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## Meteorites in the Coe College Museum Cedar Rapids, Iowa

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METEORITES IN THE COE COLLEGE MUSEUM  
CEDAR RAPIDS, IOWA

GLENN S. DILLÉ

There are a number of meteorites in the Coe College Museum collections, most of which are fragments or individuals of falls recorded from the state of Iowa. A few are from other states. Much of the material is fragmentary, some are entire, others are parts of stony meteorites.

The College is indebted to the Iowa Masonic Library at Cedar Rapids for a number of the meteorites. They were in its possession when the entire geological collection was given to Coe College. Much credit is due Mr. Newton R. Parvin, for many years curator of the Library, for his faithful preservation of the meteorites and the data concerning each.

*Hartford Meteorite*—Also known as: Marion; Hartford; Iowa; Linn County.

Fell February 25, 1847, at 2:45 a.m. in Hartford, Linn county, Iowa. Two fragments of this fall were donated to the Iowa Masonic Library. They are No. 1 (1847) Masonic Library, and No. 5 (no date) Masonic Library.

No. 1 (1847) is the larger fragment, weighing 182.7 grams. It was presented to the Library on May 7, 1890, by Dr. William Reynolds. It is a stony meteorite, three surfaces of which are covered with a dull black, finely pitted crust. The other faces are light gray and the material is filled with metallic grains. (Coe College Museum number 57.)

No. 5 (no date) weighs 24.70 grams and appears to be chiefly siliceous material. This is the only questionable meteorite in the collection. Has not been analyzed and was presented to the Library by Mr. Marshall Paul of Lisbon, Iowa. (Coe College Museum number 55.)

These fragments are part of the fall now represented in the collections of Harvard University by two fragments, one weighing 203.5 grams; the other, an irregular fragment showing crust, 167.5 grams. Other small fragments totaling 3.5 grams are also in the Harvard collection. The Harvard part of the fall is described by O. W. Huntington in Proc. Am. Acad. Arts and Sci., N. S. XV,

37-110, 1887, p. 68. He says of the 203.5 gram piece: "Stone. Light gray, full of iron grains, and intersected with cracks filled with crust. Dull black finely pitted crust on three sides, all in different degrees of fusion. One polished face." (Smith Collection.)

Of the 167.5 gram piece he says, "An irregular fragment showing crust."

Mr. G. F. Prior in Catalogue of Meteorites, British Museum, 1923, p. 108, gives a review of the fall. He says, "Stone. Veined white hypersthene-chondrite. Described by C. M. Shepard (Am. Jour. Sci. 1847, vol. 4, p. 288, 429; 1848, vol. 6, p. 403; 1851, vol. 11, p. 38); Analyzed by C. Rammelsberg (Monatsber. Akad. Wiss. Berlin, 1870, p. 457).

"The 20 pound stone is in Amherst College. One kilogram in Yale University. In the British Museum 805½ grams; and fragments — 8 grams and 137 grams."

In a paper entitled "The recorded meteorites of Iowa, with special mention of the last, or Winnebago County, meteorite," by Joseph Torrey and E. H. Barbour (Am. Geol. vol. 8, 1891, p. 65), the following analysis of the Hartford meteorite is given.

*Analysis of the stony part*

	PER CENT
Silica	60.16
Ferrous oxide	23.50
Magnesia	11.20
Magnetic pyrite	4.60
Soda and potash	0.30
	99.82

*Analysis of the metal part*

	PER CENT
Nickel	86.00
Iron	14.00

In the Ward-Coonley collection of meteorites (Catalogue of Ward-Coonley Collection of Meteorites, Henry A. Ward, Chicago, 1904, p. 52) a notice is given of 188 grams of the Marion meteorite. The largest piece weighs 60 grams.

*Amana Meteorite* — Also known as: Iowa County; Marengo; Sherlock; West Liberty.

Fell February 12, 1875, at 10:15 p.m. This fall is represented in the Coe College museum by two specimens. One individual weighing 144.2 grams was presented to the Iowa Masonic Library, February 13, 1875. It shows only the black surface without a fracture and in one place where polished shows the metallic grains.

