and comprised descriptions and figures of over 400 different species.

From an early period he began to mount the most remarkable types, placing as much as possible allied forms in the same case, and demonstrating their habits and chief characteristics, and especially the ever varying hues of their colours, by the different attitudes in which he arranged the specimens. This collection of mounted Humming Birds contained about 300 species and 2,000 specimens, when he exhibited it in the Zoological Gardens in Regent's Park during the great Exhibition of 1851. It proved one of the great attractions in London during that memorable year; and after it had been exhibited to the public for a year or two, he removed it to his residence in Charlotte Street, Bedford Square, where he had built a gallery for its reception. Here it was seen and admired by hundreds of naturalists during his life time.

It was always Mr. Gould's hope and wish that the whole collection of mounted and unmounted specimens should be preserved as the property of the Nation, and accordingly it was offered by his executors to the trustees of the British Museum who eventually purchased it.

At that time I was at Nice, where I first heard of Mr. Gould's death, and that his collection was for sale. I came at once to London and offered to buy it for the price asked to the British Museum, and in so doing I roused a sort of emulation among the authorities of the British Museum, which resulted in the prompt acquisition of the collection. This acquisition was all the more important, as almost all the original specimens from which the figures on his work on Humming Birds were taken, are contained in it.

Among the many types contained in the collection are three of new species discovered by me in Mexico, when I was not an amateur myself. They are *Phaeoptila sordida*, *Cyanomya violiceps* and *Selasphorus pulchra*. Few are the naturalist travellers of the second part of this century who have not contributed in procuring new or rare species for Mr. Gould. Among them I may mention such naturalists as Bourcier, Sallé, Buckley, Bartlett, Salvin, and many others. In the last years of his life his great ambition was to procure some specimens of the rare genus and magnificent species *Loddigesia mirabilis*, known only by one specimen, discovered by Matthews at Chachapoyas, Peru, when travelling for the account of the well-known botanist Loddiges, who had formed a very fine collection of Humming Birds. This typical specimen is still in the collection of his grandson, Conrad Loddiges, of London.

I was present when he offered to Buckley (who in a previous voyage had seen the bird, but had not been able to procure any) fifty pounds a piece for ten specimens, if he could get them.

He was as enthusiastic about it as a young collector; but unfortunately Buckley came back without the bird, although he stayed several months purposely at Chachapoyas and tried very hard to get some. Soon after, Jelski, a successful traveller, who was

exploring Peru for the Museum of Varsovia, had the good fortune to re-discover the species, and brought home about fifteen specimens of this rare species, including the female, "which was not known," and youngs; but John Gould was no more at that time !!

Besides the fine collection of Humming Birds exhibited, John Gould has left another collection of skins, containing all his *types*, which is kept in the study room, and where it is accessible to students.

Humming Birds, or *Trochilidæ*, are only found in the New World, and form a group by themselves, for which I have proposed the name of TROCHILI, Cat. Avium, 1876.

About 430 species are actually known. Nearly all of them are conspicuous for the beauty of their colours and the originality of their forms. In a few species the females are as brightly coloured as the males. No other group of birds can compare in beauty of colours with the Humming Birds, which in that respect are the gems of Nature, and quite as gorgeous as the finest precious stones.

They are the smallest birds known, some of the smallest species being hardly larger than a middle size Sphynx "Moth," meanwhile the largest species known, "*Patagona gigas*" is not larger than a swallow.

They are somewhat allied to the Swifts and the Woodpeckers, with which they have many points of their internal organisation in common.

MAMMALIAN GALLERY.

The Mammalian Gallery which is on the first floor is entered from the western corridor of the Central Hall. It contains the series of stuffed specimens of animals of this class, with the exceptlon of the Cetacea and the Sirenia. Skeletons of the most important types are incorporated with this series. The collection of antlers of the family Deer is ranged along the top of the cases.

