BIBLIOGRAPHY OF IOWA GEOLOGY

BY

CHARLES ROLLIN KEYES.
Before entering upon any investigation a knowledge of what has already been done in the same line is very essential, in order that labor may not be uselessly expended in duplicating work.

In glancing over the titles herein enumerated, the majority of the people in the State will probably be impressed at once with the large number of references, and with the apparently extensive literature pertaining to the geology of Iowa. More careful perusal, however, will doubtless bring out the striking fact that with few exceptions the publications are purely scientific in character. The reason for this is not far to seek. For a long period of years past scientific work in the State has received little or no public aid or encouragement. Whatever work has been carried on has been done at private expense by scientific men who have received no financial compensation in return for either their time or the money necessary to prosecute their researches. Thus, only the purely scientific results were placed before the world; while all the economic aspects of the various lines of investigation were unable to be directed through those channels most likely to reach the people of the State. This information has therefore been largely forgotten or put away in places now almost entirely inaccessible to the public. Nevertheless, the scientific work
so generously done by persons having no hope of reward
or public aid has placed the economical investigation of
Iowa's natural resources on a firmer basis than could pos-
sibly have been done otherwise, without years of special
labor.

The arrangement of the present index to the literature
pertaining to the geology of Iowa was intended, primarily,
for the convenience of members of the Survey. Portions
of it, as a card catalogue of authors, was originally started
some years ago. A large number of additions have been
made recently, and the whole is brought together now
in the form of a bibliography of the subject.

The plan is essentially that of a dictionary catalogue or
bibliographical index. It consists of:

(1) An author's list, in which is given the full title,
volume, pages, and illustrations of the book or serial in
which each article appeared, place and date of publication.
This is followed by a very brief synopsis of the contents of
each paper.

(2) A title index, in which the name of each article
appears under each of its leading words. Then comes the
name of the author and an abbreviated reference to its
place of appearance.

(3) Subject entries and cross-references. These em-
brace, under each topic, all references to any particular
subject, as to each county, geological formation, zoological
group, special subject, etc.; also those writings referring to
Iowa in general. The names of authors, and abbreviated
references to place and time of publication are given in all
cases. Whenever additional information is wanted, refer-
ence can be made to the name of the author.

For convenience the whole is arranged alphabetically.
It is believed that the list of papers is fairly complete; though doubtless there are some omissions.

One of the most noticeable considerations connected with the bibliographical index is the fact that the literature is so widely scattered, and now largely inaccessible to the people of the State. The last of the two earlier geological reports was issued nearly a quarter of a century ago. They were rather sparingly distributed, and during the period which has elapsed since their publication most of the copies have been lost, destroyed, or passed beyond the boundaries of the State. In the meantime the population has largely increased, so that if the reports were all at hand the supply would be inadequate. A goodly number of references have appeared in the publications of leading societies and have had a limited distribution, a large share of which has been foreign. Many of the papers referring to the geological phenomena as presented in Iowa are found in the reports of other states; still others are scattered far and wide through various journals and serials, both in English and foreign languages; besides, there are many short articles, and more or less lengthy allusions included in the long list of publications printed by the Federal government. A large majority of these descriptions are unknown to the people of the State, who, consequently, know not where to look for the information desired.

Yet all these have to be gone over, involving so much time and labor that considerable hesitancy arises before the preparation of indices of this kind are entered upon finally.

Bibliography.

Abstract of an Introduction to the Final Report on the Geological Survey made in Wisconsin, Iowa and Min-

Adair County.
Analyses of Peat. Rush Emery. (Geol. Iowa, II, 401. 1870.)
Geology. C. A. White. (Geol. Iowa, I, 336-339. 1870.) The drainage and surface characters briefly described. A few notes with section of the rocks given, with reference to the probable material resources, and notice of peat beds.

Adams County.
Analyses of Coal. Rush Emery. (Geol. Iowa, II, 389. 1870.)
General Remarks. C. A. White. (Geol. Iowa, I, 339-343. 1870.) Drainage and surface characters alluded to. The geological features along the Nodaway river briefly described. Allusion also made to the rich soil of the county.

Additional Notes on the Devonian Rocks of Buchanan County, Iowa. S. Calvin. (Am. Geologist, VIII, 142-145. 1891.)

Age of the Goniatite Limestone at Rockford, Indiana, and its Relations to the Black Slate of the Western
BIBLIOGRAPHY.

Age, etc.—Continued.

States and to some of the succeeding rocks above the latter. F. B. Meek and A. H. Worthen. (Am. Jour. Sci., (2), XXXII, 167-177. 1861.)

Allamakee County.

Notice of the Geology. J. D. Whitney. (Geol. Iowa, I, 317-323. 1858.)

Alluvium.

General Remarks. C. A. White. (Geol. Iowa, I, 102-103. 1870.) Brief account of the alluvial deposits of the State.

In Henry county. A. H. Worthen. (Geol. Iowa, I, 210. 1858.)


Aluminum.


Annual Report (First) of Progress of the State Geologist. C. A. White. (pp. 1-4. Des Moines, 1867.)
BIBLIOGRAPHY.


Appanoose County.
General Description of Geology. C. A. White. (Geol. Iowa, II, 270. 1870.) Merely a brief reference to the geology of the county.

Artesian Wells.
At Davenport. A. S. Tiffany. (Am. Geologist, III, 117-118. 1889.)
At Keokuk, Ottumwa and Sigourney. C. H. Gordon. (Am. Geologist, IV, 237-239. 1889.)
Chemical Analyses of Waters. R. E. Call. (Monthly Rev. Iowa Weather and Crop Service, II, No. 2, 1-5. 1892.)
General Description. C. A. White. (Geol. Iowa, II, 331-333. 1880.) A brief general account of the artesian wells in different parts of the State.

Asteroids.
Attachment of Platyceras to Fossil Crinoids. G. R. Keyes.
(Am. Naturalist, XXII, 924. 1888.)

Audubon County.
General features briefly described. O. H. St. John.
(Geol. Iowa, II, 164-167. 1870.)


Elwacrinus obovatus.
Elwacrinus meloniformis.


Stereocrinus.
Stereocrinus triangulatus.
Stereocrinus triangulatus var. liratus.
Megistocrinus nodosus.
Barris, W. H.—Continued.

_Rhynochonella intermedia._
_Avicula (Plerinea) cancellata._
_Gyroceras pratti._
_Praetus davenportensis._


_Barytes._

From Decatur, Madison; Marion, Johnson, Bremer and Dubuque counties. C. A. White. (Geol. Iowa, II, 305. 1870.)

Beachler, Charles S. Keokuk Group of the Mississippi Valley. (Am. Geologist, vol. X, pp. 88-96. Minneapolis, 1892.) A short sketch of the Keokuk rocks, with an attempt to a correlation of the different beds in the several states of the upper Mississippi region.


_Benton County._

Geological notes. J. D. Whitney. (Geol. Iowa, I, 260-266. 1858.)

_Biennial Report of the State Mine Inspector to the Governor of the State of Iowa, for the years 1880-1881._ P. C. Wilson. (165 pp. Des Moines, 1882.)


Binks, Thomas. Report of the Mine Inspector for the First District. (Fifth Biennial Report of the State Mine Inspectors for the years 1890-1891, pp. 1-51. Des Moines, 1891.) Short accounts of the different mines in southeastern Iowa, with tables showing the number of mines, output, number of miners, and value of products.

Black Hawk County.


Blastoids.

Description of New Crinoids and Blastoids from the Hamilton Group. W. H. Barris. (Proc. Dav-
Blastoids.—Continued.

Description of the new species *Elxacrinus obovatus* and *E. meloniformis*.


Description of New Species from Iowa Rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)

Description of New Species from the Lower Carboniferous of Iowa. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, V, 323-619. 1873.)


Boone County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 390-391. 1870.)
BIBLIOGRAPHY.

Boone County.—Continued.
Coal mines at Boonsboro. C. A. White. (Second
General Description. C. A. White. (Geol. Iowa, II,
259. 1870.) Mere reference to the geology of the
county.

Brachiopods.
Brachiopoda. James Hall. (Nat. Hist. New York,
Pal., VIII, Part i, 1-367. 1892.)
Contribution to the Fauna of the Lower Coal Measures
Sci., 1890-1891, 22-23. 1892.) A preliminary
note. One species described from the Lower Coal
Measures at Des Moines.
Description of New Genera and Species. C. A. White
City, 1867.)
Description of New Species. F. B. Meek and A. H:
Geol. Sur. Wis., Iowa and Minn., App. Art. i, 583-
586. 1852.)
Description of New Species from Iowa. C. A. White.
Description of New Species from Iowa Rocks. F. B.
Meek and A. H. Worthen. (Geol. Sur. Illinois, II,
143-411. 1866.)
Description of New Species from the Iowa Lower Car-oniferous. F. B. Meek and A. H. Worthen. (Geol.
Description of a New Species of Spirifera from the
Hamilton Group, near Iowa City, Iowa. S. Calvin.
1889.)
Brachiopods.—Continued.


Five new species from the dark shale at Independence. S. Calvin. (Bul. U. S. Geol. and Geog. Sur., IV, 725-730. 1878.)


New species from Iowa. C. A. White. (Twelfth Ann.
Brachiopods.—Continued.


New species from the Lower Carboniferous rocks of Iowa. A. H. Worthen and F. B. Meek. (Geol. Sur. Illinois, VI, 489-532. 1875.)


Paleontology of New York. J. Hall. (Nat. Hist. New York, Paleontology, IV, 422. 1867.) A number of references to fossils occurring in Iowa.


Bremer County.


Brick.


Bryozoans.


Buchanan County.


Devonian Rocks. S. Calvin. (Am. Geologist, VIII, 142-145. 1891.)


Notes on the geology. J. D. Whitney. (Geol. Iowa, I, 295-296. 1858.)

Buena Vista County.

BIBLIOGRAPHY.

Building Stones.


General references to the building stones of Iowa. G. P. Merrill. (Stones for Building and Decorating, 453 pp. New York, 1891.)


In Iowa. W. C. Day. (Report of the Mining Industry of the U. S. at 11th Census, 1890, 593-666. 1892.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 196-197. 1858.)

Burlington Limestone.


Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-367. 1892.)

Certain Forms of Straparollus from Southeastern Iowa. C. R. Keyes. (Am. Geologist, V, 193-197. 1890.)


Description of fossils. James Hall. (Geol. Iowa, I, 524-605. 1858.)

Burlington Limestone.—Continued.


Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)

Evidence of Two Distinct Geological Formations in the Burlington Limestone. W. H. Niles and
Burlington Limestone.—Continued.
General description. C. A. White. (Geol. Iowa, I, 201-209. 1870.) Its general characters, distribution, economic value and fossils described.
General description of the characters. James Hall. (Geol. Iowa, I, 92-93. 1858.)
In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 203. 1858.)
In Henry county. A. H. Worthen. (Geol. Iowa, I, 217. 1858.)
In Lee county. A. H. Worthen. (Geol. Iowa, I, 195-196. 1858.)
In Washington county. A. H. Worthen. (Geol. Iowa, I, 244-245. 1858.)
Burlington Limestone.—Continued.


Burlington Limestone.—Continued.


Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.) The recent investigation along the Mississippi river and the stratigraphical details described with a proposed new classification of the lower Carboniferous rocks in the Mississippi basin.

Burlington Limestone.—Continued.


Calciferous Sandstone.

General description of the characters. James Hall. (Geol. Iowa, I, 49-51 1858.)

Calcite.


Calhoun County.

General account of the surface features. O. H. St. John. (Geol. Iowa, II, 146-150. 1870.)


Call, R. E., C. R. Keyes and. On a Quaternary Section Eight Miles Southeast of Des Moines, Iowa. (Proc.
Call, R. E.—Continued.
Iowa Acad. Sci., 1890-1891, 30. Des Moines, 1892.) Description of a section near the terminal moraine near Des Moines.


\[ \text{Streptindytes.} \]

\[ \text{Streptindytes acervularia.} \]


Calvin, S. Note on the Difference between Acervularia profunda, Hall, and Acervularia davidsoni, Edwards and Haime. (Am. Geol., vol. IX, pp. 355-358. Minne-
Calvin, S.—Continued.
apolis, 1892.) A short account of the difference between the two species at Independence, Iowa, and elsewhere.

Calvin, S. Notes on a Collection of Fossils from the Lower Magnesian Limestone, from Northeastern Iowa. (Am. Geologist, vol. X, pp. 144-148. 1892.) Short notes on various fossils. The following species, without figures, described as new:

- *Straparollus claytonensis.*
- *Straparollus pristiniiformis.*
- *Raphistoma multivolvalum.*
- *Raphistoma paucivolvalum.*
- *Cyrtoceras lutei.*


Calvin, S. Notes on the Geological Formations of Iowa. (Pamphlet, printed at World's Exposition at New Orleans, pp. 1-8. 1884.) A brief résumé of the geological formations of the State.

Calvin, S. Notes on the Synonymy, Characters and Distribution of Spiriferella parryana, Hall. (Bul. Lab. Nat. Hist. State Univ. Iowa, vol. I, pp. 19-28. Iowa City, 1888.) All the related species of *Spiriferella parryana* described from the Iowa formations considered to be synonyms of this species.

Calvin, S. On some Dark Shale recently Discovered below the Devonian Limestones, at Independence, Iowa; with a Notice of its Fossils and Description of new Species. (Bulletin United States Geol. and Geog.
Calvin, S.—Continued.

Sur. Terr., vol. IV, pp. 725-730. 1878.) A short account of the rocks of the locality, with remarks on some of the fossils. The following species are regarded as new:

- *Strophodonta variablis.*
- *Strophodonta quadrata.*
- *Orthis infera.*
- *Rhynchonella ambigua.*
- *Gypidula munida.*


Calvin, S. Some Geological Problems in Muscatine County, Iowa, with Special Reference to the Rectifica-
Calvin, S.—Continued.

tion of the Supposed Kinderhook near the Mouth of Pine Creek. (Am. Geologist, vol. III, pp. 25-36. Minneapolis, 1889.) Special account of certain yellow sandstones in Muscatine county, formerly referred to the Kinderhook, but now shown to be Devonian in age.


- Terebratula iowensis.
- Schizodus symmetricus.
- Holopea grandis.
- Straparollus lativolvis.
- Straparollus bicornatus.
- Straparollus tricornatus.


Cambrian.


Correlation of Potsdam rocks in northeastern Iowa. C. D. Walcott. (Bul. 81, U. S. Geol. Sur., 187-188. 1891.)

Description of the lower sandstone of the Upper Mississippi (Potsdam). D. D. Owen. (Geol. Sur. Wis., Iowa and Minn., 48-58. 1852.) A detailed account of its lithological characters, range and paleontology.

Capellini, J.—Continued.

XXII, pp. 1-24. 1867.) Description of the Cretaceous deposits of the upper Missouri region.

Carboniferous (Lower).

Age of Certain Sandstones near Iowa City. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-1891, 26. 1892.) Owing to the recent discovery of fossils in the sandstones near Iowa City, the suggestion is made that their age may be Kinderhook (lower Carboniferous) instead of Upper Coal Measures as have been heretofore regarded.


Attachment of Platyceras to Palæocrinoids. C. R. Keyes. (Am. Philosophical Soc., XXV, 231-243. 1888.) Description of examples recently found showing attachment of gasteropod to crinoids. Four new species described.

Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-367. 1892.)


Brief geological description. C. A. White. (Geol. Iowa, I, 189-230. 1870.) An account of the general characters and leading subdivisions, the last being as follows: Chester, St. Louis, Keokuk, Upper and Lower Burlington, Kinderhook. Each
BIBLIOGRAPHY.

Carboniferous (Lower)._Continued.

of these then receives special consideration. (See under these titles.) A full description of the unconformability of the coal measures upon the older rocks and of the St. Louis limestone upon the older formations of the subcarboniferous group.


Certain Forms of Strapatollus from Southeastern Iowa. C. R. Keyes. (Am. Geologist, V, 193-197. 1890.)


Classification of Crinoids. C. R. Keyes. (Am. Naturalist, XXIII, 153. 1889.) Remarks on the changes necessitated by the discovery of the ventral structure of Taxocrinus (from Marshalltown, Iowa).


Correlation of the rocks in Iowa. H. S. Williams.
Carboniferous (Lower).—Continued.

(Bul. 80, U. S. Geol. Sur., 1-279. 1891.) Numerous references.


Description of Burlington fossils. James Hall. (Geol. Iowa, I, 524-605. 1858.)


Description of Keokuk fossils. James Hall. (Geol. Iowa, I, 606-667. 1858.)

Description of Kinderhook fossils. James Hall. (Geol. Iowa, I, 517-523. 1858.)


Description of new species of echinoderms. S. A. Miller and W. F. E. Gurley. (Pamphlet, 59 pp. 1890.)
Carboniferous (Lower).—Continued.


Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)


Description of St. Louis fossils. James Hall. (Geol. Iowa, I, 667-677. 1858.)

BIBLIOGRAPHY.

Carboniferous (Lower).—Continued.


Gasteropods from Iowa. J. Hall. (Nat. Hist. New York, Pal., V, pt, ii. 1879.) A number of references to fossils from Iowa.

General description of the Burlington limestone. C. A. White. (Geol. Iowa, I, 201-209. 1870.)


In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 201-206. 1858.)
BIBLIOGRAPHY.

Carboniferous (Lower).—Continued.

In Franklin county. C. A. White. (Geol. Iowa, II, 240. 1870.)

In Hamilton county. C. A. White. (Geol. Iowa, II, 256-257. 1870.)

In Humboldt county. C. A. White. (Geol. Iowa, II, 244. 1870.)