The other specimen is smaller and weighs 61.98 grams. It is a fragment of stony material, dull gray, with metallic grains sprinkled throughout the mass. Two surfaces are dull black and finely pitted. One surface is polished. The latter specimen was presented to Coe College by Dr. E. H. King of West Liberty, Iowa, February 10, 1876. (Coe College museum numbers respectively 60 and 59.)

This meteorite is a part of the fall now represented in the Harvard collections and described in part by Huntington (*Op. cit.*, p. 95) as follows:

"Stone. Fragment, weight 5,425 grams. Dull gray, with iron grains sprinkled through the mass. Nearly covered with a dull black crust, deeply pitted (Smith collection)."

"Complete individual. Weight 2,803 grams. Covered entirely with crust (Smith collection)."

"Fragment with crust. Weight 1,746 grams (Smith collection)."

"Complete individual. Weight 1,691 grams (Smith collection)."

"Complete individual. Weight 1,677 grams (Smith collection)."

"Individual. Weight 1,346 grams. Completely covered with crust except that on one side the crust is only thinly formed over a surface of recent fracture (Smith collection)."

"Complete individual. Weight 875 grams (purchased from Ward and Howell)."

"Complete individual. Weight 685 grams with surface showing imperfectly formed crust (Smith collection)."

"Fragment, showing crust, also crust partially formed over fracture. Weight 286 grams (Smith collection)."

"Fragment showing crust. Weight 273 grams (Smith collection)."

"Weight 200 grams. One polished face, elsewhere crust (Purchased)."

"Complete individual. Weight 139 grams. With coatings of different thickness (Smith collection)."

"Irregular fragment. Weight 63 grams (Smith collection)."

"Fragment with crust. Weight 74 grams (Smith collection)."

"Fragment with crust. Weight 51 grams (Smith collection)."

"Fragment with crust. Weight 21 grams (Smith collection)."

"Fragment with no crust. Weight 30 grams (Smith collection)."

"Fragment with no crust. Weight 4 grams (Smith collection)."

Prior (*Op. cit.*, p. 73) gives the following brief review of the Homestead (Amana) meteorite: "Stone. Brecciated grey bronzite-chondrite. Described by G. Hinrichs (*Popular Science Monthly*, N. Y. Sept., 1875; N. R. Leonard, *Am. Jour. Sci.*, 1875, vol. 10, p. 357). Described by C. W. Gumbel (*Sitzingsber Akad. Wiss. Munchen, Math-Phys. Cl.*, 1875, vol. 5, p. 313). Analyzed by G. T. Prior (*Mineral Mag.*, 1918, vol. 18, p. 173). Thirty-five kilograms in Yale University, over 19 kilograms in Chicago (Field Museum Natural History), 17 kilograms in Harvard University. Specimens in the British museum: A complete stone from G. Hinrichs, 3800 grams; another of 127 grams.

Torrey and Barbour (*Op. cit.*, p. 66) have examined and studied parts of the fall which are now in Harvard University. They report the availability of occluded gases as follows:

*At 100°C the Gaseous Mixture Evolved Consisted of*

	PER CENT
Carbon dioxide.....	95.46
Carbon monoxide.....	00.00
Hydrogen .....	4.54
Nitrogen .....	00.00
	100.00

*When Exposed to Full Red Heat There Was Found*

	PER CENT
Carbon dioxide.....	5.56
Carbon monoxide.....	0.00
Hydrogen .....	87.53
Nitrogen .....	6.91
	100.00

They give the specific gravity as 3.6.

In addition to the above recorded parts of the fall there are specimens in the department of Geology, University of Iowa.

In the Ward-Coonley collection (Op. cit., p. 45) there are a number of pieces totalling 6,737 grams. The largest piece weighs 5,403 grams.

This analysis of gases from the Homestead meteorite is given by Wright (Meteorites. Farrington, p. 195).

	PER CENT
Vols .....	2.50
H .....	57.88
CO <sub>2</sub> .....	35.44
CO .....	1.80
N .....	4.88
CH <sub>4</sub> .....	0.00
	100.00

*Estherville meteorite* — Also known as: Emmet county; Iowa; Perry meteor.