The series commences on the left with the PRIMATES, the most highly organised forms, viz., the apes and monkeys—"Cases 1—10," of which the fine series of Gorillas, Chimpanzees and Orang-Outangs deserve special attention. Among the ordinary monkeys, some of the striking species, both in form and colour, are the Proboscis monkey "*Nasalis larvatus*," so called on account of the remarkable length of its nose; the Guereza, "*Colobus guereza*," which has on its side a peculiar fringe of long white hairs reaching quite down to the ground; the Macaques, one species *Inus ecaudatus*, leading a precarious existence on the rocks of Gibraltar. the Baboons, *Cynocephalus*; hideous animals with powerful teeth, projecting jaws, nearly equal fore and hind limbs and dull-coloured fur, and the Mandrill, "*Papio Maimon*," with a short stumpy tail and a perfectly naked face, the skin of which is brightly marked with blue and vermillion. Next comes the group *Cebidæ* comprising the Spider monkeys *Ateles*, the Howling monkeys, *Mycetes*, the males of which possess a most extraordinary voice; the resonance of which is increased by a peculiar chamber formed by the middle portion of the bone of the tongue. At day-break and at sun-set the dulness of the forests of tropical countries of Central and South America is enlivened by the terrific noise made by these animals; the Negro monkeys, *Lagothrix*, the Squirrel monkeys *Nyctipithecus*, *Callethrix* and *Chrysothrix*, all beautiful little creatures, with soft bright coloured fur; the Sapajous or Capucin monkeys, "*Cebus*," and the *Hapalidæ* or Marmosets.

Then comes the LEMUROIDEA for the most part natives of Madagascar, including the *Indrisinae*, *Indris and Propithecus*, the *Lemurinæ* or true Lemurs, the *Galeaginæ* "*Chirogale* and *Galago*," the *Lorisinæ*, the *Tarsiidæ* and *Chiromydæ*. The type of this last family is the extraordinary animal *Aye-Aye* of Madagascar, "*Chiromys madagascariensis*," with only 18 teeth, very large ears, a long bushy tail, and long compressed claws on all the fingers and toes, with the exception of the hallux, which is opposable and has a flat nail.

In Cases 11—26, are exhibited the whole assemblage of animals known by the name of beasts of prey, comprising the Cats, Wolves and Dogs, Bears, Weasels, and many other allied animals, viz., the Seals and Walruses.

The series of *Felidæ* Lions, Tigers, Leopards, Jaguars, Ocelots and Lynxes, is very fine.

Several varieties of the domestic Dog are exhibited in Cases 19 and 20. In the upper compartments of Cases 17 and 18 are the Wolves.

The last great division of the fissiped Carnivora is the *Arctoidea*, consisting of the Bears, Weasels, Racoons, etc. The most typical members are completely plantigrade, walking flat on their palms and soles; and all have five toes on each of their feet.

The series of true Bears *Ursidæ*, is very well represented. Conspicuous among them are the Polar bear, *Ursus maritimus*, and the Grizzly bear, *Ursus ferox*.

The fin-footed Carnivores or *Carnivora pinnipedia*, consisting of the Seals and their allies are exhibited in several cases in the centre of the gallery. Very fine male specimens of *Otaria stelleri* and *Otaria jubata* are in a special case by themselves.

Of the numerous species of Eared seals, one of the most worthy of mention is the Fur seal, *Callorhinus ursinus*, of the North Pacific, from which most of the sealskins sold are obtained.

The small order of INSECTIVORA comprising the *Tupaiidæ* or Tree-shrews, the Macroscelididæ or Elephant-shrews, the *Erinaceidæ*, Hedgehogs and Gymnura, the *Talpidæ* or moles, the *Soricidæ* or Shrews, the *Centetidæ* or Taurecs, and the *Chrysochloridæ* or Moles is exhibited in Case 27. In this same case are also the Frugivorous and Insectivorous Bats belonging to the Order CHIROPTERA.

Cases 27—32 contain the order RODENTIA or Gnawing Mammals, comprising the Squirrels, Rats, Hares, etc., and form by far the largest order of Mammals, containing over 900 distinct species.

The Order UNGULATA or Hoofed animals, comprising Elephants, Rhinoceroses, Tapirs, Pigs, Camels, Llamas, Oxen, Sheep, Antelopes, Gazelles, Chevrotains, and Deers, is exhibited in Cases 35—94. The series of these animals is large and very interesting.

Cases 33 and 34 contain the curious order of EDENTATA, so named on account of the incomplete-

ness of their dentition, or entire want of teeth. It comprises the Sloths and Anteaters, Armadilloes, Pangolins, and Aard-varks, which differ considerably between themselves. The West African Pangolin, *Manis tricuspis*, and the Aard-varks, *Orycteropus capensis* and *æthiopicus*, are very remarkable species.

