

SCIENCE

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FRIDAY, MARCH 4, 1898.

CONTENTS:

<i>Audubon and his Journals (with Plate):</i> C. HART MERRIAM.....	289
<i>The Import of the Totem:</i> ALICE C. FLETCHER....	296
<i>Multiple-cylinder Steam Engine:</i> R. H. THURSTON....	304
<i>Prehistoric Quartzite Quarries in Central Eastern Wyoming:</i> WILBUR C. KNIGHT.....	308
<i>Association of American Anatomists:</i> D. S. LAMB.....	311
<i>Current Notes on Anthropology:—</i>	
<i>South American Ethnography; Living Tribes in the Stone Age:</i> D. G. BRINTON	312
<i>Scientific Notes and News</i>	313
<i>University and Educational News.....</i>	316
<i>Discussion and Correspondence:—</i>	
<i>Brevity in Citations:</i> HENRY B. WARD.....	317
<i>Scientific Literature:—</i>	
<i>Pfeffer's Pflanzenphysiologie:</i> D. T. MACDOUGAL. Trail and Camp-fire: C. H. M.....	318
<i>Societies and Academies:—</i>	
<i>The Philosophical Society of Washington:</i> E. D. PRESTON. <i>Zoological Club of the University of Chicago:</i> C. M. CHILD, G. W. HUNTER, JR. <i>Torrey Botanical Club:</i> E. S. BURGESS.....	321
<i>Scientific Journals.....</i>	323
<i>New Books.....</i>	324

MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Prof. J. McKeen Cattell, Garrison-on-Hudson, N. Y.

AUDUBON AND HIS JOURNALS.

THE memory of Audubon is dear to the hearts of the American people. The vigor and versatility of his writings, the eminence he attained as a naturalist, and his high personal character won him the admiration of his contemporaries and made

him an honored son in the land of his adoption. Born at an opportune time and transported to the New World when still a lad, he undertook and accomplished one of the most gigantic tasks it has ever fallen to the lot of one man to perform. Although for years deflected from the course Nature had laid out for him, and tortured by half-hearted attempts at a commercial life against which his restive spirit rebelled, he finally broke loose from his bondage and devoted the remainder of his days to the grand work which has made his name immortal.

Audubon was a man of phenomenal powers of endurance and indomitable courage; his determination, perseverance and force of character are shown by the way he overcame seemingly insuperable obstacles. Is it not extraordinary that a person of his humble means should not only complete such an unparalleled series of paintings but should cross the ocean, make friends and admirers of noblemen and leading men of science, and succeed, in spite of the enormous cost, in bringing out in colors an atlas of 435 double elephant folio plates of birds?

His magnificent contributions to the natural history of the New World have not been surpassed. The best known of these is the *Birds of America*.* The equally

*The plates were originally issued in 87 parts, covering a period of twelve years (1827-1838). The



JOHN JAMES AUDUBON.

sumptuous *Quadrupeds of North America*, the text of which was published under joint authorship with Dr. John Bachman of Charleston (1846-1854), was apparently not begun until the bird books had been completed.

Audubon's fame as a painter of birds is world wide and his *Birds of America* is described by an eminent ornithologist as 'by far the most sumptuous ornithological work ever published.' His genius and power as a painter of mammals was even greater though less widely known, owing to the rarity of his magnificent folio plates of 'Quadrupeds.' He must have been nearly seventy when he began these drawings and it is no wonder he was not able to finish all of them himself. Happily, his sons Victor and John Woodhouse inherited his talent and were able to complete the series, thus perfecting a work the equal of which no other man or country has yet produced.

One is surprised at the misgivings with which Audubon undertook the preparation of the *Ornithological Biography*, as shown by an entry in his journal for October 16, 1830, where he writes depreciatingly: "I know that I am a poor writer, that I scarcely can manage to scribble a tolerable English letter, and not a much better one in French, though that is easier to me. I know I am not a scholar, but meantime I am aware that no living man knows better than I do the habits of our birds; no man living has studied them as much as I have done, and with the assistance of my old journals and memorandum-books which were written on the spot, I can at least put down plain truths, which may be useful and perhaps interesting, so I shall set to at once. I cannot, however, give *scientific* descriptions, and here must have assist-

text, entitled *Ornithological Biography*, was not begun until 1830, and the original five volumes appeared at intervals from 1831 to 1839.

ance." This technical assistance was rendered by the well-known ornithologist, William MacGillivray. And many years later, when Audubon joined forces with John Bachman in the preparation of their great work on Mammals, the latter author looked after the technicalities. It must not be inferred from this that Audubon lacked a scientific knowledge of the distinctive characters of species; on the contrary he had a keen appreciation of these matters as every one knows who is familiar with his writings, but the drudgery of preparing technical diagnoses was so distasteful to him, and he was kept so busy with his paintings and biographies, that he preferred to let others do this part of the work.

