

GEM COLLECTION OF THE U. S. NATIONAL MUSEUM.

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The collection of gems exhibited by the National Museum at the Cincinnati and New Orleans Expositions is now on exhibition in the Museum in Washington. This much-needed accession, representing a small part of the appropriation for the World's Fair, promises to be one of the most attractive and instructive features of the Museum. The large number of visitors, who examined the collection, both at the expositions and in its present location, can testify to its interesting character. Although a mere beginning, it is the most complete public collection of gems, in the United States. It is contained in three flat plate-glass exhibition cases, the gems being neatly marked with printed labels, and arranged on velvet pads, with a silk rope border. The diversity, brilliance, and richness of nature's brightest colors displayed render the whole effect a very attractive and pleasing one. The collection begins with a suite of glass models of the historical diamonds, followed by a series of diamonds in their natural state, among which is an interesting octahedron, 18 carats in weight*, and by two smaller, though very perfect, octahedra of about 2 carats each. These specimens are good illustrations of the form from South Africa, though of little commercial value as gems. One dozen other crystals, from one quarter to 1 carat in weight, complete a representative set of form and occurrence in that region. Next we have a very neat set of a dozen more crystals, small, but choice, principally from India and Brazil, formerly belonging to the Mallet collection. One of these is a perfect cube, a form peculiar to Brazil, while another is twinned parallel to the octahedron. Another stone of 1 carat is only half cut, and for comparison we have a stone of about the same weight completely cut.

* Gems are generally bought and sold by the weight, called a carat, which is equal to about 3.168 troy grains. It is usually divided, however, into 4 diamond or pearl grains, each of which is .7925 of a true grain. Fractions of a carat are also known as fourths, eighths, sixteenths, thirty-seconds, and sixty-fourths. The weight of the carat formerly differed slightly in different countries, and this diversity finally led a syndicate of Parisian jewelers, goldsmiths, and gem dealers, in 1871, to propose a standard carat. This was subsequently confirmed by an arrangement between the diamond merchants of London, Paris, and Amsterdam, fixing the uniform value of the diamond (?) carat at . 205 gramm.

Among the sapphires, we find a carat oblong stone of dark blue color, from the Jenks mine, Macon County, North Carolina, which has yielded a few fair sapphires—yellow, violet, and blue—and a few rubies, some of the finest of which were in the Leidy collection; also the first stones found here, the dark brown, asteriated sapphires, described in "Transactions of the New York Academy of Sciences," March, 1883, and two other cut stones weighing from 4 to 8 carats. These all show a slight bronze play of light on the dome of the cabochon in ordinary light, but, under artificial light, they all show well-defined stars, being really asterias or star sapphires, and not cat's eyes, as would seem at first glance. There are also two cut stones, light blue and light green, weighing 1 and 2 carats respectively, which, for light-colored sapphires, are perhaps, when cut, brighter than those from any other locality. The cutting of one of these gems has given it a remarkable luster. They are found in the sluice-boxes at and near Helena, Mont. Following are two broken crystals of the dark-green sapphires from the quite recent find at the Hills of Precious Stones in Siam, beautifully dichroic, being green and blue when viewed in different axes. The most showy group among the sapphires is a lot of thirteen assorted fancy stones, ranging from one-half to 4 carats in size. It includes two oriental amethysts, one oriental topaz, two pale rubies, four blue, one light-blue opalescent, one pale green, and two white sapphires. An asteria of good blue color, measuring nearly 1 inch across, a beautiful 2-carat ruby-asteria, and a small three-quarter-carat ruby, of fair color, complete the corundum gems.

