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

MINERAL RESOURCES

OF THE

UNITED STATES

CALENDAR YEAR 1885

DIVISION OF MINING STATISTICS AND TECHNOLOGY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1886

PRECIOUS STONES.

By George F. Kunz.

In addition to the report on precious stones in the last volume, where the subject was treated in detail, the following pages are intended to show the progress in this field during 1885.

Work was carried on at the Mount Mica tourmaline locality, Paris, Maine, during the months of June, July, and August of the present year, but no crystals of any value were found, all efforts being directed to the removal of the rock above the tourmaline layer. Messrs. N. H. Perry and E. M. Bailey also worked at the Rumford locality for a few weeks, some good specimens were obtained.

For two months during the summer of 1885 work was carried on by the Emerald and Hiddenite Mining Company, at Stony Point, North Carolina, under the direction of the superintendent, Mr. W. E. Hidden, and with flattering success. A remarkably large pocket, containing fine crystals of muscovite with brilliant crystals of rutile implanted on them, was found and sold as cabinet specimens for $750. While they were working in the soil overlying the rock nine crystals of emerald were found all doubly terminated and measuring from 25 millimeters (1 inch) to 77 millimeters (3⅛ inches) in length and 42 millimeters (1⅝ inches) in width. This latter crystal is very perfect as a specimen; it is of a fine light green color and doubly terminated. It weighs 8¾ ounces, only one fourth ounce less than the famous Duke of Devonshire emerald crystal, and is held by the company at $1,500 as a cabinet specimen, the nine crystals together being held at $3,000.

Another of these crystals, which is doubly terminated, measures 63 millimeters (2½ inches) by 23 millimeters (1½ inch), and is filled with large rhombohedral cavities, formerly containing dolomite. As mineral specimens these crystals are quite unique. The only gem which has been cut from this find was found in a pocket at a depth of over 43 feet. In color it is a pleasing light green, and weighs 4$\frac{13}{32}$ carats. No crystal of finer color has yet been found in the United States, and this gem is held by the company at $200.

During the recent mining the largest fine crystal of lithia emerald ever found was also brought to light. It measures 68 millimeters (2¾ inches) by 14 millimeters (⅗ inch) by 8 millimeters (⅓ inch). One end is of very fine color, and would afford the largest gem yet found of this mineral, weighing perhaps 5½ carats. With this was a number of

superior crystals and some ounces of common pieces of the same mineral. The owners estimate the worth of this entire yield of hiddenite at about $2,500.

A quantity of quartz filled with white byssolite or asbestiform mineral, which makes very attractive specimens, is valued at $250. On the whole this is an encouraging find for this line of minerals.

The locality for emeralds referred to in the last volume of "Mineral Resources of the United States," page 739, is only a duplication of the locality described as J. O. Lackey's in the *American Journal of Science*, III. series, Vol. XXVII., page 153.

Hiddenite has also been found during the past year in working the property known as the Morton tract, formerly known as Smeaton's and Lyon's properties ("Mineral Resources of the United States, 1883 and 1884," page 739).

Among the fictitous reports of the finding of gems may be mentioned that of the finding of three diamonds and about a dozen topazes in the gravel along the Sangamon river, near Springfield, Illinois.

What is perhaps the finest collection of rough diamond crystals in existence was exhibited during the past year by Messrs. Tiffany & Co. in New York. It consisted of 904 crystals, weighing in the aggregate 1,876$\frac{11}{32}$ carats, and was valued at $30,000. This has since been returned to Europe. For description see "Report of the American Association for the Advancement of Science, 1885," page 250.

At the meeting of the British Association, held at Birmingham, September, 1886, Prof. H. Carvil Lewis read a paper on "Diamond-bearing Peridotite," in which he said he had found in Kentucky, peridotite similar to that which occurs in the Kimberley mine, and was convinced that a search would reveal the presence of diamonds in that State. Now, the diamonds in the South African deposits are accompanied by carbonaceous shale which surrounds the mine, and is also scattered through the so called "blue stuff" in sizes varying from microscopic specks to large detached masses, and forming a sort of breccia, so to speak. The theory of the volcanic origin of these pipes was first advanced by Dr. E. Cohen. In the opinion of the writer the peridotite alone is not sufficient to account for the diamonds, but rather its mixture with the shale. Unless this carbonaceous shale is present under similar conditions in Kentucky the outlook for diamonds is not encouraging. In further confirmation of this view may be mentioned Prof. H. E. Roscoe's discovery of an aromatic hydrocarbon on treating diamond earth with hot water. This hydrocarbon, which he separated by digesting the earth with ether and allowing it to evaporate, was crystalline, strongly aromatic, volatile, burned with a smoky flame, and melted at 50° C. It was unfortunate that the quantity of the substance obtained was too small to admit of a full investigation. (Proceedings of Manchester Literary and Philosophical Society, October 17, 1884, page 5.)