In Marion county. C. A. White. (Geol. Iowa, II, 263-265. 1870.)

In Van Buren county. A. H. Worthen. (Geol. Iowa, I, 226-228. 1858.)

In Wapello county. A. H. Worthen. (Geol. Iowa, I, 254-255. 1858.)

In Washington county. A. H. Worthen. (Geol. Iowa, I, 242-246. 1858.)


Keokuk group of the Mississippi valley. C. S. Beachler. (Am. Geologist, X, 88-96. 1892.)

Lamellibranchiata. James Hall. (Nat. Hist. New York, Pal., V, pt. i, second half. 1885.) A number of species of fossils from Iowa noted.


New eocrinoids from the Burlington. F. B. Meek and
Carboniferous (Lower).—Continued.


Carboniferous (Lower).—Continued.


New species of sponges from the Keokuk.  E. O. Ulrich.  (Geol. Surv. Illinois, VIII, 243-251. 1890.)


Carboniferous (Lower).—Continued.


Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.) The recent investigations along the Mississippi river and the stratigraphical details described, with a proposed new classification of the lower Carboniferous rocks in the Mississippi basin.

Platyceras Attached to Fossil Crinoids. C. R. Keyes. (Am. Naturalist, XXII, 924-925.) Statement of the association of certain species found in Iowa.


Remarks on the Age of the Goniatite Limestone at Rockford, Indiana, and its Relations to the Black Slate of the Western States and to some of the Succeeding Rocks of the latter. F. B. Meek and A. H. Worthen. (Am. Jour. Sci., (2), XXXII, 167-177. 1861.)

Some Geological Problems of Muscatine County. S. Calvin. (Bul. Lab. Nat. Hist. State Univ. Iowa, I, 7-18. 1883.) Certain rocks in the locality shown to be Devonian instead of Kinderhook as was formerly supposed by Hall.


Carboniferous (Lower).—Continued.
1878.) A sketch of the evolution of certain crinoids, chiefly from southeastern Iowa.

Carboniferous (Upper).
Age of Certain Sandstones near Iowa City. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-1891, 26. 1892.) Owing to the recent discovery of fossils in the sandstones near Iowa City the suggestion is made that their age may be Kinderhook (lower Carboniferous) instead of upper Coal Measures as have been heretofore regarded.
Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-367. 1892.)
Chert of the Upper Coal Measures in Montgomery County. S. Calvin. (Am. Geologist, I, 116-117. 1888.)
Carboniferous (Upper).—Continued.


Description of Middle Coal Measures. O. H. St. John. (Geol. Iowa, I, 264-284. 1870.)


Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)

Description of the Lower Coal Measure fossils. James Hall. (Geol. Iowa, I, 711-724. 1858.)

Description of the rocks along the Des Moines river. D. D. Owen. (Rep. Geol. Sur. Wis., Iowa and Minn., 105-133. 1852.)


Fauna of the Lower Coal Measures of Central Iowa.
Carboniferous (Upper).—Continued.


Fossils in Iowa drift. C. A. White. (Geol. Iowa, I, 98. 1870.)

General description. C. A. White. (Geol. Iowa, I, 231-285. 1870.) The general characters briefly considered, the economic value and animal remains of the different divisions described, with sections and practical remarks.


Carboniferous (Upper).—Continued.


In Adair county. C. A. White. (Geol. Iowa, I, 337-339. 1870.)

In Adams county. C. A. White. (Geol. Iowa, I, 340-343. 1870.)

In Cass county. C. A. White. (Geol. Iowa, I, 373-375. 1870.)

In Dallas county. O. H. St. John. (Geol. Iowa, II, 13-46. 1870.)

In Decatur county. C. A. White. (Geol. Iowa, I, 320-325. 1870.)

In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 200-201. 1858.)

In Fremont county. C. A. White. (Geol. Iowa, I, 357-360. 1870.)

In Greene county. O. H. St. John. (Geol. Iowa, II, 134-138. 1870.)

In Guthrie county. O. H. St. John. (Geol. Iowa, II, 105-129. 1870.)

In Hamilton county. C. A. White. (Geol. Iowa, II, 256-257. 1870.)

In Harrison county. O. H. St. John. (Geol. Iowa, II, 179-181. 1870.)

In Henry county. A. H. Worthen. (Geol. Iowa, I, 211-214. 1858.)

In Jefferson county. A. H. Worthen. (Geol. Iowa, I, 233-236. 1858.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 188-190. 1858.)

In Lucas county. O. H. St. John. (Geol. Iowa, II, 85-95. 1870.)
Carboniferous (Upper).—Continued.

In Madison county. C. A. White. (Geol. Iowa, I, 308-315. 1870.) A rather full account, with sections, of geology of the county, with special reference to the coal.

In Mills county. C. A. White. (Geol. Iowa, I, 368-370. 1870.)

In Montgomery county. C. A. White. (Geol. Iowa, I, 363-366. 1870.)

In Muscatine county. J. D. Whitney. (Geol. Iowa, I, 274-277. 1858.)

In Page county. C. A. White. (Geol. Iowa, I, 349-352. 1870.)

In Pottawattamie county. C. A. White. (Geol. Iowa, I, 378-380. 1870.)

In Ringgold county. C. A. White. (Geol. Iowa, I, 328. 1870.)

In Scott county. A. S. Tiffany. (Geol. Scott County, etc., 30-34. 1885.)

In Taylor county. C. A. White. (Geol. Iowa, I, 347. 1870.)

In Union county. C. A. White. (Geol. Iowa, I, 232-234. 1870.)

In Van Buren county. A. H. Worthen. (Geol. Iowa, I, 222-226. 1858.)

In Wapello county. A. H. Worthen. (Geol. Iowa, I, 250-254. 1858.)

In Warren county. O. H. St. John. (Geol. Iowa, II, 46-47. 1870.)

In Washington county. A. H. Worthen. (Geol. Iowa, I, 241-242. 1858.)

Carboniferous (Upper).—Continued.


Paleontology of Eastern Nebraska. F. B. Meek. (U. S. Geol. Surv. of Nebraska, 83-245. 1872.) Numerous incidental references to the occurrence of fossils in Upper Coal Measures of Iowa.


Rocks of southwestern Iowa shown to be of this age instead of Lower Carboniferous. C. A. White. (Am. Jour. Sci., (2), XLIV, 23-31. 1867.)

Stratigraphy of the Carboniferous of Central Iowa. C. R. Keyes. (Bul. Geol. Soc. America, II, 277-292.) Description of the stratigraphical relations
Carboniferous (Upper).—Continued.

of the various beds in the central part of the State.

Carroll County.
General description. O. H. St. John. (Geol. Iowa, II, 138-146. 1870.) The surface features and general geology briefly described, with several sections.

Cass County.
General geological characters. C. A. White. (Geol. Iowa, 371-376. 1870.) The drainage, surface characters and geology briefly given, with several sections.


Caverns.
General remarks. C. A. White. (Geol. Iowa, I, 80-81. 1870.) A few of the best known briefly considered.

Cedar County.
Analyses of peat. Rush Emery. (Geol. Iowa, II, 397. 1870.)
Cedar County.—Continued.
Geological notes. J. D. Whitney. (Geol. Iowa, I, 278-282. 1858.)

Cedar Valley Limestone.

Celestite.
Its occurrence near Ft. Dodge. C. A. White. (Geol. Iowa, II, 304. 1870.)

Cephalopods.
Description of new species from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)
Cerro Gordo County.

Analyses of peat. Rush Emery. (Geol. Iowa, II, 398-399. 1870.)


General description. C. A. White. (Geol. Iowa, II, 240-251. 1870.)

Notes on the Rockford Shales. C. L. Webster. (Am. Naturalist, XXII, 444-446. 1888.)

Certain Forms of Straparollus from Southeastern Iowa. C. R. Keyes. (Am. Geologist, V, 193-197. 1890.)


Chemical Analyses of coal from various counties. Rush Emery. (Geol. Iowa, II, 357-395. 1870.)


Chemistry and Economical Geology. J. D. Whitney. (Geol. Iowa, I, 324-472. 1858.)

Chemistry of Iowa Artesian Waters. R. E. Call. (Monthly Rev. Iowa Weather and Crop Service, II, No. 2, 1-5. 1892.)

Chemung Group.
General description of the characters. James Hall. (Geol. Iowa, I, 88-91. 1858.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 196. 1858.)

In Scott county. A. S. Tiffany. (Geol. Scott County, etc., 27-30. 1885.)

Cherokee County.

Chickasaw County.
Notice of the geology. J. D. Whitney. (Geol. Iowa, I, 306-311. 1858.)

Cincinnati Group.
General description. C. A. White. (Geol. Iowa, I,
Cincinnati Group.—Continued.

180-182. 1870.) The general characters, economic value and geological age described briefly.


Clarke County.

General description. C. A. White. (Geol. Iowa, I, 310-318. 1870.) Brief reference to the geology and economic resources.

Classification of the Crinoidea. C. R. Keyes. (Am. Naturalist, XXIII, 153. 1889.)


Clay.


Properties. C. A. White. (Geol. Iowa, II, 323-328. 1870.) A short account of some of the properties of Iowa clays.

Analyses. Rush Emery. (Geol. Iowa, II, 349-350. 1870.)

Clay County.

General description. C. A. White. (Geol. Iowa, II, 224-225. 1870.) Mere reference to the surface features.

Clayton County.

Notes on the geology. J. D. Whitney. (Geol. Iowa, I, 297-302. 1858.)

Climate.

Of Iowa. J. D. Whitney. (Geol. Iowa, I, 27-34. 1858.)
Climate.—Continued.

Of Iowa. T. S. Parvin. (Geol. Iowa, i, Ch. iv, 139-164. 1870.) A summary of the climatology of the State, based upon observations from 1839 to 1870, with tables.

Clinton County.

Geological notes. J. D. Whitney. (Geol. Iowa, i, 278-282. 1858.)

Pockets of fire-clay in Niagara limestone. J. P. Farnsworth. (Am. Geologist, II, 331-334. 1888.)

Clinton Group.

General description of the characters. James Hall. (Geol. Iowa, I, 70-71. 1858.)

Coal.


Chemical analyses. J. D. Whitney. (Geol. Iowa, I, 397-414. 1858.)

Chemical analyses. Rush Emery. (Geol. Iowa, II, 357-395. 1870.)


General description of the characters. James Hall. (Geol. Iowa, I, 120-141. 1858.)

CoaL—Continued.
In Guthrie county.  O. H. St. John.  (Geol. Iowa, II, 128-129. 1870.)
In Henry county.  A. H. Worthen.  (Geol. Iowa, I, 218. 1858.)
In Iowa drift.  C. A. White.  (Geol. Iowa, I, 97. 1870.)
In Jefferson county.  A. H. Worthen.  (Geol. Iowa, I, 237. 1858.)
In Lucas county.  O. H. St. John.  (Geol. Iowa, II, 94. 1870.)
In Marion county.  C. A. White.  (Geol. Iowa, II, 263-265. 1870.)
In Wapello county.  A. H. Worthen.  (Geol. Iowa, I, 256. 1858.)
In Washington county.  A. H. Worthen.  (Geol. Iowa, I, 246. 1858.)
Iowa Coal Beds.  C. R. Keyes.  (Coal Trade Jour., XXXII, 133. March 1, 1893.)
Iowa Coal Beds.  C. R. Keyes.  (Mon. Rev. Iowa Weather and Crop Service, IV, No. 1, 3-5. 1893.)
Coal.—Continued.
Accounts of the different coal mines of the State.
Coal Measures (Lower).
Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-367. 1892.)
BIBLIOGRAPHY.

Coal Measures (Lower).—Continued.


Description of Iowa fossils. James Hall. (Geol. Iowa, I, 711-724. 1858.)

Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)

Description of the general characters in Iowa. C. A. White. (Geol. Iowa, I, 232-241. 1870.) The general characters, economic value and fossils described.

Description of the rocks along the Des Moines river. D. D. Owen. (Rep. Geol. Sur. Wis., Iowa and Minn., 105-133. 1852.)


Coal Measures (Lower).—Continued.

In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 200-201. 1858.)

In Guthrie county. O. H. St. John. (Geol. Iowa, II, 105-106. 1870.)

In Hamilton county. C. A. White. (Geol. Iowa, II, 256-257. 1870.)

In Henry county. A. H. Worthen. (Geol. Iowa, I, 211-214. 1858.)

In Jefferson county. A. H. Worthen. Geol. Iowa, I, 233-236. 1858.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 188-190. 1858.)

In Lucas county. O. H. St. John. (Geol. Iowa, II, 81-85. 1870.)

In Muscatine county. J. D. Whitney. (Geol. Iowa, I, 274-277. 1858.)

In Scott county. A. S. Tiffany. (Geol. Scott County, etc., 30-34. 1885.)

In Van Buren county. A. H. Worthen. (Geol. Iowa, I, 222-226. 1858.)

In Wapello county. A. H. Worthen. (Geol. Iowa, I, 250-254. 1858.)

In Warren county. O. H. St. John. (Geol. Iowa, II, 46-47. 1870.)

In Washington county. A. H. Worthen. (Geol. Iowa, I, 241-242. 1858.)


BIBLIOGRAPHY.

Coal Measures (Lower).—Continued.

Stratigraphy of the Carboniferous in Central Iowa. C. R. Keyes. (Bul. Geol. Soc. America, II, 277-292. 1891.) Description of the stratigraphical relations of the various beds in the central part of the State.

Coal Measures (Middle).—See Upper Coal Measures.

Coal Measures (Upper).
Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, I-367. 1892.)

Chert of the Upper Coal Measures in Montgomery County. [S. Calvin.] (Am. Geologist, I, 116-117. 1888.)


In Adair county. C. A. White. (Geol. Iowa, I, 337-339. 1870.)

In Cass county. C. A. White. (Geol. Iowa, I, 373-375. 1870.)
Coal Measures (Upper).—Continued.
In Dallas county. O. H. St. John. (Geol. Iowa, II, 13-46. 1870.)
In Guthrie county. O. H. St. John. (Geol. Iowa, II, 128. 1870.)
In Harrison county. O. H. St. John. (Geol. Iowa, II, 179-181. 1870.)
In Lucas county. O. H. St. John. (Geol. Iowa, II, 93-94. 1870.)
In Madison county. C. A. White. (Geol. Iowa, I, 308-315. 1870.) A rather full account, with sections, of the geology of the county, with special reference to the coal.
In Mills county. C. A. White. (Geol. Iowa, I, 369-370. 1870.)
In Montgomery county. C. A. White. (Geol. Iowa, I, 363-366. 1870.)
In Page county. C. A. White. (Geol. Iowa, I, 349-352. 1870.)
In Pottawattamie county. C. A. White. (Geol. Iowa, I, 378-380. 1870.)
In Ringgold county. C. A. White. (Geol. Iowa, I, 328. 1870.)
In Taylor county. C. A. White. (Geol. Iowa, I, 345. 1870.)
In Union county. C. A. White. (Geol. Iowa, I, 232-234. 1870.)
In Warren county. O. H. St. John. (Geol. Iowa, II, 46-47. 1870.)
BIBLIOGRAPHY.

Coal Measures (Upper).—Continued.

Of Decatur county. C. A. White. (Geol. Iowa, I, 320-325. 1870.)

Paleontology of Eastern Nebraska. F. B. Meek. (U. S. Geol. Surv. of Nebraska, pp. 83-245. 1872.)
Numerous incidental references to the occurrence of fossils in the Upper Coal Measures of Iowa.


Rocks of southwestern Iowa shown to be of this age, instead of Lower Carboniferous. C. A. White. (Am. Jour. Sci., (2), XLIV, 23-31. 1867.)

Coelenterates.—See Corals.


Concretionary Limestone.—(Also see St. Louis Limestone.)

In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 201. 1858.)

In Henry county. A. H. Worthen. (Geol. Iowa, I, 215-216. 1858.)

In Jefferson county. A. H. Worthen. (Geol. Iowa, I, 236-237. 1858.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 190-191. 1858.)

In Van Buren county. A. H. Worthen. (Geol. Iowa, I, 226-227. 1858.)

In Wapello county. A. H. Worthen. (Geol. Iowa, I, 254-255. 1858.)
Cone-in-Cone.


Contribution to the Knowledge of the Genus Pachyphyllum. C. L. Webster. (Am. Naturalist, XXIII, 621-625. 1889.)


Contribution to the Paleontology of Iowa, being descriptions of Crinoidea and other fossils. J. Hall. (Geol. Iowa, I, Supp., 1-92. 1859.)

Copper.
In Iowa drift. C. A. White. (Geol. Iowa, I, 96. 1870.) Occurrence in Iowa. C. A. White, (Geol. Iowa, II, 342. 1870.) The report of native copper ore from the drift.

Corals.

Corals.—Continued.

Description of new species from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)


Pachyphyllum from the Rockford Shales. C. L. Webster. (Am. Naturalist, XXIII, 621-625. 1889.)
Corals.—Continued.


Corniferous.

In Scott county. A. S. Tiffany. (Geol. Scott County, etc., 13-19. 1885.)

County Geology. J. D. Whitney. (Geol. Iowa, I, 259-323. 1857.) Geological notes on the northeastern counties of Iowa.

Crawford County.


Crinoids.


Classification of Crinoidea. C. R. Keyes. (Am. Naturalist, XXIII, 153. 1889.)


Description of new species. J. Hall. (Pamphlet, pp. 1-19. 1861.)


Description of new species from Iowa. J. Hall. (Geol. Iowa, I, 1-92. 1859.)

Crinoids.—Continued.


Description of new species from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)


Crinoids.—Continued.


Crinoids.—Continued.


