two forms actually cross one another, and that the area where *P. bilineata* comes into contact with the northern section of *P. nigriceps* corresponds more or less to that occupied by *P. albiloris*, at once suggesting the supposition that *P. albiloris* is not a true species at all, but due to the intermingling of *P. bilineata* and *P. nigriceps*, and, further, that technically these last named birds are not true species either."

The authors next endeavor to explain this geographical muddle by some curious conjectures which exactly reverse the accepted workings of the theory of evolution as understood on this side of the Atlantic. *P. nigriceps* and *P. bilineata* are supposed to have been originally distinct species, which having extended their respective ranges to a point of meeting, where a hybrid race, *P. albilora*, was produced, crossed each other's path, and in their further extension apart, *resumed* their distinctive characters.

A simpler solution than this must surely be found to exist, and to the ornithologist who next takes up the investigation, I offer the preceding analogy, in the hope that it may at least have some bearing on what seems to me a parallel case.

Recent Literature.

VOGT ON THE SECOND FOSSIL ARCHÆOPTERYX.* — This specimen was found by M. Haeberlein in the same slates as the first. As described by Professor Vogt, it shows several structural peculiarities which were not visible in the first specimen. Of the head, which was not preserved in the first example, Professor Vogt only says that the upper jaw had two small teeth at its end (i. e. in premaxillæ?), and that the entire skull is strongly reptilian in its appearance. The position of the teeth in the *Archæopteryx* is thus exactly the opposite of their position in the *Odontornithes*, where teeth were absent only in the end of the upper jaw. The cervical vertebræ were not very numerous and were provided with ribs. The dorsal vertebræ were ten in number, and their ribs lacked uncinate processes. One of the points of great interest is the thoracic arch,

* L'Archæopteryx macroura. — Un intermédiaire entre les oiseaux et les reptiles. Par M. C. Vogt. La Revue Scientifique, 2e Sér., 9e Année, No. 11, 13 Sept. 1879, pp. 241-248, figg. 18-21. There is a translation of this piece, supplemented by a photograph of the slab, in the "Ibis" for October, 1880, pp. 434-456.

which is composed of only a pair of coracoids united in the median line, and a pair of scapulæ placed over the ribs parallel to the back bone and at right angles to the coracoids. No sternum, so characteristic of birds, and no clavicles were present. The "clavicles" of Professor Owen are considered by Professor Vogt to be the pubes anchylosed as in the Ostrich. The arm is as one would expect till we come to the carpus, where only the radio-carpal is developed; the metacarpals were free and three in number. They bore fingers of 2, 3, and 3 phalanges respectively, the distal phalanx in each case incased by a claw. In describing the manus of birds Professor Vogt makes the following statement. "In the latter [birds] the pollex — sometimes wanting, as in *Eudyptes* — is placed at the base of the metacarpus and directly on the carpus; its single segment sometimes bears a spur or a nail; the metacarpus is formed by two bones that coalesce at their extremities, but sometimes still separate, as in *Eudyptes*. This characteristic metacarpus bears two digits — one, the longest, with two phalanges; the other, often rudimentary, with one phalanx."* Now on studying the manus of an embryo chick any one will at once see its strong resemblance to Vogt's figure of the manus in the *Archæopteryx*. The only differences are in the proportions of the parts, the number of the phalanges in the III digit and the remains of the IV metacarpus in the chick.

In considering the genetic relations of the *Archæopteryx* Professor Vogt says that it "doubtless forms a bond of union between Reptiles and *Odontornithes*," but that the development of the wing prevents the origin of flying birds from the Dinosaurs. Yet he seems to consider the *Apteryges* and *Struthiones* to be derived from the Dinosaurs, not modified from flying birds. These conclusions Professor Vogt sums up in the following words. "A second consequence of this view would be the polyphytetic origin of the class of birds. The Dinosaurs would lead to the *Ratitæ*, the *Archæopteryx* to the birds that fly."† Allowing this view to be true, it would be very difficult to explain the strange likeness in the structure of the wing of the Ostriches and flying birds. The flying birds have the arm and wrist joints so articulated as to allow adduction and abduction, not flexion and extension, of the fingers, and in accordance with this the morphological flexor and extensor muscles are brought round to the radial edge of the index. The same is true of the muscles in the *Apteryges* and *Struthiones* judging from the works of Owen, Schoepss, Rüdinger and

* Vogt, l. c. p. 244, and p. 444 of "Ibis," from which the text is taken. The original is as follows:

"La main de l'Archæopteryx ne se laisse pas comparer à celle d'un Oiseau. Chez ceux-ci, le pouce, faisant quelquefois défaut, comme chez l'Eudyte, est placé à la base du métacarpe et immédiatement sur le carpe; son seul segment porte quelquefois un éperon ou un ongle; le métacarpe est formé de deux os soudés aux deux extrémités, quelquefois encore séparés, comme chez l'Eudyte; ce métacarpe charactéristique porte deux doigts: un, plus allongé, à deux phalanges; un autre, souvent rudimentaire, à une phalange."

