1934

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BULLETIN 40 VOLUME I SEPTEMBER, 1934

THE NEBRASKA STATE MUSEUM
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THE NEBRASKA METEOR AND METEORITE OF AUGUST 8, 1933

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At approximately 10:30 a. m., mountain standard time, on August 8, 1933, a large meteor, traveling in a westerly direction, exploded over the panhandle of Nebraska. The phenomenon was witnessed by many citizens throughout the region, and by a number of students from the University of Nebraska, who were engaged at the time in palaeontological field work in northwestern Nebraska.

Most of the observers of the meteor described it as a "ball of fire shooting across the sky from the east, leaving a streak of smoke". Many heard a whining or whizzing sound as it passed. The meteor finally burst over southeastern Sioux County and the noise of the explosion was heard and the smoke was seen as far as 200 miles away. A few observers reported that after the explosion a meteorite was seen to fall to the earth within a mile or two of them, but actually the distance was 100 miles or more. The sky was nearly free from clouds and the trail of smoke left by the meteor remained visible for a number of minutes.

In the near vicinity of the explosion, houses are reported to have been shaken for ten to fifteen seconds as in an earthquake. Dishes are said to have fallen from shelves. Farm animals throughout the region were badly frightened, and teams bolted and ran away. One woman was thrown to the ground by the concussion, and her husband in a neighboring field was cut and bruised in a runaway. The stubble and grass in several fields caught fire about 10:30 a. m. on August 8, and the origins of the fires were popularly attributed to the fall of "hot meteorites"; however, no meteoric stones could be found in any of these fields.

There are many witnesses to the observation that the sound of the explosion reached the ear and the flash reached the eye simultaneously even though sound and light travel at extremely different rates of speed. This is confirmatory of Dr. Sellard's observations in connection with the Texas meteor of 1928. Under ordinary conditions, sound travels a mile in about five seconds, and light a mile in 1/186,300 second. In the case of the Sioux County meteor, the sound apparently

traveled at the same speed as light. Identical observations were made in connection with the Texas meteor of June 23, 1928.[1] Dr. E. H. Sellards, in reporting on this meteor, suggests that "one must either consider some other explanation for the noise or must discard a considerable number of observations made independently at various places and under varying conditions, all of the observations being in essential agreement."

A search for meteorites from the Sioux County fall was organized and an attempt made to obtain facts about the phenomenon. Search was rewarded, and one small but interesting stony meteorite was secured for the Nebraska State Museum. Immediately following the flight and explosion of this meteor, Director J. D. Figgins of the Colorado Museum of Natural History dispatched a party, in charge of Mr. H. H. Nininger, to search for stones and to record information.

On September 2, Lloyd Metcalf and Karl Spence of Crawford, Nebraska, reported to members of the State Museum Field Party that a small meteorite had been found. Lloyd Metcalf, Thompson Stout, and C. Bertrand Schultz drove to the farm of Guy Yohe, southwest of Glen, Sioux County, Nebraska, and learned that Mr. Yohe's son had found a small meteorite. Homer Yohe, his brother Wayne Yohe, and Ray Bacon were working in a potato patch in Sec. 1, T. 29 N., R. 54 W., on the Yohe farm on August 8. At 10:30 a. m. they heard "thunder" which grew increasingly louder and then died away. At the same time they noticed two streaks of smoke to the south, one of which appeared to be straight and the other quite irregular. At the end of each there was a large "ball" or cloud of smoke. The two seemed to be a short distance apart and traveling to the southwest. The three observers thought perhaps an aeroplane had exploded. Mr. Ray Bacon states that he "heard a stone strike the ground while the noise of the explosion could still be heard." Mr. Bacon, mistaking this for a stone thrown mischievously by the Yohe boys, mentioned the matter to their father. The next day, on learning that an actual meteor had exploded, Homer Yohe returned to the field and soon found a meteorite.

It is rarely that a meteorite is seen to fall and, fortunately, this one seems to be especially well authenticated. Homer Yohe donated this specimen to the Nebraska State Museum where it is an acceptable acquisition. It has been added to other

[1] Sellards, E. H. The Texas Meteor of June 23, 1928. University of Texas Bulletin, No. 2901, January 1, 1929, pp. 89-90.

meteorites of the State and surroundings and put on exhibition for the interest and instruction of our citizens and other guests. It is entered in the accession book as 1-3-9-33.