New species from the Lower Carboniferous rocks of Iowa. A. H. Worthen and F. B. Meek. (Geol. Surv. Illinois, VI, 489-532. 1875.)

New species from the Lower Carboniferous of Marshall county. S. A. Miller and W. F. E. Gurley. (Pamphlet, 59 pp. 1890.)


BIBLIOGRAPHY.

Crinoids.—Continued.


With Platyceras attached. C. R. Keyes. (Am. Naturalist, XXII, 924. 1888.)

Cretaceous.


Description of the rocks at Sioux City. J. Marcou. (Bul. Soc. Géol. de France, (2), t. XXIV, 56. 1866.)
BIBLIOGRAPHY.

Cretaceous.—Continued.


Fossils in Iowa drift. C. A. White. (Geol. Iowa, I, 98. 1870.)

Fossils in Nishnabotna sandstone. C. A. White. (Geol. Iowa, I, 290. 1870.)


Fossils in the drift of Hardin county. C. A. White. (Am. Geologist, I, 221-227. 1888.)

Fossils in the drift of Linn county. [S. Calvin.] (Am. Geologist, I, 237. 1888.)

In Carroll county. O. H. St. John. (Geol. Iowa, II, 143-144. 1870.)

In Cass county. C. A. White. (Geol. Iowa, I, 373-375. 1870.)

In Greene county. O. H. St. John. (Geol. Iowa, II, 133-134. 1870.)


In Mills county. C. A. White. (Geol. Iowa, I, 368-370. 1870.)

In Montgomery county. C. A. White. (Geol. Iowa, I, 363-366. 1870.)
Cretaceous.—Continued.


In Woodbury county. O. H. St. John. (Geol. Iowa, II, 192-199. 1870.)

Leaves found in the Nishnabotna sandstone. C. A. White. (Geol. Iowa, I, 292-293. 1870.)


References to the geology at the mouth of the Big Sioux. F. B. Meek. (U. S. Geol. Sur. Terr., IX, p. xxv. 1876.)

Relation of the Cretaceous Deposits of Iowa to the Subdivisions of the Cretaceous proposed by Meek and Hayden. S. Calvin. (Proc. Iowa Acad. Sci., I, pt. iii, pp. 7-12. 1893.)

Crustacea.


BIBLIOGRAPHY.

273

Crustacea.—Continued.


Dallas County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 390. 1870.)

General description of the geological features. O. H. St. John. (Geol. Iowa, II, 13-46. 1870.) A full account of the geology of the county, with numerous sections and illustrations. A number of localities affording fossils mentioned.


Davis County.

General description. C. A. White. (Geol. Iowa, II, 271. 1870.) Mere mention of the occurrence of the Coal Measures in the county.


Decatur County.

General geology described. C. A. White. (Geol. Iowa, I, 318-327. 1870.) A consideration of the surface characters and geology of the county, with a number of sections and a detailed description.


Delaware County.


Description of a New Genus of Corals from the Devonian Rocks of Iowa. C. L. Webster. (Am. Naturalist, XXIII, 710-712. 1889.)


Description of Invertebrates. A. H. Worthen and F. B. Meek. (Geol. Sur. Illinois, VI, 489-532. 1875.)


Description of New Fossil Crinoidea from the Paleozoic Rocks of the Western and Southern Portions of the United States. B. F. Shumard. (Trans. Acad. Sci., St. Louis, I, 71-80. 1858.)


Description of New Species of Blastoidea from the Paleozoic Rocks of the Western States, with some Observa-
Description, etc.—Continued.


- **Description of New Species of Crinoidea.** J. Hall. (Pamphlet, 1-19. 1861.)


- **Description of New Species of Crinoidea from the Carboniferous Rocks of the Mississippi Valley.** J. Hall. (Bost. Jour. Nat. Hist., VII, 251-328. 1861.)


Description of Some New Genera and Species of Echinodermata from the Coal Measures and Subcarboniferous Rocks of Indiana, Missouri and Iowa. S. A. Miller and W. F. E. Gurley. (Pamphlet, 59 pp., 10 plates. 1890.)


Description of the Quarries and Quarry Regions of Iowa. W. J. McGee. (Tenth Census of U. S., X, 256-265. 1883.)


BIBLIOGRAPHY.

Description of New Species of Crinoidea and Echinodermata
from the Carboniferous Rocks of Illinois and other
Western States. F. B. Meek and A. H. Worthen.

Des Moines County.
Attachment of Platyceras to Palæocrinoids. C. R.
Keyes. (Am. Naturalist, XXII, 924. 1888.)
Brief notes on the geology. C. A. White. (First
Certain Forms of Straparollus from Southeastern Iowa.
C. R. Keyes. (Am. Geologist, V, 193-197. 1890.)
Classification of the Lower Carboniferous Rocks of the
Mississippi Valley. C. R. Keyes. (Washington:
Judd and Detweiller, printers; 1-24. 1892.) Sections
and details of the rocks in southeastern Iowa.
Description of new species of crinoids from Burling-
Description of new species of echinoderms. F. B.
Phila., XIX, 251-275. 1868.)
1870.)
Evidence of Two Distinct Geological Formations in
the Burlington Limestone. W. H. Niles and
Charles Wachsmuth. (Am. Jour. Sci., (2), XLII,
95-99. 1866.) A sketch of the Burlington beds
and a list of crinoids found in the upper and lower
divisions.
Fish remains in the Carboniferous limestone. A. H.
1856.)
Fossils from the “yellow” sandstone found at Bur-
BIBLIOGRAPHY.

Des Moines County.—Continued.


General account of the geological formations. A. H. Worthen. (Geol. Iowa, I, 198-208. 1858.) A brief detailed account of the geology of the county.


New species of brachiopods from Burlington. A.
Des Moines County.—Continued.


New species of crinoid from Burlington limestone.


New species of crinoids from Burlington. C. A. White.

New species of echinoderms described from Burlington.

New Species of Platycrinus and other Fossils from the Mountain Limestones of Illinois and Iowa.
        A. H. Worthen. (Trans. Acad. Sci., St. Louis, I, 569-571. 1860.)

Observations on rocks and description of new species of fossils from Burlington, Iowa.

Principal Mississippian Section. C. R. Keyes. (Bull. Geol. Soc. America, III, 283-300. 1892.) Sections and details of the lower Carboniferous rocks described.


Devonian.

Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-367. 1892.)


Description of new fossils. James Hall. (Geol. Iowa, I, 476-516. 1858.)


Devonian.—Continued.

Description of the geological features along the Cedar and Iowa rivers in eastern Iowa. D. D. Owen. (Rep. Geol. Sur. Wis., Iowa and Minn., 77-90. 1852.)


General geological description. C. A. White. (Geol. Iowa, I, 184-188. 1870.) The general characters economic value and geological age of various beds briefly described.

In Buchanan county. S. Calvin. (Am. Geologist, VIII, 142-145. 1891.)

In Scott county. A. S. Tiffany. (Geol. Scott County, etc., 1-30. 1885.)

General Preliminary Description of the Devonian Rocks of Iowa, which constitutes a Typical Section of the Devonian Formation of the Interior Contin-
Devonian.—Continued.

Entafarea of North America. C. L. Webster. (Am. Naturalist, XXIII, 229-243. 1889.)


New Genus of Corals. C. L. Webster. (Am. Naturalist, XXIII, 710-712. 1889.)


New species of Blastoisea from the Paleozoic rocks of Western States. B. F. Shumard. (Trans. Acad. Sci., St. Louis, I, 238-248. 1858.)


BIBLIOGRAPHY.

Devonian.—Continued.

Notes on the Rockford Shales. C. L. Webster. (Am. Naturalist, XXII, 444-446. 1888.)


Some Geological Problems of Muscatine County. S. Calvin. (Bul. Lab. Nat. Hist. State Univ. Iowa, I, 7-18. 1888.) Certain rocks in the county shown to be Devonian instead of Kinderhook, as was formerly supposed by Hall.


Dickerson County.


Distribution of Certain Loess Fossils. C. R. Keyes. (Am. Geologist, VI, 119. 1890.)

Drainage.


General drainage features. C. A. White. (Geol. Iowa, I, 35-70. 1870.) General course and characters of the rivers with estimates of average fall of the principal streams. Also special description of the different water courses.

Drift.


At Burlington, Iowa. C. R. Keyes. (Am. Naturalist, XXII. 1049-1054. 1888.)


Cretaceous fossils in the drift. [S. Calvin.] (Am. Geologist, I, 237. 1888.)


Drift.—Continued.

Cretaceous fossils found in the drift at Des Moines. General description. C. A. White. (Geol. Iowa, I, 32-102. 1870.) A general account of the physical composition and properties of the drift, as found in Iowa; together with its distribution. Its origin, glacial phenomena and foreign substances found in it described. Altered drift briefly referred to.


In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 200. 1858.)
In Henry county. A. H. Worthen. (Geol. Iowa, I, 210-211. 1858.)
In Lee county. A. H. Worthen. (Geol. Iowa, I, 187-188. 1858.)
In Madison county. C. A. White. (Geol. Iowa, I, 305-308. 1870.)
In Van Buren county. A. H. Worthen. (Geol. Iowa, I, 221. 1858.)
Iowa Drift. C. A. White. (Am. Naturalist, II, 615-616. 1869.) Calls attention to the original site of the granite boulders found in Iowa.
Its derivation. C. A. White. (Am. Naturalist, II, 615-616. 1869.)
Notes on the geology of a part of the Mississippi Valley. W. J. McGee. (Geological Magazine, (2), VI, 412-420 and 353-362. 1879.)
BIBLIOGRAPHY.

Drift.—Continued.


Quaternary Section Eight Miles Southeast of Des Moines, Iowa. C. R. Keyes and R. E. Call. (Proc. Iowa Acad. Sci., 1890-1891, 30. 1892.) Description of a section near the terminal moraine near Des Moines.


Surface geology of Keokuk. C. H. Gordon. (Am. Geologist, IX, 183-190. 1892.)

Drift.—Continued.


Transitional Drift of a Portion of Northern Iowa. C. L. Webster. (Am. Naturalist, XXIV, 1182-1185. 1890.)

Dubuque County.


BIBLIOGRAPHY. 291


**Echinoderms.**


Classification of Crinoidea. C. R. Keyes. (Am. Naturalist, XXIII, 153. 1889.)

Description of new species from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)


Echinoderms.—Continued.


Echinoderms.—Continued.


New species from the Lower Carboniferous of Marshall county. S. A. Miller and W. F. E. Gurlley. (Pamphlet, 59 pp. 1890.)

New species from the Lower Carboniferous rocks of Iowa. A. H. Worthen and F. B. Meek. (Geol. Sur. Illinois, VI, 489-532. 1875.)


Echinoderms.—Continued.

New species of crinoid from the Burlington limestone.


Echinoids.


New species from the Burlington, F. B. Meek and
Echinoids.—Continued.


New species from the Burlington limestone of Burlington.

New species from the Lower Carboniferous of Marshall county.
S. A. Miller and W. F. E. Gurley. (Pamphlet, 59 pp. 1890.)

Elevations.

Principal points in the State. C. A. White. (Geol. Iowa, I, 30. 1870.) A tabular statement of the elevation of some of the chief places in the State.


Emmet County.

General geological description. C. A. White. (Geol. Iowa, II, 215-218. 1870.) Brief account of its surface features.

Notice of a Meteorite Fall. J. Torrey and E. H. Barbour. (Am. Geologist, VIII, 66. 1891.)

Epsomite.


Evidence that Lake Cheyenne Continued till the Ice Age.

Exogenous Leaves in the Cretaceous Rocks of Iowa.

Fall of the Meteoric Stones in Iowa.
C. U. Sheppard.
(Am. Jour. Sci., (2), IV, 228-289. 1847.)

Farnsworth, J. P. Pockets Containing Fire-Clay and Carboniferous Material in the Niagara Limestone at Clinton, Iowa.

Farnsworth, J. P. The Geology and Topography of Iowa with a Sanitary Point of View.

Fauna of the Lower Carboniferous Limestones of Spergen Hill, Ind., with a Revision of the Descriptions of its Fossils Hitherto Published and Illustrations of the Species from the Original Type Series.

Fayette County.
New Species of Paleozoic Fossils.
Notice of the geology.
J. D. Whitney. (Geol. Iowa, I, 302-305. 1858.)

F. V. Hayden.
(pp. 1-245. 1872.)

First Annual Report of the State Geologist.
C. A. White.
(First and Second Ann. Rep. State Geologist, 5-8. 1868.)
First Biennial Report of the State Mine Inspector for the years 1882-1883. P. C. Wilson. (pp. 1-94. 1883.)

Fire-Clay.

Fishes.

Floyd County.
Floyd County.—Continued.


New Genus of Corals from the Devonian. C. L. Webster. (Am. Naturalist, XXIII, 710-712. 1889.)

Notice of the geology. J. D. Whitney. (Geol. Iowa, I, 306-311. 1858.)


Pachyphyllum from the Rockford Shales. C. L. Webster. (Am. Naturalist, XXIII, 621-625. 1889.)


Fossil Wood from the Keokuk formation, Keokuk, Iowa. S. J. Wallace. (Am. Jour. Sci., (3,) XV, 396. 1878.)

Fossils.


Carboniferous Fossils from Jackson County. Herbert
Fossils.—Continued.


Certain forms of Straparollus from Southeastern Iowa. C. R. Keyes. (Am. Geologist, V, 193-197. 1890.) Notes on the species of this genus occurring near Burlington.


Classification of the Crinoidea. C. R. Keyes. (Am. Naturalist, XXIII, 153. 1889.) Brief remarks on the Classification of the order and changes necessitated by the discovery of the ventral structure of Taxocrinus (from the Kinderhook, near Marshalltown, Iowa).

Coal Measures of Central Iowa. C. R. Keyes. (Am. Geologist, II, 996-404.. 1888.) List of some of the species found in the middle Coal Measures at Des Moines.


Cretaceous and Carboniferous species in Iowa drift. C. A. White. (Geol. Iowa, I, 98. 1870.)


Description of the New Crinoids and Blastoids from the Hamilton Group. W. H. Barris. (Proc. Dav-
Fossils.—Continued.


Distribution in the Loess. C. R. Keyes. (Am. Geologist, VI, 119. 1889.)


BIBLIOGRAPHY.

Fossils.—Continued.
the lower Coal Measures of the central part of the state.
Fossils in Nishnabotna sandstone. C. A. White. (Geol. Iowa, I, 290. 1870.)
From Cretaceous, near Des Moines. C. R. Keyes. (Am. Naturalist, II, 396-404. 1888.) Notes on the species found in an erratic boulder at Des Moines; also reference to fossils of the same age found in other parts of Iowa in the drift.
From the Iowa Loess. R. E. Call. (Am. Naturalist, XV, 585-586. 1881.)
From the Loess of Iowa. C. R. Keyes. (Bul. Essex Inst., XX. 1889.)
From the Loess at Iowa City. B. Shimek. (Am. Geologist, I, 149-152. 1888.)
Fossils.—Continued.

From the Lower Magnesian limestone. S. Calvin. (Am. Geologist, X, 144-148. 1892.)


Leaves found in the Nishnabotna sandstone. C. A. White. (Geol. Iowa, I, 292-293. 1870.)

Fossils.—Continued.

New Genus of Corals from the Devonian. C. L. Webster. (Am. Naturalist, XXIII, 710-712. 1889.)


New species of organic remains from Iowa. J. Hall. (Geol. Sur. Wisconsin, pt. iii. 1-94. 1871.)


Notes on the Rockford Shales. C. L. Webster. (Am. Naturalist, XXII, 444-446. 1888.)


Of the Cincinnati group, Hudson river shales or Maquoketa shales. C. A. White. (Geol. Iowa, I, 182. 1870.)


Pachyphyllum from the Rockford Shales. C. L. Webster. (Am. Naturalist, XXIII, 621-625. 1889.)
Fossils.—Continued.

Platyceras attached to the fossil crinoids. C. R. Keyes. (Am. Naturalist, XXII, 924-925. 1889.)
Brief accounts of certain species of gastropods found attached to Iowa crinoids.


References to Iowa fossils. K. A. Zittel. (Handbuch der Paläontologie, I Band, 1-765. 1880.)


BIBLIOGRAPHY.

Fossils.—Continued.

Sponges from Iowa. E. O. Ulrich. (Geol. Surv. Illinois, VIII, 243-251. 1890.)

Stratigraphy of the Carboniferous in Central Iowa. C. R. Keyes. (Bul. Geol. Soc. America, II, 277-292. 1891.) List of the fossils found in the lower Coal Measures in the central part of the state with remarks on the same.


Table of species found in the Maquoketa shales. J. F. James. (Am. Geologist, V, 335-356. 1890.)


Franklin County.

Aluminum in Iowa. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-1891, 29-30. 1892.) Announce-
Franklin County.—Continued.

ment of the establishment of a plant for the manufacture of aluminum in Franklin county.

General description. C. A. White. (Geol. Iowa, II, 239-241. 1870.) The surface characters and material resources briefly described.


Fremont County.

General description. C. A. White. (Geol. Iowa, I, 353-362. 1870.) The drainage, surface characters, geological details and material resources of the country described.


Fuels.


A classification of the different kinds and their combustibility.

Galena Limestone.

Chemical analyses. J. D. Whitney. (Geol. Iowa, I, 350-356. 1858.)


Fossils mentioned from Iowa localities. R. P. Whitfield. (Geol. Sur. Wisconsin, IV, 163-349. 1882.)


General description of the characters. James Hall. (Geol. Iowa, I, 60-63. 1858.)


Gas (Natural).

Gas Wells near Letts, Iowa. F. M. Witter. (Proc. Iowa Acad. Sci., 1890-1891, 68-70. 1892.) Gas reported as being found in a number of places near Letts, in Louisa county, and furnishing supplies for a number of families.


