

cretaceous rocks of that region. By F. B. Meek and F. V. Hayden, M. D." Referred to a committee consisting of Dr. Leidy, Mr. Lea and Dr. Bridges.

Dr. Carson exhibited a specimen of cochineal received by him from Prof. Henry, and accompanied by a letter from Capt. A. W. Bowman, U. S. A., dated Fort Stanton, New Mexico, September 13th, 1856, stating that the specimen was collected on Sept. 9th, in about lat. 34° from the most common variety of Cactus, known as "prickly pear," Dr. C. remarked that the specimen was interesting in consequence of exhibiting the webby matter thrown out by the insect at a certain period of its growth.

Dr. Uhler called attention to a second specimen of red and black catfish, similar to and obtained from the same locality as the one presented by him some weeks ago.

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*November 18th.*

MR. LEA, Vice-President, in the Chair.

Dr. Hallowell presented a paper entitled, "On a new and remarkable genus of Ranidæ, from the river Parana, by Edward Hallowell, M. D." Referred to a committee consisting of Maj. Le Conte, and Drs. Leidy and Uhler.

Dr. Rand announced the death, on the 16th inst., of Edmund Lang, M. D., late a member of this Academy.

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*November 25th.*

DR. BRIDGES, Vice President, in the Chair.

The Committees to which were referred Messrs. Sclater's and Lea's papers, read 4th inst.; Messrs. Sclater's Haymond's, Leidy's, Meek and Hayden's papers read 11th inst.; and Dr. Hallowell's paper read 18th inst.; severally reported in favor of publication in the Proceedings.

*Description of a new species of Tanager of the genus SALTATOR.*

By PHILIP LUTLEY SCLATER.

SALTATOR ATRIPENNIS.

Suprà olivaceo-viridis; capite alis et caudâ nigris; vitta superciliari longâ et maculâ auriculari utrinque albis; subtus pallidè cinerascenti-albus, gulâ albâ, crisso ochracecente; rostro nigro; pedibus nigro-fuscis. Long. tota 7.4, alæ 4.2, caudæ 3.6 poll. angl.

*Hab.* in Novâ Grenada, Popayan.

*Mus.* Acad. Nat. Sc. Philada.

Two specimens of this very distinct species of *Saltator* are in the Academy's collection, one marked "Popayan," the other "New Grenada." There is no known bird of the genus to which it shows great resemblance, but I think it may be most naturally arranged near to *S. orenocensis*.

*Description of eleven New Species of Ezotic UNIONES, from Georgia.*

By ISAAC LEA.

**UNIO ELLIOTTI.** Testâ grandè plicatâ, subquadratâ, inflatâ, valdè inæquilaterali; valvulis percrassis; natibus prominentibus, tumidis; epidermide nigrâ, nitidâ; dentibus cardinalibus permagnis, duplicis; lateralibus crassis, longis, lamellatis subcurvisque; margaritâ argenteâ et iridescente.

*Hab.* Othcalooga Creek, Gordon Co., Georgia. Bishop Elliott.

**UNIO GRACILIOR.** Testâ lævi, ellipticâ, inflatâ, inæquilaterali; valvulis tenuibus; natibus prominulis; epidermide tenebroso-fuscâ, obsolete radiatâ et nitidâ; dentibus cardinalibus compressis erectisque; lateralibus lamellatis, longis subcurvisque; margaritâ albidâ et valdè iridescente.

*Hab.* Buckhead Creek, Burke Co., Georgia. Bishop Elliott.

**UNIO PULLATIS.** Testâ lævi, transversâ, inflatâ, valdè inæquilaterali; valvulis crassis; natibus prominulis; epidermide tenebroso-nigrâ; dentibus cardinalibus curtis, crassis, duplicis; lateralibus crassis, longis subrectisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.

*Hab.* Creeks near Columbus, Georgia. Bishop Elliott.

**UNIO FAVOSUS.** Testâ lævi, subtriangulari, subcompressâ, inæquilaterali; posticè subangulatâ; valvulis subcrassis; natibus prominulis, ad apices undulatis; epidermide luteo-olivaceâ, virido-maculatâ; dentibus cardinalibus magnis, erectisque; lateralibus crassis, sublongis subrectisque; margaritâ argenteâ et valdè iridescente.

*Hab.* Othcalooga Creek, Gordon Co., Geo. Bishop Elliott.

**UNIO RETILANS.** Testâ lævi, ellipticâ, inflatâ, valdè inæquilaterali, in medio ad basim paulisper compressâ; valvulis tenuibus; natibus prominulis; epidermide luteo-viridi et valdè radiatâ; dentibus cardinalibus parvis, compressis, duplicis; lateralibus prælongis, lamellatis subcurvisque; margaritâ cæruleo-albâ et valdè iridescente.

*Hab.* Othcalooga Creek, Gordon Co., Georgia. Bishop Elliott.

**UNIO ERRANS.** Testâ lævi, oblongâ, compressâ; valdè inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ, obsolete radiatâ; dentibus cardinalibus parvis, compressis; lateralibus prælongis, lamellatis subrectisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.

*Hab.* Tobesaufkie Creek, near Macon, Georgia. Bishop Elliott.

**UNIO VICINUS.** Testâ lævi, oblongâ, compressâ, inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide virido-fuscâ, obsolete radiatâ; dentibus cardinalibus parvis, acuminatis compressisque; lateralibus longis subcurvisque; margaritâ argenteâ et valdè iridescente.

*Hab.* Swift Creek, near Macon, Georgia. Bishop Elliott.

**UNIO SUBELLIPSIS.** Testâ lævi, ellipticâ, inflatâ, inæquilaterali, ad basim rotundâ; valvulis crassis; natibus subprominentibus; epiderme tenebroso-brunneâ, politâ, radiatâ; dentibus cardinalibus brevibus, tumidis, subelevatisque; lateralibus prælongis subrectisque; margaritâ argenteâ et iridescente.

*Hab.* Creeks near Columbus, Georgia. Bishop Elliott.

**UNIO GEMINUS.** Testâ lævi, ellipticâ, inflatâ, inæquilaterali; valvulis crassis; natibus prominulis; epidermide tenebroso-castaneâ, obsolete radiatâ, ad umbones politâ; dentibus cardinalibus magnis, acuminatis, duplicis; lateralibus longis, crassis subcurvisque; margaritâ purpureâ et iridescente.

*Hab.* Buckhead Creek, Burke Co., Georgia. Bishop Elliott.

**UNIO ROSTRÆFORMIS.** Testâ lævi, valdè transversâ, compressâ, at latere planulatâ, valdè inæquilaterali, posticè acutè acuminatâ; valvulis tenuibus; natibus vix prominulis, ad apices undulatis; epidermide tenebroso-fuscâ, obsolete ra-

diatâ, dentibus cardinalibus parvis, acuminatis, duplicis; lateralibus prælongis, lamellatis rectisque; margaritâ subpurpureâ et iridescente.

*Hab.* Swift Creek, near Macon, Geo. Bishop Elliott.

UNIO BLANDIANUS. Testâ tuberculatâ, quadratâ, inflatâ, subinæquilaterali, posticè truncatâ et emarginatâ, ad basim emarginatâ, in medio sulcatâ; valvulis percrassis; natibus prominentibus, incurvis, ad apices rugoso-undulatis; epidermide tenebroso-castaneâ; dentibus cardinalibus crassissimis, crenulatis, duplicis; lateralibus brevibus, percrassis rectisque; margaritâ argenteâ et iridescente.

*Hab.* Othcalooga Creek, Gordon Co., Geo. Bishop Elliott.

*Characters of an apparently undescribed bird belonging to the genus CAMPYLORHYNCHUS, of Spix, with remarks upon other species of the same group.*

By PHILIP LUTLEY SCLATER, M. A.

CAMPYLORHYNCHUS HUMILIS.

Suprà rufescenti-griseus albo et nigro mixtus; dorsi et scapularium pennis medialiter albis indè nigris hoc colore rufescenti-griseo undique limbatis: nuchâ cum cervice posticâ et lineâ postoculari rufis; capitis antici pennis nigris rufo terminatis: alis caudâque nigris suprà albido regulariter transfasciatis, subtus autem ferè unicoloribus, reatricibus omnibus albo latè terminatis: lineâ latâ et elongatâ superciliari et corpore subtus lactescenti-albis; crisso nigro regulariter transfasciato: striâ parvâ gutturali utrinque nigrâ: rostro plumbeo: pedibus brunneis: long. totâ 5.5, alæ 2.5, caudæ 2.2, rostri a rictu .75 poll. angl.

*Hab.* in Mexico Boreali propè Mazatlan (Bell).

This bird nearly resembles the *Campylorhynchus capistratus*, of Southern Mexico and Central America, figured by Des Murs in his *Iconographia Ornithologique* (pl. 63), but may be at once distinguished by its diminutive size and the rufous head and post-ocular stripe, these parts being black in the other species. There are three specimens of it in the Academy's collection. One of these was obtained by Mr. Bell, near Mazatlan, a second is marked "*California, Dr. Gambel's collection*," and the third is one of the birds procured during the voyage of the *Venus*, but has no locality affixed. The Academy's collection, likewise, contains six examples, which I consider referable to *Camp. capistratus*. Four of these present the usual normal appearance of that bird, but the remaining two are considerably inferior in size, and but slightly exceed the present species in dimensions. One of these latter birds is also much spotted and blotched on the lower surface, and seems to be in that state of plumage in which it was characterized by Lesson as *Picolaptes rufinucha*. But as the black head is persistent in all these examples, even in such as are in manifestly immature plumage, I am induced to believe that the present bird with its rufous head and size, still more diminutive than in the smallest examples of *C. capistratus*, is really to be regarded as a distinct species.

I think it very probable that this is the *Campylorhynchus* described, but not named, by Prince Bonaparte, in his *Notes upon Delattre's collections*, (p. 43.)

The genus *Campylorhynchus* was established by Spix in the first volume of his *Birds of Brazil*. In the *Magazin de Zoologie* in 1835, M. de Lafresnaye, proposed to use Lesson's term *Picolaptes*, for the same group. This is not proper, as M. de Lafresnaye has himself subsequently acknowledged, because, in the first place, Spix's name has the priority; and secondly, Lesson's term was applied by him originally to a particular genus belonging to the different subfamily (*Dendrocolaptinae*) for which it should be retained, although the same author subsequently described several typical members of the group as being *Picolaptes*. Many species of this genus present very great similarity in plumage, and from this fact and from their being considerable variation in the size and coloring of individuals, in some of the species, there is often much difficulty in determining them satisfactorily.

As to the true position of the group, I quite agree with M. de Lafresnaye, who first described the greater part of the species, that its natural place is among the true wrens near the genus *Thryothorus*, though pointing through the closely-allied forms *Heleodytes* and *Donacobius*, towards the mocking-birds (*Mimus*.)

The following is a list of the species of *Campylorhynchus*, which I consider to rest on good authority:

1. *C. scolopaceus*, Spix, Av. Bras. i. pl. 79, fig. 1. (*Opetiorhynchus turdinus*, P. Max.) from Brazil: one specimen in the Academy's collection. The synonyms of this bird in Prince Bonaparte's *Conspectus*, have been somehow mixed up with those of the last species of the genus next preceding it. Spix has figured it with tolerable accuracy. *Turdus variegatus*, of Gmelin, is sometimes considered to be identical with this species.
2. *C. hypostictus*, Gould, P. Z. S., 1855, p. 68, from Eastern Peru. An ally of the preceding, but having the body below much more thickly covered with spots. The only specimens I have seen of it were those received by Mr. Gould, which were obtained by Hawkswell, on the Ucayali.
3. *C. unicolor*, Lafr., R. Z., 1846, p. 53. (*Picolaptes scolopaceus*, Lafr. & D'Orb., Syn. Av. in Mag. de Zool., 1837, p. 46. *Anumbius scolopaceus*, D'Orb. Voy., p. 256), from Bolivia. Two specimens of this bird are in the Academy's collection. They may be distinguished from *C. scolopaceus*, to which they are most closely related, by their nearly uniform white under-surface.
4. *C. unicoloroides* (!) Lafr., R. Z., 1846, p. 316, from Bolivia. I am not acquainted with this species. It would seem, from its curious name, to be closely allied to the last.
5. *C. zonatus*, (Less. Cent. Zool., t. 70.) A Mexican species not uncommon in collections. The Academy possesses three examples, one of which, was obtained by Mr. Pease, in the province of Vera Cruz.
6. *C. zonatoides* (!) Lafr., R. Z., 1846, p. 92, from New Grenada. I have not yet seen this bird in very perfect plumage. There is one specimen in the Academy's collection probably referable to this species.
7. *C. megalopterus*, Lafr., (Des Murs, Icon. Orn., p. 54.) A large species, recognized by its being wholly spotted and barred with black and white. There are examples in the Academy's collection, probably from Mexico.
8. *C. pallescens*, Lafr., R. Z., 1846, p. 93. One specimen in the Academy's collection, which I take to belong to this species, seems to be closely allied to the preceding, but distinguished by its nearly uniform head, more obsolete spotted under-surface, and differently marked tail. It is labelled "*Guyaquil*."
9. *C. nuchalis*, Cab. Orn. Notiz. in Weigm. Archiv. I., p. 206.—This bird is very like *C. megalopterus*, but much smaller in size, and with the head and nape unstriped. There are examples in the Academy's collection from Venezuela, and I have often seen it from Trinidad.
10. *C. brevirostris*, Lafr., R. Z., 1845, p. 339, from Bogota. I have not met with this species.
11. *C. brunneicapillus*, (*Picolaptes brunneicapillus*, Lafr., et Cass. B. Cal. pl. 25, p. 156), from Texas and Northern Mexico. There are specimens of this bird and of its eggs in the Academy's collection. The latter are rather peculiar in coloring, and somewhat resemble those of the European Redbreast—(*Erythacus rubecula*.)
12. *C. capistratus*, (*Picolaptes capistratus*, Less. R. Z., 1842, p. 174: *Picolaptes rufinucha*, Lafr. R. Z., 1845, p. 339, et Less. Descr. d. Mamm. & Ois., p. 285), from Southern Mexico and Central America.
13. *C. humilis*.

Besides these species, *Thryothorus guttatus*, Gould, P. Z. S., 1836, p. 39, and *Picolaptes cinnamomeus*, Less. R. Z., 1844, p. 433, are sometimes considered as probably referable to species of this group.

A very closely allied form is *Heleodytes*, of Cabanis. I have made remarks on the synonyms of the type of this genus (*H. griseus*), in Proceedings Zool. Society, 1856, p. 97.