The series of spinels is well chosen and varicolored; it consists of a long 2-carat stone of green color, an oblong almandine-colored stone of 3 carats, an inky stone of $1\frac{1}{2}$ carats, a half-carat ruby spinel of fair color, a pretty rubicelle of three-quarters of a carat, and a suite of crystals of the ruby-colored spinel from Ceylon and Burmah. We have also a cut Alexandrite (so called after the Czar Alexander I), from the original Russian locality. This is of fair color; but the wonderful Ceylonese gems of recent years have really given to this phenomenal variety of chrysoberyl, which changes from green to red under artificial light, its present high rank among gems. There is a 6-carat typical chrysoberyl (the chrysolite of the jeweler), finely cut, truly, as the name indicates, golden beryl; and a dark green one of that shade, repeatedly sold as Alexandrite, though it does not change color by artificial light; also a rich yellowish-brown specimen of $1\frac{1}{4}$ carats. A set of seven rough fragments from Brazil is instructive by comparison.

Among the beryls, we have a flawed emerald of 10 carats, that well illustrates the typical color, as does a pear-shaped drop of about the same weight and quality. Besides these, there is a flawed stone of about the same weight, but much lighter in color, from Bogota. There is also a crystal, that has been in the Institution for many years, labeled from New Mexico. An emerald crystal, $1\frac{1}{2}$ inches long, one of a series of minerals brought by Prof. J. D. Dana from Peru when with the

Wilkes Exploring Expedition, is historically interesting. It was purchased by him in the streets of Callao. In the same series are two good cut beryls, one 6 carats in weight, of a light-green color, another 1-carat light blue, both from Royalston Mass.; and perhaps the finest specimen ever found at the Portland (Connecticut) quarries, 15 carats in weight, and of such a rich, deep sea-blue color, as almost to rival in splendor the matchless 5-carat Brazilian blue stone, that is in the same case.

A fine blue beryl from the Mourne Mountains, Ireland, is interesting for its locality and deep color. Stoneham, Me., has contributed a 2-carat white cut stone and a similar fragment; while Siberia is represented by a common white stone of about 6 carats weight, and a rich yellow one of 2 carats.

Next comes a series of the emerald-green and greenish-yellow varieties of spodumene (Hiddenite), embracing crystals and fragments, and five cut stones, the latter weighing from a quarter to three-quarters of a carat, and varying in color from green to greenish-yellow, from Stony Point, N. C.; also a quarter-carat light yellow, and a 1-carat golden-yellow spodumene of the variety resembling chrysoberyl, described by Pisani, of Paris, in "Comptes Rendus" for 1877, from Brazil. The mountain-green cut euclase of 2 carats weight, from Brazil, and the white cut phenakite of 3 carats, from Russia, are of rare occurrence, though the latter has recently been found in two localities in Colorado.

The tourmalines include a dark-red gem (rubellite) of 6 carats' weight, and of good color; a dark-green one of the same weight; two light-red ones of one-half carat each, and a fine dark-blue one (indicolite) of three-eighths carat; a light sea-green one, of the same weight as the indicolite, and four long bottle-green (called Brazilian emeralds) of 2 carats each; two olive-green stones of 2 carats each, and four sections of green crystals, that have red centers. This difference of color between the outer and inner crystals is peculiar to tourmalines, as many as three colors being found in one crystal. All these are from Brazil. The well-known domestic localities are represented by an oblong, table-cut, light-green stone from Paris, Oxford County, Me., that once held a conspicuous place in the collection of Dr. Joseph Leidy, which, unfortunately, had to be scattered. From Auburn, Me., a locality quite recently discovered, we have a 1-carat blue indicolite, two lavender-colored stones of $1\frac{1}{2}$ and 2 carats each, a light emerald-green stone of three-quarters of a carat, as handsome as an emerald by artificial light, and a 2-carat green one of the same tint as the Leidy stone; also a suite of loose crystals of various colors. The neighboring 2-carat yellow and 3-carat yellowish-brown cut stones are from Ceylon. The fine 2-inch grass-green crystal and 1-inch bluish-green crystal are also part of the treasure brought home by Professor Dana from the Wilkes expedition of 1838-1842.

