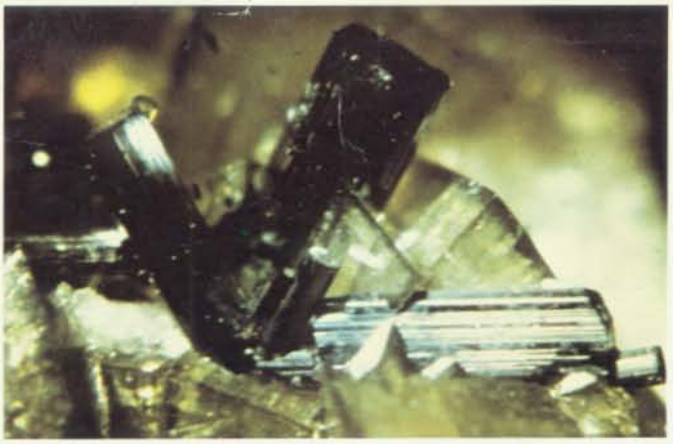
Mineral Collecting Sites in North Carolina

By W. F. Wilson and B. J. McKenzie



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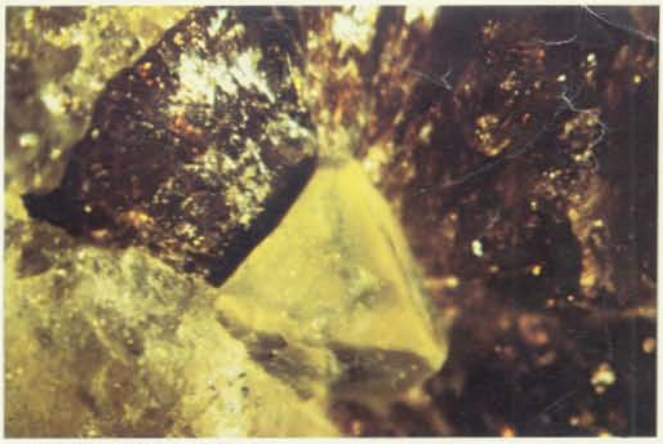

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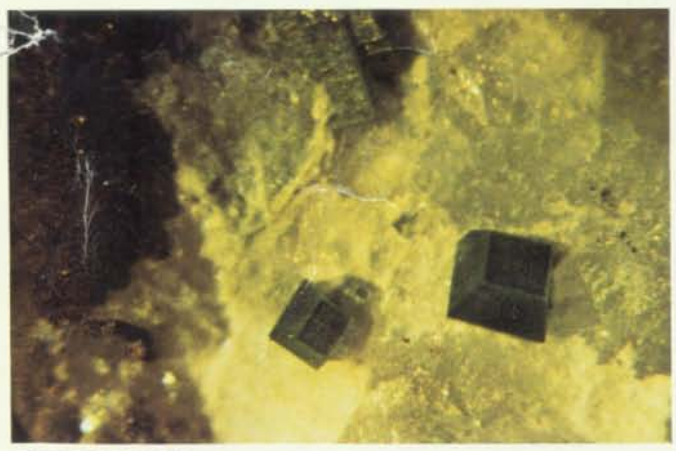

TORBERNITE

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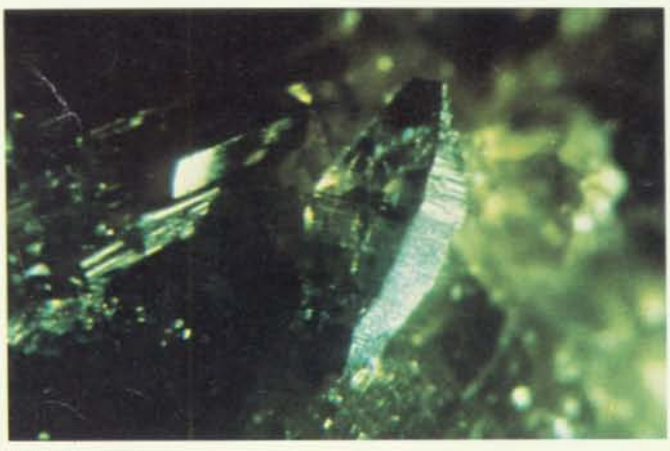