In Cases 95—98 are exhibited the members of the Order MARSUPIALIA, a very remarkable group of animals comprising the well-known Kangaroos, the Bandicoots, the Tasmanian Wolf, the Phascologales, the Marsupial Anteater, the Wombats, the Phalangers, the Koala, and the Opossums.

Last comes the order MONOTREMATA consisting of two families, the *Echidnidæ* and the *Ornithorhynchidæ*, showing a remarkably low type of organisation, a type transmitted more or less directly from some of the earliest Mammalian forms.

The Monotremes lay eggs and have pouches ; but their mode of incubation is not yet satisfactorily known, they are without true mammary nipples, the mother's milk exuding from group of pores in the skin. The males are provided with remarkable horny spurs on their heels, connected with a small gland on the back of the thigh, the function of which is entirely unknown. The temperature of the blood is lower than that of other mammals, recent observations having shown that that of Echidna stands only at about 78 degrees, some 20 degrees lower than that of man, and about 30 degrees below that of the average of birds.

They are supposed to live exclusively on ants, which they catch with their long extensile tongues, like the true anteaters. Their palates are covered with rows of horny spines, which serve to scrape the ants off the tongue when it is withdrawn into the mouth. Echidnas are able, by the help of their strong curved claws to bury themselves in loose soil in a few minutes.

The family contains five species, *E. australis* from Australia, and *E. novæ guineæ*, *Bruijni*, *villosissima* and *Lawesii* from New Guinea ; but it is probable that many more species will be discovered before long.

The second family of the order, *Ornithorhynchidæ*, distinguished by the extraordinary structure of the muzzle, which resembles the bill of a duck, and is provided with horny lamellæ instead of teeth ; the tail is long and broad, and the toes are webbed ; its coat consists of thick, close hair without any spines. The only known species is the Duck-billed Platypus, *Ornithorhynchus anatinus* or Water Mole of the colonists, which, as might be expected from its structure, is entirely an aquatic animal, feeding on water animals, for which it searches in the mud in the same manner as a duck. It is a native of both Australia and Tasmania.

On the whole, the collection of Mammals is very fine and of the greatest interest.

MINERAL GALLERY.

The gallery on the first floor, entered from the south end of the east corridor of the hall, contains the extensive Mineral collection. Entering the gallery the visitor will find, in the first window-case on the left hand side, a series of specimens selected and labelled to serve as an introduction to the study of minerals.

Beginning with a definition of what is meant by a mineral, it is there shown how essential characters were gradually recognised, and how minerals have been distributed into kinds and classified.

In the next three window-cases, specimens are arranged to illustrate the various terms which have been found useful in the description of minerals.

Recently acquired specimens are shown for a time in the fifth window-case.

The remaining window-cases in the gallery contain the collection of crystals and pseudomorphs, and are intended for the special student.

Specimens of every mineral species and variety are exhibited in table-cases numbered 1 to 42.

In Cases 1 and 2 are the native metals, as *Copper*, *Silver*, *Gold* and *Platinum*, and non-metals as *Sulphur*, *Graphite* and *Diamond*.

The next six Cases contain minerals which have mostly a metallic lustre, and consist of metals in chemical combination with sulphur or arsenic, such as *Argentite*, an important silver ore containing 87 per cent. of silver and 13 of sulphur, *Blenda*, *Galena*, *Copper-glance*, *Cinnabar*, from which mercury or quicksilver is obtained, *Pyrites*, *Erubescite*, etc.

COMMON SALT is represented in Case 8.

The next division, consisting of compounds of oxygen and including most of the stony minerals, begins with *Cuprite*, an important ore of copper, and continues with different kinds of *Spinel*, the deep red is the Spinel Ruby, the rose tinted is Balas Ruby, precious stones, *Magnetite*, the richest and most valuable of the ores of iron, *Chrysoberyl*, precious stone, *Corundum*, known, when pure, as Lux-sapphire ; when red it is the true Ruby, when azure it is the Sapphire, while the yellow, green and purple varieties are known as Topaz, Esmerald, and Amethyst. After Diamond it is the most precious of stones ; *Haematite* is a valuable ore of iron, *Cassiterite* or tin stone, *Zircon* which is one of the precious stones ; one variety with peculiar red tints is the Hyacinth or Jacynth *Quartz*, which is the most common of minerals. In its clear and transparent variety it is the Crystal of the ancients and the rock crystal of modern times. Several varieties of quartz are known as Topaz, Amethyst and Quartz Cats-eye ; *Jasper* ; *Lydian* or Touch stone *Chalcedony* ; *Heliotrope* or Blood stone, green with red blood-like spots.

