DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
J. W. POWELL, DIRECTOR

MINERAL RESOURCES

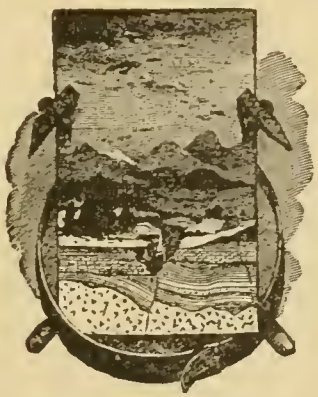
OF THE

UNITED STATES

CALENDAR YEAR

1888

DAVID T. DAY
CHIEF OF DIVISION OF MINING STATISTICS AND TECHNOLOGY



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PRECIOUS STONES.

By George F. Kunz.

No systematic mining for precious stones was carried on during 1888, although two small crystals of emerald, valued at about $100, were found at the mines at Stony Point, Alexander county, North Carolina.

Diamonds.—Considerable excitement prevailed during the spring at Morris Station, 13 miles south of Atlanta, Georgia, where the diamond described on page 558 of Mineral Resources for 1887 was found; and much was said at the time as to the resemblance of this locality to that of other diamond-producing districts; but no further discoveries have been reported, although there was every reason to believe, from the statement of the local newspapers, that extensive working would be carried on. During the summer of 1888 a small elongated hexoctahedral crystal of diamond, weighing seven-sixteenths of a carat, was reported to have been found by Mr. C. O. Helm on the farm of Mr. Henry Burris, about 300 yards from the Cabin Fort creek, Russell county, near Adair county, Kentucky. While walking through an old field Mr. Helm observed a small, bright stone in the gravel. On investigation it proved to be a diamond, octahedral in form, with curved faces, lustrous, but slightly off color. The rock in the vicinity is said to be composed of granite dikes, slates and quartz, feldspar, magnetic iron ore, flint, garnets, etc., scattered through hills of clay.

Beryl, phenacite, and topaz.—During the summer of 1888 prospecting was carried on near the top of Mount Antero, Colorado, at an altitude of from 12,000 to 14,000 feet above the level of the sea, and several pockets of crystals of blue beryl and phenacite were found. The blue beryls resembled those from Mourne mountain, Ireland, except that they were very curiously etched and partly eaten out. From the crystals, perhaps a hundred in number, material was obtained which furnished cut gems weighing from 1 to 12 carats. They were of good blue color, although often containing the characteristic beryl striations. The crystals and gems together brought about $600 or $700. The phenacites were found implanted on quartz and beryl, and crystals valued at more than $500 were obtained, although none of them were suitable for cutting. On January 12, 1888, near Little Robinet's store and Little River church, in the vicinity of Russell Gap road, Alexander county, North Carolina, a farmer, while plowing, found a crystal of dark, sea-green beryl, weighing 28 ounces, parts of which would furnish gems weighing from 1 to 20 carats each. This beryl resembles that variety

found at the Stony Point emerald mine, 10 miles distant, and at the Miller farm, 12 miles distant, and also that found in Alexander county. This stone would furnish larger gems than any previously found in North Carolina. During May, 1887, Mr. E. D. Andrews discovered a deposit of crystals of topaz and phenacite on Bald mountain, North Chatham, New Hampshire. The crystals were transparent, light blue, and sherry colored, the larger specimens measuring over 2 inches in length. None of the phenacites were more than half an inch in diameter and all were very primitive in habit. The find was worth about $700.

Garnet.—During the past year considerable attention has been paid to the gathering of the blood-red garnets, the so-called "Arizona and New Mexico rubies." The Navajo Indians have collected and sent from their reservation several hundred pounds of these, among which were some fine gems. Three splendid ones were valued at $75, $50, and $35, respectively. Some of these garnets are believed to have been pounded from what is evidently a peridotite rock. This theory requires verification, as no Government survey has been made of the locality. Of the variety of spessartite garnet found in the Allen mica mines at Amelia Court House, Virginia, mentioned in Mineral Resources for 1887, page 459, a number of irregular masses with a crystalline exterior were obtained, which on cutting furnished fine gems very similar in color and luster to the essonite or hyacinth of Ceylon. The cut stones varied from 1 to 100 carats in weight.