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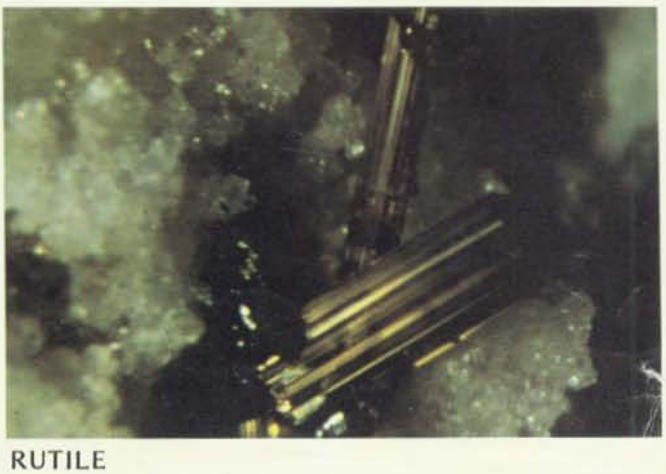

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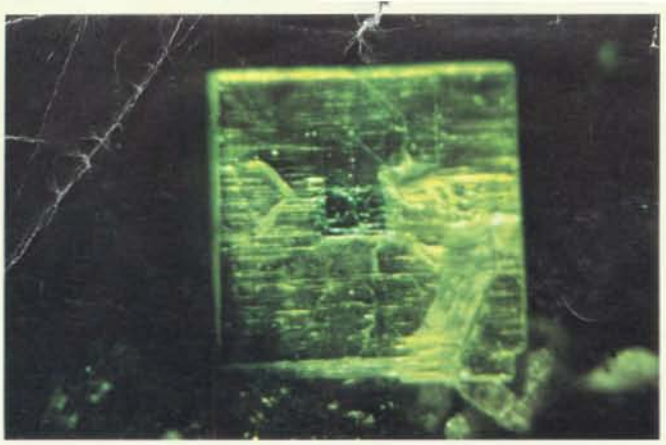


AUTUNITE AND TORBERNITE

THULITE AND PYRITE

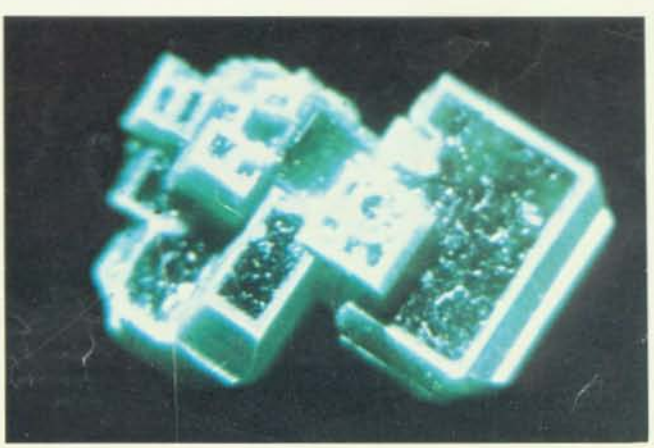
MONAZITE

EMERALD

CUPRITE

SMOKY QUARTZ

ZIRCON



TORBERNITE

Information Circular 24

Mineral Collecting Sites in North Carolina

By W. F. Wilson and B. J. McKenzie

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GEOLOGICAL SURVEY SECTION

The Geological Survey Section shall, by law ". . .make such examination, survey, and mapping of the geology, mineralogy, and topography of the state, including their industrial and economic utilization as it may consider necessary."

In carrying out its duties under this law, the section promotes the wise conservation and use of mineral resources by industry, commerce, agriculture, and other governmental agencies for the general welfare of the citizens of North Carolina.

The Section conducts a number of basic and applied research projects in environmental resource planning, mineral resource exploration, mineral statistics, and systematic geologic mapping. Services constitute a major portion of the Sections's activities and include identifying rock and mineral samples submitted by the citizens of the state and providing consulting services and specially prepared reports to other agencies that require geological information.

The Geological Survey Section publishes results of research in a series of Bulletins, Economic Papers, Information Circulars, Educational Series, Geologic Maps, and Special Publications. For a complete list of publications or more information about the Section please write: Geological Survey Section, P. O. Box 27687, Raleigh, North Carolina 27611.