† Vogt, l. c., p. 247.

Macalister. Again it is hard to see why Ostriches, which never flew, should have hand bones so much like those of keeled birds; or to explain the struthious nature of the skull and pelvis of the *Crypturi*, or of the sternum of *Notornis*. But this question of relations between the carinate and ratitate birds does not, of course, touch the descent of birds from the Dinosaurs provided we allow flying birds to be derived from the struthious ones.

Arguing from the fact that no contour feathers are present save on the tibia Professor Vogt thinks that the body was naked. In this case an *Archæopteryx* must have been a strange sight when flying, its reptilian head stretched out to balance the long tail with its row of rectrices on each side. From what Professor Vogt has discovered by a cursory examination there can be no doubt that much of great interest will be learned when this fossil is properly worked out from the matrix. — J. A. JEFFRIES.

NEHRLING'S ORNITHOLOGICAL OBSERVATIONS IN TEXAS.* — These observations consist of a running commentary on the more common birds met with by Dr. Nehrling in March, April, and May, 1879, in Lee and Fayette Counties, Texas. It is apparently the first of a series of papers on the birds of Texas, consisting of interesting field-notes on birds observed in various parts of the State by this well-known German ornithologist, with, incidentally, notes on the mammals, the plants, and the general character of the country.

It may he here added that Dr. Nehrling has also in the journal already cited (Jahrgang V, No. 12, Dec. 1880, pp. 214-223) published a detailed account of the Bluebird (Der Blauvogel oder Hüttensänger, *Sialia Wilsonii*, Swains.) with a colored plate of a family group of old and young.—J. A. A.

SHUFELDT'S OSTEOLOGICAL MEMOIRS. — With notably few exceptions the anatomy of birds has received little attention at the hands of American ornithologists. Aside from Dr. Coues's elaborate memoir on the osteology and myology of *Colymbus torquatus*, the same author's briefer accounts of the osteology of the *Sphenicidæ* and *Laridæ*, and Morse's admirable researches on the carpus and tarsus, the anatomy of birds has been but lightly touched by American writers. It; therefore, gives us pleasure to note the energy with which Dr. Shufeldt has entered upon this new field, the two memoirs here noticed being, we have reason to hope, but the forerunners of others, some of which we are advised are well advanced in preparation. The readers of the Bulletin have already been apprised of Dr. Shufeldt's work upon the osteology of the Burrowing Owl,† through the publication of the plates which

* Ornithologische Beobachtungen aus Texas. I. Von H. Nehrling. Monatsschrift des Deutschen Vereins zum Schutze der Vogelwelt, V Jahrgang, No. 7, Juli 1880, pp. 122-139.

† Osteology of Speotyto Cunicularia var. Hypogæa. By R. W. Shufeldt, [First Lieutenant and] Assistant Surgeon, U. S. Army. Bull. U. S. Geol. and Geogr. Surv. Territories, Vol. VI, No. 1, Feb. 11, 1881, pp. 87-117, pll. i-iii.

illustrate it in the number of this Bulletin for July, 1880. The thirty pages of text now accompanying the plates give a detailed description of the osteology of the bird in question, setting forth with minuteness and clearness the osseus structure of this rather specialized type of the order *Striges*. The second memoir, in a nearly equal number of pages and one plate, describes in a similar manner the osteology of the Horned Lark.* In point of detail and comparison of special points of structure with other forms there is little further to be desired. The well-executed plates represent the skeleton of each species as a whole, and also the principal bones in detail. As memoirs of descriptive osteology these papers merit high praise, and may well be welcomed as valuable contributions in a little worked field.—J. A. A.

FORBES ON THE FOOD OF BIRDS, INSECTS, AND FISHES. —In the last number of this Bulletin we gave some account of Professor Forbes's investigations of the food of various insectivorous birds, with a somewhat extended summary of the results attained. We have now a further report of his studies, † about seventy pages of which relate to birds. Of the remainder, fifteen pages are devoted to introductory remarks on the general subject, forty-eight to fishes, and twelve to insects. The species of birds investigated are, as before, the Thrushes and the Bluebird, and the results given cover not only the observations previously reported but those of the season of 1880, the present report being based on the examination of more than twice the number of specimens forming the basis of the earlier reports. The general showing seems to be favorable to the Thrush family, not excepting even the Robin, respecting which Professor Forbes expresses his belief that while he is too valuable to exterminate he is not so precious that we need to hesitate to protect our fruits from excessive depredation. The Bluebird, however, still maintains a bad record, in consequence of its great predilection for predaceous insects. It is gratifying to observe that these important investigations are now conducted under the authorization of the Illinois State Legislature, and that a small appropriation ($350 *per annum*) is available for the prosecution of these researches and the publication of the results. The investigation of the food of predaceous insects is undertaken for the purpose of determining to what extent they are really beneficial, since some of the *Carabidæ* are known to feed in part upon vegetable substances, and therefore it has its bearing upon the question of the utility of insectivorous birds. —J. A. A.