The absence of a trustworthy biography of Audubon has been a matter of such general regret that the recent appearance of two handsome volumes entitled *Audubon and his Journals** is hailed with widespread satisfaction. The author, Miss Maria R. Audubon, a daughter of John Woodhouse Audubon and granddaughter of the celebrated naturalist, had the rare advantage of familiarity with the family traditions and the possession of unpublished manuscripts. She has supplied not only a reliable and entertaining account of Audubon's life, but also the full text of his most important journals—those of his trips to Europe, Labrador, and the Missouri and Yellowstone Rivers. Many of his journals and manuscripts were early destroyed by fire, and others lost, but happily those of greatest value have been discovered and are now for the first time made public. From these we learn so much of interest that only the merest outline can be given here.

**Audubon and His Journals*. By Maria R. Audubon, with Zoological and other Notes by Elliott Coues. New York, Charles Scribner's Sons. December, 1897. Large 8vo. Vol. I., pp. xiv+532, pls. 22; Vol. II., pp. viii+654, pls. 15. \$7.50.

Since the object of the present article is to call attention to the fund of information contained in the journals nothing need be said of Audubon's personal history or the vicissitudes of his early and middle life.

In his search for mammals and birds Audubon traveled thousands of miles afoot in the Eastern and Southern States, from Maine to Florida, Louisiana and Texas, and made special expeditions to Labrador and the Yellowstone—the latter at a time of life when most men who have lived to reach such a ripe age seek the quiet and comforts of home. It was on this latter trip he wrote: "I am getting an old man, for this evening I missed my footing on getting into the boat and bruised my knee and elbow, but at seventy and over I cannot have the spring of seventeen."

In 1833, when about sixty years of age, Audubon chartered a schooner and with his son John Woodhouse, and four other companions, set sail for Labrador to obtain additional material for his great work on the *Birds of America*. The journal of this cruise overflows with interesting observations in natural history and is of special value to the ornithologist. Now and then an error of interpretation creeps in, as when 'tracks of Deer and Caribou' are mentioned—for the only deer in Labrador is the Caribou—and when glacier-carried boulders are supposed to have been cast up by the sea.

On their way the party visited Bird Rock in the Gulf of St. Lawrence. It was on the 14th of June, and "at eleven," Audubon writes, "I could distinguish its top plainly from the deck, and thought it covered with snow to a depth of several feet; this appearance existed on every portion of the flat, projecting shelves. Godwin [the pilot] said, with the coolness of a man who had visited this rock for ten successive seasons, that what we saw was not snow—but Gan-nets! I rubbed my eyes, took my spy-

glass, and in an instant the strangest picture stood before me. They were birds we saw,—a mass of birds of such a size as I never before cast my eyes on. The whole of my party stood astounded and amazed, and all came to the conclusion that such a sight was of itself sufficient to invite any one to come across the Gulf to view it at this season. The nearer we approached, the greater our surprise at the enormous number of these birds, all calmly seated on their eggs or newly hatched brood, their heads all turned to windward."

On the 17th of June the party reached South Labrador, in the neighborhood of Natasquan, and Audubon wrote in his journal: "The shores appeared to be margined with a broad and handsome sand-beach; our imaginations now saw Bears, Wolves, and Devils of all sorts scampering away on the rugged shore." A little later he continues:

"And now we are positively on the Labrador coast, Latitude 50° and a little more,—farther north than I ever was before. But what a country! When we landed and passed the beach, we sank nearly up to our knees in mosses of various sorts, producing as we moved through them a curious sensation. These mosses, which at a distance look like hard rocks, are, under foot, like a velvet cushion. We scrambled about, and with anxiety stretched our necks and looked over the country far and near, but not a square foot of *earth* could we see. A poor, rugged, miserable country; the trees like so many mops of wiry composition, and where the soil is not rocky it is boggy up to a man's waist."