Eldon P. Allen, Chief Geologist

FRONT COVER PHOTO
Twinned emerald crystal from North Carolina,
photo from Smithsonian Institution (slide 78-10)
Cover Design – Gay Brantley

PREFACE

Information Circular 24 is a compendium of viable mineral collecting sites throughout North Carolina. Some sites are commercially operated during the spring, summer, and fall months for a collecting fee. Those not commercially operated are on private property and require permission from the property owner to visit the site and collect. Care should be taken not to abuse or misuse these collecting sites. The prospect of a continued privilege of collecting minerals should dictate a special emphasis on leaving the site in good condition.

The large variety of minerals found in North Carolina has attracted thousands of collectors, not only from within our state, but also from other states as well. The rarity, beauty, durability, and ever-increasing value of minerals and gem stones have made them sound financial investments.

The emerald, considered by many to be the most beautiful of all gem stones, was adopted in 1973 by the North Carolina Legislature as the State's official gem stone. North Carolina has the distinction of producing the largest emerald crystal in North America -- 1,438 carats. The most expensive cut emerald also comes from North Carolina. This is the 13.14 carat Carolina Emerald owned by Tiffany & Company of New York and valued at $100,000. First thought to be emerald but later identified as a chromium spodumene, the mineral hiddenite has become a valuable collector's item in its own right. North Carolina was known as the Golden State from 1820 to 1840 because more gold was produced from this state during that period than from all of the other states in the Nation. Between 1843 and 1893, while panning for placer gold, thirteen authentic diamonds were found in gold washings. Two commercially operated gold mines are still open to the public for a fee. While panning for gold, you just might find a diamond yourself! North Carolina has the beautiful rhodolite garnet named after the colorful purplish-pink rhododendron which grows wild in the mountains of western North Carolina. Ruby and sapphire of exceptional beauty are found in Cowee Valley in the Franklin County area of western North Carolina. Many of these gems exhibit asterism. Some of the more desirable semiprecious gem stones found in North Carolina include aquamarine, golden beryl, amethyst, almandite garnet, citrine, and smoky quartz.

It is hoped that this publication will find a place beside some of the more prized books on your bookshelf, not only because it will serve as a useful and helpful guide to the mineral sites of our state, but also because it contains fine color prints of some of these outstanding minerals.

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INTRODUCTION

North Carolina contains rocks ranging in age from Precambrian to Recent. Within this assemblage of rocks is located one of the most varied groups of minerals identified to date in any state in the Nation. These minerals range from clays to gem stones to valuable ores.

This publication was prepared to assist visitors to and citizens of North Carolina who are interested in mineral and gem stone collecting in our state.

The text begins with a short history of gem stones and a description of some of the more important gem stones found in North Carolina. The rest of the text consists of the mineral locality descriptions, which are listed by county. These localities are indicated on the maps in Appendix 1. For people who want to be sure of finding something of interest during their fieldtrips, a list of the museums which have mineral or earth science displays is included as Appendix 2. Appendices 3 and 4 contain the addresses of the mineral dealers and mineral clubs, respectively, in the state. Since time of year, weather conditions, and, sometimes, construction activity affect the condition of each locality, it may be useful to contact a mineral club in the area while planning your trip. To assist visitors to the Franklin and Spruce Pine areas, the physical characteristics of minerals frequently found there are given in Appendix 5. The inclusion of the state highway map in the back of the book should be of considerable assistance in planning field trips throughout the state.

The equipment needed for collecting minerals may be easily obtained at little expense. The basic tool is the prospector's pick or hammer. This consists of a hammer head with a pointed pick extension on the back of the head. Sledge hammers and cold chisels may be needed when working with large rocks. A magnifying glass is a necessity for identifying small crystals and examining sands. For field work, an inexpensive hand lens of 10 X magnification is just as useful for general work as a more expensive, corrected lens. Old newspapers are useful for wrapping specimens to avoid damage during transportation and storage. All specimens should be properly wrapped and their source identified.