Next follow the Plasma and Chrysoprase, green stones, and the Sard as also the Sardonyx, its banded variety : all of them prized by the ancients as being more suited to the display of the engravers skill than the harder and more precious stones.

Then comes the *Agates*, the *Moss-agates*, the *Carnelian*, the *Opal* including the precious or Noble Opal, among the specimens of which is a fine suite from Queensland, presented by Professor Maskelyne. They are abundant in Central America. Next to it are : *Jade*, *Serpentine*, *Topaz*, *Garnet*, *Tadeite*, *Mica*, *Beryl*, of which the bright green variety, *Emerald*, is one of the most valued of precious stones, *Tourmaline* *Gypsum* *Borax*, *Turquoise*, etc.

As a supplement to the collection of simple minerals, there is arranged in Cases 41 and 42, a

group of natural substances which either belong or are closely related to the mineral kingdom; although in their formation organised matter has played a very important part. The most important are Coal and Amber.

A series illustrating the various kinds of rocks is exhibited in the four table-cases in the windows; but the most important collection is that of the *Meteorites*. From the entrance of the gallery the large mass of meteoric iron, weighing three and a half tons, found about 1854 at Cranbourne, "Australia," and presented to the Museum in 1862 by James Bruce, Esq., can be seen in the pavillion at the opposite end of the gallery. The other meteorites are in the same room, the smaller specimens in the four central cases, and the larger on separate stands.

The fall of masses of stone and iron from the sky was very rarely credited by anyone besides the spectators themselves, and till the beginning of this century no attempt to collect such specimens for examination and comparison was made. It is supposed that meteorites are closely related not only to the ordinary shooting stars, but also to comets and probably to the nebulæ and fixed stars.

OSTEOLOGICAL GALLERY.

The Osteological Gallery (on the second floor) is devoted to the skeletons and skulls of Mammalia, the arrangement of which corresponds as far as practicable with that of the stuffed specimens.

The series commences, on the left hand on entering, with a male and female human skeleton, followed by a selection of skulls showing the different modifications of the cranial and facial bones in the various races of mankind. Among these is the skeleton of a full grown *Akka*, only four feet high, which appears to be the usual size of the pygmy tribe of negroes from Central Africa. The next wall-case contains several skeletons of man-like apes, the Orang-Outang, Gorilla and Chimpanzee with the principal forms of the other monkeys and lemurs.

In Cases 4—8, numerous representations of the Carnivorous and Rodent Mammalia are shown, the remainder of the cases of this side of the gallery being devoted to the exhibition of skulls of the larger UNGULATA, viz.: Elephants, Rhinoceroses and Horses. The series of elephants is continued in the pavilion at the end of the gallery, where skulls and skeletons of the African and Indian elephants are exhibited, among them a skeleton of a very large tusky elephant or Mooknah.

In the pavillion are also placed skeletons of the *Sirenia* or Sea Cows, aquatic animals more nearly allied to the Ungulates than to the Whales. Stuffed examples of these animals have also been placed here

The majority of the cases on the right hand of the gallery are occupied by the Ruminant Ungulata, such as Camels, Oxen, Antelopes, Sheep, Goats, and Deer. Cases 23 and 24 contain the *Edentata*, Sloths, Anteaters, Armadillos, the *Marsupials*, and finally the *Monotremes* Ornithorhynchus and Echidna.

Along the centre of the gallery is ranged a very complete series of skeletons of the wild cattle of the Old and New World, and of the various species of Rhinoceros and Hippopotamus.

A collection of horns of Oxen, Buffaloes, Antelopes, and Sheep is placed on the top of the cases of the gallery and on the wall of the pavilion.

BOTANICAL GALLERY.

The collections of this department consist of two portions, the one open to the public consisting of specimens illustrating the various groups of the Vegetable Kingdom, and the broad facts on which the natural system of classification of plants is based; the other set apart for the use of persons engaged in the scientific study of plants.

The natural system of classification is followed in the exhibition cases in the public gallery. The series of specimens begin with the natural order *Ranunculaceæ*, and the principal orders are represented in this and the following cases by dried specimens of the plants themselves, coloured drawings, fruits and prepared sections of the woods. Diagrams are employed to indicate the characters in the flowers on which the grouping is based. Descriptive labels give particular information respecting each specimen.