Epidote.—Specimens of epidote in brilliant crystals, 1 inch in length and one-half inch in diameter, apparently dark or black, but perfectly transparent, showing a deep grass green and brownish yellow when viewed in different directions, have been found by Rev. C. D. Smith, 1 mile from Rabun Gap, Rabun county, Georgia. They occur in single simple crystals and twins, identical in habit with those from Unter Sultzbachthal, Tyrol. They were found in veins of pink granite rock on the south slope of the Blue Ridge mountains. The locality promises to afford crystals as fine as the famous Tyrolese gems, although the size may be smaller.

Agatized wood.—Large quantities of the agatized and jasperized wood from Arizona, for which the name "shinarump" (the name used by the Indians) has been suggested as appropriate by Maj. J. W. Powell, have been taken from the locality, and have been cut into sections and polished for table tops, tiles, and for other ornamental purposes. Some of these have been prepared for exhibition at the Paris exposition. One monster stump, weighing $2\frac{1}{10}$ tons, was sent to New York City, and when polished had a surface of $40\frac{1}{2}$ by 36 inches—as large a polished surface of so hard a substance as is known.

Fire opal.—A specimen of fire opal, $1\frac{1}{2}$ by 1 by $\frac{1}{2}$ inch, evidently a water-worn fragment, was found near John Davis river, in Crook county, Oregon. It is transparent, grayish white in color, with red, green, and yellow flames. The play of colors equals in beauty that of any Mexican material, and it is the first opal found in the United States

that exhibits color. Undoubtedly better material exists in the locality where this was found.

Dumortierite.—About the same time that Messrs. Riggs and Diller found that the blue mineral supposed to be indicolite was identical with dumortierite in Harlem, New York, masses of quartz were discovered in Yuma county, Arizona, heavily impregnated with dumortierite and of an indigo-blue color, and which when polished resembled the blue lapis lazuli, and would serve the same purpose in jewelry, as the quartz is harder than lapis lazuli.

Tourmaline.—Among some very interesting minerals found by Messrs. C. E. Beecher and S. A. Robinson, at Newcomb, Essex county, New York, were some remarkable specimens of brown tourmaline. The crystals, although not so fine as those from Gouverneur, New York, were frequently sufficiently transparent to offer material for at least one hundred gems, weighing from 1 to 10 carats. They varied from golden brown to topaz-yellow in color.

Rhodonite.—This mineral, which has been known to occur in bowlders near Cummington, Massachusetts, has been traced to the ledge. Fine masses, weighing several hundred pounds, have been blasted out, and efforts will be made during the coming year to introduce this as an ornamental stone, it being as beautiful as the Siberian variety, which is so extensively used for table tops, mantel pieces, paper weights, etc., in Russia.

Turquois.—Considerable mining of a desultory character has been carried on at the turquois mines near Cerrillos, New Mexico, by the Indians and hunters, who obtained the turquois in a primitive manner by building fires against the wall rock and then cracking off large masses by throwing water on it. This method, however, invariably destroys the color. Some of the material sent from this locality during the past year was in form of thin veins entirely free from rock. In color it was almost equal to the poorer Persian material, and should find a ready use as an ornamental or decorative stone. The recent releasing of the property is likely to prevent the existing method of working the locality. A new deposit of turquois was opened during the year in the Holy Cross mining district, 30 miles from Leadville, Colorado, which is very similar to the variety from Arizona and New Mexico, the color being, if anything, a better blue. At this locality there was no evidence of prehistoric mining. Until recently the impression in the vicinity was that the turquois was an ore of copper.