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*Notice of remains of two species of Seals.*

By JOSEPH LEIDY, M. D.

1. PHOCA WYMANI.

*Remains of a Seal.* Wyman, Am. Jour. Sci. x. 229.

*Phoca Wymani*, Leidy. Anc. Fauna of Nebraska, 8.

A tooth, apparently an inferior canine, from the miocene deposit of Virginia, recently presented to the Academy by Prof. Tuomey, I suspect to belong to the same species as the remains of a seal from the same deposit, described by Prof. Wyman.

The tooth is 14 lines long, and about as robust in its proportions as the corresponding tooth of *P. barbata*. The crown is  $4\frac{1}{2}$  lines long and  $3\frac{1}{2}$  broad at base; and it presents an anterior and a posterior ridge, of which the former is denticulated, and bifurcates half way towards the base. The enamel is rugose, especially towards the base of the crown internally; and at one or two points in front and behind it presents a short inconspicuous tubercle.

2. PHOCA DEBILIS Leidy.

A species of seal is apparently indicated by three specimens of molar teeth obtained by Capt. Bowman, U. S. A., from the sands of Ashley River, South Carolina. The teeth bear considerable resemblance to the corresponding ones of *Otaria jubata*, having small, compressed conical crowns, tuberculate in front and behind, and single, long, gibbous fangs. The smallest specimen is  $5\frac{1}{2}$  lines long, and the largest, when perfect, was about an inch long.

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*Descriptions of new fossil species of MOLLUSCA collected by Dr. F. V. Hayden, in Nebraska Territory; together with a complete Catalogue of all the remains of Invertebrata hitherto described and identified from the Cretaceous and Tertiary Formations of that region.*

By F. B. MEEK and F. V. HAYDEN, M. D.

Since the publication of our former papers on the Nebraska fossils, some additional collections have come to hand, containing new species, which we here propose to describe. Along with these we also find better specimens of some of the species previously investigated by us, than those first received, so that we are now able to correct a few errors into which we had been led, in consequence of having only imperfect specimens to examine. The extensive material at our command, also enables us to rectify some little confusion in the labors of others, which doubtless resulted from the same cause. In order to do this, as well as to furnish a convenient index to these Nebraska species, we append to this paper a complete list of all the fossil invertebrata now known from the rocks of that country.

In glancing over this catalogue, the palæontologist will not fail to be struck with the great preponderance of *Lamellibranchiata*, *Gasteropoda*, and *Cephalopoda* over all the other invertebrate forms of life. Among all the collections we have yet seen from this region, the *Bryozoa* are represented by but one rare species of *Reticulipora*, and the *Brachiopoda* by only one species of *Caprinella* and one of *Lingula*, both so rare that but a single specimen of each has been found; while of the whole great class of *Echinodermata*, which existed in such vast numbers, and presented such an infinite variety of beautiful forms, during these epochs in

some parts of the world, we have yet only seen from this region, a single fragment, too imperfect to give any clue to its generic relations. The paucity of some, and entire absence of others, of the more common genera of *Mollusca*, such as *Ostrea*, *Gryphaea*, *Exogyra*, &c., in these collections is worthy of notice. Future investigations, it is true, may add more species to our present meager list of these rare forms, yet it is probable we have here something like an expression of the numerical proportions in which many of the lower types of life existed in these ancient seas.

Of the one hundred and ninety-one species enumerated in this catalogue, forty-four belong to the Tertiary system, and one hundred and forty-seven to the Cretaceous. None of the former are known to occur in the States, or on the other side of the Atlantic, while of the Cretaceous species, nine appear to be common to the Nebraska formations and those of the States, and four are identical with forms occurring in the old world.\* Of these nine species having so great a geographical range, six, or nearly one-third of all that class of *Mollusca* contained in the list, belong to the *Cephalopoda*, while nearly all the remaining one hundred and seventy-six species, which appear to be restricted to the north west, belong to the *Lamellibranchiata* and *Gastropoda*. This, however, is not so surprising when we bear in mind the fact that the habits and organization of these ancient *Mollusca* must have been such, from what we know of their existing analogues in our present seas, that the former depended on accident, or feeble locomotive organs, for their gradual distribution over the world from their various centers of creation, while the *Cephalopoda*, owing to their superior locomotive powers, were capable of wandering freely far out over the most profound parts of the ocean.

In order to convey a clear idea of the relative positions and vertical range of the fossils enumerated in this catalogue, as well as of the nature and order of succession of the various strata from which they were obtained, we give at the end of these remarks, a more complete section of the Nebraska formations than has been yet published. Future investigations may, it is true, show a more intimate relation between the sub-divisions represented in this section than we are aware of at this time, yet so far as we now know, each one of them appears to have been formed during the prevalence of physical conditions so widely different from those in existence at the time of the deposition of each of the others, that not a single species of the fossils found in them seems to be common to any two, excepting No. 4 and 5, and perhaps No. 2 and 3. We think, however, when more is known in regard to the range of species in these rocks, it may be found convenient to group them together as follows:—

- Group A. Miocene.
- “ B. Eocene.
- “ C. No. 4 and 5 of the section.
- “ D. No. 2 and 3 “ “
- “ E. No. 1 “ “

At any rate, by such a classification, we would have divisions which, so far as our present knowledge extends, appear to be characterized, not merely by distinct species, but by rather different types of fossils.

In one of our former papers, we mentioned the fact that some of the forms in division No. 4 resemble those of the upper Green Sand of English geologists. Although this is the case, later collections appear to show that many species we had supposed restricted to the upper of these two rocks, also occur in the lower. In addition to this, we have more recently ascertained that *Pleurotoma minor* (Evans and Shumard's unpublished MSS.,) as well as a species of *Fasciolaria*†

\* It is quite probable a few other species may yet be found in Nebraska that will prove to be common to the Cretaceous rocks of that region and those of the States, as well as with those of the old world. We look for them chiefly amongst the *Cephalopoda*.

† These genera are generally regarded as having been introduced towards the close of the Cretaceous epoch.

perhaps identical with our *F. buccinoides*, both of which were at first only met with in the bed of No. 5, likewise occur in No. 4. From these facts, we are inclined to regard these two rocks as only well marked subordinate members of the same natural group, which is of the age of the true chalk.

Too few fossils have yet been found in No. 2 and No. 3 to settle very definitely their position in the Cretaceous system, though the late discovery by one of us\* of *Inoceramus problematicus*, near the base of the first, appears to show that this bed is not, at any rate, older than the upper Green Sand, and that it may also belong to the chalk.

In our section of the Nebraska formations, given in a paper published in the 8th vol. of the Proceedings of the Academy, page 63, it will be remembered we placed provisionally the beds of sandstone and clay composing formation No. 1, seen at the mouth of Big Sioux river and below there, along with the Cretaceous strata, stating at the same time that they were not positively known to belong to that system. We still think it barely possible these beds may be older than Cretaceous, though if represented, as we think they are, by similar beds seen holding about the same position near the mouth of Judith river, far up towards the sources of the Missouri, we must either refer them to the Cretaceous system, or admit the introduction of the genus *Baculites* before that epoch, as we have fragments of a small species of that genus from the Judith river beds. At the same time it should be borne in mind that these strata at the last named locality are characterized by a group of fossils remarkably distinct from those in the rocks above, and that one species belongs to the genus *Hettangia*, a type of bivalves, not known to occur, in the old world, in more modern formations than those of the age of the Lias. If not older than Cretaceous, we think, from these facts, as well as from the stratigraphical position of these beds, they probably represent some of the older members of that system. What relation they bear to the formations near the same locality, in which the saurian remains were found, supposed by Prof. Leidy to be allied to the genera *Iguanodon* and *Megalosaurus*, is still an unsettled question.

Should these Big Sioux and Judith river formations prove to be Jurassic, or even to represent both the Jurassic and Triassic systems, it would not conflict with the statement made by us in our last paper, that Mr. Marcou was mistaken in coloring as Triassic and Jurassic the immense extent of country referred to by us between these two localities, as we know this great area to be wholly occupied by well marked Cretaceous and Tertiary strata, while the above named doubtful beds, no where come to the surface near the Missouri, between these two widely separated localities, excepting for a short distance below the mouth of Judith river.

It would, perhaps, be premature to attempt, at the present time, the task of tracing out in much detail the parallelism of the various members of the Cretaceous system in Nebraska, with those of New Jersey and other well known districts in the States, or with those of the south western Territories; yet the occurrence of several of the more common and characteristic fossils of the upper two Nebraska formations, such as *Ammonites placenta*, *Scaphites Conradi*, *Baculites ovatus*, *Nautilus Dekayi*, &c., in the first and second Green Sand beds and intervening ferruginous stratum of New Jersey,† as well as in the "Rotten Limestone" of Alabama, clearly indicates the synchronism of these deposits, notwithstanding their widely separated geographical positions.

At the same time the total absence of the above named fossils, and indeed so far as we yet know, of all the other species of the lowest and upper two Nebraska Cretaceous formations, in the rocks from which Roemer and others collected so many species in Texas, and other south western localities, renders it highly probable that if the latter occur at all in Nebraska they must be represented by

\* Dr. Hayden.

† For our knowledge of the geological positions of these fossils in New Jersey, we are indebted to Prof. Geo. H. Cook, of the geological survey of that State.

the beds No. 2 and 3 of our section. This conclusion is further strengthened by the fact that the only Nebraska species yet found in the south west, so far as we know, are *Inoceramus problematicus* and *Ostrea congesta*, both of which are unknown in the north west excepting in the above named beds, and are mainly restricted to the latter. The well marked specific characters of these two fossils, and their limited vertical range, together with their extensive geographical distribution, render the bed in which they occur a horizon of the highest importance in the identification of strata at remotely separated localities in these far western territories.

That these beds, or formations of the same age, are widely distributed over a vast area of country, extending from near the great bend of the Missouri in lat.  $44^{\circ} 15'$ , long.  $99^{\circ} 20'$ , westward to, and perhaps beyond, the eastern slope of the Rocky mountains, and far south into Texas and New Mexico, is highly probable, from the occurrence of their characteristic fossils at many widely separated localities in this region. At any rate, we know, from information obtained through Mr. Henry Pratten, of the Geological Survey of Illinois, that *Inoceramus problematicus* is found in a light colored limestone overlying a red sand stone on Little Blue river, a tributary of Kansas River. Col. Fremont also collected specimens of the same shell from a similar rock on Smoky Hill river, in lat.  $39^{\circ}$ , long.  $98^{\circ}$ , and at other localities between there and the Rocky mountains.\* More recently, Lieut. Abert found the same, or a closely allied species, at a point as far south west as lat.  $35^{\circ} 13' N.$ , long.  $107^{\circ} 2' W.$ , and apparently on the western declivity of the anticlinal axis of the Rocky mountains.† Roemer likewise collected in Texas specimens of a shell he refers to *Inoceramus myteloides* of Mantell, which is considered identical with *I. problematicus* of Schlotheim. In addition to this, we have seen, in Mr. Marcou's collection, specimens of *Ostrea congesta*, from Galisteo, between Fort Smith and Santa Fe, where it probably holds the same geological position as the so-called *Gryphaea dilatata*.

The formations from which the above named fossils were obtained in the south western Territories, appear, from the statements of the various explorers of that region, to repose on a series of red, yellow, and whitish sandstones and various colored clays, which are referred by Mr. Marcou to the Jurassic and Triassic systems. These lower beds we think are represented wholly, or in part in Nebraska, by our formation No. 1, which, as previously stated, we regard as probably belonging to the lower part of the Cretaceous system, though it may be older.

In the remarks accompanying our paper on the fossils of the Lignite Tertiary formations of Nebraska, although satisfied they must be middle or lower Tertiary types, we refrained from the expression of any opinion as to the exact age of the beds in which they were found; not having been able to identify positively any of the species with characteristic forms of either of these members of the Tertiary system in other countries. Being all specifically distinct from previously known forms, and belonging nearly exclusively to land and fresh water genera, we could of course base no conclusions on comparisons with the fossils of the Tertiary formations hitherto most successfully investigated on other parts of this continent, since the latter deposits are almost wholly characterized by marine genera. So far as we had been able to compare them with figures and descriptions of foreign species, the evidence appeared contradictory, some of them being like Miocene and others like Eocene types. As we now have, however, the additional weight of evidence derived from Dr. Newberry's investigations of the fossil flora of these formations, in favor of the conclusion that they are of Miocene age, we can no longer hesitate in referring them to that epoch. Dr. Newberry's opinion on this point is worthy of the highest confidence, since, in addition to an extensive and accurate general knowledge of fossil botany, he has had the advantage of being able to make direct comparisons of these plants with the flora of well determined Miocene deposits in California.

\* See Prof. Hall's figures and remarks in Fremont's report, p. 174, pl. 4.

† Lieut. Abert's report of explorations in New Mexico and California, p. 547.



*Vertical Section of the Geological formations of Nebraska Territory, so far as determined.*

		SUBDIVISIONS.	LOCALITIES.	Estimated thickness.
TERTIARY SYSTEM.	MIOCENE.	Beds of clay, sandstone and lignite, containing numerous remains of plants, and land and fresh water, with a few marine or estuary <i>mollusca</i> .	Great extent of country on both sides of the Missouri, between Heart and Milk rivers.	350 to 400 feet.
	Eocene.	Light colored indurated clays, with occasional beds of sandstone, conglomerate, and white limestone, the latter in thin layers. Numerous remains of <i>Mammalia</i> and <i>Chelonia</i> , with a few land and fresh water <i>mollusca</i> .	Mauvaises Terres of White River.	250 to 300 feet.
CRETACEOUS SYSTEM.	No. 5.	Gray and yellowish arenaceous clays, sometimes weathering to a pink color. Great numbers of marine <i>mollusca</i> , with a few land plants, bones of <i>Mosasaurus</i> , &c.	Moreau Trading Post and under the Tertiary at Bear and Sage Creeks. Fox hills.	100 to 150 feet.
	No. 4.	Bluish and dark gray plastic clay, containing numerous marine <i>mollusca</i> .	Great area about Fort Pierre and along the Missouri below. Under No. 5, at Sage and Bear Creeks. Great Bend of the Missouri. Near Milk and Muscle shell rivers.	250 feet.
	No. 3.	Lead gray calcareous marl, weathering to light yellowish tint. Scales of fishes— <i>Ostrea congesta</i> , <i>Inoceramus problematicus</i> , &c.	Bluffs along the Missouri below Great Bend.	100 to 130 feet.
	No. 2.	Dark gray laminated clay. Scales of fishes, with a few small <i>Ammonites</i> , &c.	Along Missouri Bluffs, below mouth of James River.	90 feet.
	No. 1.	Heavy bedded yellowish sandstone, passing downwards into alternations of sandstone and clay, containing bits of water-worn lignite and bands of dark carbonaceous matter. This formation is not positively known to belong to the Cretaceous System.	Near the mouth of Big Sioux River, and between there and Council Bluffs. Near Judith River?	90 to 100 ft. near Sioux R.
CARBONIFEROUS SYSTEM. UPPER.		Yellow limestone, containing <i>Fusulina cylindrica</i> , <i>Terebratula subtileta</i> , <i>Spirifer Muesebachanus</i> , <i>Allorisma regularis</i> and other fossils of the Coal measures.	Forms shoals in the Missouri near Black Bird Hills. Eight or ten feet above low water mark at Council Bluffs.	Unknown.