A 6-carat blue and a 2-carat sherry-colored topaz from Siberia are exceedingly brilliant; but the domestic reputation is well sustained by the

white 15 carat cut stone from Pike's Peak, Colo., which is not surpassed in beauty by the brilliant white 4-carat (Minas Novas) from Minas-Geraes, in Brazil. A 6-carat orange-yellow stone, also from Minas-Geraes, is quite characteristic of the topaz, which is most commonly used in jewelry. A series of two cut stones, of 5 and 8 carats respectively, and a number of crystal fragments show the effect, which heat has upon some varieties of topaz. These specimens vary in color from dark pink to white, according to the degree of calorification.

Among the garnets are ten flat, brilliant-cut stones, one carbuncle, two long table-cut stones, and six rose-cut from Bohemia; six Tyrolese red garnets, three essonites (usually sold as hyacinths by the jewelers), 4 carats, $1\frac{1}{4}$ and one-quarter carat from Ceylon, six small brilliant-cut stones from Cape Colony, and a series, cut and uncut, from New Mexico, which furnishes the finest garnets in the world in point of color. In addition to these, we notice a 1-carat and a $1\frac{1}{2}$ -carat demantoid (green garnet or Uralian emerald) from Bobrowska River, Syssersk, in the Urals, and a brownish-green 2-carat stone from the same locality.

From New Mexico we have a fine yellowish-green peridot or olivine, of $2\frac{1}{2}$ carats, called chrysolite by the mineralogist, but not by the jeweler; also a number of pebbles of the same, known as "Job's Tears" locally (from their pitted, tear-like appearance). The Orient is represented by a beautiful olive-green cut stone of about 18 carats weight.

From the zircons or jargons we may single out for remark a number of small cut stones, steel-blue, yellowish-brown, yellow, and white, the latter color being often produced by heating. Stones of this kind were at one time used for incrusting watches, which were then sold as diamond-incrusted. Next we observe a fine, rich, hyacinth-colored gem (the true hyacinth of the mineralogist), a 2-carat green, a yellow, an orange, and a long brownish-green 3-carat stone, all from Ceylon. The 2-carat axinite, from Dauphny, is one of the rarest of gems. A 6-carat greenish-brown epidote, from the Knappenwand, the well-known locality in Tyrol, should be mentioned.

Here, too, is a one-fourth-carat idocrase from Ala, in Piedmont. This mineral, which received the name of vesuvianite, because it is found among the formations in the lava at Vesuvius, is sold by the Neapolitan jewelers, and used to make the letters I and V in the manufacture of initial or sentimental pieces of jewelry. The same mineral is found at Sanford, Me., and other localities here, but rarely in gem form.

Iolite (dichroite, cordierite), or water sapphire (*saphire-d'eau*), as it is also called, is here seen in the form of a flat-cut stone of 2-carats' weight from Ceylon, and a cube one-fourth inch square from Bodenmais, Bavaria. These are not comparable with one found at Haddam, Conn., that was worn as a charm by the late Dr. Torrey. This stone has dichroic properties; if viewed in one direction it appears blue; if in another, pure white.

The 5-carat titanite or yellow sphene is from the Tavetschthal, in the

Tyrol. This gem shows the play of colors peculiar to the diamond. Specimens have also been found at Bridgewater Station, Pa. There are two long andalusites of 1 and 2 carats' weight, stones which are at times so dichroic that they have been offered in London as Alexandrites; also a square brilliant cut stone of 1 carat. No stones in this collection show the dichroic property to the visitor so perfectly as these, they being so cut as to show the red and green colors at once from the same point of view. These are from Brazil, where fine green ones are also obtained.

Next in order are four light-green diopsides from De Kalb, N. Y., a locality which has yielded 20-carat gems, of rich oil-green color, equal to the 2½ carat cut-stone from Ala., in Piedmont.

A small, long, 1-carat kyanite, from Russia, is noteworthy, as is also the suite of opals, consisting of two noble cut stones, from Hungary, and a polished slab of the light matrix from the same place, beautifully mottled with opalescent spots; a set of over twenty gems, white, yellow, and brown, from Querétaro, Mexico, and two milky opals without the play of colors, from Honduras, an inch and an inch and a half long, respectively; three pieces of blue opal, in the impure brown limonite, or ironstone matrix, from the Baricoo River, Queensland, Australia, termed opaline by the jewelers, and a cut stone from the same locality.