Natural Gas and Oil in Iowa. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-1891, 68-70. 1892.)


Gasteropods.


Certain Forms of Straparollus from Southeastern Iowa. C. R. Keyes. (Am. Geologist, V, 193-197. 1890.)

Gasteropods.—Continued.

Inary note. Two species described from the Lower Coal Measures at Des Moines.

Description of new species from Iowa. J. Hall.

(Geol. Iowa, I, Supp., 1-92. 1859.)

Description of new species from the Iowa Lower Carboniferous. F. B. Meek and A. H. Worthen.

(Geol. Sur. Illinois, III, 289-565. 1868.)

Description of new species from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)


Distribution of fossils in the Loess. C. R. Keyes.

(Am. Geologist, VI, 119. 1890.)


From the Iowa Loess. R. E. Call. (Am. Naturalist, XV, 585-586. 1881.)

From the Loess at Iowa City. B. Shimek. (Am. Geologist, I, 149-152. 1888.)

From Iowa. J. Hall. (Nat. Hist. New York, Pal., V, pt. ii. 1879.) A number of references to fossils from Iowa.

From the Lower Magnesian limestone. S. Calvin.

(Am. Geologist, X, 144-148. 1892.)
Gasteropods.—Continued.

In the Loess of Central Iowa. R. E. Call. (Am. Naturalist, XV, 782-784. 1881.)


Gasteropoda, etc. J. Hall. (Nat. Hist. New York, Pal., V, pt. ii. 1879.)


Notes on the Rockford Shales. C. L. Webster. (Am. Naturalist, XXII, 444-446. 1888.)

Gasteropods.—Continued.
Soleniscus; its Relations and Generic Characters. C. R. Keyes. (Am. Naturalist, XXIII, 420-429. 1889.)
Species mentioned from Silurian rocks of Iowa. R. P. Whitfield. (Geol. Sur. Wisconsin, IV, 163-349. 1882.)
General Geology of Iowa. James Hall. (Geol. Iowa, I, 34-146. 1858.)
General Preliminary Description of the Devonian Rocks of Iowa, which constitutes a Typical Section
General, etc.—Continued.


Geological History of the North American Continent. J. Hall. (Pamphlet, 1-24. 1869.)

Geological Map of Iowa. C. A. White. (Geol. Iowa, I, 32. 1870.)

Geological Map of the Eastern Half of the State of Iowa; by Legislative Authority. J. Hall, J. D. Whitney and A. H. Worthen. (Geol. Iowa, I. 1858.)


Geological Map of the State of Iowa. C. A. White. (Geol. Iowa, II. 1870.)


Geology of certain counties. A. H. Worthen. (Geol. Iowa, I, 183-258. 1858.)


Geology of Scott County, Iowa, and Rock Island County, Illinois, and the adjacent Territory. A. S. Tiffany. (1-34, Glass and Hoover, Printers, Davenport, 1885.)

Geology of the Des Moines valley. A. H. Worthen. (Geol. Iowa, I, 147-182. 1858.)


Geology of the Middle Region of Western Iowa. O. H. St. John. (Geol. Iowa, II, 1-200. 1870.)


BIBLIOGRAPHY


Glacial Phenomena (General.) See Quaternary.

Gold.

In Iowa drift. C. A. White. (Geol. Iowa, I, 97. 1870.)


Gravel.
In the drift. C. A. White. (Geol. Iowa, I, 84. 1870.)

Greene County.
Analyses of coal. Rush Emery. (Geol. Iowa, II, 391-392. 1870.)
General description of the geology. O. H. St. John. (Geol. Iowa, II, 130-138. 1870.) The geological features briefly described, with several sections.


Guthrie County.
Analyses of coal. Rush Emery. (Geol. Iowa, II, 387-388. 1870.)
Description of the geological features. O. H. St. John. (Geol. Iowa; II, 95-130. 1870.) A detailed account of the leading geological features in various parts of
BIBLIOGRAPHY.

Guthrie County.—Continued.

the county accompanied by numerous sections and illustrations.

Fossils in Nishnabotna sandstone. C. A. White. (Geol. Iowa, I, 290. 1870.)

Gypsum.


Hackberry Shales.


Hall, James. Description of New Species of Crinoidea from the Carboniferous Rocks of the Mississippi Valley. (Boston Jour. Nat. Hist., vol VII, pp. 251-328. Boston, 1861.) The majority of the species described are from Iowa.

Hall, James. Description of New Species of Crinoids. (Pamphlet, pp. 1-19. Albany, 1861.)


Hall, James. General Geology of Iowa. (Geol. Iowa, vol. I, pp. 34-146. Albany, 1858.) A short general account of the rocks of the State, with special reference to their geological relations, forms chapter ii. A general description of the geological formations of the State forms chapter iii.


Hall, James. Notes Explanatory of a Section from Cleveland, Ohio, to the Mississippi River, in the Southwest Direction, with Remarks upon the Identity of the Western Formations with those of New York. (Trans. As. Am. Geologists and Naturalists, pp. 267-293. Boston, 1842.) Incidental references to the geology of Iowa.


Hall, James. On the Carboniferous Limestone of the Mississippi Valley. (Proc. Am. As. Ad. Sci., vol. X, pp. 51-69. Cambridge, 1857.) Statement that the Coal Measures were deposited unconformably upon strata beneath, whether they were Carboniferous limestones, Devonian, Upper and Lower Silurian; the unconformity differing only in degree, and that the
Hall, James.—Continued.
Coal Measures were laid down over a much greater area than they now occupy.


PART FIRST (GEOLOGY).
Chapter I is a description of the Physical Geography of the State. (See J. D. Whitney, 1858.)
Chapter II treats of the General Geology of the State, and the relations of the formations with those of the East.
Hall, James.—Continued.

Chapter III describes in detail the different geological formations of the State from observations made during the years 1855-1857.

Chapter IV deals with the geology of Des Moines valley. (See A. H. Worthen, 1858.)

Chapter V is a detailed account of the geology of certain counties in southeastern Iowa. (See A. H. Worthen, 1858.)

Chapter VI is an account of the geology of various counties in the central and northern part of eastern Iowa. (See J. D. Whitney, 1858.)

Chapter VII is a chemical and economical report. (See J. D. Whitney, 1858.)

PART SECOND (PALEONTOLOGY).

Chapter VIII is made up of descriptions accompanied by illustrations of the numerous fossils of the different horizons as found in Iowa.

Hall, James. Report of the Geology of the State of Iowa. (Vol. I, pp. 474-724, Part Second, Paleontology, 29 plates. 1858.) This forms Chapter VIII of Vol. I, and is made up entirely of descriptions of fossils. A large number of genera and species are described as new.


Hall, James, Whitney, J. D., and Worthen, A. H. Geological Map of the Eastern Half of the State of Iowa; by Legislative Authority. (Geol. Iowa, vol. I. Albany, 1858.)
Hamilton Formation.

Analyses of Lime. J. D. Whitney. (Geol. Iowa, I, 370-376. 1858.)

Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-267. 1892.)


Description of Conocardium altum regarded as new. General description. C. A. White. (Geol. Iowa, I, 184-188. 1870.) The general characters, economic value and geographical age of various beds, with their fossils briefly described.


Description of the geological features along the Cedar and Iowa rivers in eastern Iowa. D. D. Owen. (Rep. Geol. Sur., Wis., Iowa and Minn., 77-90. 1852.)


Description of Devonian fossils from Iowa. James Hall. (Geol. Iowa, I, 476-516. 1858.)
Hamilton Formation.—Continued.

General description of the characters. James Hall. (Geol. Iowa, I, 85-88. 1858.)

In Scott county. A. S. Tiffany. (Geol. Scott County, etc., 19-26. 1885.)


Hamilton County.


General description. C. A. White. (Geol. Iowa, II, 256-257. 1870.) Brief reference to the geology.

Hancock County.
General description. C. A. White. (Geol. Iowa, II, 247-249. 1870.) Brief general account of the surface characters.

Hardin County.
Analyses of coal. Rush Emery. (Geol. Iowa, II, 392-393. 1870.)
Geological notes. J. D. Whitney. (Geol. Iowa, I, 266-273. 1858.)
General description. C. A. White. (Geol. Iowa, II, 257-258. 1870.) Very brief general reference to the geology of the county.

Harrison County.
Description of the geology. O. H. St. John. (Geol. Iowa, II, 175-182. 1870.) The surface features and soil described and the upper Coal Measures noted in the vicinity of Logan.


Hayden, F. V. (Final Report of the U. S. Geological Survey of Nebraska and Portions of the Adjacent Territories, pp. 1-79. 1872.) A number of incidental references to the geology of western Iowa.

Henry County.
General description of the geology. A. H. Worthen.
(Geol. Iowa, I, 209-219. 1858.) Brief general account of the geological formations of the county.

Helderberg (Upper).
General description of the characters. James Hall.
(Geol. Iowa, I, 81-84. 1858.)
In Scott county. A. S. Tiffany. (Geol. Scott County, etc., 13-19. 1885.)

An abstract of a more fully explained paper.


(Second Ann. Rep. State Geologist, pp. 263-279. Des Moines, 1868.) The report embraces chemical notes on fuel, water, rocks and coal of Iowa; also notes on the minerals.


Howard County.
Notice of the geology. J. D. Whitney. (Geol. Iowa, I, 306-312. 1858.)

Hudson River Shales.
(Am. Geologist, V, 335-356. 1890.)
General description. C. A. White. (Geol. Iowa, I, 180-182. 1870.) The general characters, economic
Hudson River Shales.—Continued.

value and geological age of these rocks in Iowa described, with brief references to their sections and the fossils contained. See also Maquoketa Shales. General description of the characters. James Hall. (Geol. Iowa, I, 64-70. 1858.)


Humboldt County.

General geological description. C. A. White. (Geol. Iowa, II, 243-245. 1870.) Brief account of surface features; and mention of lower Carboniferous rocks.


Hydrography.

General drainage features. C. A. White. (Geol. Iowa, I, 35-70. 1870.) General course and character of the rivers, with estimates of average fall of the principal streams. Also special description of the different water courses.

Ida County.

General surface features described. O. H. St. John. (Geol. Iowa, II, 158-164. 1870.)

Igneous Rocks.

Iowa Volcano. C. R. Keyes. (Mon. Rev. Iowa Weather and Crop Service, IV, 5-6. 1893.)
Igneous Rocks.—Continued.


Volcanic Eruption in Iowa, An Old. C. R. Keyes. (Science, XXI, 132. 1893.)

Independence Shales.


Iowa (General).


Age of Certain Sandstones near Iowa City. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-1891, 26. 1892.) Owing to the recent discovery of fossils in the sandstones near Iowa City the suggestion is made that their age may be Kinderhook (lower Carboniferous) instead of upper Coal Measures as have been heretofore regarded.


Iowa (General).—Continued.
Building stones in Iowa. W. C. Day. (Rep. Mining Industry in the U. S. at the 11th Census, 1890, 593-666. 1892.)
Chemical report on the fuels of Iowa. G. Hinrichs.
Iowa (General).—Continued.

A classification of the different kinds of fuels and comparisons of their combustibility.


Classification of the Lower Carboniferous Rocks of the Mississippi Valley. C. R. Keyes. (Washington: Judd and Detweiller, printers, 1-24. 1892.) Sections and details of some of the lower Carboniferous rocks in southeastern Iowa described; with allusions to the Coal Measures of the central part of the state.


Contributions to the Paleontology of Iowa. J. Hall. (Geol. Iowa, I, Supp., 1-92. 1859.)


Iowa (General).—Continued.

Cretaceous Deposits at the Mouth of the Big Sioux. F. B. Meek. (U. S. Geol. Sur. Ter., IX, p. xxv. 1876.)

Cretaceous Rocks near Sioux City. J. Marcou. (Bul. Soc. géol. de France, (2), t. XXIV, 56. 1866.)


Description of Burlington fossils. James Hall. (Geol. Iowa, I, 524-605. 1858.)

Description of Devonian fossils. James Hall. (Geol. Iowa, I, 476-516. 1858.)


Description of fossils from the Kinderhook. James Hall. (Geol. Iowa, I, 517-523. 1858.)

Description of geological features along the Cedar and Iowa rivers in eastern Iowa. D. D. Owen. (Rep. Geol. Sur. Wis., Iowa and Minn., 77-90. 1852.)


Description of Keokuk fossils. James Hall. (Geol. Iowa, I, 606-667. 1858.)


Description of lower Coal Measure fossils. James Hall. (Geol. Iowa, I, 711-724. 1858.)
BIBLIOGRAPHY.

Iowa (General).—Continued.


Description of New Species of Crinoidea. J. Hall. (Pamphlet, pp. 1-19. 1861.)


Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)
Iowa (General).—Continued.


Description of rocks in eastern Kansas and Nebraska and their relation to those of adjacent states, etc. F. B. Meek. (Am. Jour. Sci., (2), XXXIX, 157-174. 1865.) Numerous incidental references to the geology of western Iowa.

Description of St. Louis fossils. James Hall. (Geol. Iowa, I, 667-677. 1858.)


Description of the Upper Carboniferous rocks along the Des Moines river. D. D. Owen. (Rep. Geol. Sur. Wis., Iowa and Minn., 105-133. 1852.)


Derivation of Iowa drift. C. A. White. (Am. Naturalist, II, 615-616. 1889.)

Distribution of fossils in the Loess. C. R. Keyes. (Am. Geologist, VI, 119. 1890.)
Iowa (General).—Continued.


Iowa (General).—Continued.


Fossils from the lower Magnesian limestone. S. Calvin. (Am. Geologist, X, 144-148. 1892.)

Fossils from the Loess of Iowa. C. R. Keyes. (Bul. Essex Inst., XX. 1889.)

Fossils mentioned from Iowa localities. R. P. Whitfield. (Geol. Sur. Wisconsin, IV, 163-349. 1882.)


Gasteropods from Iowa. J. Hall. (Nat. Hist. New York, Pal., V, pt. ii. 1879.) A number of references to fossils from Iowa.


General references to the building stones of Iowa. G. P. Merrill. (Stones for Building and Decorating, 453 pp. New York, 1891.)

Iowa (General).—Continued.

General Preliminary Description of the Devonian Rocks of Iowa; which Constitutes a Typical Section of the Devonian Formation of the Interior Area of North America. C. L. Webster. (Am. Naturalist, XXIII, 229-243. 1889.)

Geological map of eastern Iowa. James Hall. (Geol. Iowa, I. 1858.)


Geological map of Iowa. C. A. White. (Geol. Iowa, II. 1870.)


Geology and Topography of Iowa in a Sanitary Point of View. J. P. Farnsworth. (Iowa State Board of Health, Second Biennial Rep., 383-396. 1883.)


Iowa (General).—Continued.


Iowa Drift. C. A. White. (Am. Naturalist, II, 615-616. 1889.) Calls attention to the original site of the granite boulders found in Iowa.

Iowa Coal Beds. C. R. Keyes. (Coal Trade Jour., XXXII, 133, Mch. 1, 1893.)

Iowa Coal Beds. C. R. Keyes. (Mon. Rev. Iowa Weather and Crop Service, IV, No. 1, 3-5. 1893.)

Iowa Volcano. C. R. Keyes. (Mon. Rev. Iowa Weather and Crop Service, IV, 5-6. 1893.)

Keokuk group of the Mississippi valley. C. S. Beachler. (Am. Geologist, X, 88-96. 1892.)


Iowa (General).—Continued.
List of useful minerals and their localities. Albert Williams, Jr. (U. S. Geol. Sur., Statistical Papers, 813 pp. 1883.)
Iowa (General).—Continued.


Millerite. E. Haworth. (Science, VIII, 369. 1886.)


Natural Gas in Iowa. R. E. Call. (Iowa Weather and Crop Service, III, 6-7. 1892.) A mention of several reported occurrences of natural gas in Iowa.


Notes Explanatory of a Section from Cleveland, Ohio, to the Mississippi River. J. Hall. (Trans. As. Am. Geologists and Naturalists, 267-293. 1842.)

Incidental references to the geology of Iowa.


Iowa (General).—Continued.
New species of organic remains from Iowa. J. Hall. (Geol. Sur. Wisconsin, pt. iii, 1-94. 1871.)
Observations on the Geological Structure of the Valley.
Iowa (General).—Continued.


Occurrence of Natural Gas in Iowa, and its Probable Future. C. R. Keyes. (Mon. Rev. Iowa Weather and Crop Service, III, No. 12, 3-4. 1892.) A general account of the conditions necessary for a successful flow of oil and gas, with an account of how these conditions are satisfied within the limits of Iowa so far as is known.


On the Parallelism of the Paleozoic Deposits of North America with those of Europe, etc. [Translated.] J. Hall. (Am. Jour. Sci., (2), V, 176-183. 1848.)


Iowa (General).—Continued.

New York, Paleontology, IV, 422 pp. 1867.) A number of references to fossils occurring in Iowa.


Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.) The recent investigations along the Mississippi river and the stratigraphical details described with a proposed new classification of the lower Carboniferous rocks in the Mississippi basin.

Producti found in the Western States and Territories, with Description of Twelve New Species. J. G. Norwood and Henry Pratten. (Jour. Acad. Nat. Sci., Phila., (2), III, 5-22. 1855.)


Recent Wind Action upon the Loess. J. E. Todd.
Iowa (General).—Continued.


Reference to the lead region of northeastern Iowa. J. D. Whitney. (Geol. Sur. Illinois, I, 153-207. 1866.)

References to Iowa fossils. K. A. Zittel. (Handbuch der Palaeontologie, I Band, 1-765. 1880.)