*Descriptions of Species.*

## NATICA TUOMYANA.

Shell subglobose, thick and solid; spire not much elevated; volutions four to four and a half, convex, last one crossed by strong folds; suture distinct or slightly grooved; surface marked with fine closely arranged lines of growth, crossed by flat revolving bands; aperture apparently ovate; umbilicus very small or only rudimentary. Length and breadth about .88 inch; apical angle slightly convex; divergence about 110°.

We have seen but one specimen of this species, a portion of the body volution of which is broken away. The outer lip seems to have been bevelled, and joins the body whorl above, at an angle of about 90°. The revolving bands are generally faint, and wider than the grooves between them on the upper part of the whorls, but more distinct and about equal to, or smaller than, the depressions near the middle and below. The inner lip is not callous in the umbilical region.

This species may be at once distinguished from any other known to us from the Nebraska formations, by its greater thickness, and the strong vertical folds and revolving bands. We name it in honor of Prof. M. Tuomy, State Geologist of Alabama and South Carolina.

*Locality and position.* Mouth of Judith River, in a sandstone, probably the same as No. 1 of the section.

## BULLA SUBCYLINDRICA.

Shell elongate oval, or subcylindrical; spire umbilicate; surface (of cast) marked with faint remains of lines of growth, crossed by about forty revolving striae, generally a little narrower than the elevated spaces between. Aperture very narrow, arcuate, extending a little above the summit of the body, and increasing in breadth very gradually from the upper to the lower extremity. Umbilicus small or closed. Length .91 inch; breadth .48 inch. Breadth of aperture near the centre .12 inch; breadth at the widest place below .24 inch.

This species, of which we have seen only a cast, is near *Bulla pupa* of Evans and Shumard, (unpublished MSS.,) but the form of the aperture is quite different, being very narrow, almost linear, excepting at the lower end, where it widens out gradually, on the inner side, to about twice its breadth near the middle, while that of *B. pupa* is "elongate ovate." From our *B. volvaria* (Proceedings of the Academy of March last, page 69,) it may be distinguished by its larger size, and the equal breadth of the two ends; it differs from all the other Nebraska species we have seen, in its greater size and much more elongate form.

*Locality and position.* Near mouth of Milk River, formation No. 4 of the accompanying section.

## PANOPÆA OCCIDENTALIS.

Shell elongate ovate; posterior end broader than the anterior, subtruncate and gaping; buccal end narrowly rounded, almost closed; base straight along the middle, rounding up abruptly behind, and gradually in front; cardinal border nearly parallel with the base behind the beaks, and sloping in front; beaks small, rather depressed, incurved, approximate and located a little in advance of the center; surface ornamented by irregular concentric wrinkles or undulations, most distinct on the upper half.

We have but one specimen of this species, which shows none of the internal characters, and has lost its finer surface markings, if there were any, by the exfoliation of the external lamina. It is too imperfect to give exact measurements, though it must have been about 3.10 inches in length, 2 inches high, and 1.42 inches wide. We are in some doubt whether or not it is distinct from a species described by Prof. Tuomy under the name of *P. cretacea*, (see Proceedings of the Academy, Sept., 1854, page 170,) though it is much larger; and it is hardly probable, had his species differed much in the breadth of the two ex-

tremities, he would have omitted to mention it. It is more narrowly rounded in front than any of the casts we have seen from the New Jersey formations, or than any species we have seen figured in foreign works.

*Locality and position.* Sandstone near mouth of Judith River, probably No. 1 of the section.

#### MACTRA FORMOSA.

Shell thin, triangular oval, somewhat compressed; cardinal border sloping from the beaks at an angle of about  $115^{\circ}$ , straight in front, and slightly convex behind the beaks; extremities narrowly rounded, almost angular, nearly alike; base forming a broad regular curve; beaks small, elevated, approximate, central or a little in advance of the middle; surface marked with fine lines of growth, which become stronger and more regular on the large lanceolate lunule and escutcheon. Length 1.70 inches; breadth .82 inch; height 1.36 inches.

The lunule and escutcheon extend from the beaks to the extremities of the shell, the former being slightly impressed, and the latter bounded by a very obscure ridge. By grinding down upon the cardinal edge of a right hand valve, we found it thin, and having under the beaks apparently an oblique cardinal tooth and a small ligamentary pit, the former being divided into two diverging parts; while the anterior and posterior portions of the edge have each a long groove, probably for the reception of slender lateral teeth in the other valve.

*Locality and position.* Same as last.

#### MACTRA WARRENANA.

Shell triangular oval, moderately compressed; cardinal border sloping from the beaks at an angle of about  $110^{\circ}$ ; anterior end narrowly rounded; posterior end wider, rounded or very slightly truncate, and gaping a little at the extremity; base forming a broad curve; beaks elevated, rather small, incurved, nearly central; surface marked with fine lines of growth, which become stronger and more regular on the large lanceolate lunule and escutcheon. Length 1.55 inch; height 1.20 inch; breadth .85 inch.

The muscular impressions are oval or ovate; the anterior one being rounded below, and contracted and prolonged above. The sinus of the pallial impression is small, obtuse at the extremity and nearly horizontal.

This species is nearly related in most of its characters to the last, but may be distinguished by its less compressed form, more elevated and gibbous beaks and thicker shell. We have had no opportunity of comparing their internal characters, nor have we seen the hinge of this species. Their distant geographical, and widely separated stratigraphic positions, in addition to the above named differences, lead us to regard them as distinct.

We name this species in honor of Lieut. G. K. Warren, of the U. S. Topographical Engineers.

*Locality and position.* Yanktonin trading post, No. 5 of the accompanying section.

#### MACTRA ALTA.

Shell thin, subtriangular, compressed; cardinal border sloping from the beaks at an angle of about  $80^{\circ}$ ; base forming a broad regular curve; extremities narrowly rounded or subangular, and nearly alike; posterior slope having an obscure ridge or angle passing obliquely backwards and downwards from the beaks; umbones much elevated, (pointed?) nearly central; surface marked with concentric striæ. Length about 2.62 inches; height 2.15 inches; breadth 1.15 inch.

We have not yet had an opportunity of seeing the interior of this shell, nor the details of its hinge, and all our specimens are worn so as to obscure the surface markings. It resembles the last two species, but is larger and much more compressed than either of them, and the much greater elevation of its beaks gives it more nearly the form of an equilateral triangle.

*Locality and position.* Bad Lands of Judith River; in a sandstone, the position of which is doubtful, but probably No. 1 of the series.

TELLINA SUBTORTUOSA.

Shell elliptical or narrow ovate, compressed; anterior end rounded; posterior side obliquely truncate at the extremity, and having (in the cast) an obscure ridge passing obliquely backwards and downwards from the beaks; base forming a broad curve, a little more prominent before than behind the middle; beaks small, very slightly elevated above the dorsal margin, located a little in advance of the center; surface unknown. Length 2·23 inches; height 1·27 inch; breadth (of left valve) about ·22 inch.

The only specimen of this species we have seen is an internal cast of a left valve, with a few fragments of the inner laminæ of the shell adhering. On these fragments indistinct traces of radiating lines are visible, though they may have had no connection with external markings. The anterior muscular impression is narrow ovate, placed near the front margin, with the narrow end above, and slightly inclined backwards. The posterior muscular impression is round ovate, located near the upper margin, and about one eighth the entire length of the shell in advance of the posterior extremity; the narrower end being above and inclined obliquely forwards. Sinus of the pallial impression deep, nearly horizontal and apparently rounded at the end. From the inward warping of the back part of the lower border, and the general flatness of this valve, it is probable the other was more convex.

The compressed narrow elliptical form, and slightly elevated beaks, will distinguish this from all the other species known to us from the Nebraska formations.

*Locality and position.* Mouth of Judith River, from a sandstone supposed to be No. 1 of the series.

VENUS? CIRCULARIS.

Shell very thin, subcircular, rather gibbous; cardinal border rounding from the beaks; extremities and base rounded; beaks located about half way between the center and the buccal border, elevated, pointed, incurved and directed obliquely forwards; muscular impressions very faint, anterior one almost marginal, and near the beaks; surface ornamented with fine concentric lines; sinus of the pallial impression funnel shaped, the apex being directed obliquely upwards towards the beaks. Length ·74 inch; height ·67 inch; breadth ·45 inch.

Not having seen the hinge of this species, we refer it with doubt to the above genus. It may be distinguished from any of the allied Nebraska forms known to us, by its greatest diameter being from the beaks obliquely downwards to a point a little behind the middle of the base, and by its more elevated, pointed, gibbous and oblique beaks.

*Locality and position.* Just above the mouth of Milk River, No. 4 of the section.

CYTHAREA PELLUCIDA.

Shell extremely thin and fragile, broad ovate or subcircular, compressed; extremities rounded, the posterior end being a little wider than the anterior; base semioval or semicircular; beaks moderately elevated, placed about one-third of the distance from the center towards the anterior end; surface marked with fine regular concentric striæ; muscular impressions very faint; sinus of the pallial impression triangular, longer than wide, not quite reaching the middle of the shell, and if continued across would strike the opposite border below the beaks. Length (of ovate variety) 1 inch; height ·83 inch; breadth 40 inch.

Amongst the shells we refer to this species, there are two varieties of form, one being less compressed and more nearly circular, with more gibbous beaks than the other; but as there are some intermediate forms, and they agree in all other respects, we are at present inclined to regard them as identical. More

extensive collections, however, may hereafter prove them to be distinct species. This shell may be readily distinguished from a species described by us in the Proceedings of the Academy in April last, under the name of *C. Deweyi*, (page 83,) by its extreme thinness; and from *Venus? circularis* of this paper, by its less elevated and more obtuse beaks, as well as by the widely different form and direction of the sinus of the pallial impression. It is more liable to be confounded with *C. tenuis* of Hall and Meek, (*Mem. Am. Acad. Arts and Sci.* p. 383, plate 1, fig. 8,) but presents in some of its varieties a more oval or ovate form, and is always less broadly rounded at the extremities. In addition to these differences, it comes from a distant locality, and from a higher bed, in which not a single species known to occur in that in which *C. tenuis* is found, has yet been recognized. This and the following species are referred to the genus *Cytherea*, chiefly from external characters, as we have not seen the hinge of either.

*Locality and position.* Two hundred miles above the mouth of Milk River, No. 4 of the series.

#### CYTHEREA OWENANA.

Shell round oval, compressed; beaks moderately elevated, placed about half way between the center and the anterior end; cardinal border convex behind and concave before the beaks; extremities rounded, the anal end being broader than the buccal; base semioval; anterior muscular impression narrow ovate, and the posterior round ovate, both pointed above and very shallow; sinus of the pallial impression narrow and deep, directed obliquely upwards towards a point a little in advance of the beaks. Length 1.56 inch; height 1.35 inch; breadth about .66 inch.

The surface markings of our specimen are almost entirely carried away by the exfoliation of the outer laminae of the shell. A small remaining portion near the lower border is marked with small concentric wrinkles and much finer lines of growth. We have not had an opportunity of examining the hinge.

The greater thickness of the substance of the shell will at once distinguish this species from all the allied Nebraska forms known to us, excepting our *C. Deweyi* (see Proceedings of the Academy, April last, page 83) and *C. orbiculata* of Hall and Meek, (*Mem. Am. Acad. Arts and Sciences*, page 382.) From the former it may be known by its much deeper and relatively narrower pallial sinus; that of *C. Deweyi* being in the form of an equilateral triangle, and not reaching the center, while in this it is about one-third deeper than wide, and extends beyond the middle of the shell. They are, moreover, from distant localities, and widely separated stratigraphical positions. From the latter it will be distinguished by its more oval and compressed form and less elevated beaks. We name it after Dr. David Dale Owen, of New Harmony, Indiana.

*Locality and position.* Mouth of Judith River, from a sandstone supposed to be the same as No. 1 of the series.

#### LUCINA OCCIDENTALIS.

? *Tellina occidentalis* (Morton.) Jour. Acad. Nat. Sci. vol. 8, pl. xi., fig. 3.

Mould of *Lucina?* (Owen.) Report Wis., Iowa and Min. tab. vii., fig. 8.

Shell rather thick, transversely oval, compressed; cardinal border slightly concave, and sloping very little in front of the beaks, convex and declining behind; anal end vertically subtruncate at the extremity, and having sometimes a very obscure ridge passing obliquely backwards and downwards from the beaks; anterior end rounded and a little wider than the posterior; base semioval, more prominent before than behind the middle; beaks small approximate, little elevated above the hinge, slightly in advance of the center; lunule very small, lanceolate; surface ornamented by distinct irregular concentric lines. Length (large specimen) 1.90 inch; height 1.56 inch; breadth .94 inch.

By breaking open some of the specimens, we find under the beaks two diverging cardinal teeth in each valve; and in front of these one anterior lateral tooth in the right valve, which fits between two smaller ones in the left. If

there are any posterior lateral teeth they must be small and remote from the beaks. At the anal extremity of each valve there is one shallow muscular impression, of an oval or subquadrate form, with a faint slender ridge passing from its inner side obliquely up towards the beaks. At the buccal end there is in each valve one long shallow, arcuate muscular impression, with its narrower end downwards, and directed a little back, so that more than half of its lower part is detached from the pallial impression. Immediately behind the upper end of this, a second very small circular muscular impression may be seen in each valve. The ligament was chiefly external, and occupied a narrow lanceolate depression behind the beaks; a portion of it, however, was partly internal, being deeply seated between the beaks. Exfoliated specimens show on the internal laminae of the shell, faint radiating lines, which are never visible on the surface.

From the foregoing description it will be seen this species unites characters belonging to two genera. Its form and general appearance, as well as its hinge, and elongated anterior muscular impression, partly detached from the pallial line, are all characters that would place it in the genus *Lucina*; while its double anterior muscular impressions indicate an affinity to the genus *Corbis* of Cuvier.