Of turquoise, we have a bluish-green piece 1½ inches long, cut into a flat cabochon stone, from Los Cerillos, New Mex., a fine suite of the mineral in the matrix, recently brought on by Maj. J. W. Powell, from New Mexico, and a set of twenty-four gems from Persia, showing all the characteristic gradations of color between blue and green; a curious three-quarter-inch cabochon cut stone, and a piece 1¼ inches long in the matrix, from Persia, noticeable for the pleasing contrast of the bluish-green stone on the background of chocolate color. A handsome suite, consisting of a 1-inch flat cabochon and seven polished specimens of turquoise in the matrix, from Los Cerillos, New Mex., has lately been deposited by Mr. Thomas Donaldson, of Philadelphia. These vary in color from the malachite-green to the rich light-blue, and in size from 1 by 2 by 3 inches to 3 by 4 by 6 inches.

Hematite is exhibited, cut in the form of a ball and in a cut intaglio. Displayed near these is a cut 1-carat rutile, from Alexander County, N. C. This so closely resembles the black diamond in color and luster as to have been mistaken for it when first found. A large rhodonite, cut *en cabochon*, is on the same pad with these specimens.

A dark, almost black, hypersthene from Norway shows a pleasing bronze-like reflection on the dome of the cabochon, while a polished slab of lighter color is also quite attractive. Chlorastrolite is represented by three small polished pebbles from Isle Royale, Lake Superior. One of the most instructive of the series is a quantity of gem-gravel from Ceylon, containing sapphires of various colors, chrysoberyl, zircon, quartz, and other stones.

A series of the American stone Thomsonite, found as pebbles in the Lake Superior region, presents some fine cut stones, with the circles from one-fourth to three-fourths of an inch across. A few large, polished pieces measure over 1 inch across. Some pebbles of Lintonite, a green variety of Thomsonite from the same locality, are also polished.

The quartz array is very instructive. It begins with a 2½-inch Japanese crystal ball, and an eagle seal 3 inches high, of Russian cutting; a smaller ball and a combination form of the cube and dodecahedron, from Japan, half of a Brazilian pebble, polished, a mounted scarf-pin, cut in cuboidal form, and a small pendant complete the display of rock crystal. Cut citrines, cairngorm, and the so-called smoky, Saxon or Spanish topaz, eleven of the dark-purple amethysts from Siberia, often wrongly called Oriental amethysts, and a set of seven from Brazil show all the changes from light pink to dark purple.

Perhaps the most unique gem of the collection is a piece of amethyst, that was found in Haywood County, N. C., and deposited here by Dr. H. S. Lucas. The present form is just such as would be made by a lapidary in roughly shaping a stone preliminary to cutting and polishing it. It now measures 7 centimeters in length, 6 centimeters in width, 4 centimeters in thickness, and weighs 136.5 grams. It was turtle-shaped when found, and was said to have been worked by pre-historic man. This shape was unfortunately destroyed by chipping it to its present form. It is perfectly transparent, being slightly smoky and pale at one end; it also has a smoky streak in the center. This coloring is peculiar to the amethyst, however. A fine cut amethyst from Stow, Me., represents New England. There are also a three-quarter inch yellowish quartz cat's-eye from Ceylon, a 3-carat green one from Hoff, Bavaria, and a native Indian necklace from Ceylon, composed of numerous yellowish quartz cat's-eye beads of about 3 carats each. There has been recently added to the collection a handsome Siamese ring of cat's-eyes and chip diamonds. The rich gold setting is a model of exquisite Oriental workmanship, the reliefs seeming to have been hammered rather than engraved. The handsome embossed flowers within the ring can not be seen in the case. Its crown is a pyramid, 13 millimeters high and 20 millimeters across the base. The base of the pyramid is surrounded with a row of fourteen cat's-eyes; above this is a row of chip diamonds, while the apex is formed of the largest and finest cat's-eye of the lot. On each side of the crown, on the shank, is a handsome cat's-eye, next in size to the stone which forms the apex.