The best places to look for mineral specimens are in working mines and old mine dumps. Railroad and highway cuts often contain some excellent mineral specimens, as do stream beds and banks. Many excellent specimens have also been found in freshly plowed fields.

The localities described in this report are places where minerals have been found and where at least some of the mentioned minerals may still be found. Some of them have been almost obliterated by time, vegetation, and man. It is not unusual to find that buildings, highways, and even towns and lakes now cover what were once good collecting sites. Specimens at some localities may be difficult to find, while other localities are well-preserved and specimens easily obtained.

Almost any place a collector goes will be on private property, and he should have the permission of the property owner or the mine operator to enter the locality and remove specimens. Inclusion of a locality in this book does not imply that the land owner will permit free access to the site.

This book represents a compilation of existing data and information provided by numerous individuals from throughout the state. Only a few of the localities were field-checked by the authors. Additions or corrections to the information contained herein should be sent to the address on the back cover. Comments on the usefulness of this book or on how it can be improved will be greatly appreciated.

ACKNOWLEDGEMENTS

A publication of this type is a difficult and complex undertaking. The interest, enthusiasm, and information provided by others was invaluable in the compilation of this book. Mrs. Helen M. Coe, Curator of the Franklin Gem and Mineral Museum at Franklin, North Carolina brought forth ideas and suggestions which were incorporated into this publications. We are grateful for her friendship. Mr. Carter Hudgen of Marion, North Carolina furnished over forty of his outstanding color slides of minerals, many of which appear in this book. We thank him for his generosity. Mr. Bob Orchard of Orchards Minerals, Raleigh, North Carolina shared his knowledge of the collecting sites which were too dangerous to visit and those that no longer contain specimens of collecting value. He also added numerous new collecting sites of which we were not aware. Mr. and Mrs. Dell Curtis of the Emerald Valley Mines at Hiddenite, North Carolina allowed us to visit their property and furnished pictures of emerald and hiddenite which appear in this publication. Dr. Ronald Yadusky, of the Piedmont Mineral and Gem Society, submitted additional mineral sites which were incorporated into the text. Individuals who furnished new mineral site information are acknowledged at the end of each site description.

We are also indebted to Mr. Dennis Walters of Reidsville, N. C.; the Colburn Museum of Asheville, N. C.; the Charlotte Gem and Mineral Club; the Gem and Mineral Society of Franklin, N. C.; the Catawba Valley Gem and Mineral Club, Hickory, N. C.; and Mr. Vernon Hoffman of the Foothills Mineral Society, Lincolnton, N. C.

A special appreciation is extended to the professional staff of the Public Affairs Section of the Department of Natural Resources and Community Development. They gave freely of their outstanding photographic and artistic talents.

We thank and acknowledge Ms. Anne Vironț-Lazar of our staff for all the hours she spent on map preparation, and a special thanks to Mrs. Chris Bain for typing the manuscript and correcting our errors and misspellings. We also thank the entire staff of the North Carolina Geological Survey Section for their help, interest, and enthusiasm.

Also, acknowledgement is made of the liberal use of data provided by Information Circular 16, Mineral Localities of North Carolina, which was of considerable aid in preparation of this publication.

GEM STONES

History of Gems

For centuries precious gem stones and cut gems have been prized by mankind. Their qualities of beauty, rarity, value, and durability provide their owners with a lasting value and pride of ownership. They were once called noble stones, for only people of noble birth and wealth could afford their ownership. It has been written that even the beauty and color of the most magnificent flowers, the variegated greens of our majestic forests, and the glory and beauty of a golden sunset are forever changing. But the brilliance and color of gem stones are the same today as they have been for centuries.

The quest for gem stones of rare beauty and value has stimulated man's curiosity for centuries. This fascination caused the early explorers to sail to the New World in search of treasure and fortune for themselves and their rulers. Some rare gem treasures were found and became the crown jewels of kings and queens. Some were found only to become lost in the depths of the sea on the storm-treacherous journey homeward. The expectation of finding gem wealth almost always exceeded the fear of the long journeys and the difficulties experienced in early exploration. Even in the most adverse conditions, the thought that gem treasure may lie just beyond the next mountain would cause them to explore ever deeper into unknown and many times unfriendly territory.