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* Osteology of Eremophila Alpestris. By R. W. Shufeldt, [First Lieutenant and] Assistant Surgeon, U. S. Army. Bull. U. S. Geol. and Geogr. Surv. Territories, Vol. VI, No. 1, Feb. 11, 1881, pp. 119-147, pl. iv.

† Studies of the Food of Birds, Insects and Fishes, made at the Illinois State Laboratory of Natural History, at Normal, Illinois. Illinois State Laboratory of Natural History, Bulletin, No. 3, November, 1880, 8vo. pp., 1-160.

REICHENOW AND SCHALOW'S RECORD OF THE LITERATURE OF ORNITHOLOGY FOR 1879.*—Although the compilers of this excellent report regret its late appearance, in consequence of unanticipated delays in printing, their promptness is still commendable. The report appears to be very carefully and satisfactorily prepared, the annotations being sufficiently full and explicit.

REICHENOW AND SCHALOW'S COMPENDIUM OF NEWLY DESCRIBED GENERA AND SPECIES OF BIRDS.† The authors of the "Compendium" are placing ornithologists under a debt of gratitude in promptly bringing together the diagnoses of the new genera and species of current ornithological literature. The last installment apparently covers the first half of the year 1880, and the families from *Cuculidæ* upward through the *Oscines*. The "Compendium" gives full transcripts of the original diagnoses.—J. A. A.

CORY'S "BEAUTIFUL AND CURIOUS BIRDS OF THE WORLD."—In the Bulletin for October, 1880 (Vol. V, p. 236), Part I of Mr. Cory's beautiful work was noticed from advance sheets. This part was published shortly afterwards and early in February Part II appeared. The latter is of especial interest to North American students from the superb plate of the Great Auk (*Alca impennis*) which it contains. This figure, taken, we are told, from a specimen in the British Museum, represents an adult bird sitting on a bluff overlooking the sea, while on a rocky promontory in the background are grouped the erect forms of several others. The general execution of this plate is both spirited and artistic while the coloring is quite beyond criticism.

In the accompanying letter-press Mr. Cory gives some well chosen extracts from the principal accounts that have appeared relating to the habits of the species, and to the history of its supposed extinction. The statement respecting the number of the skins, eggs, and skeletons known to exist in the various museums and collections of the world, gives information of much interest. There are in all seventy-one or seven-two skins, of which Germany has twenty and Great Britain twenty-two. Of eggs there are sixty-five, forty-one of which are preserved in Great Britain alone. Nine complete skeletons, besides a great number of detached bones, complete the list.

In addition to the plate of the Great Auk, Part II contains equally beautiful representations of the King Bird of Paradise (*Cicinnurus regius*) and an Apteryx (*Apteryx australis*). If, as we have every reason to believe will be the case, the author carries through this work in the way in which

* Zoologischer Jahresbericht für 1879. Herausgegeben von der Zoologischen Station zu Neapel. Redigirt von Prof. J. Victor Carus (W. Engelmann, Leipzig). 5. Aves. Bd. II, pp. 1108-1161. Referenten Dr. Ant. Reichenow und H. Schalow.

† Compendium der neu beschriebenen Gattungen und Arten. Von Anton Reichenow und Hermann Schalow. Journal für Ornithologie, 1879, pp. 308-329, 420-437, 1880, pp. 97-102, 194-209, 314-324.

it has been begun it can scarcely fail to take the highest rank among the few publications of its kind which this country has produced. — W. B.

MINOR ORNITHOLOGICAL PAPERS.—141. *Food of the Great Blue Heron.* By Wm. P. Neild. *Forest and Stream*, XV, p. 7. — Large snakes and fish.

142. *A Captive Woodcock.* Editorial, *Ibid.*, XV, p. 27.—Account of a caged specimen kept for some weeks in confinement and fed on earthworms.

143. *Mocking Bird in Canada. Ibid.*, XV, p. 67.—Record of its appearance at Strathroy, Canada, on the authority of L. H. Smith, in the Strathroy "Age."

144. *Kingbirds catch Fish.* By Milton P. Pierce. *Ibid.*, XV, p. 85.—Kingbirds catchings minnows.