A few days later he gave a more pleasing picture:

"The country, so wild and grand, is of itself enough to interest any one in its wonderful dreariness. Its mossy, gray-clothed rocks, heaped and thrown together as if by chance, in the most fantastical groups im-

aginable, huge masses hanging on minor ones as if about to roll themselves down from their doubtful-looking situations, into the depths of the sea beneath. Bays without end, sprinkled with rocky islands of all shapes and sizes, where in every fissure a Guillemot, a Cormorant, or some other wild bird retreat to secure its eggs and raise its young, or save itself from the hunter's pursuit. The peculiar cast of the sky, which never seems to be certain, butterflies flitting over snow-banks, probing beautiful dwarf flowerets of many hues pushing their tender stems from the thick bed of moss which everywhere covers the granite rocks. Then the morasses, wherein you plunge up to your knees, or the walking over the stubborn, dwarfish shrubbery, making one think that as he goes he treads down the *forests* of Labrador."

Those who have felt the fury and grandeur of a Labrador storm will appreciate Audubon's description of one he witnessed July 10, 1833, when the blasts 'seemed strong enough to rend the very rocks asunder.' He says:

"The rain is driven in sheets which seem scarcely to fall on sea or land; I can hardly call it rain, it is rather a mass of water, so thick that all objects at any distance from us are lost to sight every three or four minutes, and the waters comb up and beat about us in our rock-bound harbor as a newly caged bird does against its imprisoning walls. The great Black-backed Gull alone is seen floating through the storm, screaming loudly and mournfully as it seeks its prey; not another bird is to be seen abroad; the Cormorants are all settled in the rocks close to us, the Guillemots are deep in the fissures, every Eider Duck lays under the lee of some point, her brood snugly beneath her opened wings, the Loon and Diver have crawled among the rankest weeds * * * and the gale continues as if it would never stop."

Ten years after the Labrador trip Audubon made his famous expedition to the junction of the Missouri and Yellowstone Rivers. The journals of this expedition, which was undertaken solely for the sake of his work on the Quadrupeds of North America, are storehouses of information. He set out from New York for St. Louis, March 11, 1843, and took with him Edward Harris, John G. Bell, Isaac Sprague and Lewis Squires. The party left St. Louis by river steamboat on the 25th of April, but owing to contrary winds, innumerable sandbars, and the delays incident to cutting firewood for the engine along the way, it was the 12th of June before they reached Fort Union.

In those days Parakeets were common along the Missouri, and were seen, the journal states, near St. Joseph, Missouri; at Fort Leavenworth, Kansas; near the mouth of the Platte River, Nebraska; near Council Bluffs, Iowa, and at several points near Great Bend, South Dakota. Big game abounded everywhere. An important record is that of the Black-tail or Mule Deer at the mouth of Little Sioux River, Harrison County, Iowa, where four were seen May 12, 1843. This species was long before exterminated in this region and is not included in Allen's list of the mammals of Iowa, published in 1869. Two weeks later one was shot and others seen at Great Bend, South Dakota.

Elk or Wapiti were noted at various places in Nebraska and Dakota from opposite the mouth of the Little Sioux River northward; Antelope were said to occur within 25 miles of Fort Vermilion, South Dakota, and the first Buffaloes were observed near the mouth of the James River in the same State. A little higher up the latter animals were seen constantly and often in enormous numbers.

Before reaching Fort Pierre the party met a curious boat which "instead of being

made of wood, had only a frame, covered with Buffalo skins with the hair on." The two occupants "had been nine days coming 150 miles, detained every day, more or less, by Indians."

In the entry for May 25th, Audubon mentions meeting three Mackinaw barges a little below the mouth of White River, South Dakota. "On the roofs of the barges" he writes "lay much Buffalo meat, and on the island we left this morning probably some hundreds of these poor animals, mostly young calves, were found dead at every few steps; and since then we have passed many dead as well as many groups of living. In one place we saw a large gang swimming across the river; they fortunately reached a bank through which they cut their way towards the hills." Later the same day he says: "Within the last mile or so we must have passed upwards of a hundred drowned young Buffalo calves, and many large ones." On the 28th, between Great Bend and Fort George "both shores were dotted by groups of Buffaloes as far as the eye could reach," and by noon he estimated that he had seen more than 2000.