We are in doubt whether or not this is the shell figured by Dr. Morton under the name of *Tellina occidentalis*. Although certainly not very nearly like his figure, it resembles it more than any other shell we have seen in all the Nebraska collections. It cannot be a *Tellina*, as the pallial impression is unquestionably simple.

*Locality and position.* Near Milk River, and eighty miles above on the Missouri, also on the Yellowstone and Moreau rivers. Formation No. 4 of present section.

#### HETTANGIA AMERICANA.

Shell rather thick, ovate or subrhomboidal, compressed; posterior end much broader than the anterior, obliquely subtruncate and gaping; buccal side long, rostrated and closed, very narrowly rounded at the extremity; base forming an elliptical curve, excepting near the anterior end, where it is slightly contracted; dorsal border elevated in the umbonal region, concave in front and convex behind; beaks small, approximate, located a little behind the middle, surface marked with rather faint lines of growth, and sometimes, near the border, with small obscure concentric wrinkles. Length 2.63 inch; height 1.76 inch; breadth 1.25 inch.

We have but one specimen of this species showing the hinge. This is a left valve, in which there is one strong cardinal tooth located very slightly in advance of the point of the beak. Immediately behind this tooth, and directly under the beak, there is a distinct pit, from which a shallow depression passes round the upper side of the tooth. This pit was doubtless occupied by a strong tooth in the other valve. The posterior lateral tooth is prominent, obtuse and compressed, while the cardinal edge between it and the depression under the beak is somewhat callous.

This shell is closely related to two or three of the species figured by Terquem in the Bulletin of the Geological Society of France, (2d ser. t. x. pl. 1, 2,) but is relatively higher in the umbonal region, and more distinctly rostrated in front than any of them. It is also more strongly truncate behind than any of Terquem's species, though it varied somewhat with age in this character.

It is an interesting fact that this, the first species of the genus recognized in this country, is found associated with a small *Baculite*, while all its known congeners in the Old World are peculiar to the Lias.

*Locality and position.* No. 1. Mouth of Judith River.

#### CARDIUM SPECIOSUM.

Shell circular or round oval, higher than long, gibbous in the central and umbonal regions; buccal border a little more rounded than the anal; base regularly rounded; beaks elevated, slender, pointed, incurved and nearly central,

very slightly oblique; surface ornamented with numerous simple, slender, radiating costæ, alternating with rows of elevated points of about their own breadth; border crenulated? Length .57 inch; height .67 inch; breadth .48 inch.

In different conditions of weathering the surface markings of this species present a variety of aspects. In some cases the elevated points look as though arranged on costæ, instead of between them, while in other instances only the costæ are to be seen. Usually, however, these elevated points are quite distinct on casts, and so regularly disposed that worn fragments, when seen embedded in the matrix, present much the appearance of bits of *Fenestella*. On some specimens traces of fine concentric striæ are visible, curving strongly upwards in crossing the ribs. The shell is so nearly equilateral, and the beaks so slightly oblique, that when viewed on the side it looks much like a *Brachiopod*. We know of no species with which this is liable to be confounded, amongst all the Nebraska shells, and it differs from the allied forms we have seen figured from foreign localities, in having the rows of elevated points of uniform size, and not alternately larger and smaller.

*Locality and position.* Bad Lands of Judith River, from a sandstone, the position of which is doubtful, but probably No. 1 of the series.

#### NUCULA OBSOLETASTRIATA.

Shell thick, oval ovate or elliptical, moderately compressed; surface ornamented with fine concentric striæ and obscure traces of small closely arranged radiating lines; buccal end obliquely truncated from the beaks forward to a point nearly half way down the front border, where it is narrowly rounded; posterior end more broadly rounded; base semiovate, most prominent behind the center; cardinal border sloping from the beaks at an angle of about 120°. Beaks small, rather depressed, nearly touching, and placed a little in advance of the middle; lunule narrow ovate, deeply impressed. Length 1.20 inch; height .81 inch; breadth .60 inch.

The cardinal edge is thinnest near the beaks, from which point it gradually thickens towards the extremities, especially towards the posterior end. We have had no opportunity of ascertaining whether or not the edge of the lower border is crenulated. As the radiating striæ are very obscure, it is probable they are obsolete on worn specimens, though on the surfaces of internal lamina they are usually quite distinct. The anterior muscular impression is deeply impressed, of a narrow ovate form, and placed near the edge of the buccal extremity; while the posterior one is a little narrower, less deeply impressed, and located close up under the back end of the hinge. There are about thirty hinge teeth in each valve behind, and nearly half as many before the beaks, all of which are curved in crossing the edge, so as to present the concave sides towards the extremities.

This species will be easily distinguished from all the others known to us from the Nebraska formations, by its larger size and other obvious characters.

*Locality and position.* Great Bend of the Missouri, No. 4 of the series.

#### CUCULLÆA EXIGUA.

Shell thick, very small, oval cordiform; posterior end obliquely truncate; anterior extremity rounded; base nearly straight; ligament area rather short and straight, marked with longitudinal lines, and in the middle with exceedingly small, regular, closely set transverse striæ. Umbonal region gibbous. Beaks elevated, incurved, rather distant, and located a little in advance of the center. Surface ornamented by irregular concentric wrinkles, and very fine lines of growth, crossed by small, regular, faint, closely arranged radiating striæ. Length .30 inch; breadth .27 inch; height .27 inch.

The ligament area, which is not much more than half the entire length of the shell, is often bounded by a slightly elevated border. That portion of it marked with transverse striæ is margined by a fine impressed hair line, and has in each valve a broad triangular form. The longest sides of these two triangles are

joined together at the hinge, when the valves are united, while the opposite angles terminate immediately under the beaks. Muscular impressions shallow, ovate or oblong, and having a very slightly elevated line passing from the lower inner border of each up towards the beaks. Lateral teeth of the hinge oblique, but not horizontal. The beaks are curved at right angles to the hinge, and slightly angular behind. A neat little shell, not apt to be confounded with any other species known to us.

*Locality and position.* Quite abundant at the mouth of Milk River, in formation No. 4 of the series.

#### MYTELUS SUBARCUATUS.

Shell narrow ovate, arcuate; posterior end compressed and rounded; dorsal edge regularly arched and sharp; base nearly straight or slightly arcuate, scarcely carinated; the two edges converging towards the nearly straight, pointed beaks, at an angle of about 35°. Surface unknown. Length 1·03 inch; breadth ·27 inch; height ·36 inch.

The beaks are nearly or quite terminal, and appear to have been straight or but slightly declining. Our specimen being only an internal cast, shows none of the surface characters, excepting traces of concentric lines of growth. The dorsal border looks as though it had formed a regular curve, without any angle marking the posterior termination of the hinge.

This species is very near *M. lanceolatus* of Sowerby, (Min. Con. pl. 439, fig. 2,) but is proportionally wider behind, and not quite so pointed at the beaks. It is about intermediate in form between that species and *M. edentulus* of the same author.

*Locality and position.* Dog River, near mouth of Judith River, from sandstone supposed to be No. 1 of the series.

#### GERVILIA SUBTORTUOSA.

Shell thick, lanceolate, tortuous and laterally curved. Beaks terminal? pointed? posterior end narrow, the widest part being at the back end of the hinge; hinge line straight, forming an angle of about 20° with the longitudinal axis of the shell; ligament fossæ about six, nearly equalling the spaces between. Surface unknown.

Our specimens of this shell consist of fragments, from which it is impossible to make out a complete diagnosis of the species. None of them show the hinge teeth, and they have all lost the surface markings. The largest fragment we have seen (which is imperfect at both extremities) is four inches in length by 1·65 inch in height at the posterior end of the hinge. It retains 2·70 inches in length of the hinge, which is ·44 inch in thickness, though some of the outer laminae are wanting, and shows five of the ligament fossæ, of which there may have been one or two more.

When viewed on the side, the outline of this shell is much like *G. aviculoides* of Sowerby, (Min. Con. vol. 6, page 16, pl. 511,) but it is much more curved and twisted, though not so much so, nor so obtuse at the anterior extremity as *Gervilia (Gastrochena) tortuosa* of the same author. So far as we know, this is the first species of the genus described from the cretaceous rocks of this country. Prof. Tuomy informed us he has found a species in Alabama, but as he has not yet published a description of it, we have no means of instituting a comparison.

*Locality and position.* Three hundred miles above Fort Union, on the Missouri, No. 4 of the series.

#### INOCERAMUS PERTENUIS.

Shell very thin, broad ovate or oval, somewhat compressed; cardinal border straight; anterior end rounded; posterior extremity broad, obtusely rounded; base broadly curved. Beaks near the anterior end, rising above the hinge line, nearly touching. Surface irregularly and rather faintly undulated, marked with fine lines of growth. Length about 4·30 inches; height 3·40 inches; breadth 2·20 inches.



It is possible this shell may prove to be only a variety of *I. ventricosus*, described by us from the same locality, in a paper read before the Academy last April. It differs, however, from all the specimens we have seen of that species, in being broader, much more compressed and more regularly marked with concentric undulations. The beaks are also smaller, more elevated above the hinge line, and located a little further back from the anterior margin. It has likewise much the form of *I. convexus* of Hall and Meek, (vol. 5, Mem. Am. Acad. Arts and Sc. page 386, pl. 2, fig. 2,) but may be at once distinguished from that and *I. Sagenensis* of Owen, as well as from all the other species we have seen from the higher formations of Nebraska, by the extreme thinness and entire fibrous structure of the shell.

*Locality and position.* Mouth of Judith river, in a sandstone probably the same as No. 1 of the series.

#### INOCERAMUS INCURVUS.

Shell ovate, globose or cordiform, equivalve. Beaks located a little behind the anterior end, strongly incurved; umbonal region very gibbous and much elevated above the hinge line. Surface ornamented with regular distinct concentric undulations, strongest near the beaks, where they are directed very obliquely inward toward the hinge, in passing round from the front to the posterior side. Length unknown; breadth 2 inches; height 1.80 inch.

The young of this species, judging from the curve of the undulations near the beaks, must have been of an ovate form, being a little broader behind than in front. As the shell advanced in age it became rapidly more globose, and the beaks curve so strongly inwards, as to bring the umbonal regions of the two valves nearly, if not quite, in contact behind and above the points of the beaks, which are directed away from each other. The substance of the shell is composed of an external fibrous, and an internal lamellar portion, the former being generally exfoliated. The surface was probably marked with concentric striæ, though not preserved on our specimen. This shell may be distinguished from all the other species we have seen from this region, by its more globose form, as well as by its strongly incurved and gibbous umbones.

*Locality and position.* Little Bear's village, between Fort Pierre and Fort Clark, formation No. 4.

#### OSTRÆA PATINA.

Shell circular, oval or ovate, oblique, rather compressed. Superior valve concave above, thin, excepting at the beaks, where it is suddenly thickened and truncate. Inferior valve thicker, concave on the inner or upper side, sometimes auricled; beaks triangular, flat, slightly curved upwards and turned a little towards the anal side. Muscular impression oval or circular, shallow nearest the anal margin. Surface of both valves marked with imbricating lines of growth, and faint irregular concentric undulations. Greater diameter of largest specimen (inferior valve) 3.50 inches; smaller do. 3.10 inches; depth of concavity .70 inch.

The usual form of the shell is nearly circular or broad ovate. The buccal side is short and rounded, while the anal border is longer and sometimes (especially in the inferior valve) contracted above just behind the beaks. The areas of both valves are broad triangular, and as usual depressed in the middle, and transversely striate.

This species is evidently related to *O. visicularis* (Lamk.) of which it may be considered a far western representative. It always differs from that species, however, in having the inferior valve much less concave, more distinctly auricled, and never characterized by a posterior lobe. The beak of this valve is also much less curved upwards, being often almost horizontally flattened. We have some fifteen or twenty specimens of this species, in a good state of preservation, all of which are quite uniform in their characters. None of the beaks show marks of the fracture by which the shell became detached.

*Locality and position.* Two hundred miles above the mouth of Milk River, No. 4 of the series.

*Catalogue of all the invertebrate fossil remains hitherto described and identified, from the Tertiary and Cretaceous formations of Nebraska Territory.\**

## TERTIARY SPECIES.

	Eocene.	Miocene.
Gen. CYPRIS.		
C. LEIDYI, Evans and Shumard, Proc. Acad. Nat. Sc. Phila. vol. 7, p. 165	*	
Gen. HELIX.		
H. LEIDYI, Hall and Meek, Mem. Am. Ac. Arts & Sc. vol. 5, new ser. p. 394	*	
Gen. BULIMUS.		
B. ? TERRES, Meek and Hayden, Proc. Acad. Nat. Sc. Phila. vol. 8, p. 117	*	
B. ? VERMICULUS, Meek & Hayden, " " " " 118	*	
B. LIMNEAIFORMIS, Meek & Hayden, " " " " "	*	
B. NEBRASCENSIS, Meek & Hayden, " " " " "	*	
Gen. PUPA.		
P. HELICOIDES, Meek and Hayden, Proc. Acad. Nat. Sc. Phila. vol. 8, p. 118	*	
Gen. LIMNEA.		
L. DIAPHANA, Evans and Shumard, Proc. Acad. N. S. Phila. vol. 7, p. 165	*	
L. NEBRASCENSIS, Evans & Shumard, " " " " "	*	
L. TENUICOSTA, Meek and Hayden, " " " vol. 8, p. 119	*	
Gen. PHYSA.		
P. SECALINA, Evans and Shumard, Proc. Ac. Nat. Sc. Phila. vol. 7, p. 165	*	
P. LONGIUSCULA, Meek and Hayden, " " " vol. 8, p. 119	*	
P. RHOMBOIDEA, Meek and Hayden, " " " " "	*	
P. NEBRASCENSIS, Meek and Hayden, " " " " "	*	
P. SUBELONGATA, Meek and Hayden, " " " " p. 120	*	
Gen. PLANORBIS.		
P. NEBRASCENSIS, Evans and Shumard, Proc. Ac. N. S. Phila. vol. 7, p. 164	*	
P. SUBUMBILICATUS, Meek and Hayden, " " " vol. 8, p. 120	*	
P. CONVOLUTUS, Meek and Hayden, " " " " "	*	
Gen. VELLETTIA. (Ancylus.)		
V. MINUTA, Meek and Hayden, Proc. Acad. Nat. Sc. Phila. vol. 8, p. 120	*	

\* In addition to the fossils included in this catalogue, we have received from Drs. Evans and Shumard, of St. Louis, a descriptive list of eight new species of *Gasteropoda* and nine of *Acephala*, from the cretaceous formations of Nebraska, which they have not yet published.