A recent London periodical made the statement that any one who found the sapphire and ruby in its original matrix would soon be called the "King of Rubies," and that his fortune would be assured. This recalls the fact that Col. C. W. Jencks, of Boston, was the original finder of the true corundum gems *in situ* at the Jencks mine at Franklin, North Carolina; that he obtained from this locality nearly all of the fine crystals in the best American collections. One of the most interesting of his finds is a piece of a blue crystal with a white band running across it, and a place in the center where a nodule had dropped out.(*a*) This piece was cut and placed back in its original place, and the white band can be seen running across both gem and rock. Nearly all of the fine gems from this locality mentioned in the two previous reports were also brought to light by his mining. The gems were found here in their original matrix, but they were of such rare occurrence that it was not feasible to mine for them more thoroughly. The corundum mining has proved profitable, however, and is still carried on by Dr. Lucas.

A number of beryls of fine blue color, resembling the Mourne mountain beryls, have been found near Mount Antero, in the Arkansas valley, Chaffee county, Colorado. One of these was 4 inches long and three-eighths of an inch across with cutting material in it. The other crystals measured from 1 inch to 1¼ inches in length and one fifth to one third inch in width.

The large beryl mentioned in "Mineral Resources" for 1883 and 1884, has afforded the finest aquamarine of American origin known. It weighs 133¾ carats and measures 35 by 35 by 20 millimeters. It is a brilliant cut gem and with the exception of a few internal hair-like striations it is absolutely perfect. The color is a deep bluish green, equal to that of gems from any known locality.

Mr. George F. Breed, manager of the Valencia Mica Company, has cut from white beryls nearly 100 aquamarines, ranging from one half to 4 carats in weight, and of a light blue color, which were found in their mica mine at North Groton, Grafton county, New Hampshire.

A number of very fine, deep golden yellow, blue, and green beryls, equaling any ever found, were shown to the writer by Mr. M. W. Barse, of Olean, New York, taken from his mica mine between New Milford and Litchfield, Litchfield county, Connecticut. Some fine blood-red garnets from here were cut into gems. Some other parties have sold stones from the same locality which are possibly new gems nearly as hard as the sapphire, and said to come from South America. Since these statements gained currency abroad a correction was deemed necessary. They are undoubtedly American beryls from the above locality.

The finest large phenacite crystal ever found in the United States is the one in the possession of Mr. Whitman Cross. It was found at Crystal Park, Colorado, weighs 59 pennyweights 6 grains, and measures 46.5

---

a London *Jeweler and Metalworker*, August, 1886.

millimeters in length and 32 millimeters in thickness. Occasional transparent spots are noticeable. Full descriptions of phenacite from Crystal Park and Florissant, Colorado, and of topaz from near Pike's Peak and Devil's Head mountain, Colorado, and also of that found in nevadite at Chaltk mountain, in the same State, are given by Messrs. Cross and W. F. Hillebrand in "Bulletin No. 20 of the United States Geological Survey, Washington, 1885." Phenacite from the Florissant locality was also described by W. E. Hidden in the *American Journal of Science*, III. series, Vol. XXIX., page 249. These crystals at Florissant were first found by Mr. J. G. Heistand, of Manitou, Colorado.

Thousands of garnet crystals found at Ruby mountain, near Salides, Chaffee county, Colorado, have been made into paper weights and sold to tourists. Those weighing a few ounces sell for about 10 cents each, and one weighing 14 pounds was sold. Regular printed lists running up to 4 pounds weight are sent out with scale of prices attached. They have a chlorite coating which can easily be removed.

The finding in the heart of New York City, in Thirty-fifth street, between Broadway and Seventh avenue, of a garnet crystal as perfect as any ever found on this continent, and weighing 9 pounds 10 ounces, is of peculiar interest.

A full account of the wood jasper deposit of Arizona was published in the *Popular Science Monthly* for January, 1886, and in the *Scientific American* for January. Several thousands of dollars' worth of this material has been cut into paper weights, charms, and other articles of jewelry, or polished on one side for cabinet specimens. At the present time numbers of these articles are being cut and sold to tourists along the line of the Atchison, Topeka and Santa Fé railroad. The base of the *World*-fund memorial to be presented to the eminent sculptor, M. Bartholdi, was made out of pieces of this stone.