On the 6th of June Audubon stopped to see the famous Mandan village, on the west side of the Missouri nearly opposite the spot now occupied by Bismarck, the capital of North Dakota. The inhabitants at the time were mainly Riccarees, the Mandans having been almost exterminated by small pox 5 or 6 years before. In his journal Audubon thus describes the appearance of the village and its inmates: "The Mandan mud huts are very far from looking poetical, although Mr. Catlin has tried to render them so by placing them in regular rows, and all of the same size and form, which is by no means the case. But different travellers have different eyes! We saw more Indians than at any previous time since leaving St. Louis, and it is possible that there are a hundred huts, made of mud,

all looking like so many potato winter-houses in the Eastern States. * * The appearance of these poor, miserable devils, as we approached the shore, was wretched enough. There they stood in the pelting rain and keen wind, covered with Buffalo robes, red blankets, and the like, some partially and most curiously besmeared with mud; and as they came on board, and we shook hands with each of them, I felt a clamminess that rendered the ceremony most repulsive."

The Bighorn or Mountain Sheep, which still occurs sparingly in the 'badlands' of North Dakota, was then abundant and not infrequently appeared along the Missouri near the mouth of the Yellowstone, where a band of 22 was observed by Audubon and his associates.

At length, on the 12th of June, 48 days after setting out from St. Louis, the party arrived at the end of their journey and were heartily welcomed and hospitably entertained by Mr. Culbertson, the fur trader in charge of Fort Union.

Speaking of his quarters at the fort Audubon says: "Our room was small, dark, and dirty, and crammed with our effects. Mr. Culbertson saw this, and told me that to-morrow he would remove us to a larger, quieter, and better one. I was glad to hear this, as it would have been very difficult to draw, write, or work in; and yet it is the very room where the Prince de Neuwied [Maximilian, Prince of Wied] resided for two months, with his secretary and bird-preserver. The evening was cloudy and cold; we had several showers of rain since our bath in the bushes this morning, and I felt somewhat fatigued. Harris and I made our beds up; Squires fixed some Buffalo robes, of which nine had been given us, on a long old bedstead, never knowing it had been the couch of a foreign prince; Bell and Sprague settled themselves opposite to us on more Buffalo skins, and night closed in."

The journal of the stay at Fort Union is a running account of the daily life at this remote outpost, with records of hunting—particularly Buffalo and Wolf hunting—and observations on the habits of birds, mammals, Indians, half-breeds, and traders, interspersed with graphic episodes and descriptions of the country. Audubon speaks also of his labors in painting new birds and quadrupeds—the real object of his trip—and tells of the successes and disappointments attending his ceaseless efforts to obtain new or rare specimens.

Wolves were very abundant about the fort and were often shot from the ramparts. A week after Audubon's arrival his journal contains this record: "*June 19, Monday.* It began raining early this morning; by 'early,' I mean fully two hours before daylight. The first news I heard was from Mr. Chardon, who told me he had left a Wolf feeding out of the pig's trough, which is immediately under the side of the fort. The next was from Mr. Larpenteur, who opens the gates when the bell rings at sunrise, who told us he saw seven Wolves within thirty yards, or less, of the fort. I have told him since, with Mr. Chardon's permission, to call upon us before he opens these mighty portals, whenever he espies Wolves from the gallery above, and I hope that to-morrow morning we may shoot one or more of these bold marauders. Sprague has been drawing all day, and I a good part of it; and it has been so chilly and cold that we have had fires in several parts of the fort. Bell and Harris have gone shooting this afternoon, and have not yet returned. Bell cleaned the Wolf shot last night, and the two Antelopes; Old Provost broiled brine, and the whole of them are now in pickle. * * * * —*Later.* Harris and Bell have returned, and, to my delight and utter astonishment, have brought two new birds: one a Lark, small and beautiful [named by Audubon, Sprague's Lark and

now known to naturalists as *Anthus spraguei*]; the other like our common Golden-winged Woodpecker, but with a red mark instead of a black one along the lower mandible running backward." A few days later he adds some valuable notes on the habits of the Lark: "The little new Lark that I have named after Sprague has almost all the habits of the Skylark of Europe. Whilst looking anxiously after it, on the ground where we supposed it to be singing, we discovered it was high over our heads, and that sometimes it went too high for us to see it at all. * * * * *

The male rises by constant undulations to a great height, say one hundred yards or more; and whilst singing its sweet-sounding notes, beats its wings, poised in the air like a Hawk, without rising at this time; after which, and after each burst of singing, it sails in divers directions, forming three-quarters of a circle or thereabouts, then rises again, and again sings; the intervals between the singing are longer than those which the song occupies, and at times the bird remains so long in the air as to render it quite fatiguing to follow it with the eye. Sprague thought one he watched yesterday remained in the air about one hour. Bell and Harris watched one for more than half an hour, and this afternoon I gazed upon one, whilst Bell timed it, for thirty-six minutes."