						Eocene.	Miocene.
Gen. PALUDINA.							
P. MULTILINEATA,	Meek and Hayden,	Proc. Acad. N. S. Phila.	vol. 8,	p. 120		*	
P. VETULA,	Meek and Hayden,	"	"	"	121	*	
P. LEAH,	Meek and Hayden,	"	"	"	"	*	
P. BETUSA,	Meek and Hayden,	"	"	"	122	*	
P. CONRADI,	Meek and Hayden,	"	"	"	"	*?	
P. PECULIARIS,	Meek and Hayden,	"	"	"	"	*	
P. TROCHIFORMIS,	Meek and Hayden,	"	"	"	"	*	
P. LEIDYI,	Meek and Hayden,	"	"	"	123	*	
Gen. MELANIA.							
M. MINUTULA,	Meek and Hayden,	Proc. Ac. Nat. Sc. Phila.	vol. 8,	p. 123		*	
M. ANTHONYI,	Meek and Hayden,	"	"	"	124	*	
M. MULTISTRIATA,	Meek and Hayden,	"	"	"	"	*	
M. NEBRASCENSIS,	Meek and Hayden,	"	"	"	"	*	
M. CONVEXA,	Meek and Hayden,	"	"	"	125	*?	
Gen. VALVATA.							
V. PARVULA,	Meek and Hayden,	Proc. Acad. Nat. Sc. Phila.	vol. 8,	p. 123		*	
Gen. CERITHIUM.							
C. NEBRASCENSIS,	Meek and Hayden,	Proc. Ac. N. S. Phila.	vol. 8,	p. 125		*	
Gen. CYCLAS.							
C. FORMOSA,	Meek and Hayden,	Proc. Acad. Nat. Sc. Phila.	vol. 8,	p. 115		*	
C. FRAGILIS,	Meek and Hayden,	"	"	"	"	*	
C. SUBELLIPTICUS,	Meek & Hayden,	"	"	"	"	*	
Gen. CYRENA.							
C. MOREAUENSIS,	Meek and Hayden,	Proc. Ac. Nat. Sc. Phila.	vol. 8,	p. 115		*	
C. INTERMEDIA,	Meek and Hayden,	"	"	"	116	*	
C. OCCIDENTALIS,	Meek and Hayden,	"	"	"	"	*?	
Gen. CORBULA.							
C. SUBTRIGONALIS,	Meek & Hayden,	Proc. Ac. Nat. Sc. Phila.	vol. 8,	P. 116		*?	
C. PERUNDATA,	Meek and Hayden,	"	"	"	"	*?	
C. MACTRIFORMIS,	Meek and Hayden,	"	"	"	117	*	
Gen. UNIO.							
U. PRISCUS,	Meek and Hayden,	Proc. Acad. Nat. Sc. Phila.	vol. 8,	p. 117		*	

## CRETACEOUS SPECIES.

	Formations in ascending order.				
	1	2	3	4	5
Gen. CALLIANASSA.					
C. DANAI, Hall & Meek, Mem. Am. Ac. Arts & Sc. Bost. vol. 5, n. s. p. 379	...	...	...	*	
Gen. BELEMNITELLA. D'Orbigny.					
§ B. MUORONATA,* Schlotheim, sp. Petfr. p. 47, No. 4.....	...	...	...	...	*?
B? BULBOSA, Meek and Hayden, Proc. Acad. Nat. Sc. Phila. vol. 8, p. 70	...	...	...	...	*
Gen. NAUTILUS.					
§ N. DEKAYI, Morton, Synopsis Org. Rem. p. 33.....	...	...	...	*	*?
Gen. AMMONITES					
A. PLACENTA, Dekay, Ann. N. Y. Lyc. Nat. Hist. vol. 2, p. 5, fig. 2 (not. 3)	...	...	...	*	*?
A. LOBATUS,† Tuomy, Proc. Acad. Nat. Sc. Phila. vol. 7, p. 168.....	...	...	...	...	*
A. LENTICULARIS, Owen, Rept. Iowa, Wisconsin and Min. tab. 8, fig. 5.....	...	...	...	...	...
A. OPALIS, Owen, " " " " " " 6.....	...	...	...	...	*
A. COMPLEXUS, Hall and Meek, Mem. Am. Ac. Arts & Sc. vol. 5, n. s. p. 394	...	...	...	...	*
A. PERCARINATUS, Hall and Meek, " " " " " " 396	...	*	...	...	...
A. HALLI, Meek and Hayden, Proc. Acad. Nat. Sc. Phila. vol. 8, p. 70.....	...	...	...	...	*
Gen. TURRILITES.					
T. NEBRASCENSIS †.....	...	...	...	...	...
<i>Ancyloceras?</i> <i>Nebrascensis</i> , Meek and Hayden, Proc. Ac. Nat. Sc. Phila. vol. 8, p. 71.....	...	...	...	...	*
T. CHEYENNENSIS.....	...	...	...	...	*
<i>Ancyloceras?</i> <i>Cheyennensis</i> , Meek and Hayden, Proc. Ac. Nat. Sc. Phila. vol. 8, p. 71.....	...	...	...	...	*

NOTE.—This mark (||) indicates that the species is also known to occur in the States; this (§) that it is common to this country and the old world; and these two (||§) that it occurs both in the States and on the other side of the Atlantic.

\* We place this species in the list of Nebraska Fossils, on the authority of Dr. Morton, (see *Belemnites mucronatus*, Jour. Acad. Nat. Sc. vol. 8, p. 211) not having recognized it in any of the collections we have seen from that region.

† Adult specimens of this shell almost equal in size the largest individuals of *A. placenta*, with which species it is apt to be confounded. They may always be distinguished, however, by external characters, even when the septa cannot be seen; the dorsal margin of the former being thin and sharp, especially in young individuals, while that of *A. placenta* is always flattened immediately on the edge. It is a little remarkable that Dr. Dekay's original description agrees more nearly with this shell than with that referred by Morton and others to *A. placenta*, while his figure is more like the latter. Possibly he may have had fragments of both species before him.

Suspecting our Nebraska shell might be identical with a species indicated by Prof. Tuomy, from Mississippi, under the name of *A. lobatus*, we sent him drawings of one of our specimens, showing its form and all the details of the septa, since which he writes he has no doubt of their identity. As the name *lenticularis* was previously applied to one or two other species, that given this shell by Prof. Tuomy will have to take precedence, though published after Dr. Owen's.

‡ Having at first only unsatisfactory fragments of this and the following species, we were much puzzled in regard to their affinities, and referred them provisionally to the genus *Ancyloceras*. Better specimens recently received, prove them to be *Turrilites*.

	Formations in ascending order.				
	1	2	3	4	5
Gen. ANCYLOCERAS.					
A? NICOLETTI, Hall and Meek, Mem. Am. Ac. Arts & Sc. Bost. vol. 5, new ser. p. 397.....				*	
A. MORTONI, Hall and Meek, Mem. Acad. Arts & Sc. Bost. vol. 5, new ser. p. 396 (see corrections at end of that memoir).....				*	
Gen. BACULITES.					
B. OVATUS, Say, Jour. Ac. Nat. Sc. Phila. vol. 7, pl. 5, fig. 5 and 6.....			*	*	?
B. COMPRESSUS, Say, Am. Jour. Sc. vol. 11, p. 41.....			*	*	
B. GRANDIS, Hall & Meek, Mem. Am. Ac. Arts & Sc. Bost. vol. 5, n. s. p. 402				*	
Gen SCAPHITES.					
S. CONRADI,* Morton, sp.....					*
<i>Ammonites Conradi</i> , Morton, 1834, Synopsis Org. Remains, p. 39.....					
<i>A. Nebrascensis</i> , Owen, Report Iowa, Wis. and Min. tab. 8, fig. 3 and 3a, tab. 8a, fig. 2.....					
<i>A. Nebrascensis</i> ? Owen, Report Iowa, Wis. and Min. tab. 8, fig. 2.....					
<i>A. Moreauensis</i> , Owen, " " " " fig. 7.....					
<i>A. Cheyennensis</i> , Owen, " " " " tab. 7, fig. 2.....					
S. MANDANENSIS,† Morton, sp.....					*
<i>Ammonites Mandanensis</i> , Morton, Jour. Acad. N. S. Phila. v. 8, p. x. fig. 2					
? <i>A. abyssinus</i> , Morton, " " " " " 1					
<i>A. Mandanensis</i> ? Owen, Report Iowa, Wisc. and Minn., tab. 7, fig. 5					
S. NICOLETTI, Morton, sp. 1841, Journ. Acad. N. S. Philad. vol. 8, pl. 10, fig. 3				*	?
<i>S. comprimus</i> , Owen, 1852, Report Iowa, Wisc. and Minn., tab. 7, fig. 5					*
<i>Ammonites Nicoletti</i> , Morton, Jour. Acad. N. S. Phila. vol. 8, pl. x. fig. 3					
S. NODOSUS Owen, (not of others,) Rep. Iowa, Min. & Wis. tab. 8, fig. 4 and 4				*	

\* Of this truly protean species we have a fine collection of beautiful specimens from the same locality and position as those investigated by Dr. Owen. These we find agree in all respects with his figures, and only differ from his descriptions in always exhibiting, when the matrix is cleared out from the umbilicus, six or seven volutions, instead of one and a half to three and a half. A critical comparison of our specimens, with Dr. Owen's figures and Dr. Morton's original specimens in the cabinet of the Academy at Philadelphia, as well as with others from Alabama, loaned us by Prof. Winchell, leads us unavoidably to the conclusion, that they all belong to one exceedingly variable species, in which opinion Mr. Conrad, who has looked over our specimens, concurs with us. *A. Nebrascensis*, *A. Moreauensis*, and *A. Cheyennensis* of Owen, are the inner volutions of one strongly marked variety having a larger umbilicus, narrower volutions and stronger costæ. It is difficult to believe this is not a distinct species, yet after a very careful comparison, we cannot see any difference between the septa of shells having these characters, and those of well marked specimens of *S. Conradi*.

† We have perfect specimens of this species, which prove it to be a true *Scaphite*. Like *S. Conradi*, it invariably shows, when the matrix is removed from the umbilicus, about seven volutions. When divested of the outer whorls, it is so nearly like Dr. Morton's figures of his *Ammonites abyssinus*, that we cannot see the slightest difference; the perforate character of the umbilicus in the specimen figured by him, being probably due to accident. The lobes of the septa of this species are very nearly like those of *S. comprimus* of Owen, yet we have seen no intermediate gradations of external form connecting those two, like those between the different varieties of *S. Conradi*. We find it exceedingly difficult to define limits between species amongst these Nebraska *Scaphites*. The position and relative size of nodes and costæ, as well as the more or less compressed form of the shell and relative size of the umbilicus, are not, within a considerable range of limits, characters that can always be relied upon. One of our specimens of *S. nodosus*, (Owen) for example has near the dorso-lateral margin of one side, the usual row of nodes, and none at all on the other.

	Formations in ascending order.				
	1	2	3	4	5
Gen. SCALARIA.					
S. CERITHIFORMIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., v. 8, p. 63	...	...	...	...	*
Gen. TURRITELLA.					
T.? CONVEXA, Meek & Hayden, Proc. Acad. Nat. Sci. Philada., vol. 8, p. 70	...	...	...	...	*?
T. MOREAUENSIS, Meek & Hayden, " " " "	...	...	...	...	*
Gen. ACTEON.					
A. CONCINNUS, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 8, N. S., p. 390	...	...	...	...	*
A. SUBELLIPTICUS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., v. 8, p. 63	...	...	...	...	*
Gen. AVALANA.					
A. SUBGLOBOSA, Meek & Hayden, Proc. Acad. Nat. Sci. Philada., v. 8, p. 64	...	...	...	...	*
Gen. NATICA.					
N. TUOMYANA, Meek & Hayden, (see accompanying paper.)	...	...	...	...	*
N. OBLIQUATA, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 389	...	...	...	...	*
N. CONCINNA, Hall & Meek, " " " "	...	...	...	...	*
N. PALUDINAFORMIS, Hall & Meek, " " " "	...	...	...	...	*
N.? AMBIGUA, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 64	...	...	...	...	*
N. SUBCRASSA, Meek & Hayden, " " " " 87	...	...	...	...	*?
N. OCCIDENTALIS, Meek & Hayden, " " " " 64	...	...	...	...	*
N. MOREAUENSIS, Meek & Hayden, " " " " 64	...	...	...	...	*
Gen. SOLARIUM.					
S. FLEXISTRATUM, Evans & Shumard, Proc. Ac. Nat. Sc. Phila., v. 7, p. 163	...	...	...	...	*
Gen. TURBO.					
T. NEBRASCENSIS, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., v. 8, p. 64	...	...	...	...	*
T. TENULINEATUS, Meek & Hayden, " " " " "	...	...	...	...	*
Gen. ROSTELLARIA.					
R. NEBRASCENSIS, Evans & Shumard, Proc. Ac. Nat. Sc. Phila., v. 7, p. 164	...	...	...	...	*
R. FUSIFORMIS, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 393	...	...	...	...	*
R. BIANGULATA, Meek & Hayden, Proc. Acad. Nat. Sci. vol. 8, p. 65	...	...	...	...	*
Gen. FUSUS.					
F. SHUMARDII, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 391	...	...	...	...	*
F.? TENULINEATUS, Hall & Meek, " " " " "	...	...	...	...	*
F. DAKOTAENSIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 65	...	...	...	...	*
F. GALFINANUS, Meek & Hayden, " " " " "	...	...	...	...	*
F. CONTORTUS, Meek & Hayden, " " " " "	...	...	...	...	*
F. CULBERTSONI, Meek & Hayden, " " " " "	...	...	...	...	*
F. FLEXUOCOSTATUS, Meek & Hayden, " " " " "	...	...	...	...	*
F. NEWBERRYI, Meek & Hayden, " " " " "	...	...	...	...	*
Gen. BUSYCON.					
B. BAIRDI, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 126	...	...	...	...	*
<i>Pyrgula Bairdi</i> , Meek & Hayden, " " " " "	...	...	...	...	*
Gen. FASCIOLARIA,					
F. CRETACEA, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 63	...	...	...	...	*
F. BUCCINOIDES, Meek & Hayden, " " " " " p. 67	...	...	...	...	*