Man's interest in gem stones goes beyond their use as jewels for personal adornment. Just as the brilliant beauty of gems captured the hearts and imagination of mankind, turn another facet, and we can delve into man's inherent sense of superstition and myths which involve the powers of gems. This is, in part, portrayed by the wearing of a certain gem at particular times for their supposed supernatural or mystical powers. Some gems were thought to protect the owner from the invasion of evil spirits into the body, while others might offer good fortune or good luck and also protection of the mind and body from sickness.

In ancient Egypt, there was an accepted custom of engraving symbols onto certain semi-precious gem stones which had been cut into various symbolical forms. These symbols were taken from a very ancient ritual composition called the Book of the Dead. The symbols were inscribed on exceptional pieces of emerald in matrix, green and red jasper, malachite, lapis-lazuli, feldspar, serpentine, turquoise, and carnelian. They were hand-carved in the form of heart-shaped amulets and beetle-shaped scarabs. The ancient symbols were usually inlaid with gold with ornamental gold surrounding the amulets and scarabs. These carved gems were usually placed around the neck of a mummy to assure safe passage of the soul of the deceased through the realm of the dead and to insure protection from all evil influences. One particular amulet called "uat" insured that the deceased would enjoy eternal youth in the realm of the dead. There were many other amulets and scarabs, each with their own unique supernatural powers.

Beginning in the First Century A.D., the writings of the Jewish historian Josephus (37-95 A.D.) set forth the belief that to each month of the year a special stone was dedicated and that the stone of the month was endowed with a particular virtue for those born in that month. This was called their "natal" stone, later to become known as birth stones. However, it was not until the Eighteenth Century in Poland that the wearing of natal or birth stones became an accepted custom. This disparity in time and custom may be attributed to the fact that the special virtues of the gem stone were customarily accepted. But it was centuries before what many believed to be a mystic bond between the stone of the month and the person born in that month was fully realized.

Each stone had particularly strong powers for the person born during its month. This belief grew from early studies of the Bible, in particular, the books of Exodus (28: 17-20) and Revelation (21: 19, 20). The following table gives the month and name of birth stones in Biblical times as compared to those of today.

Month	Exodus	Revelation	Today
January	Beryl	Jacinth (zircon)	Red Garnet
February	Jasper	Amethyst	Amethyst
March	Carnelian	Jasper	Aquamarine
April	Peridot	Sapphire	White Sapphire/Diamond
May	Emerald	Chalcedony	Green Spinel
June	Ruby	Emerald	Alexandrite
July	Lapis Lazuli	Sardonyx	Ruby
August	Onyx	Sardius (Carnelian)	Peridot
September	Sapphire	Chrysolite	Blue Sapphire
October	Agate	Beryl	Rose Zircon
November	Amethyst	Topaz	Golden Sapphire/Topaz
December	Topaz	Chrysophase	Zircon

Although the special powers of gem stones were generally accepted, the practice of wearing birth stones did not become a common custom until much later. This custom appears to have originated in Poland and is attributed to the influence of Jewish rabbis and gem traders who settled there.

Today, the wearing of birth stones is an accepted custom. They are worn now not for their supposed mythical powers, but rather because of their color, brilliance, and beauty.

Qualities of Gems

Gem stones are divided into three groups -- precious, semi-precious, and ornamental stones. Although there are many beautiful and rare gem stones, only four are considered precious. These are emerald, diamond, ruby, and sapphire. All other gem stones are classified as semi-precious. Ornamental stones are used for decorative objects such as vases, carved figurines, jewel containers, and hand-carved handles for silverware and some weapons such as swords and pistols.

About 100 minerals have been classed as gem stones. These must possess beauty, durability, and rarity. Fashion is also often a factor. The beauty of a gem stone may be in its color, play of colors, brilliance, or fire.

Brilliance and fire depend upon many factors. The color of the gem stone must be uniform, unless it is a bicolored gem. The stone should be translucent to transparent and free from foreign inclusions, veils, or fractures. If these conditions are present, the light rays that enter the stone will be reflected and refracted properly and will intensify its color, brilliance, and fire and enhance its beauty.