The journal of the return trip from Fort Union contains many interesting records, the general character of which may be gleaned from the following:

August 16. Started from Fort Union at 12 M. in the Mackinaw barge 'Union.' Shot five young Ducks. Camped at the foot of a high bluff. Good supper of Chickens and Ducks.

Thursday, 17th. Started early. Saw three Bighorns, some Antelopes, and many Deer, fully twenty; one Wolf, twenty-two Swans, many Ducks. Stopped a short time on a bar. Mr. Culbertson shot a female Elk, and I killed two bulls. Camped at Buffalo Bluff, where we found Bear tracks.

* * * * *

Saturday, 19th. Wolves howling, and bulls roaring, just like the long continued roll of a hundred drums. Saw large gangs of Buffaloes walking along the river. * * *

Sunday, 20th. Thousands upon thousands of Buffaloes; the roaring of these animals resembles the grunting of hogs, with a roaring sound from the throat. * * *

Monday, 21st. Buffaloes all over the bars and prairies, and many swimming; the roaring can be heard for miles. The wind stopped us again at eight o'clock; breakfasted near the tracks of Bears surrounded by hundreds of Buffaloes. We left our safe anchorage and good hunting grounds too soon; the wind blew high, and we were obliged to land again on the opposite shore, where the gale has proved very annoying. Bear-tracks led us to search for these animals, but in vain.

Tuesday, 22d. * * * In the afternoon we started again and went below the Little Missouri, returned to the bull and took his horns, etc. Coming back to the boat Sprague saw a Bear; we went towards the spot; the fellow had turned under the high bank and was killed in a few seconds. * * *

Thursday, 24th. A bad night of wind, very cloudy * * * traveled about twenty miles when we were again stopped by the wind. Hunted but found nothing. The fat of our Bear gave us seven bottles of oil. We heard what some thought to be guns, but I believed it to be the falling of the banks. Then the wolves howled so curiously that it was supposed they were Indian dogs. We went to bed all prepared for action in case of an attack; pistols, knives, etc., but I slept very well, though rather cold. * *

Thursday, 31st. Started early; fine and calm. Saw large flocks of Ducks, Geese, and Swans; also four Wolves. Passed Mr. Primeau's winter trading house; reached Cannon Ball River at half-past twelve. No game; water good-tasted, but warm. Dinner on shore. Saw a Rock Wren on the bluffs here. Saw the prairie on fire, and signs of Indians on both sides. * * *

Thursday [Sept.] 7th. About eleven o'clock last night the wind shifted *suddenly* to northwest, and blew so violently that we all left the boat in a hurry. Mrs. Culbertson [Indian wife of the Ft. Union trader], with her child in her arms, made for the willows, and had a shelter for her babe in a few minutes. Our guns and ammunition were brought on shore, as we were afraid of our boat sinking. We returned on board after a while; but I could not sleep, the motion making me very sea-sick; I went back to the shore and lay down after mending our fire. It rained hard for about two hours; the sky then be-

came clear, and the wind wholly subsided, so I went again to the boat and slept till eight o'clock. A second gale now arose; the sky grew dark; we removed our boat to a more secure position, but I fear we are here for another day. Bell shot a *Caprimulgus*, so small that I have no doubt it is the one found on the Rocky Mountains by Nuttall, after whom I have named it. [Now known as Nuttall's Poor-will.] * *

Thursday, [Sept.] 28th. A beautiful morning, and we left at eight. The young man who brought me the calf at Fort George has married a squaw, a handsome girl, and she is here with him. Antelopes are found about twenty-five miles from this fort, but not frequently. Landed fifteen miles below on Elk Point. Cut up and salted the cow. Provost and I went hunting, and saw three female Elks, but the order was to shoot only bucks; a large one started below us, jumped into the river, and swam across, carrying his horns flat down and spread on each side of his back; the neck looked to me about the size of a flour-barrel. Harris killed a hen Turkey, and Bell and the others saw plenty but did not shoot, as Elks were the order of the day. I cannot eat beef after being fed on Buffaloes.