	Formations in ascending order.				
	1	2	3	4	5
Gen. BUCCINUM.					
B.? VINCLUM, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 390	.....	.....	.....	.....	*
B. CONSTRICTUM, Hall & Meek, " " " " p. 391	.....	.....	.....	.....	*
(See correction at end of that memoir.)	.....	.....	.....	.....	.....
B.? NEBRASCENSIS, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., v. 8, p. 67	.....	.....	.....	.....	*
Gen. CAPULUS.					
C. OCCIDENTALIS, Hall & Meek, Mem. Acad. Art. & Sc., vol. 5, N. Ser. p. 385	.....	.....	.....	.....	*
C. FRAGILIS, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 68	.....	.....	.....	.....	*
Gen. HELCION.					
H. BOREALIS, Morton sp.	.....	.....	.....	.....	*
<i>Hipponyx borealis</i> , Morton, Jour. Acad. Nat. Sc. Phila., v. 8, pl. 11, fig. 6	.....	.....	.....	.....	.....
H. SEXSULCATUS, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 68	.....	.....	.....	.....	*
H. PATELLIFORMIS, Meek & Hayden, " " " "	.....	.....	.....	.....	*
H. ALVEOLIS, Meek & Hayden " " " "	.....	.....	.....	.....	*
H. SUBOVATUS, Meek & Hayden, " " " "	.....	.....	.....	.....	*
H. CARINATUS, Meek & Hayden, " " " "	.....	.....	.....	.....	*
Gen. DENTALIUM.					
D. GRACILIS, Hall & Meek, Mem. Am. Ac. Art. & Sci. Bost., v. 5, N. S. p. 393	.....	.....	.....	.....	*
D. FRAGILIS, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 69	.....	.....	.....	.....	*
Gen. BULLA.					
B. VOLVARIA, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 69	.....	.....	.....	.....	*
B. MINOR, Meek & Hayden, " " " "	.....	.....	.....	.....	*
B. OCCIDENTALIS, Meek & Hayden, " " " "	.....	.....	.....	.....	*
B. SUBCYLINDRICA, Meek & Hayden, accompanying paper. "	.....	.....	.....	.....	*
Gen. PHALODOMYA.					
P. ELEGANTULA, Evans & Shumard, Proc. Acad. Nat. Sc. Phila., v. 7, p. 164	.....	.....	.....	.....	*
P. (GONIOMYA) AMERICANA	.....	.....	.....	.....	.....
<i>Goniomya Americana</i> , Proc. Acad. Nat. Sci. Phila., vol. 8, p. 8	.....	.....	.....	.....	*
P. UNDATA, Meek & Hayden, " " " v. 8, p. 81	.....	.....	.....	.....	?
P. FIBROSA,*	.....	.....	.....	.....	*
<i>Avicula? fibrosa</i> , Meek & Hayden, " " " v. 8, p. 86	.....	.....	.....	.....	.....
Gen. PANOPEA.					
P. OCCIDENTALIS, Meek & Hayden, (accompanying paper)	.....	.....	.....	.....	?
Gen. SOLEMYA.					
S. SUBPLICATA, .....	.....	.....	.....	.....	*
<i>Solen subplicata</i> , Meek & Hayden, Proc. Ac. Nat. Sci. Phila., vol. 8, p. 82	.....	.....	.....	.....	.....
Gen. MACTRA.					
M. FORMOSA, Meek & Hayden, (accompanying paper)	.....	.....	.....	.....	?
M. WARRENANA, Meek & Hayden, " " .....	.....	.....	.....	.....	*
M. ALTA, Meek & Hayden, " " .....	.....	.....	.....	.....	?

\* This species, of which we only had imperfect specimens, we had referred with much doubt to the genus *Avicula*, mentioning at the same time that we had not seen any specimens showing indications of an anterior wing. Recently we have been informed by Dr. Shumard, who has better specimens of it in his possession, belonging to the collection of Dr. Evans, that it is a *Pholodomya*; consequently we place it in that genus on his authority

	Formations in ascending order.				
	1	2	3	4	5
Gen. TELLINA.					
T.? CHEYENNENSIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 82	*?				
T. EQUILATERALIS, Meek & Hayden, " " " "	...	...	...	*	
T. SCITULA, Meek & Hayden, " " " "	...	...	...	*	*
T. SUBELLIPTICA, Meek & Hayden, " " " " p. 83	...	...	...	*	*
T. PROUTI, Meek & Hayden, " " " "	...	...	...	*	
T. SUBTORTUOSA, Meek & Hayden, (accompanying paper).....	*?				
Gen. CYTHEREA.					
C. MISSOURIANA, Morton, Jour. Acad. Nat. Sc. Phila., vol. 8, p. 210.....	...	...	...	*?	
C. ORBICULATA, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 382	..	*			
C. TENUIS, Hall & Meek, " " " " 383	...	*			
C. DEWEYI, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 83.....	...	...	...	*	*
C. NEBRASCENSIS, Meek & Hayden, " " " " "	...	...	...	*	*
C. PELLUCIDA, Meek & Hayden, (accompanying paper).....	...	...	...	*	*
C. OWENANA, Meek & Hayden, " " " " .....	*?				
Gen. VENUS.					
V.? CIRCULARIS, Meek & Hayden, (accompanying paper).....	...	...	...	*	
Gen. LEDA.					
L. VENTRICOSA,.....	...	...	...	*	
<i>Corbula ventricosa</i> , Meek & Hayden, Proc. Ac. Nat. Sc. Phila., v. 8, p. 83	...	...	...		
L. MOREAUENSIS,.....	...	...	...	*	
<i>Corbula Moreauensis</i> , Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 83 .....	...	...	...		
Gen. CORBULA.					
C.? GREGARIA, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 84	...	...	...	*	
Gen. THRACIA.					
T.? GRACILIS,*.....	*				
<i>Tellina gracilis</i> , Meek & Hayden, Proc. Acad. Nat. Sc. Phila., v. 8, p. 82	...	...	...		
Gen. ASTARTE.					
A. GREGARIA, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 84...	...	...	...	*	
Gen. CRASSATELLA.					
C. EVANSI, Hall & Meek, Mem. Am. Acad. Art. & Sc. Bost., v. 5, N. S. p. 383	...	...	...	*	
Gen. LUCINA.					
L. SUBUNDATA, Hall & Meek, Mem. Am. Acad. Arts & Sci. Bost., vol. 5, New Ser. p. 382.....	...	...	...	*	
L. OCCIDENTALIS, Meek & Hayden, (accompanying paper).....	...	...	...	*	
? <i>Tellina occidentalis</i> , Morton, Jour. Acad. Nat. Sc. Phila., v. 8, pl. xi. fig. 3 <i>Mould of Lucina?</i> Owen, report, Iowa, Wis. and Min. tab. vii. fig. 8.....	...	...	...		
Gen. HETTANGIA.					
H. AMERICANA, Meek & Hayden, (accompanying paper).....	*				
Gen. CARDIUM.					
C. SPECIOSUM, Meek & Hayden, (accompanying paper).....	*?				

\* Although now satisfied this species is not a *Tellina*, we are still in doubt about its affinities, and place it provisionally in the above genus, until specimens showing the hinge and interior can be seen.



	Formations in ascending order.				
	1	2	3	4	5
Gen. NUCULA.					
N. SUBNASUTA, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 5, N. Ser. p. 384	.....	.....	.....	.....	*
N. VENTRICOSA, Hall & Meek, " " " " 385	.....	.....	.....	.....	*
N. SCITULA, Meek & Hayden, Proceed. Acad. Nat. Sci. Phila., vol. 8, p. 84	.....	.....	.....	.....	*
N. EVANSI, Meek & Hayden, " " " " "	.....	.....	.....	.....	*
N. EQUILATERALIS, Meek & Hayden, " " " " "	.....	.....	.....	.....	*
N. SUBPLANA, Meek & Hayden, " " " " 85	.....	.....	.....	.....	?
N. CANCELLATA, Meek & Hayden, " " " " "	.....	.....	.....	.....	*
N. PLANOMARGINATA, Meek & Hayden, " " " " "	.....	.....	.....	.....	*
N. OBSOLETASTRIATA, (accompanying paper).....	.....	.....	.....	.....	*
Gen. PECTUNCULUS.					
P. SIOUXENSIS, Hall & Meek, Memoirs Am. Ac. Art. & Sci. v. 5, N. S. p. 384	*				
Gen. SIMOPSIS.					
L. PARVULA.....	.....	.....	.....	.....	
<i>Pectunculina parvula</i> , Meek & Hayden, Proc. Ac. Nat. Sc. Phila., v. 8, p. 85	.....	.....	.....	.....	*
Gen. CUCULLÆA.					
C. NEBRASCENSIS, Owen, Rept. Iowa, Wis. and Min. tab. vii. fig. 1 and 1a	.....	.....	.....	.....	*
C. CORDATA, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 86.....	.....	.....	.....	.....	*
C. SHUMARDI, Meek & Hayden, " " " " "	.....	.....	.....	.....	*
C. EXIGUA, Meek & Hayden, (see accompanying paper).....	.....	.....	.....	.....	*
Gen. MYTELUS.					
M. ATTENUATUS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 86	.....	.....	.....	.....	*
M. GALPINIANUS, Evans & Shumard, " " " " vol. 7, p. 164	.....	.....	.....	.....	?
M. SUBARCUATUS, Meek & Hayden, (see accompanying paper).....	*				?
Gen. AVICULA.					
A. TRIANGULARIS, Evans & Shumard, Proc. Ac. N. Sc. Phila., v. 7, p. 163	.....	.....	.....	.....	*
A. LINGUIFORMIS, Evans & Shumard, " " " " "	.....	.....	.....	.....	*
<i>Avicula</i> , undt. Owen's Report, Iowa, Wis. and Min. tab. vii. fig. 10.....	.....	.....	.....	.....	
A. HAYDENI, Hall & Meek, Mem. Acad. Arts & Sci. Bost., v. 5, N. Ser. p. 382	.....	.....	.....	.....	*
Gen. GERVILIA.					
G. SUBTORTUOSA, Meek & Hayden, (see accompanying paper).....	.....	.....	.....	.....	*
Gen. INOCERAMUS.					
§I. PROBLEMATICUS, Schlotheim, sp. 1820. Petrf. p. 312.....	.....	.....	.....	.....	*
<i>I. myteloides</i> , Mantell, Geol. Suss. p. 215, pl. 28, fig. 2.					
(?) I. BARABINI, Morton, Synopsis Org. Remains, page 62.....	.....	.....	.....	.....	*
I. SAGENSIS, Owen, Report Iowa, Wisn. and Min. tab. vii. fig. 3.....	.....	.....	.....	.....	*
I. NEBRASCENSIS,*Owen, " " " " tab. viii. fig. 1.....	.....	.....	.....	.....	*
I. SUBLEVUS, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 386	.....	.....	.....	.....	*
I. CONVEXUS, Hall & Meek, " " " " "	.....	.....	.....	.....	*
I. TENUILINEATUS, Hall & Meek, " " " " 387	.....	.....	.....	.....	*
I. CONRADI, Hall & Meek, " " " " "	.....	.....	.....	.....	*
I. FRAGILIS, Hall & Meek, " " " " 388	.....	.....	.....	.....	*
I. VENTRICOSUS, Meek & Hayden, Proc. Ac. Nat. Sc. Phila., vol. 8, p. 87.....	.....	.....	.....	.....	?
I. PERTENUIS, Meek & Hayden, (accompanying paper).....	*				?
I. INCURVUS, Meek & Hayden, " " " " "	.....	.....	.....	.....	*
Gen. PECTEN.					
P. RIGIDA, Hall & Meek, Mem. Am. Ac. Arts & Sc. Bost., vol. 5, N. S. p. 381	.....	.....	.....	.....	*
P. NEBRASCENSIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 87.....	.....	.....	.....	.....	*

\* Is Prof. Tuomy's *I. biformis*, Proc. Ac. N. S. Philada., vol. 7, p. 170, identical with this?

	Formations in ascending order.				
	1	2	3	4	5
<b>Gen. OSTREA.</b>					
O. CONGESTA, Conrad, Nicollet's Report.....	.....	.....	*		
§(?) O. LARVA, Lamk., Hist. vol. 216.....	.....	.....	.....	*	*
O. PATINA, Meek & Hayden, (accompanying paper).....	.....	.....	.....	*	
<b>Gen. CAPRINELLA.</b>					
C. CORALOIDEA, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 5, N. S. p. 380.....	.....	.....	.....	*	
<b>Gen. LINGULA.</b>					
L. SUBSPATULATA, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 5, N. S. p. 380.....	.....	.....	.....	.....	*
<hr/> <p>In addition to the foregoing list of determined species, we have seen amongst the Nebraska fossils the following miscellaneous fragments :—</p> <p>One elytron of an undt. insect?.....</p>					
Fragments of undt. <i>Baculite</i> .....	.....	.....	.....	.....	*
“ “ “ species <i>Reticulipora</i> , (very rare).....	.....	.....	.....	.....	*
One fragment of undt. <i>Echinoid</i> .....	.....	.....	.....	.....	*
Fragments of small slender coral—gen. undt. ....	.....	.....	.....	.....	*
“ “ “ discoid “ “ “ .....	.....	.....	.....	.....	*

—————

*Birds of South-eastern Indiana.*

By RUFUS HAYMOND, M. D.

Genus HALLETUS, Sav.

HALLETUS LEUCOCEPHALUS, Linn.—The Bald Eagle.

A few of these noble birds still linger in this section of the country. I have observed one or two of them each winter for the last twenty-five years. They are rarely seen at any other season of the year.

Genus PANDION, Sav.

PANDION HALLETUS, Linn.—Osprey, or Fish Hawk.

Common during spring and autumn, but more abundant during the latter season.

PANDION WASHINGTONII.—Bird of Washington.

*Falco Washingtonii*, Aud.

This bird has been observed on white Water River by some of our older citizens, every fall and winter for more than forty years. I have myself observed one or more of them almost every winter for more than twenty years. Their habits being almost identical with those of the Osprey, I have placed them, without any other authority, in the same genus.

Genus FALCO, Linn.

FALCO PALUMBARIUS.—Goshawk.

These hawks are quite numerous in all the wooded districts of the western country.

FALCO COLUMBARIUS, Wil.—The Pigeon Hawk.

I have occasionally seen a few of these hawks following the flight of pigeons in their migrations. I have no recollection of ever having seen them, except when these birds were very abundant.

FALCO SPARVERIUS.—The Sparrow Hawk.

This beautiful little falcon is quite numerous.

FALCO FUSCUS.—Long-tailed Hawk.

Probably the most numerous of all the hawks in this section of the country.

FALCO FURCATUS.—The Swallow-tailed Kite.