Dicotyledonous plants occupy three cases on the left side of the gallery, and are followed by the Monocotyledonous orders, which fill a portion of the last case on the same side, the two half-cases at the end of the gallery, and the first case returning towards the door. The Gymnosperms are placed in the next case. Then follow the Cryptogams, a case being devoted to the higher vascular orders, and another to the lower division of cellular plants.

The series closes with an interesting collection of models of the larger British Fungi or Mushrooms, prepared by Sowerby when he was engaged on his work on this group of plants, which have been re-coloured and mounted in accordance with their natural habitats by Mr. Worthington G. Smith.

The larger specimens are placed in tall cases in the centre of the gallery. The right side of the first centre-case is filled with specimens of Dycotyledonous plants, such as sections of White Oak and Walnut from Canada, *Eucalyptus*, *Acacia*, *Laportea* and other trees from Australia, trunks of *Ficus* and *Carallia* with aerial roots sent from Ceylon by Dr. Trimens, stems of *Bombax*, *Xanthoxylon*, *Flacourtia*, and *Gleditschia*, and anomalous stems of *Baulimia Entada* and *Dypsis*. The next two centre-cases are filled with Monocotyledonous plants, among which in the first case are stems and sections of the Date palm, several species of *Areca*, sections and fruit of the Palmyra palm, stem and fruit of the Sago palm and a large spike of the allied Raphia from Madagascar. In the next case are stems of the Wax palm, sections and fruit of the Cocoa-nut palm and the Seychelles palm. The remainder of this case is occupied with specimens of the Dragon tree, of Madeira, of the Grass trees of Australia, of *Vellozia* from Brazil, of *Papyrus* from Egypt, of Bamboo and Sugar-cane. On the other side of this case specimens of Gymnosperms will be found, comprising a large plant of *Welwitschia* from Africa, sections of *Araucaria* from Norfolk Island, of *Cedar* grown in Chelsea Gardens, and stems

and sections of several species of *Cycadæ*. The next two cases contain specimens of Tree-ferns, among which are a large stem of *Dichsonia*, clothed with aerial roots, stems of species of *Alsophila*, *Cyathea* and *Hemitelia*.

Suspended over the centre-cases is a fine specimen of the Wabo Bamboo, *Dendrocalamus brandisi*, from Burmah. It is 81 feet long. At the further end of the gallery are specimens of a Palm tree from Brazil, *Acrocomia sphærocarpa*, and of the Grass tree of Australia, *Kingia australlis*, and near them is placed a fine section of the White Pine, *Abies grandis*, of British Columbia.

A collection of British Plants is exhibited in glazed frames in the corners of the gallery.

The portion devoted to students consists mainly of the great Herbarium.

The foundation of this Herbarium was the collection of Sir Joseph Banks, consisting of the plants obtained by himself and Dr. Solander in their voyage round the world with Captain Cook, and of numerous series from all quarters of the globe, presented to him or purchased by him. The yearly additions since 1827 have been so extensive that the Banksian Collections form now but a small proportion of the great Herbarium. Among the principal collections contained in it may be mentioned those of Clayton, Roemer, Miller, Brown, Bowie and Cunningham, Gardner, Nutall, Horsfield, König, Martin, Masson, Wilson, Hampe, Seeman, Welwitsch, Salt and Miers. It includes also authentic specimens received from Loureiro, Gronovius, Tournefort, Jacquin, Aublet, Ruiz and Pavon, and Perrottet.

There is a separate Herbarium of British Plants, based on the collections formed by Sowerby in the preparation of his great work "English Botany."

Also the extensive Herbarium formed by Sir Hans Sloane, to which has been added the collections of Petiver, Buddle, Blukenet, Kaempfer, Kamel, Merrett, Boerhaave, Vaillant, Banister, and others.

The collection formed by Hermann, in Ceylon, from which Linnæus prepared his "Flora Zeylonica," and the singularly interesting and valuable collection gathered in 1663 by John Ray in Europe.

Besides the collection of dried plants there are two allied collections arranged in the same gallery in parallel series. One is the collection of fruits and seeds, and the other the collection of woods.

The student receives assistance in his investigations from the extensive Library of the department, and from a large collection of plates and drawings systematically arranged in the same order as the plants in the Herbarium.