Remarks on the Age of the Goniatite Limestone at Rockford, Indiana, and its Relations to the Black Slate of the Western States and to Some of the Suc-
BIBLIOGRAPHY.

Iowa (General)—Continued.


Iowa (General).—Continued.


Stratigraphy of the Carboniferous of Central Iowa. C. R. Keyes. (Bul. Geol. Soc. America, II, 277-292. 1891.) Description of the stratigraphic relations of the various beds in the central part of the State.


Table of Altitudes. H. Gannett. (Bul. U. S. Geol. Sur. No. 5, Iowa, 105-112. 1884.)


Transitional Drift of a Portion of Northern Iowa. C. L. Webster. (Am. Naturalist, XXIV, 1182-1185. 1890.)
Iowa (General).—Continued.


Une Reconnaissance géologique au Nebraska. Jules Marcou. (Bul. Soc. géol. de France, (2), XXV, 137. 1864.)

Volcanic Eruption in Iowa. C. R. Keyes. (Science, XXI, 132. 1893.)


Iowa County.


Geological notes. J. D. Whitney. (Geol. Iowa, I, 260-266. 1858.)

Iowa Geological Survey. J. Hall. (Geol. Iowa, I, Supp., 1-4. 1859.)

Iowa Drift. C. A. White. (Am. Naturalist, II, 615-616. 1869.)


Irving, R. D. Map of Wisconsin and adjoining portions
of Michigan, Illinois, Iowa and Minnesota. Showing
Geological Structure, Positions of the Principal Min-
eral Districts, etc. Scale 20 miles to 1 inch. (Trans.
Am. Inst. Mining Engrs., vol. VIII, p. 506. Easton,
Pa., 1880.)

Irving, R. D. Preliminary Paper on an Investigation of
the Archaean Formations of the Northwestern States.
ington, 1885.) Allusions are made to the Sioux Quartz-
ite of northwestern Iowa.

Jackson County.
Carboniferous Fossils from Jackson County. Herbert
1892.) Lepidodendron and Calamites reported
from a Coal Measure pocket in Jackson county.
General account of the geology. J. D. Whitney.
(Geol. Iowa, I, 282-285. 1858.) Short notes on
the geology of the county.

James, Joseph F. On the Maquoketa Shales and their
Correlation with the Cincinnati Group of Southwestern
Ohio. (Am. Geologist, vol. V, pp. 335-356. Minn-
neapolis, 1890.) A general account of the shales as
represented in Iowa, with an attempt to correlate them
with the Cincinnati shales of Ohio. A table of fossils
found at this horizon in various states is also given.

James, Joseph F. Section of the Maquoketa Shales in
250-251. Salem, 1890.) A section of the rocks given.

Jones, John H. Statistics in Regard to Iowa Coal Pro-
duct. (Rep. Mining Industry in the U. S. at the 11th
Census, 1890, 343-422. 1892.)
BIBLIOGRAPHY.

Jasper County.
Analyses of coal. Rush Emery. (Geol. Iowa, II, 388-389. 1870.)
General description. C. A. White. (Geol. Iowa, II, 262. 1870.) Brief references to the geology of the county.
Geological notes. J. D. Whitney. (Geol. Iowa, I, 266-273. 1858.)

Jefferson County.
General description. C. A. White. (Geol. Iowa, II, 273. 1870.) References to several coal mines located near Fairfield.
General description. A. H. Worthen. (Geol. Iowa, I, 231-239. 1858.) A brief account of the geology of the county, with several sections.

Johnson County.
Age of Certain Sandstones near Iowa City. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-1891, 26. 1892.) Owing to the recent discovery of fossils in the sandstones near Iowa City the suggestion is made that their age may be Kinderhook (lower Carboniferous) instead of upper Coal Measures, as have been heretofore regarded.
Analyses of peat near Iowa City. Rush Emery. (Geol. Iowa, II, 402. 1870.)
Johnson County.—Continued.

Description of a New Species of Spirifera from the
Hamilton Group near Iowa City, Iowa. S. Calvin.

Fossils from the Loess at Iowa City. B. Shimek. (Am.
Geologist, I, 149-152. 1888.)

Geological notes. J. D. Whitney. (Geol. Iowa, I,
260-266. 1858.)

Glacial scratches at Iowa City. C. L. Webster. (Am.
Naturalist, vol. XXI, 758-761. 1887.)

Iowa City and Birds' Eye "Marble." C. A. White.
(Geol. Iowa, II, 316. 1870.)

New Conocardium from the Iowa Devonian. C. R.
1892.) Description of Conocardium altum from the
Iowa Devonian.

New species of Devonian Annelid. S. Calvin. (Am.
Geologist, I, 24-28. 1888.)

Notes on the geology. C. L. Webster. (Am. Natu­
ralist, XXII, 408-419. 1888.)

Quarries. C. A. White. (Geol. Iowa, II, 308-309.
1870.)

Jones County.

Geological notes. J. D. Whitney. (Geol. Iowa, I,
278-282. 1858.)

Quarries. C. A. White. (Geol. Iowa, II, 309-311.
1870.)

Short sketch of building stones. C. A. White. (First

Keokuk Limestone.

Brachiopods from various localities in Iowa. J. Hall.
(Nat. Hist. New York, Pal., VIII, 1-367. 1892.)
Keokuk Limestone.—Continued.


Classification of the Lower Carboniferous Rocks of the Mississippi Valley. C. R. Keyes. (Washington: Judd and Detweiler, printers, 1-24. 1892.)

Sections and details of the rocks in southeastern Iowa.


Description of beds at Keokuk. C. H. Gordon. (Proc. Iowa Acad. Sci., 98-100. 1890.)


Description of Iowa Fossils. James Hall. (Geol. Iowa, I, 606-667. 1858.)


Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)

Fossil wood from the Keokuk formation, Keokuk,
BIBLIOGRAPHY.

Keokuk Limestone.—Continued.


General description. C. A. White. (Geol. Iowa, I, 210-215. 1870.) A general description of the lithological characters, economic value and fossils.

In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 202. 1858.)

In Henry county. A. H. Worthen. (Geol. Iowa, I, 216-217. 1858.)

In Jefferson county. A. H. Worthen. (Geol. Iowa, I, 237. 1858.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 193-196. 1858.)

In Van Buren county. A. H. Worthen. (Geol. Iowa, I, 228. 1858.)

Keokuk group of the Mississippi valley. C. S. Beachler. (Am. Geologist, X, 88-96. 1892.)


Keokuk Limestone.—Continued.
Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.) The recent investigations along the Mississippi river and the stratigraphical details described with a proposed new classification of the lower Carboniferous rocks in the Mississippi basin.
Keokuk County.
Artesian well at Sigourney. C. H. Gordon. (Am. Geologist, IV, 237-239. 1889.)
General geology. C. A. White. (Geol. Iowa, II, 267. 1870.) Mere references.
BIBLIOGRAPHY.


Keyes, Charles R. Age of Certain Sandstones near Iowa City. (Proc. Iowa Acad. Sci., 1890-1891, p. 25. Des Moines, 1892.) Owing to the recent discovery of fossils in the sandstones near Iowa City the suggestion is made that their age may be Kinderhook (lower Carboniferous) instead of upper Coal Measures as have been heretofore regarded.


Keyes, Charles R. An Annotated Catalogue of the Mollusca of Iowa. (Bul. Essex Inst., vol. XX. Salem, 1889.) In addition to notes on the live mollusca of the State numerous references are made to the species
Keyes, Charles R.—Continued.
collected in the loess; and a list of these species known
to occur within the limits of the State is appended.
Keyes, Charles R. Attachment of Platyceras to Fossil
Crinoids. (Am. Naturalist, vol. XXII, p. 924. Phila-
delphia, 1888.) A preliminary synopsis of the inti-
mate associations of the two organisms.
Keyes, Charles R. Brick and Other Clays of Des
Des Moines, 1892.) A brief statement of the clay in-
dustries at Des Moines.
Keyes, Charles R. Carboniferous Echinodermata of the
Mississippi Basin. (Am. Jour. Sci., (3), vol. XXXIII,
pp. 186-193. New Haven, 1889.) This is a brief
description of the lower Carboniferous rocks of the
Mississippi basin, with suggestions as to the geological
classification as indicated by crinoidal remains. A
synopsis of the genera and the distribution of the
species in the various formations given; also a sketch
of the evolution of the crinoids during this time.
Keyes, Charles R. Certain Forms of Straparollus from
Southeastern Iowa. (Am. Geologist, vol. V, pp. 193-
197. Minneapolis, 1890.) The generic characters of
Straparollus and Euomphalus discussed and of various
species found at Burlington considered.
Keyes, Charles R. Classification of the Crinoidea. 
1889.) A few remarks on the classification of the
Crinoids and the changes necessitated by the discovery
of the ventral structure of Taxocrinus (from the Kin-
hook, near Marshalltown, Iowa).
Keyes, Charles R. Classification of the Lower Carbon-
iferous Rocks of the Mississippi Valley. (Washing-
Keyes, Charles R.—Continued.

Sections and details of some of the lower Carboniferous rocks in southeastern Iowa described; with allusions to the Coal Measures of the central part of the State.


Keyes, Charles R.—Continued.
Moines; and remarks on the probable eastern limits of the Cretaceous rocks in the State.


Keyes, Charles R. Fossil Faunas in Central Iowa. (Proc. Acad. Nat. Sci., Phila., pp. 242-265. Philadelphia, 1891.) The biological relations of the fossils summarized; a general section of the rocks of the region and a list of the fossils found in the middle Coal Measures given; together with notes and bibliographic references to many of the forms found in the rocks near Des Moines. A synoptical table of the genera and species thus far recognized is appended.


Keyes, Charles R. Iowa Coal Beds. (Coal Trade Journal, vol. XXXII, p. 133. March 1, 1893.)


Keyes, Charles R.  *“Nickel Ore” from Iowa.* (Eng. and Mining Journal, vol. LIV, p. 634. New York, 1892.) A statement in regard to the recent finds of the sulphide of nickel, or millerite, from Keokuk.


Keyes, Charles R. On the Attachment of Platycerata to Palaeocrinoids; and its Effects in Modifying the Form of the Shell. (Proc. Am. Philosophical Soc., vol. XXV, pp. 231-248, 1 plate. Philadelphia, 1888.) A statement of the cases heretofore observed and opinions concerning the sedentary habits of Platyceras. There is also given a brief historical review, with remarks on the known examples. Detailed descriptions of numerous specimens recently found in which the gasteropods are attached to various species of crinoids; together with a list of the species of Platyceras which have been found attached are given. Four species are described as new.


Keyes, Charles R.—Continued.

1891.) A statement of the need of the Geological Survey of the state and of the various lines of work which especially require investigation. Comparisons with other states are made; and an outline of how the work should be conducted given. Portions appeared in various newspapers throughout the state.


Keyes, Charles R.—Continued.

species placed under Soleniscus and others to the new genus Spharodoma.

Keyes, Charles R. Stratigraphy of the Carboniferous in Central Iowa. (Bul. Geol. Soc. America, vol. II, pp. 277-292, 2 plates. 1891.) A full description of the various sections exposed along the Des Moines river in the central part of the state, with special reference to the lithological characters of the strata, and the stratigraphical relations of various beds. Several marked unconformities are described and illustrated and the leading faunal aspects of the region tabulated.


Keyes, Charles R. Synopsis of American Carbonic Calyptraeidae. (Proc. Acad. Nat. Sci., Phila., 1890, pp. 150-181. Philadelphia, 1890.) A full description of the generic characters and relations of the genus Capulus found in the Carboniferous rocks of America. Also a tabular statement of the association of crinoids and gastropods. The stratigraphical reference of all species found in the American Carboniferous to their proper horizons. All the species are described in full, with bibliographic references. The memoir is illustrated by a plate of 22 figures.

Keyes, Charles R. The Occurrence of Natural Gas in Iowa; and its Probable Future. (Mon. Rev. Iowa Weather and Crop Service, vol. III, No. 12, pp. 3-4. Des Moines, 1892.) A general account of the conditions necessary for a successful flow of oil and gas,
Keyes, Charles R.—Continued.

with an account of how these conditions are satisfied within the limits of Iowa so far as is known.


Keyes, Charles R. The Principal Mississippian Section. (Bul. Geol. Soc. America, vol. III, pp. 283-300, 1 plate. 1892.) The leading section along the Mississippi river, a historical consideration of the various terms applied to rocks and a detailed description of the different formations are given. A classification of the lower Mississippian series is proposed in accordance with the observations recently made.


Kinderhook Beds.

Age of Certain Sandstones near Iowa City. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-1891, 26. 1892.) Owing to the recent discovery of fossils in the sandstones near Iowa City the suggestion is made that their age may be Kinderhook (lower Carboniferous) instead of upper Coal Measures as have been heretofore regarded.
Kinderhook Beds.—Continued.


Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-367. 1892.)

Certain Forms of Straparollus from Southeastern Iowa. C. R. Keyes. (Am. Geologist, V, 193-197. 1890.)


Classification of crinoids. C. R. Keyes. (Am. Naturalist, XXIII, 153. 1889.)


Description of new species of echinoderms. S. A. Miller and W. F. E. Gurley. (Pamphlet, 59 pp. 1890.)


Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)
Kinderhook Beds.—Continued.


Description of fossils. James Hall. (Geol. Iowa, I, 517-523. 1858.)


Gasteropods from Iowa. J. Hall. (Nat. Hist. New York, Pal., V, pt. ii. 1879.) A number of references to fossils from Iowa.

General description. C. A. White. (Geol. Iowa, I, 191-201. 1870.) A rather detailed account with sections and illustrations of the general character of the formation and its fossils.

General description of the characters of the "Chemung." J. Hall. (Geol. Iowa, I, 91. 1858.)

In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 205-206. 1858.)

In Franklin county. C. A. White. (Geol. Iowa, II, 240. 1870.)

In Humboldt county. C. A. White. (Geol. Iowa, II, 244. 1870.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 196. 1858.)
Kinderhook Beds.—Continued.
In Washington county. A. H. Worthen. (Geol. Iowa, I, 245-246. 1858.)
Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.) The recent investigations along the Mississippi river and the stratigraphical details described, with a proposed new classification of the lower Carboniferous rocks in the Mississippi basin.
Kinderhook Beds.—Continued.


Kossuth County.

Analyses of peat. Rush Emery. (Geol. Iowa, II, 399. 1870.)

General description. C. A. White. (Geol. Iowa, II, 245. 1870.) The surface characters briefly described.

Lakes.

General remarks. C. A. White. (Geol. Iowa, I, 70-78. 1870.) The principal lakes described briefly; also explanation of the origin of "walled" lakes.


Lamellibranchs.


Lamellibranchs.—Continued.


New species from the Lower Carboniferous rocks of Iowa. A. H. Worthen and F. B. Meek. (Geol. Surv. Illinois, VI, 489-532. 1875.)


Species mentioned from Silurian rocks of Iowa. R. P. Whitfield. (Geol. Surv. Wisconsin, IV, 163-349. 1882.)

Species of Lamellibranchs from New York. J. Hall.
BIBLIOGRAPHY.

Lamellibranchs.—Continued.
(Nat. Hist. New York, Pal., V, pt. i, second half. 1885.) A number of references to fossils from Iowa.

Later Cretaceous in Iowa. S. Calvin. (Am. Geologist, I, 237. 1888.)

Lead.
Description of the deposits near Dubuque, the occurrence of the ore and the mode of work. J. D. Whitney. (Geol. Iowa, I, 422-468. 1858.)
In Iowa. C. A. White. (Geol. Iowa, II, 339-341. 1870.) A few general remarks on its occurrence.
In Iowa drift. C. A. White. (Geol. Iowa, I, 96. 1870.)
References to the lead region of northeastern Iowa. J. D. Whitney. (Geol. Sur. Illinois, I, 153-207. 1866.)

Lee County.
Artesian well at Keokuk. C. H. Gordon. (Am. Geologist, IV, 237-239. 1889.)
Breciated Character of the St. Louis Limestone. C. H. Gordon. (Am. Naturalist, XXIV, 305-313. 1890.)
Lee County.—Continued.


General description. A. H. Worthen. (Geol. Iowa, I, 184-198. 1858.) A rather full account of the different formations occurring in this county.


Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.) Sections and details of the lower Carboniferous rocks described.


Mullerite. E. Haworth. (Science, VIII, 369. 1886.)


New species of sponges from the Keokuk rocks. E. O. Ulrich. (Geol. Surv. Illinois, VIII, 243-251. 1890.)

"Nickel Ore" from Iowa. C. R. Keyes. (Eng. and Mining Journal, LIV, 634. 1892.) A statement in regard to the recent finds of the sulphide of nickel, or millerite, at Keokuk.


Surface geology of Keokuk. C. H. Gordon. (Am. Geologist, IX, 183-190. 1892.)
Lee County.—Continued.
Wood found in Keokuk limestone. C. H. Gordon. (Proc. Iowa Acad. Sci., 1887-9, 97-98. 1890.)


Lime.
Hydraulic. C. A. White. (Geol. Iowa, II, 318-322. 1870.) Various limestones which possess hydraulic properties discussed.

Hydraulic, materials for. J. D. Whitney. (Geol. Iowa, I, 392. 1858.)

Quick-lime. C. A. White. (Geol. Iowa, II, 316-318. 1870.) Brief mention of various limestones from which quick-lime may be made.

Lime Creek.
General Preliminary Description of the Devonian Rocks of Iowa; which Constitutes a Typical Section of the Devonian Formation of the Interior Continental Area of North America. C. L. Webster. (Am. Naturalist, XXIII, 229-243. 1889.)

Linn County.
BIBLIOGRAPHY.

Linn County.—Continued.