I have never seen but a single specimen of this Kite, which was shot eleven miles below Brookville. It had been feeding upon beetles and the eggs of the cat bird, (*Mimus lividus*,) which it had swallowed without breaking.

Genus BUBO, Sibbald.

BUBO VIRGINIANUS.—The Great Horned Owl.

This powerful species is rather numerous, probably as much so as any other owl.

Genus EPHIALTES.

EPHIALTES ASIO, Linn.—Screech Owl.

This little owl is quite common.

Genus SYRNIUM, Savigny.

SYRNIUM NEBULOSUM.—The Barred Owl.

Quite numerous in all the timbered country, though by no means so numerous as they formerly were.

Genus CATHARTES, Linn.

CATHARTES AURA.—The Turkey Buzzard.

Numerous throughout the country at all seasons of the year. This is the only vulture I have ever observed in this section of country.

Genus CAPRIMULGUS, Linn.

CAPRIMULGUS VOCIFERUS, Wilson.—Whip-poor-will.

These noisy birds are very numerous all over the country.

CAPRIMULGUS VIRGINIANUS.—Night Hawk.

Quite a number of these birds appear here in May, and after remaining two or three weeks, disappear, and return in largely increased quantities during the month of September.

Genus HIRUNDO, Linn.

HIRUNDO PELASGIA.—The Chimney Bird.

The most numerous of all the swallows. They are the last to arrive in the spring, but remain from four to six weeks longer than any other species.

HIRUNDO LUNIFRONS.—Republican or Social Swallow.

*Hirundo lunifrons*, Say.

*Hirundo opifex*, Clinton.

This species has been quite numerous since the summer of 1849, when, for the first time, they built their nests in this (Franklin) County. Prior to that time I had occasionally seen them passing through the country; they are now the most numerous of all the swallows, except the chimney bird.

## HIRUNDO RUFÆ.—The Barn Swallow.

These swallows are quite numerous, and rank in this respect next to the gourd swallow.

## HIRUNDO RIPARIA.—Bank Swallow.

Numerous along all the streams with abrupt sandy shores; next in numerical strength to the barn swallow.

## HIRUNDO PURPUREA.—The Martin.

Quite common, but not so numerous as the sand martin.

## HIRUNDO BICOLOR.—White-bellied Swallow.

Last May (1856) I shot one of these birds, which is the only one of the kind I have ever seen, or the only one I have recognized as certainly belonging to that species.

Genus *ALCEDO*, Linn.*ALCEDO ALCYON*, Aud.—The Belted King Fisher.

This king fisher is quite numerous along all our streams at all seasons of the year. It is the only king fisher we have.

Genus *MELLISUGA*, Briss.*MELLISUGA COLUBRIS*, Linn.—Ruby-throated Humming Bird.

Very abundant throughout the whole State. We have no other humming bird.

Genus *CERTHIA*, Linn.*CERTHIA FAMILIARIS*, Linn.—Brown Tree-creeper.

Occasionally seen, though not numerous.

*CERTHIA VARIA*.—Black and White Creeper.

Very numerous.

Genus *SITTA*, Linn.*SITTA CAROLINENSIS*, Lath.—The Nut Hatch.

This familiar bird is very numerous, and known to all our citizens by the name of "Tom-tit."

Genus *TROGLODYTES*, Vieillot.*TROGLODYTES ŒDON*, Vieill.—The House Wren.

This wren is quite numerous in this country; it, however, rarely builds its nest about houses, but usually in the hollows of trees and logs.

Genus *SYLVIA*.*SYLVIA TROGLODYTES*, Aud.—Winter Wren.

Frequently seen in fall and winter, but seldom or never at any other season.

Genus *TURDUS*, Linn.*TURDUS RUFUS*.—Ferruginous Mocking Thrush.

This is a very common bird, and the best imitator of the whole family, except the mocking bird.

*TURDUS MIGRATORIUS*, Linn.—The Robin.

This is much the most numerous of all the Thrushes, at *all seasons* of the year; more numerous, however, in fall and winter than at any other period. About six years ago they collected in vast multitudes about twenty miles south-east of this place, (Brookville,) roosting on the trees together as the pigeons

are in the habit of doing. Many thousands of them were killed by ruthless "pot-hunters."

*TURDUS MUSTELINUS*, Gmel.—The Wood Thrush.

Numerous all over the wooded districts of the Western country. The male and female sit by turns upon the eggs during the period of incubation. Of all the thrushes, its notes, though not so varied as some of the others, are the most beautiful, clear and full—varying from those of the flute, through many tones impossible to describe, ending with a kind of metallic vibratory sound, which, to be understood, must be heard.

*TURDUS POLYGLOTTUS*, Wil.—The Mocking Bird.

This celebrated songster, occasionally, though seldom, stays this far north. I have seen a few and heard the notes of a few others here within the last thirty years.

*TURDUS LIVIDUS*, Linn.—The Cat Bird.

This is a very common species all over the West. I have seen them in numbers as far north as St. Paul, in Minnesota, in the month of October.

*TURDUS AQUATICUS*, Wil.—Water Thrush.

This little thrush is very numerous in the vicinity of all our streams.

*TURDUS SOLITARIUS*, Wil. ?—Hermit Thrush.

The bird to which *I apply* this name is so similar in appearance to the wood thrush, that for a long time I confounded the two; and I am by no means certain that I am correct in applying to it the name of Hermit Thrush.

Genus *TYRANNUS*, Cuv.

*TYRANNUS INTREPIDUS*, Vieill.—The King Bird.

Numerous, and the last of the summer birds reaching this section. They are said to eat bees, and probably do, but I have never been able to find any in the stomachs of those I have killed and examined.

Genus *TYRANNULA*, Swains.

*TYRANNULA CRINITA*, Linn.—Great Crested Fly-catcher.

Very common here, and all over the West.

*TYRANNULA NUNCIOLA*.—Pewee.

Numerous, and the first of the migratory birds to make its appearance in the spring, usually arriving about the first of March.

*TYRANNULA VIRENS*, Linn.—Wood Pewee.

Probably more numerous than the common Pewee.

*TYRANNULA TRAILLI*, Aud.—Traill's Fly-catcher.

I have never seen but a few of these birds.

Genus *SETOPHAGA*, Swains.

*SETOPHAGA RUTICILLA*, Gmel.—American Redstart.

This beautiful bird may be seen almost any day in deep woods during the months of May and June.

Genus *CULICIVORA*, Swains.

*CULICIVORA CERULEA*.—Blue Gray Gnat-catcher.

The most numerous of all the fly catching tribe.

## Genus MUSCICAPA, Linn.

MUSCICAPA OLIVACEA, Wils.—Red-eyed Greentit.

These birds are so numerous, that a traveller through our woods is scarcely ever out of the sound of their voices.

MUSCICAPA CANTATRIX, Wils.—White-eyed Fly-catcher.

Very numerous.

## Genus SYLVIA.

SYLVIA SOLITARIA, Wils.—Yellow Warbler.

Very common.

SYLVIA ÆSTIVA.—Blue-eyed Yellow Warbler.

Quite numerous.

SYLVIA PENSILIS, Aud.—Yellow-throated Warbler.

Quite common.

SYLVIA MACULOSA, Aud.—Black and Yellow Warbler.

Not very numerous.

## Genus SIALIA, Swains.

SIALIA WILSONII, Swains.—The Common Blue Bird.

This interesting and familiar bird is very numerous and remains with us the whole year round.

## Genus PARUS, Linn.

PARUS ATRICAPILLUS, Linn.—Black-capped Chickadee.

This sprightly little bird is very common.

PARUS BICOLOR, Wils.—Great-crested Chickadee.

Also numerous, but probably not so much so as the preceding species.

## Genus LANIUS, Linn.

LANIUS EXCUBITOROIDES, Swains.—Gray Shrike.

Occasionally seen in autumn and winter. In Nov. 1854, whilst hunting for quails, I saw a Butcher Bird, flying with a Goldfinch (*Chrysomitris tristis*) in its talons. A short time afterwards, going in the direction which it flew, I discovered it upon a small elm tree, having suspended the bird by sticking its neck into the cleft of a split limb, and from which it was pulling off pieces and eating at its leisure. The idea instantly occurred to me that the habit this bird has of sticking pieces of flesh and insects upon thorns and other sharp substances, may be accounted for upon the ground that they do it as a matter of convenience in eating (saving the labor of holding them with their feet, which are rather feeble,) and not for the purpose of decoying other birds, as many have supposed.

## Genus CYANOCORAX, Boie.

CYANOCORAX CRISTATUS, Linn.—Blue Jay.

Very numerous, and so tame that they very frequently build their nests in the fruit trees and lilac bushes, in the town, close to our doors.

## Genus CORVUS, Linn.

CORVUS CORAX.—The Raven.

Formerly very numerous, but now exceedingly rare, so much so, that I have seen but one for eight or nine years.

CORVUS AMERICANUS, Aud.—American Crow.

Quite numerous in warm weather, both winter and summer, but never seen in times of extreme cold.

## Genus STURNELLA, Aud.

## STURNELLA LUDOVICIANA.—The Meadow Lark.

This bird is quite abundant here, but vastly more numerous in the north western part of the State, and in all other prairie countries where I have been, they seem to be the most numerous bird, except, perhaps, the Red-winged Blackbird. I can see no difference between this bird and the lark called *S. neglecta*. They are probably the same.

## Genus QUISCALUS, Vieill.

## QUISCALUS VERSICOLOR, Aud.—Crow Black Bird.

These birds are very numerous except in winter. They are among the first to arrive in the spring. They build their nests always in the hollow tree tops. About the middle of June to the first of July they collect in flocks, and move off to the North, and we see no more of them until October, when they again make their appearance in large flocks, and move off southward.

## QUISCALUS FERRUGINEUS, Aud.—Rusty Gracker.

Frequently seen in spring and fall.

## Genus ICTERUS.

## ICTERUS PECORIS, Aud.—Cow Bunting.

I have never known this bird to breed here. They are frequently seen in spring and autumn during their migrations.

## Genus XANTHORNUS, Cuv.

## XANTHORNUS VARIUS, Gmel.—Orchard Hangnest or Oriole.

This lively and noisy bird is very abundant. During the breeding season the male sings almost without intermission.

## Genus YPHANTES, Vieill.

## YPHANTES BALTIMORE, Linn.—Baltimore Oriole.

This beautiful bird is very numerous in all the country west of the Alleghany Mountains. I am of opinion that the song of the bird here, varies a little from the song of those found in Virginia, though in all other respects they seem to be identical.

## Genus AGELAIUS, Vieillot.

## AGELAIUS PÆNICÆUS, Linn.—Marsh Blackbird.

Very numerous in the neighborhood of all swamps and streams. In the north western part of the State they are found in almost countless numbers.

## Genus DOLICHONYX, Swains.

## DOLICHONYX ORYZIVORUS, Linn.—Wandering Rice Bird, Bob-o-link.

I have, in three or four different years, seen a few of these birds in the months of May and June. They never breed here.

## Genus CARDINALIS, Bonap.

## CARDINALIS VIRGINIANUS.—Grosbeak, Red Bird.

Numerous all through the country.

## Genus PIPILO, Vieill.

## PIPILO ERYTHROPHthalmus, Linn.—Towke Ground Finch.

Quite abundant.

## Genus PYRANGA, Vieill.

## PYRANGA RUBRA, Linn.—Black-winged Tanager.

This beautiful species is very numerous through all our woods. It is the only one of this genus found here, so far as my knowledge extends. The Summer Red Bird I have never seen.

## Genus BOMBYCILLA.

## BOMBYCILLA CAROLINENSIS, Aud.—Cedar Bird.

These birds are quite common all seasons of the year. They breed from June to September.

I have seen but three of their nests, two in June and one with young about the middle of September. All three of these were upon shade trees which line the main business street of the town, under which hundreds of people were constantly passing.

## Genus FRINGILLA, Linn.

## FRINGILLA LUDOVICIANA, Wil.—Rose-breasted Grosbeak.

This beautiful bird is not very numerous, but may occasionally be found in thick woods adjoining open ground, rarely seen in other places.

## FRINGILLA RUFA, Wils.—Fox colored Finch.

Very numerous during winter, keeping company with the common Snow-bird.

## FRINGILLA TRISTIS, Wils.—Thistle Bird, Flax Bird.

Breeds in July August and September, and is very numerous.

## FRINGILLA SOCIALIS, Wils.—House Sparrow.

Exceedingly numerous. They remain with us until the latter part of October.

## FRINGILLA NIVALIS, Wils.—Common Snow Bird.

This finch makes its appearance here at the first of October, and leaves about the first of May.

## FRINGILLA MELODIA.—The Song Sparrow.

Very numerous and a constant resident throughout the year.

## FRINGILLA GRAMINEA, Wils.—Bay-winged Finch.

Very numerous all over our cultivated grounds. These birds have a curious habit, during the breeding season, of following persons passing through the fields, all the while uttering a kind of tantalizing, scolding cry, apparently with a view of driving off the intruder.

## FRINGILLA LEUCOPHRYS, Wils.—White-crowned Finch.

This species is frequently met with, though not nearly so numerous as many others.

## FRINGILLA PENNSYLVANICA, Lath.—White-throated Finch.

I have seen but a few of this species.

## FRINGILLA CYANEA, Wils.—Indigo Blue Bird.

This pleasant songster may be heard on the borders of our fields during the whole summer. They are very numerous.

## FRINGILLA PURPUREA, Wils.—Purple Finch.

This finch is seldom seen here in numbers except in extremely severe weather.



Genus *EMBERIZA* (?)*EMBERIZA NIVALIS*, Aud.—White Snow Bunting.

I have seen these birds on three or four occasions during severe winters.

Genus *CONURUS*, Kuhl.*CONURUS CAROLINENSIS*, Linn.—The Paroquet.

This bird was formerly very numerous along White Water river. Several years have elapsed since any of them have been seen.

Genus *PICUS*, Linn.*PICUS QUERULUS*, Wils.—The Checkered Woodpecker.

This Woodpecker is quite numerous and a constant resident. Like the Red-headed Woodpecker, they lay up in the fall a supply of acorns and beech nuts for winter use. They hull the acorns, split them in two, and firmly drive them edgewise into the cracks of old dry trees.

*PICUS ERYTHROCEPHALUS*.—Red-headed Woodpecker.

This is a numerous and wide spread species. In seasons when oak and beech mast is plenty, they lay up a sufficient quantity to keep them during the winter. But when this supply fails, they uniformly migrate to the south and remain until the weather becomes warm the following spring.