The compact quartzite of Sioux Falls, Dakota, has been quarried and polished for ornamental purposes. It is known and sold as "Sioux Falls jasper," and is really the stone referred to by Longfellow in his "Hiawatha" as being used for arrow heads. This stone is susceptible of a very high polish and is found in a variety of pleasing tints, such as chocolate, brownish red, brick red, and yellowish. The polished material has been sold to the amount of $15,000 during the last two years, and polishing works run by water power have been erected, and so ingeniously are they contrived that pillars, pilasters, mantels, and table tops can be made here as cheaply as anywhere. The pilasters of the German American Bank in Saint Paul, Minnesota, and the columns in the doorway of the Chamber of Commerce building in the same city are of this beautiful jasper. It is likely to become one of our choicest ornamental stones, especially effective in combination with the Minnesota red granite. Its great tensile strength, its high, almost mirror-like polish, the fact that though so highly polished, the stone is not slippery, the large pieces that can be quarried out, and the pleasing variety of

colors, all combine to render this one of the most desirable building stones. Polishing mills have been built of sufficient capacity to polish $100,000 worth per annum, and in view of the unequaled facility with which it can be prepared for use, it could be made into tablets, blocks, columns, and tiles with advantage, and employed for fine interior and monumental work or in the more artistic branches of stone work. Some good results have been obtained with the sand blast on polished surfaces.

A remarkable mass of rock crystal was recently sent to Messrs. Tiffany & Co. from a place near Cave City, Virginia. Although it weighed 51 pounds this mass was only a fragment of the original crystal, which weighed 300 pounds, but was unfortunately broken in pieces by the ignorant mountain girl who found it. Still this fragment will furnish slabs 8 inches square and ½ to 1 inch thick. The original crystal, if it had remained intact, would have furnished a crystal ball perhaps 4½ to 5 inches in diameter and almost perfect. It is likely that further working in this locality would bring some fine material to light. (Trans. American Assoc. Adv. Science, 1886.)

Mr. F. C. Yeomans, of Washougal, Washington Territory, has found quite a variety of fine agates and moss agates at the above locality.

The menaccanite from Cumberland, Rhode Island, is often spotted with white quartz. Mr. E. Passmore, of Hope, Rhode Island, has cut it into oval stones several inches long, which admitted of a fine polish. This quality, coupled with its hardness, makes it a desirable ornamental gem stone.

It may be worthy of mention that the writer found pieces of peridot, of sufficient transparency to afford *gems* one-fifth inch long, in the largest mass of the Glorieta mountain, Santa Fé county, New Mexico, meteorite. (*American Journal of Science.*, III. series, Vol. XXXII., October, 1886.)

The turquois pseudomorph after apatite from Taylor's ranch on the northeast side of the Chowchilla river, California, has been described by G. E. Moore and V. von Zepharooich (*Zeitsch. fur Kryst. u. Min.*, Vol. X., p. 240). The turquois from Los Cerillos, New Mexico, has been fully analyzed and described by Prof. F. W. Clarke and Mr. J. S. Diller in the *American Journal of Science*, III. series, Vol. XXXII., page 211, September, 1886. Large quantities of this material have been sold, both as specimens and gems. Unfortunately many of those of finest color were found to have been artifically stained. A full series of this mineral has been presented to the National Museum.

Malachite in large masses has been found at the Copper Queen mine at Bisbee, Arizona. One of these masses weighed 15 pounds and others were nearly as large. All were of good enough quality and large enough for tablet tops.

Mr. F. F. Chisolm states that specimens of what appears to be amber were found in one of the Union Pacific coal mines in Wyoming

in 1885, but the tests are not yet completed, so that its genuineness cannot be asserted. He says: "The material which was brought to Denver was hard, highly electric, and of a good clear yellow color. Its fusion point was a little low, and the odor of a burning fragment slightly resembled that of burning india rubber. In places the substance occurs 2 inches thick. The exact place of its occurrence has not yet been ascertained." A few of the choice minerals and gems in the collection of Mr. Clarence S. Bement were well described by Prof. Gerhard vom Rath in the *Jewelers' Circular*, Vol. XVI., No. 12, January, 1886.