Cretaceous fossils in the drift. [S. Calvin.] (Am. Geologist, I, 237. 1888.)


Geological notes. J. D. Whitney. (Geol. Iowa, I, 260-266. 1858.)


Loess.

At Burlington. C. R. Keyes. (Am. Naturalist, XXII, 1049-1054. 1888.)


Distribution of fossils. C. R. Keyes. (Am. Geologist, VI, 119. 1890.)
Loess.—Continued.

Driftless area of the upper Mississippi. T. C. Cham-
lin and R. D. Salisbury. (U. S. Geol. Sur., 6th
Ann. Rep., 199-322. 1886.)

Fossils collected in the state of Iowa. C. R. Keyes.
(Bul. Essex Inst., XX. 1889.)

Fossils of the Iowa Loess. R. E. Call. (Am. Natu-
ralist, XV, 585-586. 1881.)

Fossils at Iowa City. B. Shimek. (Am. Geologist, I,
149-152. 1888.)

In central Iowa. R. E. Call. (Am. Naturalist, XV,
782-784. 1881.)

Phil. Soc. Washington, VI, 93-97. 1883.)

Univ. Iowa, I, 200-214. 1890.)

Loess and Associated Deposits of Des Moines. W. J.
XXIV, 202-223. 1882.)

Hist. State Univ., II, 88-98. 1890.)

Soc., XVII, 263-270. 1882.)

Loess in Central Iowa. R. E. Call. (Am. Naturalist,
XV, 782-784. 1881.)

Loess of North America. R. E. Call. (Am. Natural-
ist, XVI, 369-381. 1882.)

Notes on the Geology of Johnson County. C. L.
Webster. (Am. Naturalist, XXII, 408-419. 1888.)

Notes on the Geology of a Part of the Mississippi Val-
ley. W. J. McGee. (Geological Magazine, (2),VI,
412-420 and 353-362. 1879.)
Loess.—Continued.

Notice of Arrow Points from the Loess in the City of Muscatine. F. M. Witter. (Proc. Iowa Acad. Sci., 1890-1891, 66-68. 1892.)


On a Quaternary Section Eight Miles Southeast of Des Moines, Iowa. C. R. Keyes and R. E. Call. (Proc. Iowa Acad. Sci., 1890-1891, 30. 1892.) Description of a section near the terminal moraine in the vicinity of Des Moines.


Surface geology of Keokuk. C. H. Gordon. (Am. Geologist, IX, 183-190. 1892.)
Loess.—Continued.


Louisa County.


Gas wells near Letts, Iowa. F. M. Witter. (Proc. Iowa Acad. Sci., 1890-1891, 68-70. 1892.) Gas reported as being found in a number of places near Letts, in Louisa county, and furnishing supplies to a number of families.

Lucas County.

Its geology. O. H. St. John. (Geol. Iowa, II, 77-95. 1870.) A full account of the geological formation as exposed in the county.

Lyon County.

General description. C. A. White. (Geol. Iowa, II, 226-229. 1870.) Brief mention of the surface features.

Madison County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 386-387. 1870.)

General geological description. C. A. White. (Geol. Iowa, I, 305-316. 1870.) A rather full account of the surface features, geology and economic resources.


Magnesian Limestone (Lower).
Chemical analyses. J. D. Whitney. (Geol. Iowa, I, 332-337. 1858.)


Description of the rocks in northeastern Iowa. D. D. Owen. (Geol. Sur. Wis., Iowa and Minn., 58-69. 1852.) An account of the lithological and geological features, its range, mineral contents and palaeontology.

Fossils from Northeastern Iowa. S. Calvin. (Am. Geologist, X, 144-148. 1892.)


Mahaska County.
Analyses of coal. Rush Emery. (Geol. Iowa, II, 370-375. 1870.)


Mammals.


Maps.


Geological map of Iowa. C. A. White. (Geol. Iowa, II. Des Moines, 1870.) A sketch-map showing the general geological formations.

Geological map of Iowa. D. D. Owen. (Rep. Geol. Sur. Wis., Iowa and Minn. 1852.) A large colored map showing the geological formations in the Mississippi valley.

Geological map of eastern Iowa. James Hall. (Geol. Iowa, I. 1858.) A colored sectional map showing the different geological formations in the eastern part of the state.

Geological map of the state of Iowa. C. A. White. (Geol. Iowa, vol. II. 1870.)

Geological map model of Iowa. C. A. White. (Geol. Iowa, I. 1870.)

Geological map of the lead region in the states of Wisconsin, Illinois and Iowa. J. D. Whitney. (Geol. Sur. Wisconsin, I. 1862.)

Geological map of the eastern half of the state of Iowa. J. Hall, J. D. Whitney and A. H. Worthen. (Geol. Iowa, I, 146. 1858.)

Geological Section from the Mouth of Rock River through the Blue Mounds to the Wisconsin River, in Connection with a Geological Chart of Part of
Maps.—Continued.

Iowa, Wisconsin and Illinois. (Report of Geological Explorations of Parts of Iowa, Wisconsin and Illinois, made in the autumn of the year 1839, Plate iii. [Washington], 1844.)


Keokuk and vicinity (sketch-map). C. H. Gordon. (Am. Geologist, IX, 183-190. 1892.)


Map of Wisconsin and Adjoining Portions of Michigan, Illinois, Iowa and Minnesota, showing geological structure, positions of the two principal mineral districts, etc., scale 20 miles to 1 inch. R. D. Irving. (Trans. Am. Inst. Mining Engrs., VIII, 506. 1880.)


Provisional Geological Map of Part of the Chippewa Land District of Wisconsin, with Part of Iowa, and of Minnesota Territory to Illustrate the Report of a Geological Reconnaissance made in 1847. (Report of a Geological Reconnaissance of the Chippewa land district of Wisconsin; and incidentally
Maps.—Continued.

of a portion of the Kickapoo country, and of a part of Iowa and of the Minnesota Territory. [Washington, 1849.]


Sketch-map of Worth, Mitchell, Cerro Gordo and Floyd counties, showing distribution of the Rockford shales. C. L. Webster. (Proc. Davenport Acad. Nat. Sci., V. 1887.)

Sketch-Map of the State of Iowa. C. A. White. (Geol. Mag., VIII; 222. London, 1871.)

Topographical sketch-map of Burlington and vicinity. C. R. Keyes. (Am. Naturalist, XXII. 1888.)

Maquoketa Shales.

General description. C. A. White. (Geol. Iowa, I, 180-182. 1870.) The general characters, economic value and geological age of these rocks in Iowa described, with brief references to their sections and the fossils contained.


Their correlation. J. F. James. (Am. Geologist, V, 335-356. 1890.)

“Marble.”

In Marshall county. C. A. White. (Geol. Iowa, II, 303. 1870.)

“Iowa City and Birds’ Eye.” C. A. White. (Geol. Iowa, II, 316. 1870.) Occurrence in Johnson county.


Marshall County.
Classification of the Crinoids. C. R. Keyes. (Am. Naturalist, XXIII, 153. 1889.)
Description of new species of Echinoderms. S. A. Miller and W. F. E. Gurley. (Pamphlet, 59 pp. 1890.)

General reference. C. A. White. (Geol. Iowa, II, 260. 1870.)

Geological notes. J. D. Whitney. (Geol. Iowa, I, 266-273. 1858.)

"Marble." C. A. White. (Geol. Iowa, II, 313. 1870.)

New species of crinoids from the Kinderhook. C.
Marshall County.—Continued.

Wachsmuth and F. Springer. (Geol. Surv. Illinois, VIII, 157-251. 1890.)


Marion County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 364-370. 1870.)


Geology. C. A. White. (Geol. Iowa, II, 263-265. 1870.) Brief account of Coal Measures in the county.


Chapter I is a very full description of the landscape and general topography of northeastern Iowa.

Chapter II forms a statement of the principles involved in the description of the geological history of the region, with full definitions.

Chapter III deals with a general account of the stratigraphical rocks of the state. A classification and description of the different formations are given, with the different kinds of disturbances recognized.

Chapter IV is a detailed account of the drainage and topography of the different quaternary formations.

Chapter V treats of the post-glacial phenomena; alluvium and terraces.

Chapter VI is a detailed account of the Loess and its occurrence in different places.

Chapter VII, a description of the drift and an account of many well sections.

Chapter VIII considers the ice markings—glacial striae and surface moldings.

Chapter IX treats of the residuary products and the history indicated by them.
McGee, W. J.—Continued.

Chapter X is a general summary of the geological history as recorded in Iowa.

McGee, W. J. The Relations of Geology and Agriculture. (Trans. Iowa State Horticultural Soc., vol. XVI, pp. 227-240. 1884.) An address before the society in which the bearing of Agriculture upon Geology is fully described with special reference to Iowa.


Medina Sandstone.

General description of the characters. James Hall. (Geol. Iowa, I, 70-71. 1858.)


Meek, F. B.—Continued.
447-472. Philadelphia, 1860.) A few species described as new from Iowa.


Meek, F. B., and A. H. Worthen. Description of New Species of Crinoidea and Echinoidea from the Carboniferous Rocks of Illinois and other Western States.
BIBLIOGRAPHY.

Meek, F. B.—Continued.


Meek, F. B., and A. H. Worthen. Remarks on the Genus Taxocrinus (Phillips) McCoy, 1844; and its
Meek, F. B.—Continued.


Merrill, George P. Stones for Building and Decorating. (453 pp. New York, 1891.) A number of general references to the building stones of Iowa.

Meteorites.

Analyses of the Winnebago fall. E. N. Eaton. (Am. Geologist, VIII, 385-387. 1891.)


Winnebago county meteorites. Joseph Torrey, Jr., and E. H. Barbour. (Science, XV, 347. 1890.) Reference to a fragment supposed to be a piece of
BIBLIOGRAPHY.

Meteorites.—Continued.

The authors claim it was not and base their claims on the grounds of: Too low specific gravity, absence of metals and external crust, and chemical analysis.

Middle Coal Measures. O. H. St. John. (Geol. Iowa, I, 264-284. 1870.)


Miller, S. A., and W. F. E. Gurley. Description of some New Genera and Species of Echinodermata from the Coal Measures and Subcarboniferous Rocks of Indiana, Missouri and Iowa. (Pamphlet, 59 pp., 10 plates. Cincinnati, 1890.) Several species of crinoids described as new from the Kinderhook rocks of Marshall county.

Millerite.


“Nickel Ore” from Iowa. C. R. Keyes. (Eng. and Mining Journal, LIV, p. 634. 1892.) A statement in regard to the occurrence of the sulphide of nickel from Keokuk.


BIBLIOGRAPHY


Minerals.


Analyses. Rush Emery. (Geol. Iowa, II, 352-354. 1870.)


List of useful minerals and their localities. Albert Williams, Jr. (U. S. Geol. Sur., Statistical Papers, 813 pp. 1883.)
Minerals.—Continued.


References to the lead region of northeastern Iowa. J. D. Whitney. (Geol. Sur. Illinois, I, 153-207. 1866.)

Mining.

Accounts of the various coal mines. Park C. Wilson. (First Biennial Report State Mine Inspector, 1882-1883, 1-94. 1883.)

Coal mines in the state. P. C. Wilson. (Biennial Rept. State Mine Inspector, for 1880-1881. 1-165. 1882.) Accounts of the different coal mines of the state.


Coal in southeastern Iowa. Thomas Binks. (Fifth Biennial Report State Mine Inspectors, 1890-1891. 1-51. 1891.)

Coal mines of southeastern Iowa. Thomas Binks. (Third Biennial Report State Mine Inspectors, 1886-1887, 1-80. 1888.)

Coal in north-central Iowa. M. C. Thomas. (Fifth
Mining.—Continued.

Biennial Report State Mine Inspectors, 1890-1891, 95-151. 1891.)


Coal. C. A. White. (Geol. Iowa, I, 258-263. 1870.) Practical conclusions regarding the mining of coal in Iowa.

In north-central Iowa. J. A. Stout. (Fourth Biennial Report State Mine Inspectors, 1888-9, 115-151. 1889.)

In southeastern Iowa. Thomas Binks. (Fourth Biennial Report State Mine Inspectors, 1888-9, 1-65. 1889.)

Mills County.


Mitchell County.

Mitchell County.—Continued.
Notice of the geology. J. D. Whitney. (Geol. Iowa, I, 306-311. 1858.)

Monona County.

Brief general description of the surface features. O. H. St. John. (Geol. Iowa, II, 182-186. 1870.)

Monroe County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 360-364. 1870.)

Montgomery County.


Chert of the Upper Coal Measures. S. Calvin. (Am. Geologist, I, 116-117. 1888.)
General geological description. C. A. White. (Geol. Iowa, I, 362-366. 1870.) A description of the surface characters and geology, with several sections.

Muscatine County.


Description of the geology. J. D. Whitney. (Geol. Iowa, I, 274-277. 1858.) Brief account of the geological formations.


Gas Wells near Letts, Iowa. F. M. Witter. (Proc. Iowa Acad. Sci., 1890-91, 68-70. 1892.) Gas re-
Muscatine County.—Continued.

ported as being found in a number of places near Letts, in Louisa county, and furnishing supplies to a number of families.


Observations upon the Loess. F. M. Witter. (Proc. Iowa Acad. Sci., 1887-9, 45. 1890.)

Reference to coal. C. A. White. (Geol. Iowa, II, 274. 1870.) Mere mention of the occurrence of coal in the county.


Natural Gas.


Natural Gas in Iowa. R. E. Call. (Mon. Rev. Iowa Weather and Crop Service, III, 6-7. 1892.)

Occurrence of Natural Gas in Iowa; and its Possible Future. C. R. Keyes. (Mon. Rev. Iowa Weather and Crop Service, III, No. 12, 3-4. 1892.)

A general account of the conditions necessary for a successful flow of oil and gas, with an account of how these conditions are satisfied within the limits of Iowa so far as is known.


Niagara Limestone.

Chemical analyses. J. D. Whitney. (Geol. Iowa, I, 362-366. 1858.)

Fossils mentioned from Iowa localities. R. P. Whitfield. (Geol. Sur. Wisconsin, IV, 163-349. 1882.)

General description. C. A. White. (Geol. Iowa, I, 182-184. 1870.) A general account of its characters, features and economic value.

General description of the characters. James Hall. (Geol. Iowa, I, 71-73. 1858.)


Notes Explanatory of a Section from Cleveland, Ohio, to the Mississippi River. J. Hall. (Trans. As. Am. Geologists and Naturalists, 267-293. 1843.) Incidental references to the geology of Iowa.

Niagara Limestone.—Continued.
Pockets of fire-clay in Niagara limestone. J. P. Farnsworth. (Am. Geologist, II, 331-334. 1888.)
"Nickel Ore" from Iowa. C. R. Keyes. (Eng. and Mining Journal, LIV, p. 634. 1892.)
Nicollet, J. N. Report intended to Illustrate a Map of the Hydrographic Basin of the Upper Mississippi
are listed from various parts of Iowa and a few references are made to the rocks of the eastern part of the
state.
with list of crinoids found in the upper and lower divisions.
Nishnabotna Sandstone.
In Mills county. C. A. White. (Geol. Iowa, I, 368-370. 1870.)
In Montgomery county. C. A. White. (Geol. Iowa,
I, 363-366. 1870.)
Leaves found in the Nishnabotna sandstone. C. A.
White. (Geol. Iowa, I, 292-293. 1870.)
Occurrence of fossil leaves. C. A. White. (Am.
Jour. Sci., (2), XLIV, 119. 1867.)
Norwood, J. G., and Henry Pratten. Notice of the Pro­
ducti found in the Western States and Territories with
Description of Twelve New Species. (Jour. Acad. Nat.
Norwood, J. G., etc.—Continued.


Note on the Difference between Acervularia Profunda, Hall, and Acervularia Davidsoni, Edwards and Haime. S. Calvin. (Am. Geologist, IX, 365-368. 1892.)


Note sur le paralléisme des roches des dépots paléozoiques de l' Amerique Septentrionale avec ceux de l' Europe, suivie d'un tableau des especes fossiles commones aux deux Continents, avec l' indication des étages on elles as recontrent, et terminée par un examen critique de chacune de ces especes. Ed. de Verneuil. (Bul. Soc. géol. de France, (2), t. IV, pp. 646-710. 1847.)

Notes Explanatory of a Section from Cleveland, Ohio, to the Mississippi River, in the Southwest Direction, with Remarks upon the Identity of the Western Formations with those of New York. J. Hall. (Trans. As. Am. Geologists and Naturalists, 267-293. 1842.)

Notes on a Collection of Fossils from the Lower Magne-sian Limestone from Northeastern Iowa. S. Calvin. (Am. Geologist, X, 144-148. 1892.)

BIBLIOGRAPHY.


Notes on the Distribution of Timber in Southwestern Iowa, with Inferences Concerning the Origin of Prairies. J. E. Todd. (Am. Naturalist, XII, 91-96. 1878.)


Notes on the Fossils of the Loess at Iowa City. B. Shimek. (Am. Geologist, I, 149-152. 1888.)

Notes on the Geological Formations of Iowa. S. Calvin. (Pamphlet, printed at World's Exposition at New Orleans, 1-8. 1884.)


Notes on the Geology of Johnson County. C. L. Webster. (Am. Naturalist, XXII, 408-419. 1888.)


Notes on the Rockford Shales. C. L. Webster. (Am. Naturalist, XXII, 444-446. 1888.)

Notes upon the Geology of the Western States. J. Hall. (Am. Jour. Sci., XLII, 51-62. 1842.)

Notice of a New Species of Platyerinus and other Fossils from the Mountain Limestone of Illinois and Iowa. A. H. Worthen. (Trans. Acad. Sci., St. Louis, I, 569-571. 1860.)