Fell May 10, 1879, at 5:00 p.m. One complete individual was presented to the Iowa Masonic Library by Mr. C. R. Birge, May 7, 1890. One face shows the metallic nature, the other surfaces are dull black. Weight 90.77 grams. (Coe College museum number 56.)

Three small fragments of the metal portion were presented to the Coe College museum by Mr. J. A. Treganza of Britt, Iowa. These fragments show the metal nature exceptionally well. Weight of the three fragments 2.77 grams. (Coe College museum number 52.)

Huntington (Op. cit., pp. 98, 99) lists the following individuals and fragments from the Harvard collections:

Ragged mass. Weight 12,605 grams. Iron. Consisting of a network of iron enclosing olivine, but the proportion of the two varying largely in different parts of the meteorite. This specimen is a ragged mass partially covered

with a bluish black crust deeply pitted. It also contains a nodule of transparent cleavable olivine 8 cm. in diameter (Purchased).

Individual. Weight 1,001.5 grams. One face polished showing on the iron Widmannstättian figures before being etched.

Weight 821 grams. Similar to previous specimens but mostly iron.

Mass looking like slag but showing the iron network on cut face. Weight 545.5 grams.

Individual. Weight 492 grams. Containing small amount of iron and completely covered with crust.

Individual, mostly iron. Weight 489 grams.

Stony looking mass. Weight 431 grams.

Pure iron showing beautiful Widmannstättian figures. Weight 162 grams.

Individual, mostly iron. Weight 148 grams.

Individual, mostly iron. Weight 105 grams.

Individual, mostly iron. Weight 83.5 grams.

Individual, mostly iron. Weight 61.5 grams.

Individual, mostly iron. Weight 61.5 grams.

Stony looking mass. Weight 50 grams.

Similar but with one face cut. Weight 46 grams.

One polished face. Weight 17 grams.

297 grams nodular masses from 50 grams down to fine grains. 208 specimens all individuals and nearly pure iron.

259 grams of the stony portion in fragments.

Torrey and Barbour (Op. cit., p. 66) state that one mass weighing 500 pounds was sent to the British Museum and one of 175 pounds to the University of Minnesota, and that a total of sixteen large masses is on record. The specific gravity of the stony portion was found to be 3.35; of the metal 5.97. No chemical analysis was given. They state that chemically the Emmet County meteorite has no strongly distinguishing features.

Prior (Op. cit., p. 59) gives the following brief review of the fall: "Stony-iron. Mesosiderite. Described by S. F. Peckham (Am. Jour. Sci., 1879, vol. 18, p. 77; C. U. Shepard, *ibid.*, p. 186) described and analyzed by J. L. Smith (*ibid.*, 1880, vol. 19, p. 459), also described by G. P. Merrill, with analyses of "peckhamite," etc., by J. E. Whitfield and E. V. Shannon (Proc. U. S. Nat. Mus. Wash., 1920, vol. 58, p. 363).

The 437 pound mass was divided between London, Paris and Vienna museums; the 150 pound mass is in Minneapolis. In the British Museum: Part of largest mass 116,120 grams (256 pound piece) and pieces, 70 grams; 44 small fragments, 416 grams; 17 small fragments, 187 grams; 21½ grams; 2 fragments of 7 and 3 grams."

In the Ward-Coonley collection (Op. cit., p. 30) fragments totalling 7,896 grams are housed. The largest piece weighs 5,087 grams.

In the University of Iowa collection there is one individual representative of this fall.

*Forest meteorite* — Also known as Winnebago County; Forest City; Kossuth County; Iowa; Leland.

Fell May 2, 1890, at 5:15 p.m., eleven miles northwest of Forest City, Winnebago county, Iowa, near the town of Thompson. This fall is represented in the Coe College collections by six individuals and two fragments. All individuals are dull black and somewhat pitted. The weight of the six individuals is respectively: 15.65 grams; 8.70 grams; 5.64 grams; 4.40 grams; 1.24 grams; 9.77 grams.