The Sioux County meteorite is 61 mm. (maximum length) by 48 mm. (maximum width) by 40 mm. (maximum thickness) and weighs 113.3 grams. Its light gray stony interior is covered with a thin, glossy, black and brown glazed crust formed by the melting of its surface during its passage through the air. This stone for a time was the only one recovered from this fall but later Mr. Nininger secured specimens. Several so-called meteorites were found near Alliance and Scottsbluff, but these proved to be haystack cinders.

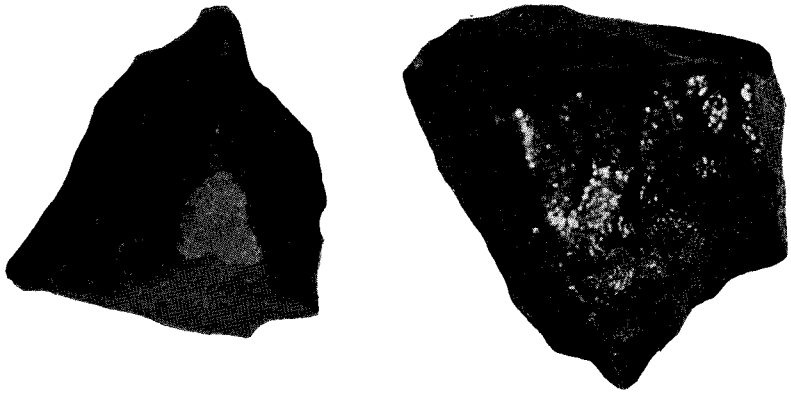

FIG. 182.—Two views of the Sioux County Meteorite No. 1-3-9-33, the Nebraska State Museum.

The following geological field parties from the University of Nebraska heard the explosion in their respective camps. The numbers in the text agree with those on the accompanying map.

(1) Frank W. Johnson, Class of 1934, and Charles Osborne, Class of 1935, were excavating Pleistocene fossils in a canyon south of Rushville, Sheridan County, in N½ of Sec. 9, T. 29, N., R. 44 W. One mistook the detonation for thunder, the other for the rumble of some heavy truck on a rough road nearby. The location of this party is shown at No. 1 on the accompanying map.

(2) Dr. A. L. Lugn, Department of Geology, University of Nebraska, was studying some Pleistocene deposits southeast of Hay Springs, Nebraska. About 10:30 a. m. August 8, he drove into the farmyard of Nick Kouzal in NE¼ of Sec. 12, T. 29 N., R. 45 W. Mrs. Kuzal informed Dr. Lugn of a strange phenomenon just witnessed. A fiery streak appeared in the sky near the zenith, a little to the south, and moved to the west from an easterly direction. This streak in the sky

was accompanied by a sizzling sound. At a point somewhat to the southwest, it seemed to burst into a ball of fire, accompanied by a loud detonation, and then faded from sight behind a white fleecy cloud. Mrs. Kouzal also noted that the turkeys and chickens were alarmed at the passing meteor. See No. 2 on the accompanying map.

(3) Robert Long, Class of 1937, and C. Bertrand Schultz, Class of 1931, were in the field near Crawford, Dawes County, Nebraska. To them the noise of the explosion came from the direction of Fort Robinson, and it was supposed that the soldiers had fired a cannon, or else were blasting with dynamite. The location is shown at No. 3 on the map.

(4) Emery L. Blue, U. of I. 1927, Loren Eiseley, Class of 1933, Eugene Vanderpool, Class of 1933, Frank W. Crabill, Class of 1935, and Thompson Stout, Class of 1936, were collecting fossils in the White River Bad Lands about 16 miles northwest of Crawford in Sec. 23, T. 33 N., R. 53 W. Some thought the sharp report that of dynamite. Others of this party, according to their position, mistook it for a clap of thunder and climbed a knoll to look for the storm cloud. The location is shown at No. 4 on the map.

The following field parties from other institutions also observed this meteor:

(5) A museum field party from the Frick Laboratories, the American Museum of Natural History of New York City, was collecting fossils south and west of Van Tassel, Wyoming, at the time of the passing of the meteor. Charles Falkenbach, in charge of the group, said that he heard the explosion and thought it was thunder, and climbed to the top of a hill to see if a storm was approaching. The location is shown at 5 on the map.