O'Brien County.


Observations upon the Rocks of the Mississippi Valley which have been referred to the Chemung Group of New York, together with Descriptions of New Species of Fossils from the same Horizon at Burlington, Iowa.
Observations, etc.—Continued.


On Fauna found at Lime Creek, Iowa, and its Relation to Other Geological Faunas. S. Calvin. (Amer. Jour. Sci., XXV, 434-436. 1883.)


On Maquoketa Shales and their Correlation with the Cincinnati Group of Southwestern Ohio. J. F. James. (Am. Geologist, V, 335-356. 1890.)


On Parallelism of the Palæozoic Deposits of North America with those of Europe, etc. [Translated.] J. Hall. (Am. Jour. Sci., (2), V, 176-183 and 369-270. 1848.)


Oneota Limestone.

Onondaga-Salt Group.
General description of the characters. James Hall. (Geol. Iowa, I, 76-80. 1858.)

Ophiurids.
Description of new species from the lower Carboniferous of Iowa. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, V, 323-619. 1873.)


Osceola County.
General description. C. A. White. (Geol. Iowa, II, 226-229. 1870.) Brief mention of the surface features.


Owen, D. D. Geological Chart of Part of Iowa, Wisconsin and Illinois. (Report of a Geological Exploration of Part of Iowa, Wisconsin and Illinois, made in the autumn of the year 1839. [Washington], 1844.) An edition of the report was printed in 1840, but without the accompanying charts. Washington is not named in the title pages as the place of publication; the only inscription is, "Ordered to be printed by the Senate of the United States."

Owen, D. D. Geological Section from the Mouth of Rock River through the Blue Mounds to the Wisconsin River, in Connection with a Geological Chart of Part of Iowa, Wisconsin and Illinois. (Report of Geological Explorations of Parts of Iowa, Wisconsin and Illinois, made in the autumn of the year 1839, Plate iii. [Washington], 1844.)

Owen, D. D. Provisional Geological Map of Part of the Chippewa Land District of Wisconsin, with Part of Iowa, and of Minnesota Territory to Illustrate the Report of a Geological Reconnaissance made in 1847. (Report of a Geological Reconnaissance of the Chippewa land district of Wisconsin; and incidentally of a portion of the Kickapoo country, and of a part of Iowa and of the Minnesota Territory. [Washington, 1849.]) Neither date nor place of publication is given, but very likely Washington is the place.


Chapter II is a description of geological formations along the Red Cedar, Iowa and Wapsipinicon rivers in eastern Iowa.

Chapter III gives an account of the Carboniferous rocks of Iowa, chiefly along the Des Moines and Racoon rivers.

The other chapters are devoted to regions outside of Iowa. The report is illustrated by many figures, numerous plates and maps.
BIBLIOGRAPHY.


Page County.

General description of geology. C. A. White. (Geol. Iowa, I, 348-353. 1870.) The surface characters and geology described with sections.


Paint (Mineral).

In Iowa. C. A. White. (Geol. Iowa, II, 328-329. 1870.) Ochery clay resembling that used for making paint reported from several localities.


Palo Alto County.
General description. C. A. White. (Geol. Iowa, II, 215-218. 1870.) Brief account of its surface features.
Parvin, T. S. Climate. (Geology Iowa, vol. I, Chapter iv, pp. 139-164. Des Moines, 1870.) A summary of the climatology of the state, based upon observations from 1839 to 1870; with tables of mean temperatures, winds, rain, snow, etc.
Peats.
Analyses. Rush Emery. (Geol. Iowa, II, 397-404. 1870.)
Brief account of its occurrence in various counties; and the manner of obtaining it. C. A. White. (Second Ann. Rep. State Geologist, 121-135. 1868.)
In Adair county. C. A. White. (Geol. Iowa, I, 339. 1870.)
Petroleum.
Physical Geography.
Of Iowa. J. D. Whitney. (Geol. Iowa, I, 1-34. 1858.)
Plants.
Leaves found in the Nishnabotna Sandstone. C. A. White. (Geol. Iowa, I, 292-293. 1870.)
Plymouth County.
Pocahontas County.
Polk County.


Coal. C. A. White. (Geol. Iowa, II, 261-262. 1870.)


Polk County.—Continued.
Loess in central Iowa. R. E. Call. (Am. Naturalist, XV, 782-784. 1881.)
Quaternary Section Eight Miles Southeast of Des Moines, Iowa. C. R. Keyes and R. E. Call. (Proc. Iowa Acad. Sci., 1890-1891, 30. 1892.) Description of a section near the terminal moraine in the vicinity of Des Moines.

Polyzoans.

Pottawattamie County.
General description. C. A. White. (Geol. Iowa, I, 376-381. 1870.) Brief general account of its surface characters and geology.

Pottery Clay.
In Henry county. A. H. Worthen. (Geol. Iowa, I, 218. 1858.)
Occurrence in Iowa. C. A. White. (Geol. Iowa, II, 327-328. 1870.)

Potsdam Sandstone.
General description. C. A. White. (Geol. Iowa, I, 171-172. 1870.) The general characters and economic value briefly stated.
Potsdam Sandstone.—Continued.

General description of the characters. James Hall. (Geol. Iowa, I, 47-49. 1858.)


Physical characters. J. D. Whitney. (Geol. Iowa, I, 328-331. 1858.)

Poweshiek County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 393. 1870.)

Geological notes. J. D. Whitney. (Geol. Iowa, I, 266-273. 1858.)

Prairies.


Origin in Iowa. J. D. Whitney. (Geol. Iowa, I, 14-25. 1858.)


Pratt, W. H. Section of the Bluff at Sixth Street, Davenport. (Proc. Davenport Acad. Sci., vol. III, pp. 127-129. Davenport, 1881.) A description of the geological formations exposed at Sixth street at Davenport and a boring at the same place.

Pratt, W. H., J. Gass and. Bones of the Mammoth in
Pratt, W. H., etc.—Continued.


Preliminary Notice of Sphæroidocrinidae. C. Wachsmuth. (Proc. Iowa Acad. Sci., 1875-80, 22. 1880.)


Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.)


Protozoans.


BIBLIOGRAPHY.


Pyrites.

Quarries.
In Dubuque county. C. A. White. (Geol. Iowa, II, 314-315. 1870.)
In Johnson county. C. A. White. (Geol. Iowa, II, 308-309. 1870.)
In Jones county. C. A. White. (Geol. Iowa, II, 309-311. 1870.)
In Marion county. C. A. White. (Geol. Iowa, II, 315. 1870.)
In Lee county. C. A. White. (Geol. Iowa, II, 314. 1870.)
In Marshall county. C. A. White. (Geol. Iowa, II, 312-314. 1870.)
In Scott county. C. A. White. (Geol. Iowa, II, 311-312. 1870.)

Quaternary.
Additional Observations on Iowa Kames and Aasar.
Quaternary.—Continued.


Derivation of Iowa Drift. C. A. White. (Am. Naturalist, II, 615-616. 1869.)


Distribution of fossils in the Loess. C. R. Keyes. (Am. Geologist, VI, 119. 1890.)


Cretaceous fossils found in the drift at Des Moines. Evidence of glacial origin of Iowa Drift. C. A. White. (Geol. Iowa, I, 92-100. 1870.) Glacial scratches
BIBLIOGRAPHY.

Quaternary.—Continued.

in various parts of the state mentioned, and their
directions. Copper, lead ore, coal, wood, fossils,
and other substances of northern origin noted in
the drift.

Fossils of the Iowa Loess. R. E. Call. (Am. Natu-
ralist, XV, 585-586. 1881.)

Fossils from the Loess of Iowa. C. R. Keyes. (Bul.
Essex Inst., XX. 1889.)

Geology of the Middle Region of Western Iowa. O.
191-201. 1868.)

Glacial scratches at Iowa City. C. L. Webster. (Am.
Naturalist, XXI, 758-761. 1887.)

History of the Drift Deposits of Iowa. J. E. Todd.
(Proc. Iowa Hort. Soc., XVIII, 316-327. 1883.)

In Henry county. A. H. Worthen. (Geol. Iowa, I,
210-211. 1858.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 187-
188. 1858.)

In Madison county. C. A. White. (Geol. Iowa, I,
305-308. 1870.)

In southeastern Iowa. C. A. White. (Am. Jour.
Sci., (2), XLIV, 119. 1867.) Additional note to
an article of the same title.

In Van Buren county. A. H. Worthen. (Geol. Iowa,
I, 221. 1858.)

Iowa drift. C. A. White. (Am. Naturalist, II, 615-
616. 1869.) Calls attention to the original site
of the granite boulders found in Iowa.

Loess and Associated Deposits of Des Moines. W. J.
XXIV, 202-223. 1882.)
Quaternary.—Continued.
Loess fossils at Iowa City. B. Shimek. (Am. Geologist, I, 149-152. 1888.)
Loess in Central Iowa. R. E. Call. (Am. Naturalist, XV, 782-784. 1881.)
Notes on the Geology of Johnson County. C. L. Webster. (Am. Naturalist, XXII, 408-419. 1888.)
Observations upon the Loess. F. M. Witter. (Proc. Iowa Acad. Sci., 1887-9, 45. 1890.)
Quaternary.—Continued.


On a Quaternary Section Eight Miles Southeast of Des Moines, Iowa. C. R. Keyes and R. E. Call. (Proc. Iowa Acad. Sci., 1890-91, 30. 1892.) Description of a section near the terminal moraine near Des Moines.


Richthofen's Theory of the Loess in the Light of the
BIBLIOGRAPHY. 413

Quaternary:—Continued.


Surface Geology of Keokuk. C. H. Gordon. (Am. Geologist, IX, 183-190. 1892.)


Transitional Drift of a Portion of Northern Iowa. C. L. Webster. (Am. Naturalist, XXIV, 1182-1185. 1890.)

Reconnaissance géologique au Nebraska. J. Marcou. (Bul. Soc. géol. de France, (2), t. XXI, p. 137. 1864.)

Recorded Meteorites of Iowa, with Special Mention of the Last or Winnebago County Meteorite. E. H. Barbour and Joseph Torrey. (Am. Geologist, VIII, 65-72. 1891.)


Remarks on the Carboniferous and Cretaceous Rocks of Eastern Kansas and Nebraska, and their Relations to those of the Adjacent States, and other Localities
Remarks, etc.—Continued.


(Vol. I, 474-724. 1858.)


Ringgold County.


Rivers.

General description. J. D. Whitney. (Geol. Iowa, I 2-11. 1858.) A short general account of the drainage system of Iowa.

General drainage features. C. A. White. (Geol. Iowa, I, 35-70. 1870.) General course and characters of the rivers, with estimates of average fall of the principal streams. Also special description of the different water courses.

Road Materials.

Occurrence in Iowa. C. A. White. (Geol. Iowa, II, 329-330. 1870.)

Rocks.


Analyses. Rush Emery. (Geol. Iowa, II, 345-349. 1870.)


Rockford Shales.

Brachiopods from various localities in Iowa. J. Hall. (Nat. Hist. New York, Pal., VIII, 1-269. 1892.)


Notes on the shales. C. L. Webster. (Am. Naturalist, XXII, 444-446. 1888.)

Pachyphyllum from the Rockford shales. C. L. Webster. (Am. Nat., XXIII, 621-625. 1889.)

Sac County.

General description. O. H. St. John. (Geol. Iowa, II, 150-158. 1870.)

Saint Louis Limestone.—(See St. Louis Limestone.)
BIBLIOGRAPHY. 419

Saint Peter Sandstone.—(See St. Peter Sandstone.)

Sand.
In the Drift. C. A. White. (Geol. Iowa, I, 84. 1870.)
Occurrence in Iowa. C. A. White. (Geol. Iowa, II, 322-323. 1870.)

Sandstones.
Age of Certain Sandstones near Iowa City. C. R. Keyes. (Proc. Iowa Acad. Sci., 1890-91, 26. 1892.) Owing to the recent discovery of fossils in the sandstones near Iowa City the suggestion is made that their age may be Kinderhook (Lower Carboniferous) instead of Upper Coal Measures as have been heretofore regarded.


Scott County.

Beds of Carboniferous Drift in the Bluffs of East Dav-
Scott County.—Continued.


Geological notes. J. D. Whitney. (Geol. Iowa, I, 278-282. 1858.)


Reference to coal. C. A. White. (Geol. Iowa, II, 274. 1870.) Mere reference to the occurrence of coal in this county.


Shelby County.

Shimek, B. Notes on the Fossils of the Loess at Iowa City. (Am. Geologist, vol. I, pp. 149-152. Minneapolis, 1888.) Brief notes on various species of gastropods found in the loess at Iowa City.


Shimek, B.—Continued.

relation, with a general discussion of the climatic conditions during the deposition of the loess.


Silurian.

Silurian.—Continued.
Correlation of the Maquoketa shales. J. F. James. (Am. Geologist, V, 335-356. 1890.)
Fossils in Iowa drift. C. A. White. (Geol. Iowa, I, 98. 1870.)
Fossils mentioned from Iowa localities. R. P. Whitfield. (Geol. Sur. Wisconsin, IV, 163-349. 1882.)
Fossils from Lower Magnesian limestone. S. Calvin. (Am. Geologist, X, 144-148. 1892.)
General description. C. A. White. (Geol. Iowa, I, 182-184. 1870.) (See Niagara Limestone.)
Its general Characters. C. A. White. (Geol. Iowa, I, 171-180. 1870.) See also Potsdam limestone, St. Peter sandstone, Magnesian limestone, Trenton limestone, Galena limestone and Maquoketa shales.
Notes Explanatory of a Section from Cleveland, Ohio, to the Mississippi River. J. Hall. (Trans. As. Am. Geologists and Naturalists, 267-293. 1843.)
Incidental references to the geology of Iowa.
Silurian.—Continued.

Pockets of fire-clay in Niagara limestone. P. J. Farnsworth. (Am Geologist, II, 331-334. 1888.)


Silurian (Lower.)—(See Silurian.)

Silurian (Upper.)—(See Silurian.)

Sioux County.


Sioux Quartzite.


General description. C. A. White. (Geol. Iowa, I, 167-171. 1870.) Its lithological characters, and economic value described.

In Lyon County. C. A. White. (Geol. Iowa, II, 228. 1870.)


Sketch Map of the State of Iowa. C. A. White. (Geol. Mag., VIII, 222. 1871.)


BIBLIOGRAPHY.


Soil.


Soleniscus: its Generic Characters and Relations. C. R. Keyes. (Am. Naturalist, XXIII, 420-429. 1889.)


Some Dark Shales recently Discovered below the Devonian Limestone, at Independence, Iowa; with a Notice of its Fossils and Description of New Species. S. Calvin. (Bul. U. S. Geol. and Geog. Sur. Terr., IV, 725-730. 1878.)


Some Geological Problems in Muscatine County, Iowa, with Special Reference to the Rectification of the Supposed Kinderhook, near the Mouth of Pine Creek. S. Calvin. (Am. Geologist, III, 25-36. 1889.)


Sponges.
Description of new species from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1886.)


Springs.
General remarks. C. A. White. (Geol. Iowa, I, 78-80. 1870.) Brief account of the springs of the state.

Springs (Salt).
In Iowa. C. A. White. (Geol. Iowa, II, 334-336. 1870.)


Springer, Frank, etc.—Continued.


Statistics in Regard to Iowa Coal Product. J. H. Jones. (Rep. Mining Industry in the United States at the 11th Census, 1890, 343-422. 1892.)


St. John, O. H. Geology of the Middle Region of Western Iowa. (Geol. Iowa, vol. II, pp. 1-200. 1870.) A general description of the physical features and geology
St. John, O. H.—Continued.

of the middle regions of western Iowa. The special geology of the following counties also described, with sections:

- Dallas county.
- Warren county.
- Lucas county.
- Guthrie county.
- Greene county.
- Carroll county.
- Calhoun county.
- Sac county.
- Ida county.
- Audubon county.
- Crawford county.
- Shelby county.
- Harrison county.
- Monona county.
- Woodbury county.

St. John, O. H. Middle Coal Measures. (Geol. Iowa, vol. I, pp. 264-284. 1870.) This forms Chapter IV of the Geology of Iowa and treats at length of the surface features, geological structure and of the region underlaid by the middle Coal Measures. A general section of the middle Coal Measures and a detailed description of the different beds are also given.


St. Louis Limestone.

Analyses of lime. J. D. Whitney. (Geol. Iowa, I, 379-383. 1858.)


Brecciated Character of the St. Louis Limestone. C. H. Gordon. (Am. Naturalist, XXIV, 305-313. 1890.)


St. Louis Limestone.—Continued.

Description of Iowa fossils. James Hall. (Geol. Iowa, I, 667-677. 1858.)


Description of new species of fossils from Iowa rocks. F. B. Meek and A. H. Worthen. (Geol. Sur. Illinois, II, 143-411. 1866.)

General description. C. A. White. (Geol. Iowa, I, 215-222. 1870.) Its general characters and economic value briefly described.

General description of the characters. James Hall. (Geol. Iowa, I, 98-106. 1858.)

In Des Moines county. A. H. Worthen. (Geol. Iowa, I, 201. 1858.)

In Henry county. A. H. Worthen. (Geol. Iowa, I, 215-216. 1858.)

In Jefferson county. A. H. Worthen. (Geol. Iowa, I, 236-237. 1858.)

In Lee county. A. H. Worthen. (Geol. Iowa, I, 190-191. 1858.)

In Van Buren county. A. H. Worthen. (Geol. Iowa, I, 226-227. 1858.)

In Wapello county. A. H. Worthen. (Geol. Iowa, I, 254-255. 1858.)