The fragments show a light gray stony material and on the polished face of one individual Widmannstättian figures are well shown. The weights of the fragments are respectively: 9.26 grams; 1.81 grams.

The eight specimens were presented to Coe College by Mr. J. A. Treganza of Britt, Iowa, in 1925. (Coe College museum number 50.)

One individual weighing 33.56 grams, came from the Masonic Library collections. Dull black with brown tarnish. Presented to the Library by Mr. C. J. Joes, May 16, 1890. (Coe College museum number 54.)

Torrey and Barbour (*Op. cit.*, pp. 67-68) state as follows concerning this meteorite:

“Seven large fragments are noted, weighing respectively in pounds — 86.00; 66.00; 10.00; 10.00; 60 oz.; 60 oz., and according to Prof. N. H. Winchell about 5000 small fragments weighing from the fraction of an ounce to a pound or more. Between two and three hundred small fragments are in Yale University collection alone. About 100 pieces and the 66 pound piece are in the University of Minnesota. Others are owned by Ward and Howell of Rochester, N. Y., and Geo. F. Kunz, New York. The dead black scoriaceous crust when broken reveals a light gray stone interspersed with innumerable dark particles of iron, and globules of troilite, quite like the Iowa County stones in appearance. Thin seams and cracks occur occasionally filled with a substance that has somewhat the appearance of graphite, and small spheroidal masses of olivine are abundant. Specific gravity 3.638.”

Chemical composition of the matrix from a fragment of the 66 pound aerolite:

	PER CENT
Silica	47.03
Iron oxide	29.43
Oxide of aluminium	2.94
Lime	17.58
Magnesia	2.96
	99.94

This is but an approximate composition and it is our opinion

that nothing else should be offered, and that no analysis yet published is strictly reliable owing to the non-homogeneous character of the matrix.

A partial analysis was made of the metal from the matrix :

	PER CENT
Iron -----	95.79
Nickel -----	2.89
Silicon -----	0.03
Carbon and manganese — undet.-----	
Sulphur -----	0.68
Phosphorus -----	0.54
	99.93

Prior (Op. cit., p. 61) gives the following brief review of this fall: "Stone. Brecciated spherical bronzite-chondrite. Described by J. Torrey and E. H. Barbour, Am. Jour. Sci., 1890, vol. 39, p. 521; and Amer. Geol., 1891, vol. 8, p. 67; G. F. Kunz, Am. Jour. Sci., 1890, vol. 40, p. 318; H. A. Newton, *ibid.*, 1890, vol. 39, p. 522. Analyzed by L. G. Eakins (G. F. Kunz, loc. cit., p. 319)  $f = 19$   $n = 15$   $m = 4\frac{1}{2}$ . The 80 lb. stone in New York (Am. Mus. Nat. Hist.); the 66 lb. stone in Minneapolis. In the British museum a large complete stone 2265 grams; six complete and one nearly complete stones 291 grams."

In the Ward-Coonley collection (Op. cit., p. 43) a number of pieces are represented totalling 5120 grams. The largest piece weighs 1774 grams.

An analysis questioning the Torrey-Barbour analysis is given by E. N. Eaton of Ames in the American Geologist, vol. 8, 1891, pp. 385-387.

*Holbrook, Navajo County, Arizona meteorite* — Also known as the Aztec.

Fell July 19, 1912, at 7:15 p.m., near Holbrook, Arizona, and was presented to the Masonic Library by Mr. Lloyd C. Henning of Holbrook. (1750 Masonic Library.) There are two individuals and one fragment which shows the stony nature. The surface of the dull black individuals is covered with tiny polygonal cracks which appear a much lighter color against the dark background. Weight respectively 47.21 grams; 14.20 grams; and 9.30 grams. (Coe College museum number 58.)

In another collection which came to Coe College (Walker-Luberger) is a single individual which had at one time been purchased from the Foote Co. of Philadelphia. It is dull black and shows the stony interior where chipped. Weight 86 grams. (Coe College museum number 53.)