The cellular plants are accommodated in a large room in the Central Tower, approached by a staircase, the entrance to which is on the left side of the statue of Sir Joseph Banks. The Mosses include the collections of Wilson, Hampe, Drummond, and Spruce; the Liverworts contain the herbarium of Hampe; with the Lichens are incorporated collections made by Caroll, Spruce, and Weddell. The Algæ contain the herbarium of Prof. Dickie, the Diatomaceæ of Kützing and Greville, and collections from Harvey, Robert Brown, Shuttleworth, etc. The extensive series of Fungi, including collections from various botanists, has been increased by the bequest of the valuable herbarium of the late Mr. E. E. Broome.

Here ends my visit to the Natural History Department of the British Museum, and with the very few exceptions mentioned in this notice, which I hope will be soon put in accordance with the rest, I may say that the collections of the British Museum are very fine and reflect a great credit on the Trustees and Staff of the British Museum.

Very profitable and agreeable hours, weeks, and even months can be passed in looking over and studying the numerous and valuable collections of this magnificent establishment. The only wish that I have to make is that it should always keep the first place among the public Museums, by acquiring progressively what they have not got among the old species known, and all the novelties which are constantly discovered in all parts of the globe.

I shall now say a few words about the Natural History Publications made by order of the Trustees of the British Museum. I consider them as important, or even more so, than the collections exhibited. They are exceedingly valuable and quite indispensable to naturalists.

Up to date, not less than several hundred publications have been issued on Mammals, Birds, Reptiles, Fishes, Insects, Fossils, etc., among which some are very important. Among them I may mention the Catalogue of Birds of which 17 volumes have been published and is still in course of publication. It has been so successful, that already Vol. I. and II. are out of print, and very likely it will be the same with all the other volumes before long.

This good example ought to be followed by all the leading Museums of the world.

Another series of publications, which I consider as very worthy, are the excellent Guide books, issued since the transfer of the collections to South Kensington, and I hope that those of the sections in preparation will soon be out, to complete the series.

These Guides, issued at a nominal price of one penny to sixpence each, are the best of their kind that I have ever seen, and I congratulate heartily the Trustees, the Director and all the staff, for having issued such useful, valuable and interesting Guides, which by the modicity of their prices are accessible to all.

In writing this notice, I have made a free use of them, and I have been able to appreciate their great value.

To make these publications complete and unrivalled, it only remains for the Trustees of the British Museum to prepare cheap editions of condensed notices on all the animals useful, neutral or injurious to agriculture, with the means of preserving the useful species and destroying the injurious.

A special room for the exhibition of all such animals should be highly prized by all.

Now I will conclude in giving the list of the actual Staff of the Natural History Branch of the British Museum.

Director: W. H. Flower, C.B., L.L.D., F.R.S.
Assistant Secretary: C. E. Fagan.
Clerks in Director's Office: T. F. Isaac and W. H. R. Holl.
Assistant in General Library: B. B. Woodward.

ZOOLOGICAL DEPARTMENT.

Keeper: A. Gunther, M.D., F.R.S.
Assistant Keeper: A. G. Butler.
Assistants: E. A. Smith, R. Bowdler Sharpe, C. O. Waterhouse, G. A. Boulenger, M. R. Oldfield Thomas, F. G. Bell, M.A., W. F. Kirby, W. R. Ogilvie Grant, R. J. Pocock, G. T. Gaham, M.A., R. Kirpatrick, F. A. Heron, B.A.

GEOLOGICAL DEPARTMENT.

Keeper: H. Woodward, L.L.D., F.R.S.
Assistant Keeper: R. Etheridge, F.R.S.
Assistants: R. B. Newton; A. S. Woodward, G. Crick, F. A. Bather, B.A.; J. W. Gregory.

MINERALOGICAL DEPARTMENT.

Keeper: L. Fletcher, M.A., F.R.S.
Assistants: T. Davies, H. A. Miers, M.A.; G. T. Prior, B.A.

BOTANICAL DEPARTMENT.

Keeper: W, Carruthers, F.R.S.
Assistants: J. Britten, G. R. M. Murray, A. Gepp, B.A.; E. G. Baker, A. B. Rendle, B.A.

A. BOUCARD.

Canal de Panama.