In Washington county. A. H. Worthen. (Geol. Iowa, I, 242-243. 1858.)

BIBLIOGRAPHY.

St. Louis Limestone.—Continued.


Principal Mississippian Section. C. R. Keyes. (Bul. Geol. Soc. America, III, 283-300. 1892.) The recent investigations along the Mississippi river and the stratigraphical details described with a proposed new classification of the lower Carboniferous rocks in the Mississippi basin.

Unconformibility of the St. Louis limestone upon the older formations of the Sub-Carboniferous group. C. A. White. (Geol. Iowa, I, 225-230. 1870.)

Stones. W. C. Day. (Rep. of the Mining Industry in the United States at the 11th Census in 1890, pp. 593-666. 1892.)

Story County.

General reference to the geology. C. A. White. (Geol. Iowa, II, 259-260. 1870.)


St. Peter Sandstone.
Chemical Analyses. J. D. Whitney. (Geol. Iowa, I, 337-340. 1858.)
General description of the characters. James Hall. (Geol. Iowa, I, 52-54. 1858.)

Surface Deposits.—(See Quaternary.)

Surface Features.


BIBLIOGRAPHY.

433

Tama County.
Geological notes. J. D. Whitney. (Geol. Iowa, I, 266-273. 1858.)

Taylor County.
General geological description. C. A. White. (Geol. Iowa, I, 344-348. 1870.) A brief account of its surface features and geology.

Terrane cretace des environs de Sioux City. J. Marcou. (Bul. Soc. géol. de France, (2), t. XXIV, p. 56. 1866.)


Tiffany, A. S. Geology of Scott County, Iowa, and Rock Island County, Illinois and the Adjacent Territory. (Pamphlet, pp. 1-84, Glass and Hoover, printers. 1885.) A general account of the different geological formations in the vicinity of Davenport, with lists of fossils found in each horizon.


29 G. Rep.
Todd, J. E. A History of the Drift Deposits of Iowa.  

Todd, J. E. Annual Deposits of the Missouri River During the Post-Pliocene.  

Todd, J. E. Evidence that Lake Cheyenne Continued till the Ice Age.  
(Proc. Am. As. Ad. Sci., vol. XXXVII, pp. 202-203. Salem, 1889.) Evidence brought forth to show that western Iowa and eastern Nebraska were occupied by a fresh water lake before the deposition of the drift. Claw of Megalonyx found in Mills county.

Todd, J. E. Geology and Soils.  

Todd, J. E. Loess and its Soils.  

Todd, J. E. Notes on the Distribution of Timber in Southwestern Iowa, with Inferences Concerning the Origin of Prairies.  

Todd, J. E. On the Folding of Carboniferous Strata in Southwestern Iowa.  
(Proc. Iowa Acad. Sci., 1887-1889, p. 58. Des Moines, 1890.) Abstract of a paper read before the Academy, with general section of the upper Carboniferous rocks in southwestern Iowa.

Todd, J. E. On the Relation of the Loess to Drift in Southwestern Iowa.  
(Proc. Iowa Acad. Sci., 1875-80,
Todd, J. E.—Continued.

p. 19. Iowa City, 1880.) A general section of the surface deposits of southwestern Iowa given.


Topography.

General topography of Iowa. C. A. White. (Geol. Iowa, I, 29-35. 1870.) General features, with tables of elevations, and profiles across the state.

Of Iowa. J. D. Whitney. (Geol. Iowa, I, 1-8. 1858.)


Table of Altitudes. H. Gannett. (U. S. Geol. Sur., Bul. No. 5, Iowa, 105-112. 1884.)


BIBLIOGRAPHY.


Torrey, Joséph, Jr., and E. H. Barbour. The Winnebago County (Iowa) Meteorites. (Science, vol. XV, p. 347. 1890.) Reference to a fragment supposed to be a piece of meteorite. The authors claim it was not and base their claims on the grounds of: Two low specific gravity, absence of metals and external crust, and chemical analysis.


Trenton Limestone.

Chemical analyses. J. D. Whitney. (Geol. Iowa, I, 341-349. 1858.)

General description. C. A. White. (Geol. Iowa, I, 174-176. 1870.) Its general characters, economic value and fossils briefly described.

General description of the characters. James Hall. (Geol. Iowa, I, 54-60. 1858.)


Trilobites.


Union County.

General description of geology. C. A. White. (Geol. Iowa, I, 330-335. 1870.) A brief account of its general character and geology.


Van Buren County.


Variation Exhibited by a Carbonic Gasteropod. C. R. Keyes. (Am. Geologist, III, 329-333. 1889.)

Vermes.—(See Worms).

Vertebrates.


Volcanic Eruption in Iowa. C. R. Keyes. (Science, XXI, 132. 1893.)


Wachsmuth, Charles, and Frank Springer. Discovery of the Ventral Structure of Taxocrinus and Haplocrinus; and Consequent Modifications in the Classification of the Crinoidea. (Proc. Acad. Nat. Sci., Phila., 1888, pp. 337-368. 1888.) Remarks upon the classification of the crinoidea necessitated by the recent discovery of the ventral structure of certain crinoids from the Kinderhook [of Marshall County, Iowa.]


Wapello County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 376-385. 1870.)
Wapello County.—Continued.
Coal. C. A. White. (Geol. Iowa, II, 268-270. 1870.) Reference to a number of coal mines in the county.

Warren County.
Analyses of coal. Rush Emery. (Geol. Iowa, II, 385-386. 1870.)
Description of the general geological features. O. H. St. John. (Geol. Iowa, II, 46-77. 1870.) The Geological features of the county briefly described with numerous sections given in detail.

Warsaw Limestone.
General description of the characters. James Hall. (Geol. Iowa, I, 97-98. 1858.)
In Lee county. A. H. Worthen. (Geol. Iowa, I, 192. 1858.)

Washington County.
Washington County.—Continued.


General account of the geology. A. H. Worthen. (Geol. Iowa, I, 239-248. 1858.) Brief account of the geological phenomena as shown in the county. Reference to coal. C. A. White. (Geol. Iowa, II, 273. 1870.)

Waters.


Wayne County.


Webster, Clement L.—Continued.

the Lime Creek beds. The Devonian divided into Corniferous, Hamilton and Hackberry. Lists of characteristic fossils given.


Webster County.

Analyses of coal. Rush Emery. (Geol. Iowa, II, 375-376. 1870.)
Webster County.—Continued.


Gypsum deposits. C. A. White. (Geol. Iowa, II, 293. 1870.)

General geological features. C. A. White. (Geol. Iowa, II, 254-256. 1870.)


Wells.


White, Charles A. A sketch of the Geology of Southwestern Iowa. (Am. Jour. Sci., (2), vol. XLIV, pp. 23-31. New Haven, 1867.) It is shown that the limestones of the region discussed belong to the upper and not to the lower Carboniferous series, as has been supposed by some previous authors.


White, Charles A. Exogenous Leaves in the Cretaceous Rocks of Iowa. (Am. Jour. Sci., (2), vol. XLIV, p. 119, New Haven, 1867.) A note announcing the discovery of exogenous leaves, and showing that the “Nishnabotna sandstone” is identical with the Dakota group.


White, Charles A.—Continued.

of the work carried on during the preceding two years, with reprint of popular letters appearing in the various newspapers of the state.

White, Charles A. Geological Map Model of Iowa. (Geol. Iowa, vol. I, p. 32. Des Moines, 1870.)

White, Charles A. Geological Map of the State of Iowa. (Geol. Iowa, vol. II. Des Moines, 1870.)

White, Charles A. The Iowa Drift. (Am. Naturalist, vol. II, pp. 615-616. Salem, 1869.) Calls attention to the original sites of the granite boulders found in Iowa.

White, Charles A. Lakes of Iowa; Past and Present. (Am. Naturalist, vol. II, pp. 143-155. Salem, 1868.) The drift lakes, including the so-called "walled" lakes are described and the origin of the "walls" explained. Also the bluff deposit of the Missouri river valley is shown to be the deposit of an ancient lake.


White, Charles A. Observations on the Summit Structure of Pentremites, the Structure and Arrangement of Certain Parts of Crinoids, and Description of New
White, Charles A.—Continued.

White, Charles A. Observations upon Geology and Paleontology of Burlington, Iowa, and its Vicinity. (Boston Jour. Nat. Hist., vol. VII, pp. 209-235. Boston, 1860.) A detailed description of the rock-section at Burlington, Iowa, with table showing vertical range of the more important fossils. All below the oölite refer to the Chemung (Devonian). Several species are described as new.


Introduction: Historical statement, popular ex­planations, and general classification of the Iowa rocks.

PART FIRST (PHYSICAL GEOGRAPHY AND SURFACE GEOLOGY):

Chapter I is a general account of the surface features of the state: Boundaries, general topography, drainage, springs, etc.

Chapter II forms a general description of the surface deposits of the state, with rather detailed accounts of the composition, distribution and origin of the drift, altered drift, alluvium and bluff deposits (loess).

Chapter III treats of the soils of the drift, loess (bluff) and alluvium; and of the adaptability of the Iowa soils for the growth of the forest trees. Also an explanation of origin of prairies.

Chapter IV is on the climate of Iowa. (See T. S. Parvin, 1870.)

PART SECOND (GENERAL GEOLOGY).

Chapter I describes the area, general characters, economic value and the fossils of the Archæan, Lower Silurian and Upper Silurian and their general subdivi­sions.

Chapter II gives an account of the Subcarbonifer­ous; the general characters, economic value and fossils of the Kinderhook, Burlington, Keokuk and St. Louis limestones, together with sections and their minor
White, Charles A.—Continued.

subdivisions. Remarks also on the unconformability of the Coal Measures upon older rocks and of the St. Louis limestone upon older formations of the Subcarboniferous group.

Chapter III. The lower, middle and upper Coal Measures recognized in their general characters; and their economic value and fossil features described. Also general observations on the Carboniferous rocks of Iowa, with some practical conclusions.

Chapter IV treats of the middle Coal Measures. (See O. H. St. John, 1870).

Chapter V. Earlier Cretaceous, Nishnabotna sandstone, Woodbury shales and Inoceramus beds described; and their areas, lithological character, economic value and fossils noted.

PART THIRD (COUNTY GEOLOGY.)

Chapter I is a general account of the geology of southwestern Iowa, with special descriptions of the geology of the following counties:

Madison.
Clarke.
Decatur.
Ringgold.
Union.
Adair.
Adams.
Taylor.
Page.
Fremont.
Montgomery.
Mills.
Cass.
Pottawattamie.

PART FIRST (COUNTY GEOLOGY.)

Chapter I deals of the geology of the middle region of western Iowa. (See O. H. St. John, 1870.) The physical features and general geology described, with special reference to the Post-tertiary, Cretaceous and Coal Measures. The general features of the following counties are briefly described, with numerous sections:

Woodbury county.
Monona county.
Harrison county.
Shelby county.
Crawford county.
Audubon county.
Sac county.
Ida county.
Calhoun county.
Carroll county.
Greene county.
Guthrie county.
Dallas county.
Polk county.
Boone county.
Webster county.

Chapter II treats chiefly of Northwestern Iowa. A general description of the geology and material resources; and the geological features of the following counties briefly described:

Pocahontas county.
Palo Alto county.
Emmet county.
Chapter III describes the middle region of northern Iowa, including the geology of the following counties:

- Franklin county.
- Wright county.
- Cerro Gordo county.
- Hancock county.
- Worth county.
- Winnebago county.
- Kossuth county.
- Humboldt county.

Chapter IV deals with the geology of the Coal Measures. A few preliminary remarks and a rather full account of the geological features of the following counties are given:

- Webster county.
- Hamilton county.
- Hardin county.
- Boone county.
- Story county.
- Marshall county.
- Polk county.
- Jasper county.
- Warren county.
White, Charles A.—Continued.
Marion county.
Mahaska county.
Keokuk county.
Monroe county.
Wapello county.
Appanoose county.
Davis county.
Van Buren county.
Jefferson county.

PART SECOND (ECONOMIC GEOLOGY.)
Chapter I describes at length the Peat formation of the state; also brief reference to the petroleum.
Chapter II describes in detail the Gypsum deposits and related materials.
Chapter III gives an account of the Building Materials, especially the clays found in the eastern part of the state; also more or less brief mention of the limestone, fire-clay, road-materials, etc., with brief allusion to the artesian wells and mineral springs.
Chapter IV is chiefly a report of chemical work done by the Survey. (See Rush Emery. 1870). This includes minerals, rocks, lead, clays, coals, waters, and peats.
Appendix A is a list of railroad elevations by chief engineers of the different railways.
Appendix B is a catalogue of Iowa Birds. (By J. A. Allen.)
Appendix C is an explanation of land surveys. (By C. W. Irish.)

White, Charles A. Report upon the Invertebrate Fossils Collected in Portions of Nevada, Utah, Colorado, New Mexico and Arizona by Parties of the Expedi-
White, Charles A.—Continued.


White, Charles A. The Iowa Drift. (Am. Naturalist, vol. II, pp. 615-616. Salem, 1869.) The derivation of the drift material from the underlying rocks, by their disintegration and comminution, is shown.


Whitney, J. D. *Chemistry and Economical Geology.* (Geol. Iowa, I, 324-472. Albany, 1858.) A mention of the chemical composition and lithological characters of the various geological formations with chemical analyses, also remarks on the mode of occurrence of lead ore in northeastern Iowa.
Whitney, J. D. County Geology. (Geol. Iowa, I, 259-323. Albany, 1858.) Detailed notice of the geology of the central and northern counties in the eastern part of Iowa.


Whitney, J. D. Physical Geography of Iowa. (Geol. Iowa, vol. I, pp. 1-34. 1858.) A descriptive account of the surface features, soil and climate of Iowa.


BIBLIOGRAPHY.


Wilson, Park C. Biennial Report of the State Mine Inspector to the Governor of the State of Iowa, for the years 1880-1881. (Pamphlet, 1-165. Des Moines, 1882.) Brief accounts of the different mines in the state and incidentally reference to the geology.

Wilson, Park C. First Biennial Report of the State Mine Inspector for the years 1882-1883. (Pamphlet, 1-94. Des Moines, 1883.) Short accounts of coal mines throughout the state. There is also a number of records of borings made in various parts of Iowa.

Wilson, Park C. Second Biennial Report of the State Mine Inspector for the years 1884-1885. (Pamphlet, 1-116. Des Moines, 1885.) Short accounts of some of the mines of the state with list of all the mines and their location; also the records of several borings.


Winnebago County.


Analyses of peat. Rush Emery. (Geol. Iowa, II, 398. 1870.)

General description. C. A. White. (Geol. Iowa, II, 247-249. 1870.) Brief general description of the surface characters.

Meteorites. Joseph Torrey, Jr., and E. H. Barbour. (Science, vol. XV, 347. 1890.) Reference to a fragment supposed to be a piece of meteorite. The authors claim it was not and base their claims on the grounds of: Too low specific gravity, absence of
Winnebago County.—Continued.

metals and external crust, and chemical analysis.

Winneshiek County.
Notice of the geology. J. D. Whitney. (Geol. Iowa, I, 312-317. 1858.)


Witter, F. M. The Gas Wells near Letts, Iowa. (Proc. Iowa Acad. Sci., 1890-1891, pp. 68-70. Des Moines, 1892.) Gas reported as being found in a number of places near Letts, in Louisa county, and furnishing supplies for a number of families.

Wood.
In Iowa drift. C. A. White. (Geol. Iowa, I, 97. 1870.)

Woodbury County.
Cretaceous deposits at the mouth of the Big. Sioux.
Woodbury County.—Continued.

F. B. Meek. (U. S. Geol. Sur. Terr., IX, p. xxv. 1876.)

Cretaceous rocks near Sioux City. J. Marcou. (Bull. Soc. géol. de France, (2), t. XXIV, 56. 1866.)

Description of the geology. O. H. St. John. (Geol. Iowa, II, 186-200. 1870.) The surface configuration noted. Stratigraphic geology described with a number of sections.

Relation of the Cretaceous Deposits of Iowa to the Subdivisions of the Cretaceous proposed by Meek and Hayden. S. Calvin. (Proc. Iowa Acad. Sci., I, pt. iii, pp. 7-12. 1893.)

Worms.


Worth County.

Analyses of peat. Rush Emery. (Geol. Iowa, II, 398. 1870.)


Worthen, A. H. Geology of Certain Counties. (Geol. Iowa, vol. I, pp. 132-258. Albany, 1858.) A detailed account of the geology of the following counties:
- Lee county.
- Des Moines county.
- Henry county.
- Van Buren county.
- Jefferson county.
- Washington county.
- Wapello county.

Worthen, A. H. Geology of the Des Moines Valley. (Geol. Iowa, I, pp. 147-182, Albany, 1856.) A detailed geological account of a trip made up the Des Moines river during the year 1856, from Keokuk to Ft. Dodge, with numerous sections.


BIBLIOGRAPHY.

Worthen, A. H.—Continued.
As. Ad. Sci., vol. X, pp. 189-192. 1856.) Beds containing fish remains recognized, the lower of which is near the top of the Burlington crinoidal limestone and has been recognized at Augusta, Iowa.


Worthen, A. H., etc.—Continued.

Wright County.
Analyses of peat. Rush Emery. (Geol. Iowa, II, 399. 1870.)

Zinc.
Ore deposits of southwestern Wisconsin. T. C. Chamberlin. (Geol. Sur. Wisconsin, IV, 367-568. 1882.) In Iowa. J. D. Whitney. (Geol. Iowa, I, 469-471. 1858.)
Its occurrence in Iowa. C. A. White. (Geol. Iowa, II, 241-242. 1870.) The ores of this metal reported from Dubuque.