Rarity is essential for any material to be classed as a gem stone. It is obvious that no common or abundant thing can be highly prized. The blue-green muzo emeralds from Columbia, South America are rare and more highly valued than emeralds from any other source. Just as rarity is essential to the value of gem stones, so is durability. Durability and resistance to abrasion are essential, for a scarred or broken gem immediately loses its attractiveness and value.

For many years, there has been a tendency for the price of gem stones to increase. In the last few years, many varieties have doubled in price, while a few varieties have quadrupled in price. As a result, they are treated as investments in many quarters. They also serve as concentrated wealth that is easily hidden or transported during times of war, governmental policy changes, or inflation within the international gem market.

Gem stones and gem material occur in a large variety of rock and mineral deposits, usually as a small fraction of the total deposit. The origins are as varied as the occurrences. Their principal formation is by precipitation from aqueous solutions, by crystallization from magmas, or by metamorphic processes. The principal host rocks are igneous intrusions, pegmatites, gneisses, schists, and quartz veins.

About one third of the gem minerals are silicate minerals, nearly one fifth alumino silicates, and nearly one seventh oxides. The remaining compositional groups include sulfides, phosphates, borosilicates, and carbonates. The compositions of selected gem stones and gem materials are included in Table 1.

Table 1. -- Guide to Selected Gem Stones and Gem Materials Used in Jewelry *

Name	Composition	Color	Practical Size[1]	Cost[2]
Amber	Hydrocarbon	Yellow, red, green, blue	Any	Low to medium
Beryl:				
Aquamarine	Beryllium aluminum silicate	Blue-green to light blue	-do-	Medium
Emerald	-do-	Green	Medium	Very high
Emerald (synthetic)	-do-	-do-	Very small	High
Golden	-do-	Yellow to golden	Any	Medium
Morganite	-do-	Pink to rose	-do-	Low to medium
Calcite:				
Marble	Calcium carbonate	White, pink, red, blue, green, brown	Any	Low
Mexican onyx	-do-	-do-	-do-	-do-
Satin spar	-do-	-do-	-do-	-do-
Chrysoberyl:				
Alexandrite	Beryllium aluminate	Green by day, red by artificial light	Soviet (small) Ceylon (medium)	High
Catseye	-do-	Greenish to brownish	Small to large	-do-
Chrysolite	-do-	Yellow, green, brown	Medium	Medium
Coral	Calcium carbonate	Orange, red, white, black, green	Branching, medium	Low
Corundum:				
Ruby	Aluminum oxide	Rose to deep purplish red	Small	Very high
Sapphire	-do-	Blue	Medium	High
Sapphire (fancy)	-do-	Yellow, pink, white, orange, green, violet	Medium to large	Medium
Sapphire and ruby stars	-do-	Red, pink, violet, blue, gray	-do-	High to low
Sapphire or ruby (synthetic)	-do-	Yellow, pink, blue, red, white, green, violet	Up to 20 carats	Low
Diamond	Carbon	White, blue-white, yellow, brown, green, red, blue, pale	Any	High
Feldspar:				
Amazonstone	Alkali aluminum-silicate	Green	Large	Very low
Labradorite	-do-	Gray with blue sheen	-do-	-do-
Moonstone	-do-	White	-do-	-do-
Garnet	Variable silicate	Brown, black, yellow, green, ruby red	Small to medium	Low to medium
Jade:				
Jadeite	Complex silicate	Green, red, black, white, mauve	Large	Low to very high
Nephrite	Complex hydrous silicate	-do-	-do-	-do-

[1]Small -- up to 5 carats; medium -- up to 50 carats; large -- over 50 carats

[2]Low -- up to $5 per carat; medium -- up to $100 per carat; high -- over $100 per carat

*Clarke, Robert G., 1975 Edition, Gem stones, in Mineral facts and problems, Bicentennial Edition: U. S. Bureau of Mines Bulletin 667, p. 419-429.