Gadolinite.—This stone admits of a high polish, and is of a deep velvet-black color. During the last year large quantities of it were obtained near Bluffton, in Llano county, Texas, 22 miles from Burnet. The occurrence of this gadolinite was somewhat similar to that of allanite in Amherst county, Virginia. It has more than ordinary interest from the fact that it contains from 40 to 50 per cent. of yttria. About 1,000 pounds were found in a single pocket, associated with xenotime, fergusonite, and euxenite. One crystal weighed 11 pounds, another 13 pounds, and a single group weighing 40 pounds was obtained. The pro-

ductions of this locality exceeded in quality and size anything yet obtained.

Fluorite.—About four years ago a small vein of fluorite was discovered in the Archaean limestones in the town of Macomb, Saint Lawrence county, New York. It was worked irregularly from time to time until last summer, when the vein suddenly widened, breaking through into an opening or cavity 22 feet in length and varying in width from 8 to 18 feet. The top, bottom, and sides were lined with a magnificent sheet of crystals, varying from 1 to 6 inches in diameter, and each in turn forming part of larger composite crystals. Between the floor and the walls was a layer of partly-decomposed calcite, which was readily removed, so that groups of crystals weighing from 10 to several hundred pounds each, and one of them measuring 2 by 3 feet, were easily detached. The cavity contained at least 15 tons of fluorite. The habit of the crystals is, in nearly every instance, that of the simple cube, but slightly-developed faces of the octahedron are often present. Almost all the crystals have on the surface a small, botryoidal elevation, an even coating of brown hydrodolomite, which is readily removed with diluted hydrochloric acid. The crystals are well colored, but the surfaces are dull. The fluorite is of a uniform light sea-green color, except where it is attached to the gangue, or at the junction of the crystals. Here there are small spots of a rich emerald-green from 1 to 2 inches in diameter. This find is strikingly like that of the famous Muscallonge lake localities of forty years ago, except that the crystals are of a finer color and occur in larger groups. The occurrence of a second deposit in this county leads the hope that fluorite may exist here in commercial quantity available for the arts.

Amber.—For the last fifteen or twenty years travelers have occasionally brought specimens of a remarkable amber from some locality in southern Mexico. The information that has been gained concerning it is brought to the coast by natives, who say that it occurs in the interior so plentifully as to be used by them for making fires. The color of this amber is a rich golden yellow, and when viewed in different positions it exhibits a remarkable fluorescence, similar to that of uranine when dissolved in water, which it also resembles in color. A specimen now in the possession of Mr. M. T. Lynde, of Brooklyn, New York, measures 4 by 3 by 2 inches, is perfectly transparent, and is even more beautiful than the famous so-called opalescent or green amber found in Catania, Sicily. This material would be extremely valuable for use in the arts. It is believed that an expedition has started for the locality in the interior where it is found.

New developments in foreign localities.—The Burmese ruby mines were leased to a powerful London syndicate in November, and machinery was immediately sent to Mandelay, Burmah, for the purpose of prospecting and working the mines. From all appearances active explorations will take place during 1889, and within a short time it will be definitely known whether or not these mines are exhausted.