Mr. William H. Andrews, of Gouverneur, Saint Lawrence county, New York, has a remarkable collection of 2,200 specimens of polished marbles, serpentines, jaspers, agates, and other ornamental stones, principally from Saint Lawrence, Jefferson, and adjacent counties. A variety of other minerals are also to be found in this collection, which, though the polishing is mainly the work of Mr. Andrews himself, is one of the most complete series of the kind in the United States.

Popular articles have appeared during the year on North Carolina gem stones by Mr. C. D. Smith; on diamonds by William Wareing Habersham (both of these appeared in *Dixie*, published in Atlanta, Georgia, January, 1886), and an article on how hiddenite was formed, by Mr. W. E. Hidden, in *Dixie*, December, 1885.

The National Museum collection of gems, formed by Prof. F. W. Clarke, is now one of the most complete for species in the United States, and as many of the gems are of more than average merit and all can have access to them, this is one of the best opportunities afforded the student in this country. The *Popular Science Monthly* for April, 1886, contains a description of this collection, which, with additions to date, will also appear in the bulletin of the National Museum.

An immense number of small collections of minerals have been sold during the past year, usually consisting of specimens not over ½ to 2 inches square of a series of some ten to fifty of the principal minerals, or the minerals of a section, or of polished and ornamental stones; sets of fifty; selling for from $1 to $5, are arrayed in cases or pasted to boards. The name which is given to them is generally copyrighted. Thousands of these collections are sold annually.

PRODUCTION OF PRECIOUS STONES IN THE UNITED STATES.

While it is impossible to obtain exact returns of the values of the precious stones found in the United States, it is believed that the estimates given in the following table represent, roughly, the total values and the proportionate values of the several mineralogical species. Gold quartz, the value of which should be more properly perhaps included under the head of gold mining, is added at the close of the list.

Estimated production of precious stones in the United States in 1883, 1884, *and* 1885.

Species.	1883.			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.	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	$200	$2,000	$2,200	$250	1,500	1,750	.....	$500	$500
Chrysoberyl	100	.....	100	25	.....	25	.....	.....	.....
Topaz	1,000	.....	1,000	200	300	500	$1,000	250	1,250
Beryl	200	300	500	300	400	700	250	500	750
Emerald	500	.....	500	.....	.....	.....	3,000	200	3,200
Hiddenite	100	500	600	.....	.....	.....	500	2,000	2,500
Tourmaline	.....	.....	.....	1,500	500	2,000	500	100	600
Smoky quartz	2,500	7,500	10,000	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	10,000	1,500	11,500
Silicified wood	5,000	.....	5,000	10,000	500	10,500	5,000	1,500	6,500
Garnet	1,000	5,000	6,000	1,000	3,000	4,000	200	2,500	2,700
Anthracite	.....	2,500	2,500	.....	2,500	2,500	.....	2,500	2,500
Pyrite	1,500	500	2,000	2,000	1,000	3,000	1,500	500	2,000
Amazonstone	3,500	250	3,750	2,500	250	2,750	2,500	250	2,750
Catlinite (pipestone)	10,000	.....	10,000	10,000	.....	10,000	10,000	.....	10,000
Arrow points	1,000	.....	1,000	1,000	.....	1,000	.....	2,500	2,500
Trilobites	500	.....	500	500	.....	500	.....	1,000	1,000
Sagenitic rutile	500	500	1,000	500	500	1,000	.....	250	250
Hornblende in quartz	500	100	600	500	100	600	.....	300	300
Peridot	50	250	300	50	100	150	.....	50	50
Thompsonite	250	500	750	250	500	750	250	500	750
Diopside	200	100	300	.....	.....	.....	100	.....	100
Agate	1,000	500	1,500	4,000	500	4,500	1,000	1,000	2,000
Chlorastrolite	500	1,000	1,500	500	1,000	1,500	.....	.....	.....
Turquois	1,500	500	2,000	1,500	500	2,000	1,500	2,000	3,500
Moss agate	1,000	2,000	3,000	1,000	2,000	3,000	500	2,000	2,500
Amethyst	2,000	250	2,250	2,000	250	2,250	2,000	100	2,100
Jasper	2,000	500	2,500	2,000	500	2,500	.....	.....	.....
Sunstone	250	200	450	250	200	450	250	100	350
Fossil coral	500	250	750	500	250	750	.....	.....	.....
Rutile	.....	.....	.....	.....	.....	.....	750	.....	750
Total	47,350	26,700	74,050	54,325	28,650	82,975	42,800	27,100	69,900
Gold quartz	40,000	75,000	115,000	40,000	100,000	140,000	40,000	100,000	140,000

By recalculating from the value of the diamond carat as used in different countries the equivalents in the metric system, the weights in the four places of decimals, according to Mr. Louis D'A. Jackson, in his "Modern Metrology," page 377, will be found in the following table:

Weight of a diamond carat in different countries.