(6) Eric Schlaikjer, who was in charge of a party of fossil collectors from Harvard University, working in Goshen County, Wyoming, furnished the following information: Mr. Schlaikjer was eight miles east of Torrington, Wyoming, driving toward Nebraska at the time of the explosion of the meteor. He felt a shaking of the car but at the time attributed it to a "washboard" road. One of his assistants, who was in the Harvard Palaeontological Laboratory, 1½ miles southwest of Torrington, noticed a cloud of smoke a little to the north. There was considerable shaking of the laboratory building. The location is shown at No. 6 on the map.

A meteor is simply a "shooting star" or "falling star", an object with which all people are familiar from childhood. Shooting stars generally pass through our atmosphere at a high speed and leave a momentary trail of light. An occasional shooting star, however, strikes the earth and comes to rest, in which event it is known as a meteorite, which may be of iron, of stone and iron mixed, or wholly of stone. Those of iron are by far the most readily recognized because of their weight and are the ones most commonly seen in museums, but are not the commonest to fall.

G. P. Merrill.[1] in his studies of meteorites, found that out of a total of 482 which were seen to fall, 458 represent stony

[1] Merrill, G. P. The Story of Meteorites. Smithsonian Scientific Series, Vol. VI. 1922, pp. 1-163.

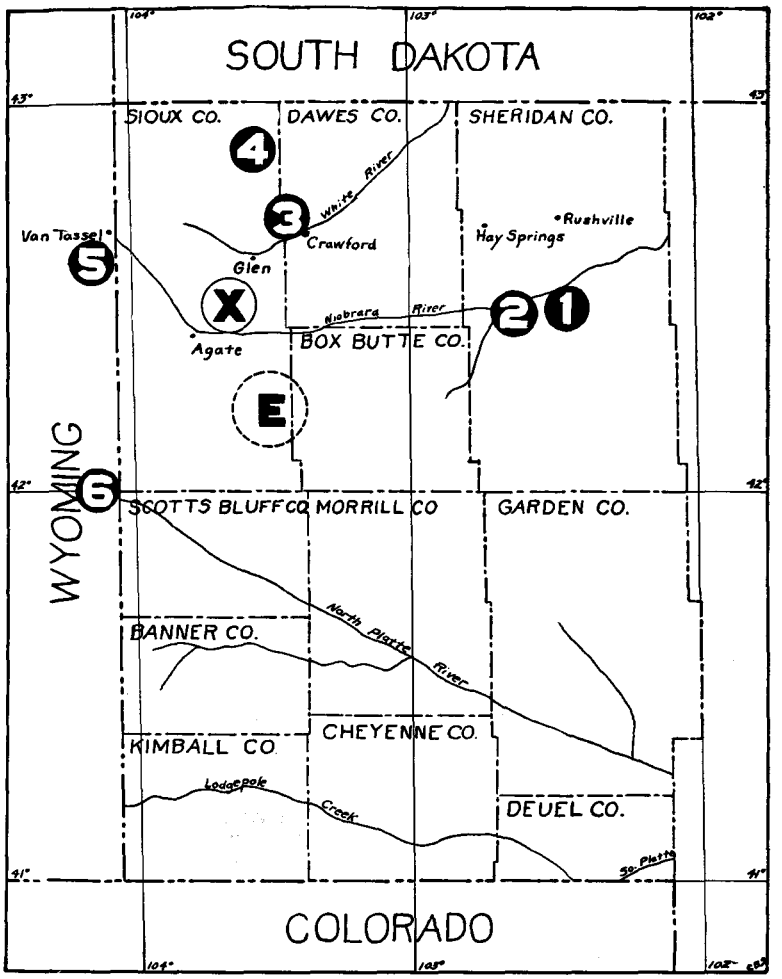

FIG. 183.—A map of the panhandle of Nebraska showing: within the circle at E the approximate point of the meteoric explosion; X the spot where the Sioux County meteorite (No. 1-3-9-33, the Nebraska State Museum) was found. Numbers 1 to 6 inclusive indicate the positions from which the various geological field parties observed the meteor.

meteorites or Aerolites, 5 stony-iron or Siderolites, and 22 nickel-iron or Siderites.

Meteoric bodies of all sizes from specks to large masses are traveling through outer space at velocities as high as 10 to 50 miles a second. Outer space in which they travel is as black as night, is intensely cold, about 459° below zero, F., and is practically a vacuum.