145. *Crows as Fruit Thieves.* By F. C. Brown[e]. *Ibid.*, XV, p. 85. —Destruction of ripe apples by these birds.

146. *An unlucky Crow.* Editorial, on the authority of George C. Cole. *Ibid.*, XV, p. 85. — Crow caught by a Goshawk.

147. *Owls.* By S. B. Buckley. *Ibid.*, XV, p. 104. — "Screech Owls" inhabiting a Wren-box, and capture of a Snowy Owl (*Nyctea nivea*) near Austin, Texas.

148. *Another Captive* [*Wood*] *Cock.* By A. E. Godeffroy. *Ibid.*, XV, p. 148.

149. *Breeding Quail in Confinement* (title covering a communication by Dr. Bradley Hull, and two pseudonymous ones. *Ibid.*, XV, p. 166.—Accounts of attempts to raise Quails in confinement. See also *Tame Quail*, *Ibid.*, XV, p. 186.

150. *European Ruff in Massachusetts.* Editorial. *Ibid.*, XV, p. 186. —Its capture at Chatham, Mass., Sept. 11, 1880, with references to previously recorded New England captures of this species.

151. *More Quail Bred in Confinement.* By B. F. Concklin. *Ibid.*, XV, p. 206.—Eggs hatched under bantam hens, and the young successfully reared.

152. *Death of the Woodcock Dick.* By F. P. Magoun. *Ibid.*, XV, p. 286. — Further history of the captive specimen previously recorded, (l. c., XV, p. 27; see above No. 142).

153. *Our Waterfowl.* Editorial [G. B. Grinnell]. *Ibid.*, XV. pp. 285, 286, 306, 307, 327, 345, 365, 385, 406, 425, 465. A popular general account of North American *Anatidæ*.

154. *Late Stay of Swallows.* By F. C. Browne. *Ibid.*, XV, p. 307.—"One or two thousand" White-bellied Swallows (*Tachycineta bicolor*) at Clark's Island, Plymouth, Mass., Oct. 13, 1880.

155. *Trigger and Reel on Martha's Vineyard.* By E. A. D. *Ibid.*, XV, pp. 306, 307.— Contains the following important reference to *Cupidonia cupido* (p. 306): "In no other part of Massachusetts, and I know not if in any of the Eastern States besides, can be found the gamy and toothsome prairie chicken, which abound[s] here in quite large numbers and retain[s]

the primitive purity of its Western fellow. . . . However, they are quite abundant and extremely tame, and being well protected during the greater part of the year by a special law, they are allowed to breed in security, and their ranks are but slightly thinned during the 'off months.'"

156. *Another Captive Woodcock.* By H. R. *Ibid.*, XV, p. 426. — A specimen "picked up in the street" in Montreal alive.

157. *Canvas Backs in Rhode Island.* By Fred'k Skinner. *Ibid.*, XV, p. 417. — Two killed at Point Judith early in November.

158. *The Wavy of Winnipeg the Snow Goose.* By H. *Ibid.*, XV, p. 466.—Ross's Goose not known to occur in the Province of Winnipeg.

159. *Domestication of the Ostrich.* By E. B. Biggar. *Ibid.*, XV, pp. 505, 506, xvi, pp. 6, 7. An original account of Ostrich-rearing in South Africa.

160. *Report of the Commissioners of Fisheries and Game, of the State of Maine, for* 1880. Augusta, 1880, 8vo. pp. 1-54. [E. M. Stillwell and Everett Smith, Commissioners.]—Contains ten pages (pp. 33-43) devoted to the game birds of the State, including six pages relating to the introduction of the European Quail.

General Notes.

Abundance of the Hermit Thrush in winter near Washington, D. C.—During the winter of 1879-80, the Hermit Thrush was commonly distributed throughout the woods of the District of Columbia as well as those of Alexandria County, Virginia. As the occurrence of this species in winter is not recorded in the lists of District birds, I, at that time, considered its appearance as exceptional and due to the unusual mildness of the season.

The present winter, however, has been one of remarkable severity in this part of the country, the rivers having frozen in November, while the ground has been covered with snow, from nine to twelve inches deep, since December 20. On the 1st of January, while hunting for birds among the wooded hills which border the Virginia shore of the Potomac, I again met with this species. These hills are very wild and steep, densely covered with a growth of young trees, and intersected by numerous deep ravines, through which streams of water work their way to the river. In these secluded places numbers of birds had sought shelter from the cold, which, during the night, had been intense, the thermometer registering a temperature of fourteen degrees below zero. The first Thrush noticed was shot about ten o'clock in a clump of saplings a few yards from the river's bank. In the course of the day seven other individuals were observed. They frequented the most sheltered and tangled portions of the ravines, principally near the summits of the hills. They were silent and