

FAMOUS MINERAL LOCALITIES. I. THE KEOKUK
GEODE REGION

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This paper represents the first of a series, one of which it is proposed to publish each month in this magazine. The object is to inform mineral collectors as to the present situation at localities from which in the past good specimens have been obtained. Contributions to this series are desired from any of our subscribers who are familiar with such localities. THE EDITORS.

WHEN the writer began the study of minerals, and became acquainted with some of the public and private collections in the city of Philadelphia, he was early impressed by the remarkable geodes lined with quartz and other minerals labeled as coming from Keokuk, Iowa. Reading of the back numbers of the *Mineral Collector* disclosed the fact that these objects had attracted much attention from collectors, and that many attempts had been made to explain their origin, without success. He looked forward to some day being able to visit the locality and see for himself how they occurred; and some fifteen years later, in the spring of 1917, a trip to the West furnished an opportunity. Meanwhile Professor Francis M. Van Tuyl, then at the University of Illinois, had taken up the study of this subject, written an elaborate account of the mode of occurrence of the geodes, and proposed a theory of their origin.¹

The town of Keokuk is situated on the west bank of the Mississippi River about 175 miles north of St. Louis, and 40 miles south of Burlington, Iowa, which is 200 miles west of Chicago, and is best reached by taking the Burlington Railroad from one of these points. There would be nothing gained by giving exact schedules, as the times of trains are subject to change, but there are at least two express trains per day in each direction, which stop at Keokuk. Good hotel accommodations can be obtained there. One full day is ample time to visit the two best localities.

Altho geodes occur in many places in the vicinity of Keokuk, the cliff behind the railroad station showing a few of them by way of welcome to the visiting mineralogist, the best locality is about a mile west of the station, and is reached by

¹ *Am. J. Sci.* 42 (1), 34-42, 1916; see abstract in this number.

following Main Street northwestward to 10th St., turning southwest on the latter, crossing a ravine, and continuing to the valley of Soap Creek. On descending to the bank of this stream, and examining critically and destructively a few of the seeming cobblestones in its bed, the collector will soon discover the objects he is searching for. On ascending the stream in quest of their source, he will find a steep bank of shale dotted over with geodes of all sizes and conditions. An hour or two may be spent collecting here, but few specimens should be taken, space being reserved in the collecting bag for the results of the afternoon's trip.

Before the morning is over it will be well to tear one's self away from this locality, return to town, and take the interurban trolley car for Warsaw, Illinois, which lies across the Mississippi from Keokuk, but in the same geological formations. Warsaw may also be reached from Peoria, Illinois, by the Toledo, Peoria and Western Railway, but this route is not to be recommended if one's time is limited. From Warsaw station go eastward up the hill as far as the lane extending off from the main street just before the High School is reached, a trip requiring perhaps 15 minutes. Follow this lane northwards down into the valley cut by a tiny stream, and get busy.

The uppermost bed exposed is a dark-colored shale, containing a few small geodes lined with calcite, but a lighter colored rock beneath, exposed in the walls of the ravine for a short distance down stream, is the Geode Bed proper. Geodes can be found here by the hundreds,—the writer obtained a barrel full for the National Museum in three hours, and all first class, complete specimens at that. They occur in the stream bed, in the talus at the bottom of the cliffs, and in the rock ledges themselves. Where loosened by the frost they can easily be pried out from the soft rock, and some of the finest examples can be obtained in this way.

Not by any means all of the round stones in sight are geodes, however, as the collector will learn by experience. Many may have been so once, but are now solidly filled with crystalline quartz, and the absence of cleavage in this mineral is well illustrated by these. It is a good idea to lift a specimen before hitting it; the heaviness or lightness will usually give an indication as to how hard a blow may safely be struck, and, in doubtful cases, listening for the rattling of loose fragments inside when the

stone is shaken, especially after a few light taps with the hammer to loosen things up, is an excellent guide.

One of the most remarkable features of the occurrence of these geodes is the fact that those found side by side in the bed are so diverse in character. One may be thin-shelled and lined with quartz, the next thick and lined with botryoidal blue chalcedony, another with calcite crystals implanted on the quartz, and the next one solid or nearly so; and yet all of these may be less than an inch from one another. Dr. Van Tuyl discussed this point in his paper, and pointed out two possible explanations, which are noted in the abstract; the second is the more probable.

Every winter the frost brings down numerous geodes from the cliffs, so at this locality the collector has no difficulty in getting something to take away; indeed the problem is rather what to leave. It is safe to load up heavily, however, as the route from here on is down stream and down grade, the trolley track being finally reached at a point a thousand feet or so from the station, where the results of the trip can be confided to the expressman. The writer had an exciting experience here. He hired a horse and buggy, bought a barrel and some paper, drove down the lane from the high school nearly to the stream, and loaded up. The barrel was filled in time to make the trip back to the station comfortably but on driving up the rough road the barrel fell out, and the whole job of packing had to be done over again. He reached the station and completed the freight shipment just one minute before the last car connecting with the train he planned to take left for Keokuk.

The writer was able to make the trip in the manner described, without waste of time in searching for the best localities, thru the kind advice and assistance of Professor Francis M. Van Tuyl and his brother, Mr. John E. Van Tuyl, of the Wilkinson Drug Co., in Keokuk, and takes this opportunity to thank them most heartily, and thru this article to extend similar aid to collectors who may pass that way in the future.

Mr. W. Scott Lewis, of Los Angeles, California, finding his time too fully taken up otherwise to contribute actively toward the editing of this magazine, has resigned as associate editor.

Mr. Hugh E. McKinstry writes from France that the most conspicuous geological feature there is mud, but that he hopes to find something beneath it eventually.