Prior (Op. cit., p. 73) states as follows: "Stone. Crystalline spherical hypersthene-chondrite. Described by Wm. M. Foote with partial analysis by G. C. Davis (Am. Jour. Sci., 1912, vol. 34, p. 437) and G. P. Merrill, with analysis by J. E. Whitfield (Smithson. Misc. Coll. Washington, 1912, vol. 60, No. 9, Publ. 2149). 196 stones weighing 11 kilograms in Chicago (Field Mus. Nat. Hist.). 3½ kilograms (4 stones) in Washington (U. S. Nat. Mus.). British museum specimens 100 stones mostly complete having a total weight of 7855 grams, the largest weighing 3120½ grams and the smallest 0.329 grams.

*Mott-Richardton meteorite* — Also known as the Stark; Richardton; North Dakota.

Fell June 30, 1918, at 9:48 p.m. Collected and presented to the Coe College museum by Mr. J. A. Treganza of Britt, Iowa. There are eight fragments weighing respectively: 65.00 grams; 44.27 grams; 25.61 grams; 25.32 grams; 24.07 grams; 12.22 grams; 8.97 grams; 3.59 grams. All show the stony interior of light gray color, with many spheroidal bodies (chondrules) throughout. A part of the surface of each specimen is covered with a dull black crust. (Coe College museum number 51. )

Prior (Op. cit., p. 148) states as follows: "Stone. Veined spheroidal bronzite-chondrite. Described by T. T. Quirke and analyzed by J. E. Whitfield (Jour. Geol., Chicago, 1919, vol. 27, p. 431, 2 figs). Specimens in the British museum four complete stones 478 grams; 413 grams; 372.2 grams; and 166 grams."

Dillé: Meteorites in the Coe College Museum Cedar Rapids, Iowa

*Meteorites in Coe College*

COE No.	FELL	NAME	LOCATION OF FALL	KIND	No. PIECES COE MUS.	WEIGHT GRAMS	REMARKS
57 and 55	Feb. 25, 1847 2:45 a.m.	Hartford	Linn Co.	Stony	2 fragments	182.7 24.70	57. Presented to Library by Dr. Wm. Reynolds, May 7, 1890 55. Presented to Library by Mr. Marshall Paul of Lisbon, Iowa
60 and 59	Feb. 12, 1875 10:15 p.m.	Amana	Amana, West Liberty, Iowa Co.	Stony	2 indiv.	144.2 61.98	60. Presented to Library, Feb. 13, 1875 59. Presented to Coe College by Dr. E. H. King, West Liberty, Iowa, Feb. 10, 1876
56 and 52	May 10, 1879 5:00 p.m.	Estherville	Emmet Co.	Stony-iron	4 fragments	90.77 2.77	56. Presented to Library by Mr. C. R. Birge, May 7, 1890 52. Presented to Coe College by Mr. J. A. Treganza, Britt, Iowa, 1925
50 and 54	May 2, 1890 5:15 p.m.	Forest	Winnebago Co.	Stone	9: 7 indiv. 2 fragments	33.56 15.65 9.26 8.70 5.64 4.40 1.81 1.24 0.77	50. Presented to Coe College by J. A. Treganza, Britt, Iowa 54. Presented to Library by Mr. C. J. Joes, May 16, 1890
58 and 53	July 19, 1912 7:15 p.m.	Holbrook	Arizona	Stone	4: 3 indiv. 1 fragment	47.21 14.20 9.30 86.00	58. Presented to Library by Mr. L. C. Henning, Holbrook, Arizona 53. Presented to Coe College in Walker-Luberger Collection, 1925
51	June 30, 1918 9:48 p.m.	Richardton	North Dakota	Stone	8: All fragments	65.00 44.27 25.61 25.32 24.07 12.22 8.97 3.59	51. Collected and presented to Coe College by J. A. Treganza, Britt, Iowa, 1925