We have, then, a beautiful series of the brown quartz cat's-eyes, so-called crocidolite cat's-eyes (also called tiger-eyes), in fine slabs, balls, buttons, etc., which is really a combination of crocidolite fibers coated with quartz. This incasing renders it harder than unaltered crocidolite, which is to be seen here together with it. Alongside of these are four handsome stones, cut cabochon, and artificially colored pink, purple, green and gendarme-blue, after the extraction, by a strong acid, of the original coloring matter from the quartz casing. All these are from

South Africa. Superb rutilated quartz (sagenite, *fleche d'amour*, Venus-hair-stone, or Love's arrows), in the rough and in cut form, are from North Carolina. Rhode Island contributes black hornblende blades in quartz, and green actinolite in the same (the Thetis-hair-stone of Dr. Jackson). The actinolite, when in straight layers in the quartz, occasionally forms a quartz cat's-eye, if cut across the fibers. The Thetis-hair-stone from Japan is one of the most interesting and beautiful stones in the series of sagenitic quartzes.

The large pieces of black onyx, chrysoprase, carnelian or sard, and sardonyx, and the series of agates, of various colors, numbering over one hundred and fifty specimens, are cut into a variety of forms; the fine 3-inch square slab of "gold quartz," of the jewelers, is from Grass Valley, California.

Fine aventurine quartz, with spangles of mica in a rich reddish-brown quartz, from Russia, vases of which are often worth thousands of dollars, and a fine green aventurine, called imperial jade by the Chinese, and more esteemed by them than any of the true jades, deserve attention. The series of fifteen small Indian mocha-stones is very attractive; the black, moss-like markings are relieved by the red spots in the gray body of the stone, thus presenting a surface beautifully diversified. A 6 by 4 inch slab of moss-agate attracts much attention, different people seeing in its markings various bits of fancied scenery. A 2 by 4 inch slab and a circular disk, 1 inch in diameter, are good representative pieces of the blood-stone or heliotrope, so much used in rings and seals. A rich, brown, speckled jasper is worthy of notice. The series of quartzes closes with three polished pieces of silicified wood.

The two cut moldavites (Moravian bottle-glass), about 1 inch across, are of rare occurrence. They are transparent, dark-green obsidians from Moravia, for which worthless green bottle-glass has sometimes been sold. With them are four sleeve-button pieces of opaque obsidian; two black, two red and black, from the Yellowstone National Park.

The two sun-stones from Norway—the largest $1\frac{1}{2}$ inches long, the other a three-quarter-inch cut cabochon—are indeed fine, but a cut stone of the same material from Delaware County, Pennsylvania, the same length as the larger specimen from Norway, is nearly equal to them. A group of fourteen moonstones, of various sizes, from Ceylon, and two from Norway, one a half inches long, the other an inch, make a handsome display, grouped with the sun-stones and smaller labradorites. The last-mentioned species is fully represented, one polished piece being over a foot across, and a number showing the beautiful chatoyant colors to perfection.

Amber—yellow, transparent, and containing flies and other insects—is present in the form of cuff-buttons, a breast-pin and beads; also, in larger pieces, with one side polished, and large "tear-drops," which are especially of educational interest.