Countries.	Weight.	Countries.	Weight.
	Gram.		*Gram.*
Turin	.2135	Turkey	.2005
Persia	.2095	Spain	.1999
Venice	.2071	Java, Borneo	.1969
Austro-Hungary	.2061	Florence	.1965
France	.2059	Arabia	.1944
Portugal, Brazil	.2058	Egypt	.1917
Germany	.2055	Bologna	.1886
England, British India	.2053	Average weight of diamond carat	.2020
Holland, Russia	.2051		

IMPORTS.

Diamonds and other precious stones imported and entered for consumption in the United States, 1867 to 1885, inclusive.

Fiscal years ending June 30—	Glazier's.	Dust.	Rough or uncut.	Diamonds and other stones not set.	Set in gold or other metal.	Total.
1867	$906	.....	.....	$1,317,420	$291	$1,318,617
1868	484	.....	.....	1,060,544	1,465	1,062,493
1869	445	$140	.....	1,997,282	23	1,997,890
1870	9,372	71	.....	1,768,324	1,504	1,779,271
1871	976	17	.....	2,348,482	256	2,350,731
1872	2,386	89,707	.....	2,939,155	2,400	3,033,648
1873	.....	40,424	$176,426	2,917,216	326	3,134,392
1874	.....	68,621	144,629	2,158,172	114	2,371,536
1875	.....	32,518	211,920	3,234,319	.....	3,478,757
1876	.....	20,678	186,404	2,409,516	45	2,616,643
1877	.....	45,264	78,033	2,110,215	1,734	2,235,246
1878	.....	36,409	63,270	2,970,469	1,025	3,071,173
1879	.....	18,889	104,158	3,841,335	538	3,964,920
1880	.....	49,360	129,207	6,690,912	765	6,870,244
1881	.....	51,409	233,596	8,320,315	1,307	8,606,627
1882	.....	92,853	449,313	8,377,200	3,205	8,922,571
1883	.....	82,628	443,996	7,598,176	2,081	8,126,881
1884	22,208	37,121	367,816	8,712,315	(a)	9,139,460
1885	11,526	30,426	371,679	5,628,916	(a)	6,042,547

a Not specified.

Imports of substances not included in the foregoing table, 1868 to 1885, inclusive.

Fiscal years ending June 30—	Unmanufactured agates.	Bookbinders' and other manufactured agates.	Carnelian.	Brazil pebbles.	Amber.	Amber beads.	Unmanufactured coral.	Manufactured coral.	Unmanufactured meerschaum.	Total.
1868	.....	.....	.....	.....	.....	.....	.....	$62,270	.....	$62,270
1869	.....	$70	$269	.....	$427	.....	.....	22,417	$6,467	29,590
1870	.....	.....	766	.....	1,433	.....	.....	18,975	3,998	25,172
1871	.....	1	661	.....	180	.....	.....	37,877	698	39,417
1872	.....	529	207	.....	2,426	.....	$83	59,598	2,194	65,037
1873	$151	1,310	.....	$1,237	1,534	$595	230	63,805	5,608	74,470
1874	177	1,524	.....	.....	1,448	1,057	527	28,152	270	33,155
1875	520	5,165	.....	57	7,169	715	1,278	33,567	2,992	51,373
1876	293	1,567	.....	.....	15,502	187	109	33,559	21,939	73,156
1877	579	1,904	(a)69	.....	17,307	329	718	28,650	9,304	58,860
1878	82	404	.....	76	13,215	1,119	1,252	12,667	16,308	45,123
1879	138	364	.....	.....	17,821	203	147	11,327	19,088	49,088
1880	57	2,346	.....	.....	36,860	2,317	62	5,492	30,849	77,983
1881	486	1,700	.....	5	42,400	1,102	89	2,561	72,754	121,027
1882	901	5,084	.....	111	72,479	4,174	1,474	669	56,118	141,010
1883	14	2,805	.....	.....	40,166	3,472	681	1,303	58,885	107,416
1884	.....	6,100	.....	3,496	56,301	4,692	158	(b)	43,169	113,916
1885	124	.....	.....	6,541	21,722	3,242	659	(b)	42,590	74,878

a Not separately classified since 1877. b Not specified.