PLATE I

1. Linn County or Hartford meteorite.  $\frac{1}{2}$  nat. size. No. 57 Coe.
2. Linn County or Hartford meteorite, opposite face.  $\frac{3}{4}$  nat. size. No. 57 Coe.
3. Estherville or Emmet County meteorite.  $\frac{2}{3}$  nat. size. No. 56 Coe.
4. Linn County or Hartford meteorite.  $\frac{1}{2}$  nat. size. No. 57 Coe.
5. Amana meteorite.  $\frac{3}{4}$  nat. size. No. 59 Coe.
6. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-a Coe.
7. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-b Coe.
8. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-c Coe.
9. Forest or Winnebago County meteorite.  $\frac{2}{3}$  nat. size. No. 54 Coe.
10. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-d Coe.
11. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-e Coe.
12. Holbrook, Ariz., meteorite.  $\frac{1}{2}$  nat. size. No. 53 Coe.
13. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-f Coe.
14. Holbrook, Ariz. meteorite.  $\frac{1}{2}$  nat. size. No. 58-a Coe.
15. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-g Coe.
16. Holbrook, Ariz., meteorite.  $\frac{1}{2}$  nat. size. No. 58-b Coe.
17. Mott-Richardton meteorite.  $\frac{1}{2}$  nat. size. No. 51-h Coe.
18. Forest or Winnebago County meteorite.  $\frac{1}{2}$  nat. size. No. 50-a Coe.