A rich, dark-brown cut aragonite, from California, and the beautiful green copper-colored Smithsonite (a zinc ore) from Laurium, Greece, demand special notice. One is a cut cabochon 1 inch long and one-half inch high, the other an ideal piece of the natural mineral. We observe, also, a fine polished malachite, from Siberia, and a smaller breast-pin piece; also, a dish of the highly-prized dark blue, or, more accurately, dark purple, fluorite from Derbyshire, England, where it is familiarly known as "Blue John." Vases of this material have often been sold for over \$1,000. Two small polished pieces of the Persian lapis-lazuli, and a slab 8 inches across, and one 4 inches, of the white-veined variety from the Peruvian Andes, well represent this species. A jade pendant, 3 inches long and of good color, is one of the sort made in Germany to sell in New Zealand, as genuine aboriginal workmanship. Also, a flat vase made of a gray Chinese jade, and one of the small bracelets of the same material, light-green in color, which are put on the arms of girls in early childhood, and allowed to remain there, until the natural growth of the arm fixes them so tightly, that they can not be removed over the hand. To the jades have recently been added an Alaskan jade labret, used by the Alaska Indians as a lip ornament, and a Chinese jade ink-stone holder, mounted on a base of carved teak-wood. This is the most elaborate jade in the collection; the body of a dragon forming a cell for water, the mouth of the cell being a hole in the dragon's back. The beast's fore-paws and head rest upon the edge of a rectangular trough, which is intended to hold the ink-stone. From this he appears to be drinking, while a smaller beast, whose head just appears above the edge at the other end of the trough, watches his powerful enemy with a stealthy, malicious fear.

A rich dark-green flower, 6 inches by 3, chiseled out of serpentine, is very pretty, as is a curious, fanciful, turtle-like talc ornament from Southern India, the shell of which is beautifully carved into a net-work of flowers, and a carved toilet-box of the same material, from the same locality. Besides the serpentine flower, there is a handsome turned vase, 8 inches high, grayish-green, crossed and recrossed with very dark olive-green streaks, giving it a mottled appearance; also a handsome, polished slab of Williamsite from Texas, Lancaster County, Penn., 6 by 10 inches, a small flower ornament from San Francisco, a paper-weight and two massive specimens of green Serpentine, spotted with red, from Cornwall, England, and a polished fancy specimen of Bowenite from Rhode Island. Red, white, and mottled Agalmatolite (Chinese figure-stone), from China, is interesting. There are three carved specimens representing human beings, and another, much more elaborate, representing a parting scene on the sea-shore. The remaining specimen of Agalmatolite is a handsomely-carved tray, on which is represented a typical oriental scene, with all its wealth of luxuriant vegetation. This well-preserved specimen was brought from Japan to Holland by the Dutch merchants in the sixteenth or seventeenth

century, and was recently deposited in the Museum by Mr. G. Brown Goode, the Assistant Secretary.

One of the finest specimens of its kind in the United States is a magnificent 6 by 4 slab of lumachellè ("fire-marble") of fossil origin, in which the color of the original shells is so deepened and intensified that it rivals the finest fire-opal. This comes from the old, exhausted locality of Carinthia, Austro-Hungary. Of alabaster, we have white, yellow, and cinnamon-gray slabs; of fossil coral, a fine slab from Iowa City. The oölite limestone from Bristol, England, is curious; the surface is highly polished, presenting a white field flecked with dark red. Beads of gypsum satin spar and a 3-inch egg of the same material are from Bridgeford, England. A wavy slab of polished light-brown barite, having its surface variegated with dark-brown spots, from Derbyshire, England, is rather interesting. A slab of jet from England, one from Germany, and another from Colorado are exhibited near two handsome carvings in cannel coal from Simpson's coal and lead mine in Missouri. One of these last represents a scene in a coal mine, and the other a bouquet of flowers. A cannon 12 inches long, mounted on truncheons, and an egg-shaped paper-weight, both made of the travertine of Gibraltar, and a small light-green slab of polished stalagmite from Baird, Cal., are among recent additions, as are ten rough, perforated garnets from an ancient grave in Bohemia, and a silver bar-pin, set with bloodstones and agates, the last the gift of Messrs. Harris and Shafer, of Washington.

The collection ends with an 8 by 3 slab of catlinite (Indian pipe-stone) and a large Indian pipe of the same material, from Coteau du Prairie, Pipestone County, Minn. The head delineated on the slab was carved by a Washington sculptor, and came into the Museum with the Abert collection, which was given to the Museum.