When one of these celestial visitors traveling in its regular and orderly course in space plunges into our atmosphere, there is instantly engendered a heat so intense that it burns off thin outer films of the meteoric body and causes the bolide itself to explode, on the same principle that a cold tumbler plunged suddenly into hot water may snap. Small meteors are generally burned up and so do not strike, but the larger ones are not wholly consumed. Some simply fall upon the surface, while others bury themselves. One distinguishing character of meteorites is their dark glazed outer crust. In the case of the Sioux County meteorite, the crust or glaze is very thin, but well defined, jet black, with dark brownish flecks and is as lustrous as though varnished.

LIST OF NEBRASKA METEORITES

The following list of Nebraska meteorites was made up from those at hand in the Nebraska State Museum, from those reported in Mr. H. H. Nininger's book, "Our Stone-Pelted Planet", and by correspondence with Mr. Nininger.

1. Ponca Creek, Nebraska. Found in 1863. 45,400 grams (100 lbs.). Iron. Lost.
2. York County, Nebraska. Found in 1878. 900 grams (1.9 lbs.). Iron. In Nebraska State Museum Collection.
3. Rock County, Mariaville, Nebraska. Fell at midnight on October 16, 1898. One mass, 340 grams (12 oz.). Iron. Lost.
4. Red Willow County, Nebraska. Found in 1899. 2,776 grams (6.13 lbs.). Iron. In Nebraska State Museum Collection.
5. Lancaster County, Nebraska. Found in 1903. 13,000 grams (28.6 lbs.). Iron. In Nebraska State Museum Collection.
6. Brown County, Ainsworth, Nebraska. Found in 1907. 10,700 grams (23.5 lbs.). Iron. In U. S. National Museum Collection, Washington, D. C.
7. Hitchcock County, Culbertson, Nebraska. Found in 1913. 5,900 grams (13 lbs.). Stone. In American Museum of Natural History Collection, New York City.
8. Keith County, Ogallala, Nebraska. Found in 1918. 3,300 grams (7.3 lbs.). Iron. In Nininger Collection, Denver, Colorado.
9. Howard County, Cotesfield, Nebraska. Found in 1928. 1,200 grams (2.6 lbs.). Stone. In Colorado Museum of Natural History, Denver, Colorado.

10. Sioux County, near Glen, Nebraska. Fell at 10:30 a. m. August 8, 1933. 113.3 grams (3.9 oz.). Stone. In Nebraska State Museum Collection.

The meteorite under consideration is small and rare, and is prized to the point where liberties cannot be taken with it even though a report is incomplete without a chemical analysis and a petrographic study of a section.

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1891. Discovery of Meteoric Iron in Nebraska. Nebraska Academy of Sciences, Proceedings of the Nebraska State Historical Society, Vol. II, 1 plate, 4 figures, 5 pages.

1901. The Unpublished Meteorites of Nebraska. Proceedings of Nebraska Academy of Sciences, Vol. VII, November, 1 plate, pp. 34-35.

1903. Meteoric Iron. Nebraska Geological Survey. Vol. I, 9 figures, pp. 181-185.

Those who are interested will find a popular article, for ready reference, entitled "Comets, Meteors, and Meteorites" by Chester A. Reeds, in Natural History, Journal of the American Museum of Natural History, New York City, May-June, 1933.

While this paper was in press, three more stones of the Nebraska meteorite of August 8, 1933, were secured for the State Museum by Lloyd Metcalf, Gordon L. Graham, and C. Bertrand Schultz, September 16, 1934. The meteorites are as follows:

1. Found in June, 1934, in E½ Sec. 1, T. 29 N., R. 54 W., Sioux County. Weight, 19.4 grams (.7 oz.). Number 1-16-9-34 in Nebraska State Museum Collection. Found and donated by Wayne Yohe, Glen, Nebraska.
2. Found in August, 1934, in NE¼ Sec. 12, T. 29 N., R. 54 W., Sioux County. Weight, 11.6 grams (.4 oz.). Number 2-16-9-34 in Nebraska State Museum Collection. Found and donated by Wayne Yohe, Glen, Nebraska.
3. Found in November, 1933, in Sec. 26, T. 30 N., R. 54 W., Sioux County. Weight, 132.7 grams (4.6 oz.). Number 3-16-9-34 in Nebraska State Museum Collection. This specimen is the largest of the four obtained by the Nebraska State Museum. Found and donated by J. C. Vantine, Glen, Nebraska.

All known specimens from this fall were found within the area of the circle at X in Fig. 183.

The University of Nebraska,
Lincoln, Nebraska,
November, 1933.