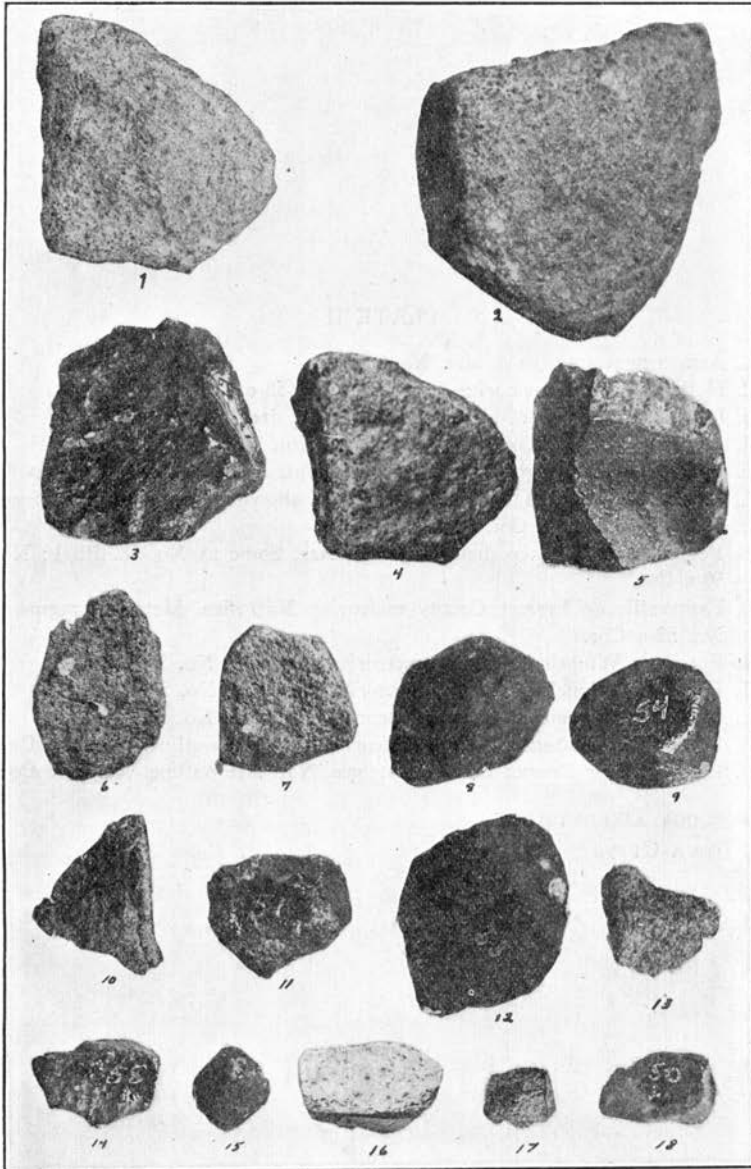


PLATE I

PLATE II

1. Amana meteorite.  $\frac{1}{2}$  nat. size. No. 60 Coe.
2. Holbrook, Ariz., meteorite.  $\frac{1}{2}$  nat. size. No. 58-c Coe.
3. Linn County or Hartford meteorite.  $\frac{1}{2}$  nat. size. No. 55 Coe.
4. Forest or Winnebago County meteorite. Nat. size. No. 50-b Coe.
5. Forest or Winnebago County meteorite. Nat. size. No. 50-c Coe.
6. Forest or Winnebago County fragment showing rough gray surface. Nat. size. No. 50-d Coe.
8. Forest or Winnebago meteorite. Nat. size. Same as No. 18. Pl. I; No. 50-a Coe.
9. Estherville or Emmet County meteorite. Nat. size. Metallic fragment. No. 52-a Coe.
10. Forest or Winnebago County meteorite. Nat. size. No. 50-f Coe.
11. Forest or Winnebago County meteorite. Nat. size. No. 50-g Coe.
12. Forest or Winnebago County meteorite. Nat. size. No. 50-h Coe.
13. Estherville or Emmet County meteorite. Nat. size outline. No. 52-b Coe.
14. Estherville or Emmet County meteorite. Nat. size outline. No. 52-c Coe.

GEOLOGY DEPARTMENT,  
IOWA CITY.

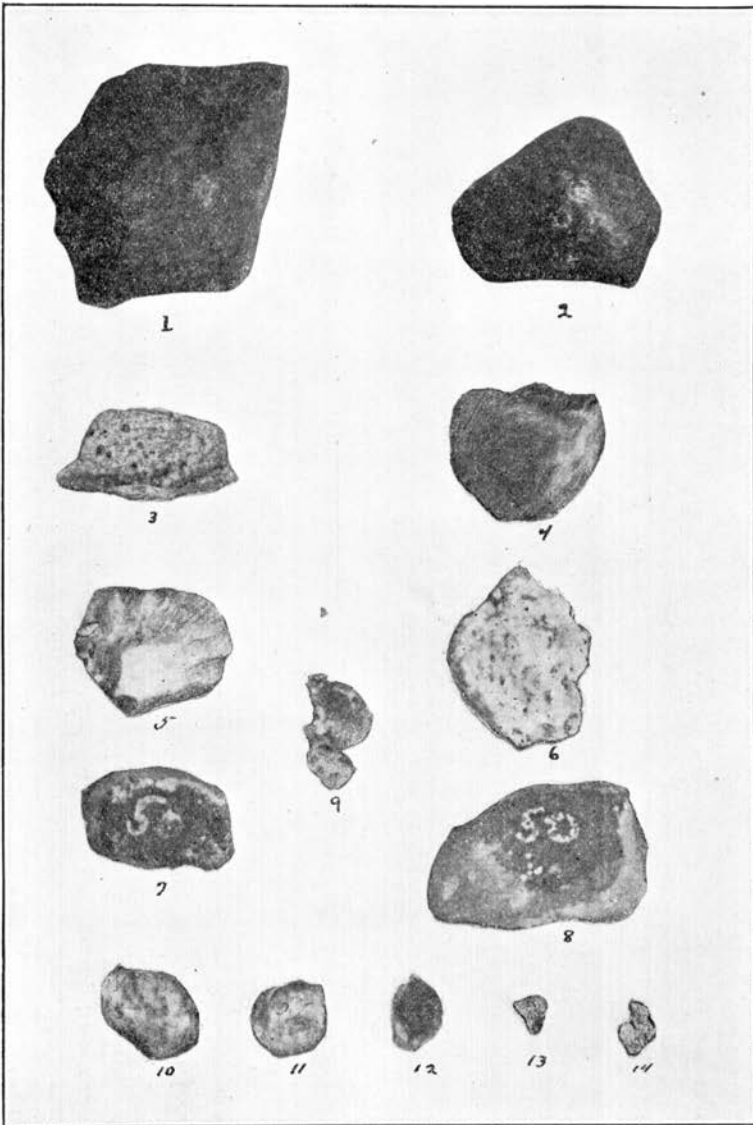


PLATE II