*PICUS PILEATUS*, Linn.—Called by the people Woodpecker.

Once very numerous, but are now rarely seen.

*PICUS PUBESCENS*, Linn.—Downy Woodpecker.

Very abundant and a constant resident.

*PICUS VILLOSUS*, Linn.—Hairy Woodpecker.

About equal in numbers to the preceding, and very similar in all its habits.

*PICUS AURATUS*.—Yellow Hammer.

This is probably the most numerous with us of all the woodpeckers.

*PICUS* ———.—The "Sap Sucker."

This is a shy bird, and but rarely seen. I am inclined to believe it less numerous than any other species. Were we to judge of its numbers by the number of holes it bores in the apple-tree, sugar maple, hickory, &amp;c., for the purpose of collecting the sap, we might conclude that it was very numerous.

Genus *COCCYZUS*, Vieill.*COCCYZUS AMERICANUS*, Linn.—Yellow-billed Cuckoo.

We rarely see this bird, yet they are rather numerous. Their uncouth notes may be heard in the recesses of the forest at almost any time during the summer, day or night—probably oftener in the night than day.

Genus *ECTOPISTES*, Swain.*ECTOPISTES MIGRATORIUS*, Linn.—Wild Pigeon.

Still occasionally seen in large numbers, though they have evidently been constantly diminishing in numbers for the last thirty years, and are probably not more than half so numerous as they were thirty years ago. In the month of January and February, 1854, these birds roosted about two miles from this town, (Brookville,) notwithstanding the country is thickly inhabited. No one who did not see them, or who has not seen a "pigeon roost," can form any proper conception of their numbers.

*ECTOPISTES CAROLINENSIS*, Linn.—Turtle Dove.

The Turtle Dove is very numerous here, and a permanent resident. The winter of 1855, '56 was so severe that a great many of them perished.

## Genus MELEAGRIS, Linn.

## MELEAGRIS GALLAPAVO, Linn.—The Wild Turkey.

Formerly very numerous. They have now become almost extinct in this section. A very few, however, still linger amongst us.

## Genus ORTYX, Steph.

## ORTYX VIRGINIANUS, Linn.—The American Quail.

Still quite numerous, though gradually diminishing in numbers. Here they are clearly not migratory, but upon the Illinois, Mississippi and Missouri rivers they are said to be so. Late in September and in October they seem to have a kind of undefined idea of migrating, and wander around apparently without any fixed object; but in a short time they become quiet and settle themselves into winter quarters, which they never desert until spring, unless the supply of food fails. They may always be found within a few rods of the same place during the winter if the supply of food is sufficient for their wants. During their "crazy fit" in the fall, they come into the town, and when frightened by the boys will frequently fly against the *white* houses, often, as I have witnessed, with such force as to kill themselves. I have known the same thing to happen on one occasion in the country, when there was but a single white house against which they could fly. They very rarely fly against houses of any other color.

## Genus TETRAO, Linn.

## TETRAO UMBELLUS, Linn.—Called here the Pheasant.

These beautiful birds were formerly extremely plenty, but have now become rare.

## Genus CHARADRIUS, Linn.

## CHARADRIUS VOCIFERUS, Wils.—Killdeer Plover.

These curious noisy birds are very numerous about all our streams and wet lands.

## CHARADRIUS HELVETICUS.—Plover.

Not numerous, though occasionally seen in spring and fall.

## CHARADRIUS MARMORATUS.

Similar in numbers to the former.

## Genus GRUS, Linn.

## GRUS CANADENSIS, Temm.—The Sand-hill Crane.

I have seen but two or three individuals of this species in this region. In the north western part of the State they are very numerous. In the Kankakee and Calumet swamps, which occupy so large a space in north western Indiana and north eastern Illinois, they build their nests and rear their young. If they were the young of the *Grus Americanus*, as some here supposed, they would not likely be found breeding here and producing others like themselves, none of which much resemble the latter. They are distinct birds, and vary greatly both in color and size.

A gentleman who lives upon the Iroquois, in Jasper co., Ind., informed me that he shot a white crane there in 1848, (*G. Americana*), which measured nearly seven feet from the point of the bill to the end of the toes, and weighed, he judged, about *thirty* pounds.

## Genus NUMENIUS.

## NUMENIUS LONGIROSTRIS, Wils.—Long-billed Curlew.

A few of these birds have been seen here.

## Genus ARDEA, Linn.

ARDEA HERODIAS, Linn.—Great Blue Heron.

Quite abundant during the warmer seasons of the year.

ARDEA CANDIDISSIMA.—The Snowy Heron.

Quite numerous some years along White Water, in August, September and October.

ARDEA EXILIS(?).—Least Bittern.

Very numerous along all our streams. Builds its nest in apple-trees and other scrubby trees in the vicinity of rivers. I am not sure that this is not the Green Heron of naturalists (*A. virescens*).

ARDEA LENTIGINOSA.—The American Bittern.

I have seen but three birds of this species in this part of the State. They are quite numerous on the Iroquois and Kankakee in the N. West. The people there call them "*thunder-pumpers*;" hence I infer that their love-call is equivalent to the booming of the European Bittern.

## Genus IBIS, Moehr.

IBIS LOCULATOR.—The Wood Ibis.

The first day of August, 1855, a large flock of these birds made their appearance in this neighborhood. They remained along the river and White Water canal for about a month or six weeks. A son of one of my neighbors broke the wing of one of them and caught it. After keeping it three or four weeks, feeding it upon fish, he gave it to me. I kept it until near the first of November, when it fell a victim, as many another biped has done, to its appetite. Some mackerel had been placed to soak upon a table in the back yard, one of which he stole and ate, and upon the evening of the next day died in convulsions.

It was wonderful to see with what rapidity it could swallow live fish from three to ten inches long, almost as rapidly as a chicken would grains of corn.

It became so tame whilst I kept it that it would come into the house when hungry. In that short time it learned to know its name (Tantalus), and would come when called, if it happened to be hungry. We learned it to eat raw meat, by putting it into water where it had been fed on fish.

When not hungry it would remain constantly on a certain spot in the yard, and seemed to have no disposition to leave it, except in search of food. It would stand for hours perfectly still, with its long bill hanging straight down along the neck. When tired of this position it would lay the tarsus flat upon the ground and stand upon the lower end of the tibia. It was perfectly harmless and gentle, and possessed much more good sense and sagacity than its appearance would seem to justify.

## Genus TOTANUS, Bechst.

TOTANUS FLAVIPES, Gmel.—Little Yellow Shank Tattler.

Not very numerous. Occasionally seen along the river.

TOTANUS MELANOLEUCUS, Gmel.—Great Yellow Shank Tattler.

Occasionally seen in fall and spring.

TOTANUS SEMIPALMATUS, Gmel.—The Willet.

These birds are rare, though flocks occasionally appear late in the fall and early in the spring.

## Genus TRINGOIDES, Bonap.

TRINGOIDES MACULARIA, Linn.—Spotted Sandpiper.

Rather numerous along all our streams.

TRINGOIDES BARTRAMIUS, Wils.—Upland Plover.

Very rare. I do not remember ever to have seen but two or three of these birds in this neighborhood.

## Genus TRINGA, Say.

## TRINGA SCHINZII.—Schinz's Sandpiper.

Quite a number may be found along our streams. Also, one or two others of the same genus, which I cannot name, for the want of figures and descriptions.

## Genus SCOLOPAX, Linn.

## SCOLOPAX MINOR, Wils.—The American Woodcock.

Formerly more numerous than at present. A few are still to be found here every year.

## SCOLOPAX WILSONII.—English Snipe, Jack Snipe.

Sometimes quite numerous in March and April.

## Genus RALLUS, Linn.

## RALLUS CAROLINUS, Wils.—The Carolina Rail.

I have seen but four of these birds in this section. They are to be found in September on the Kankakee in large numbers.

## Genus FULICA, Linn.

## FULICA AMERICANUS, Gmel.—The Coot or Mud-hen.

I have occasionally seen considerable numbers of these birds about our streams, who had been compelled to stop by fatigue or storms to rest, before renewing their journey to the South. They are not natives of the soil.

## Genus ANSER, Barrere.

## ANSER CANADENSIS.—The Wild Goose.

Seen in large flocks every fall and spring in their semi-annual migrations. They rarely ever stop, except they become bewildered during dense fogs.

## ANSER BERNICLA, Aud.—The Brent Goose.

Occasionally seen passing over during their migrations. This and the Wild Goose are the only two species I have ever observed here.

## Genus ANAS, Linn.

## ANAS SPONSA, Wils.—The Wood Duck.

Still seen in considerable numbers, though not so numerous as formerly. They breed here occasionally in the hollow trees.

## ANAS AMERICANA, Aud.—The Widgeon.

Occasionally seen in our waters.

## ANAS ACUTA, Wils.—The Pintail Duck.

Very common in White Water.

## ANAS BOSCHAS, Linn.—The Mallard.

The most numerous of all the wild ducks.

## ANAS CRECCA, Wils.—The Green winged Teal.

Quite common in the spring.

## ANAS DISCORS, Wils.—The Blue winged Teal.

Sometimes very numerous in September and October.

## ANAS STREPERA, Linn.—The Gadwall Duck.

Have been seen here, but are rare.

## ANAS CLYPEATA, Aud.—The Shoveller Duck.

Frequently seen in spring.

*ANAS VALISNERIA*, Wils.—The Canvas-back Duck.

This far-famed duck made its appearance here for the first and only time, so far as my knowledge extends, in March, 1855. One of my friends shot one which I had a chance to examine, and afterwards to taste. It was very tender and juicy, but had such a fishy flavor that it could scarcely be eaten. I supposed they had come from the sea coast of the Southern States, where they had fed upon shell fish instead of eel grass, which seems to be necessary to perfect their flavor.

*ANAS FERINA*, Wils.—The Pochard or Red-head.

This duck made its first appearance, so far as known, about the time or in company with the Canvas-back. One or two of them were killed.

*ANAS MARILA*, Wils.—Scaup Duck.

Occasionally seen but not numerous.

*ANAS RUFITORQUES*, Aud.—Tufted Duck.

About as numerous as the Scaup.

*ANAS OBSCURA*, Wils.—The Black Duck.

Frequently seen in Fall and Winter.

*FULIGULA MARILA*, Aud.—Lesser Scaup Duck.

Was noticed here in 1855.

*FULIGULA RUBIDA*, Bonap.—Ruddy Duck.

Occasionally seen in spring.

*FULIGULA CLANGULA*.—Golden-eye Duck.

I killed one of these birds in March, 1855, and saw several others.

*FULIGULA ALBEOLA*.—Butter Ball Duck.

These are probably more numerous in the spring than any other species.

Genus *MERGUS*.*MERGUS MERGANSER*.—The Shelldrake.

These birds are very numerous in White Water during the whole winter, which they visit for the purpose of fishing. The stream is remarkably clear and being very rapid, seldom freezes over, but the water becomes cold enough to benumb the fish, which thus fall an easy prey to these expert divers. I have known one of them to hatch and rear its brood in this vicinity.

*MERGUS CUCULLATUS*.—Hooded Merganser.

I have seen but a single individual of this species, which was killed in March, 1855.

In addition to the ducks above enumerated, there are some others, but for the want of descriptions and figures I am unable to name them.

Genus *COLYMBUS*.*COLYMBUS GLACIALIS*.—The Loon.

The loon is frequently seen in our waters in the fall and spring, being probably compelled by fatigue to stop and recruit their strength. Those which I have seen in the water were great divers, but could not be forced to take wing. The cry or wail of the Loon is, to my ear, the most melancholy sound I have ever heard, conveying the idea of utter hopelessness and despair.

*COLYMBUS* ———.—The Ludapper.

These birds are rather abundant during October and November.

Genus *PELECANUS*.*PELECANUS ONOCROTALUS*.—American White Pelican.

I have seen a few pelicans flying over; they are, however, very rare in this section.

## Genus STERNA.

## STERNA DOUGALLII.—The Roseate Tern.

I do not recollect to have seen but a single individual of this species.

## STERNA ARCTICA.—Black-capped Tern.

I have seen several flocks of these birds, generally in the month of June, during freshets and storms.

## Genus LARUS.

## LARUS LEUCOPTERUS, Aud. (?)—White-winged Gull.

Very common along the river during the winter. Besides this, there are several other species of Gull occasionally seen passing through the country.

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*On a new and remarkable genus of Ranidæ, from the river Parana.*

By EDW. HALLOWELL, M. D.

## Gen. TRIGONOPHRYS.

*Char.* Head very large, depressed; upper eyelid triangular; tongue large, subcircular, notched in front and posteriorly, more deeply behind, attached in front, free laterally and in its posterior half; upper maxillary teeth large, conical, recurved, sharp-pointed; two groups of vomerine teeth on a line with the anterior margin of the posterior nares, nearer to them than to each other; posterior nares large, subcircular; eustachian foramina of moderate size, rather large; no vocal vesicles either internal or external; tympanum indistinct; four fingers completely free; toes palmate at their base only; first cuneiform bone presenting a prominence externally, with a well defined projecting edge; transverse processes of the sacral vertebræ not dilated.

## TRIGONOPHRYS RUGICEPS, nob.

*Char.* Body thick and stout, more or less covered with tubercles above; two movable bucklers beneath the skin, posterior to the occiput; two glands upon the upper surface of each thigh near the groin; two others larger upon the breast; ground color of body and sides olive, presenting numerous dark colored, ovoid spots, with a narrow margin of white, the interspaces in the immature specimens of a beautiful rose color; extremities olive, with large and broad bands of black margined with white, the interspaces more or less tinged with red; under parts white mingled with yellow; chin and throat black spotted.

*Dimensions.* Length of head 1 inch 4 lines; greatest breadth 2 inches  $3\frac{1}{2}$  lines; breadth of bucklers 1 inch  $7\frac{1}{2}$  lines; length of body 3 inches; breadth 3 inches 2 lines; length of anterior extremities  $2\frac{1}{4}$  inches; of posterior extremities 4 inches.

*Gen. Remarks.* A more detailed description with drawings, and an account of the anatomy, will be given in the next volume of the Journal. It differs from *Ceratophrys*, to which it is closely allied, in the shape of the eyelids, the form of the body, the structure of the skull, and the teeth, which are remarkable for their great development.

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ELECTION.

Mr. Frederick G. Hesse, of Washington, and Drs. Geo. J. Ziegler and John H. Packard, of Philadelphia, were elected Members; and Philip Lutley Sclater, M. A., of London, and the Right Revd. Stephen Elliott, Bishop of Georgia, were elected Correspondents of the Academy.