Grâce à l'initiative prise par le PETIT JOURNAL, de Paris (voir les numéros de Septembre 1891 : 7, 11, 14, 17, 20, 23, 25, et ceux d'Octobre : 1, 3, 4, 5, 7, 12, 15, 16, 17, 18, 19, 23, 24, 25, 29, et 31, l'affaire du Panama est entrée dans une nouvelle phase, et il est probable que les 92,229 pétitions, déposées les 28 et 30 Octobre 1891 au Sénat et à la Chambre des Députés par Monsieur Marinani, Directeur politique du *Petit Journal*, péseront d'un grand poids sur les décisions ultérieures des deux grands Corps de l'État.

Il est plus que probable que cette œuvre grandiose commencée par la France sera bientôt reprise par elle et menée à bonne fin. C'est a souhaiter dans l'intérêt du monde entier.

Tous ceux qui auront contribué de près ou de loin à la reprise et à la termination du Canal, "qui sera une des merveilles du XIX^{e} siècle," auront fait œuvre de gens éclairés et de philantropes et leurs noms passeront à la Posterité.

Les Directeurs du *Petit Journal* peuvent déjà se féliciter du résultat qu'ils ont obtenu, et quand le Canal sera terminé ils pourront être fiers de la campagne entreprise pour la relèvement de cette affaire, car sans eux nous en serions toujours au même point, c'est à dire complétement dans les mains d'un Liquidateur et de ses satellites qui ne font absolument que vivre aux dépens de la Liquidation, sans prendre la moindre initiative en faveur des Actionnaires et Obligataires.

Il est incroyable qu'une Liquidation de cette importance soit concentrée dans les mains d'une seule personne. Il y a là quelque chose de monstrueux. Si telle est la loi, il faut la modifier au plus tôt.

Comment est-il possible qu'une personnalité, même comme celle de M. Monchicourt, qui n'est ni Ingénieur, ni Financier, qui n'a même jamais été à Panama, puisse à lui seul mener à bonne fin une Liquidation de cette importance? Deux ou trois Liquidateurs au moins, parmi les Ingénieurs et Financiers français les plus compétents, auraient dû être nommés conjointement avec lui.

Un rapport de leurs travaux et un compte des recettes et des dépenses auraient du être publiés mensuellement dans un ou plusieurs grands journaux de Paris.

Alors les Actionnaires et Obligataires auraient toujours été tenu au courant des travaux de la Liquidation et auraient pu juger du mérite des Liquidateurs.

155,000 francs par an est une bien grosse somme pour ce qui a été fait jusqu'à ce jour par le Liquidateur et ses deux Aides ! ! !

A. B.

Obituary.

During the year 1891, we have to deplore the loss of several well-known Zoologists:

Edmond André, the well known Hymenopterist of Beaune (Côte d'Or). His principal work was the "Species des Hyménoptères d'Europe et d'Algérie," commenced in 1879 and continued with the aid of his brother and other Hymenopterists until his death. It is to be hoped that this most important work will be continued.

Doctor J. M. J. af Tengström, of Kexholm, at the age of 69. His work on the *Micro-Lepidoptera* of Finland, published in 1847, placed him at that early date in the foremost rank of the Micro-Lepidopterists of Europe.

Professor Felipe Poey, *C.M.Z.S.*, at Havana (Cuba), in the ninety-second year of his age. He was one of the founders of the French Entomological Society, and was elected a Corresponding Member of the Zoological Society of London in 1836. Poey was a learned Naturalist, best known as an Ichtyologist. He published a bulky volume on the general Natural History of the Island of Cuba and many other important papers on Entomology.

Robert Gillo, of Bath, well known as a Coleopterist in the west of England.

Henry de la Cuisine Dijon (Côtes d'Or). See HUMMING BIRD, Vol. I., pages 57, 74.

Henry Edwards, see HUMMING BIRD, Vol. I., page 74.

Ferdinand Grut, *F.L.S.*, in London, on July 19th, aged 71. He was elected a fellow of the Entomological Society of London in 1846. In 1856 he was on the Council and was Vice-president in 1863. He was one of the Secretaries from 1871 to 1877 and Honorary Librarian from 1878 to 1891. Mr. Grut was also for many years Secretary to the Entomological Club. In 1872 he was elected into the Linnean Society.

Mr. Grut formed a large collection of Coleoptera, chiefly Carabidæ. He was a very modest and a learned Entomologist, thoroughly genial and cordial in social intercourse. He will be extensively mourned by his friends. His widow and two sisters remain to deplore his loss.

New and Rare Species of Birds described in Vol. I. of the "Humming Bird."

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CONTENTS OF VOL. I.

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