Estimated production of precious stones

Species.	1884.			1885.		
	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.
Diamond	.....	$800	$800	.....	.....	.....
Sapphire gems	$250	1,500	1,750	.....	$500	$500
Chrysoberyl	25	.....	25	.....	.....	.....
Topaz	200	300	500	$1,000	250	1,250
Beryl	300	400	700	250	500	750
Phenacite	.....	.....	.....	.....	.....	.....
Emerald	.....	.....	.....	3,000	200	3,200
Hiddenite	.....	.....	.....	500	2,000	2,500
Tourmaline	1,500	500	2,000	500	100	600
Smoky quartz	2,000	10,000	12,000	2,000	5,000	7,000
Quartz	10,000	1,500	11,500	10,000	1,500	11,500
Silicified wood	10,000	500	10,500	5,000	1,500	6,500
Garnet	1,000	3,000	4,000	200	2,500	2,700
Anthracite	.....	2,500	2,500	.....	2,500	2,500
Pyrite	2,000	1,000	3,000	1,500	500	2,000
Amazonstone	2,500	250	2,750	2,500	250	2,750
Catlinite (pipestone)	10,000	.....	10,000	10,000	.....	10,000
Arrow points	1,000	.....	1,000	.....	2,500	2,500
Trilobites	500	.....	500	.....	1,000	1,000
Sagenitic rutile	500	500	1,000	.....	250	250
Hornblende in quartz	500	100	600	.....	300	300
Thompsonite	250	500	750	250	500	750
Diopside	.....	.....	.....	100	.....	100
Agate	4,000	500	4,500	1,000	1,000	2,000
Chlorastrolite	500	1,000	1,500	.....	.....	.....
Turquois	1,500	500	2,000	1,500	2,000	3,500
Moss agate	1,000	2,000	3,000	500	2,000	2,500
Amethyst	2,000	250	2,250	2,000	100	2,100
Jasper	2,000	500	2,500	.....	.....	.....
Sunstone	250	200	450	250	100	350
Fossil coral	500	250	750	.....	.....	.....
Rutile	.....	.....	.....	750	.....	750
Total	54,275	28,550	82,825	39,300	30,550	69,850
Gold quartz	40,000	100,000	140,000	40,000	100,000	140,000

in the United States from 1884 *to* 1888.

1886.			1887.			1888.		
Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.
.....	$60	$60	.....	.....	.....	.....	.....	.....
$250	500	750	.....	$500	$500	.....	$500	$500
.....	.....	.....	.....	.....	.....	.....	.....	.....
1,000	.....	1,000	$1,500	500	2,000	$500	100	600
.....	5,500	5,500	500	3,000	3,500	300	500	800
.....	.....	.....	.....	.....	.....	650	.....	650
3,000	200	3,200	.....	.....	.....	100	.....	100
3,500	1,000	4,500	.....	.....	.....	.....	.....	.....
3,500	2,000	5,500	300	200	500	.....	.....	.....
2,000	5,000	7,000	1,500	3,000	4,500	1,000	3,000	4,000
10,000	1,500	11,500	10,000	1,500	11,500	10,000	1,150	11,150
500	1,000	1,500	35,000	1,000	36,000	1,000	15,000	16,000
1,250	2,000	3,250	2,500	1,000	3,500	2,000	1,500	3,500
.....	2,500	2,500	2,000	.....	2,000	1,500	.....	1,500
1,500	500	2,000	2,000	500	2,500	2,000	500	2,500
2,000	250	2,250	1,500	200	1,700	1,500	200	1,700
10,000	.....	10,000	5,000	.....	5,000	5,000	.....	5,000
.....	2,500	2,500	.....	1,500	1,500	1,500	.....	1,500
1,000	.....	1,000	500	.....	500	500	.....	500
1,750	.....	1,750	.....	.....	.....	.....	.....	.....
200	.....	200	.....	100	100	.....	.....	.....
100	300	400	250	500	750	300	200	500
.....	.....	.....	50	.....	50	.....	.....	.....
1,000	1,000	2,000	3,000	1,000	4,000	3,000	1,000	4,000
500	500	1,000	300	500	800	300	500	800
1,000	2,000	3,000	1,000	1,500	2,500	1,500	1,500	3,000
1,000	1,000	2,000	200	750	950	200	750	950
2,000	100	2,100	2,000	100	2,100	2,200	300	2,500
.....	.....	.....	.....	.....	.....	100	.....	100
200	100	300	50	100	150	.....	.....	.....
1,000	.....	1,000	1,500	500	2,000	2,500	500	3,000
750	.....	750	.....	.....	.....	.....	.....	.....
49,000	29,510	78,510	70,650	17,950	88,600	37,650	27,200	64,850
.....	.....	40,000	.....	.....	75,000	.....	.....	75,000