In another place he speaks of beef as 'very inferior to Buffalo.'

Notwithstanding the incredible abundance of Buffaloes at this time Audubon foresaw their inevitable doom, as shown by a prophetic sentence in his journal: "But this cannot last; even now there is a perceptible difference in the size of the herds, and before many years the Buffalo, like the Great Auk, will have disappeared."

One is everywhere impressed by the voluminousness and vigor of the journals. Those who have felt the strain and fatigue of arduous field-work know what it costs to write up one's notes at night, when as a rule physical weariness renders literary work out of the question. Manuscripts prepared under such conditions should be read between the lines and criticised with a lenient hand. As a rule the briefest entries follow the busiest days, and when Audubon exclaims, as he does in one place, "I could write a book on the experiences of to-day," it is easy to understand why he wrote so little. In fact, the marvel is that

a man of his age, and one so overwhelmed with work, had the strength and determination to write so much, and the mental clearness to write so well.

Miss Audubon has added to the Missouri River journals a number of footnotes quoting descriptions by early explorers—chiefly Lewis and Clark and Prince Maximilian—of places mentioned by Audubon, thus bringing together on the same page accounts of different authors who visited the region at different times.

Dr. Elliott Coues has supplemented these by another set of footnotes, over his initials, giving modern names of places and other information of geographic and historic interest; and biographical and zoological notes relating to persons and animals mentioned in the text. His familiarity with the region described, and with everything relating to its history, as well as with Audubon's books on birds and mammals, has enabled him to contribute materially to the interest and permanent value of the work. He calls attention to the first mention in the journals of three new species of birds—Bell's Vireo, Harris' Finch and Sprague's Lark—obtained on this expedition and named by Audubon after his companions; to the difference in song of the western Meadowlark from that of its eastern relative; and to the absence of any record of the first capture of the then new LeConte's Sparrow, which he learns from the 'Birds of America' was killed May 24, 1843; and so on.

Now and then he makes a slip, as when he states that the Fox Squirrel mentioned (on page 455 of Vol. I) under the name *Sciurus capistratus* is the one 'with white nose and ears, now commonly called *Sciurus niger*' [the latter is confined to the Southern States; the one to which Audubon refers is the Mississippi Valley Fox Squirrel, *S. ludovicianus*]; and when (p. 526) he ascribes to the late Thomas M. Brewer the

introduction of the English Sparrow into this country.*

The close scrutiny Dr. Coues gave the text is indicated by the rarity of lost opportunities. The only really important omission noted relates to a mouse obtained at Fort Union on July 14, 1843, of which Audubon wrote in his journal: "Although it resembles *Mus leucopus* greatly, is much larger, and has a short, thick, round tail, somewhat blunted" (Vol. II, p. 89). Dr. Coues overlooked the fact that this particular specimen afterward became the type of *Mus missouriensis* Aud. & Bach., a species previously described by Maximilian under the name *Hypudæus leucogaster*, and later made by Baird the type of the genus *Onychomys*; it now stands as *Onychomys leucogaster* (Max. Wied.).

So much—and yet so little!—has been said of the Labrador and Missouri River Journals that no space remains to speak of the important 'European Journals,' the entertaining 'Episodes' and the admirable series of portraits† and other illustrations in Miss Audubon's excellent book—a work which no student of American birds, mammals, or history can afford to do without.

C. HART MERRIAM.

THE IMPORT OF THE TOTEM.‡

IN this study of the significance of the Omaha totem the aim will be to set forth, as clearly as possible, first, what these Indians believed concerning their totems, and,

* The English Sparrow was introduced into the United States in 1850 by Nicolas Pike. Nearly 25 years later Dr. Brewer took up his pen in defense of its introduction and from that time until his death was the Sparrow's only friend among American ornithologists.

† One of these, from a painting by Audubon's son, is reproduced as a frontispiece to the present number of SCIENCE by the courtesy of the publishers of the work, Messrs. Charles Scribner's Sons.

‡ A paper read before the Section of Anthropology, of the American Association for the Advancement of Science, at the Detroit Meeting, August, 1897.