Mohs' hardness	Specific gravity	Refraction	Refractive index	May be confused with	Recognition characters
2.0-2.5	1.0 -1.1	Single	1.54	Synthetic or pressed	A fossil resin
7.5-8.0	2.63 -2.80	Double	1.58	Synthetic spinel, blue topaz	Double refraction, refractive index
7.5	2.63 -2.80	-do-	1.58	Soldered emerald, glass, tourmaline, peridot, green garnet	Emerald filter dichroism, refractive index
7.5-8.0	2.63 -2.80	-do-	1.58	Genuine emerald	Flaws, brilliant fluorescence in ultraviolet
7.5-8.0	2.63 -2.80	-do-	1.58	Quartz topaz, precious topaz, glass, doublets	Refractive index, double refraction
7.5-8.0	2.63 -2.80	-do-	1.58	Kunzite, tourmaline, pink sapphire	Refractive index
3.0	2.72	Double (strong)	1.5	Silicates	Translucent
3.0	2.72	-do-	1.6	Other onyx	-do-
3.0	2.72	-do-	1.6	Other spars	Sheen
8.5	3.50 -3.84	Double	1.75	Synthetic	Dichroism, inclusions in synthetic sapphire
8.5	3.50 -3.84	-do-	1.75	Quartz	Gravity and translucence
8.5	3.50 -3.84	-do-	1.75	Tourmaline, peridot	Refractive index, silky
3.5-4.0	2.6 -2.7			Imitations	Dull translucent
9.0	3.95 -4.10	Double	1.78	Synthetic	Inclusions and shape of flaws
9.0	3.95 -4.10	-do-	1.78	Synthetics including spinel	Inclusions, double refraction, dichroism
9.0	3.95 -4.10	-do-	1.78	Synthetics, glass, and doublets	Inclusions, double refraction, refractive index
9.0	3.95 -4.10	-do-		Star quartz, synthetic stars	Shows asterism, color on side view
9.0	3.95 -4.10	-do-	1.78	Synthetic spinel, glass	Double refraction, refractive index
10.0	3.516-3.525	Single	2.42	Zircon, titania	High index, dispersion, single refraction, hardness, cut, luster
6.0-6.5	2.54 -2.75			Jade	Cleavage sheen, vitreous to pearly, opaque
6.0-6.5	2.54 -2.75			Brazilian butterfly	-do-
6.0-6.5	2.54 -2.75		1.52	Glass or white onyx	Blue sheen, opalescent
6.5-7.5	3.15 -4.30	Double (strong)	1.79-1.98	Synthetics, spinel, glass	Double refraction, wear on facet edges, light-color varieties are transparent
6.5-7.0	3.3 -3.5		1.65-1.68	Onyx or glass	Luster of polished surface, translucent to opaque
6.0-6.5	2.96 -3.10		1.65-1.68	-do-	-do-

Table 1. -- Guide to Selected Gem Stones and Gem Materials Used in Jewelry

Name	Composition	Color	Practical Size[1]	Cost[2]
Olivine:				
Peridot	Iron magnesium silicate	Yellow, green	Any	Medium
Opal	Hydrous silica	Colors flash in white, gray, black, red, yellow	Large	Low to high
Pearl	Calcium carbonate	White, pink, black	Small	-do-
Quartz:				
Agate	Silica	Many colors	Large	Low
Amethyst	-do-	Purple	-do-	Medium
Cairngorm	-do-	Smoky	-do-	Low
Citrine	-do-	Yellow	-do-	-do-
Crystal (rock)	-do-	Colorless	-do-	-do-
Jasper	-do-	Uniform or spotted, red, yellow, brown, green, blue	-do-	-do-
Onyx	-do-	Many colors	-do-	-do-
Rose	-do-	Pink, rose red	-do-	-do-
Spinel	Magnesium aluminum	Red, blue, lilac, orange, yellow, purple, green	Medium	Low to medium
Spinel (synthetic)	-do-	Blue, white, light blue, yellow, gray, green, alexandrite colors	Up to 40 carats	Low
Spodumene:				
Kunzite	Lithium aluminum silicate	Pink to lilac	Any	Medium
Hiddenite	-do-	Yellow to green	-do-	-do-
Topaz (precious)	Complex silicate	White, blue, yellow, pink, red, green	White and blue any size Yellow and pink to medium	Low to medium
Tourmaline	-do-	Red, pink, green, blue, wine, brown, yellow	Green and red to 50 carats Others, medium	-do-
Turquoise	Copper aluminum phosphate	Blue to green	Large	Low
Zircon	Zirconium silicate	White, blue, brown, yellow, green	Small to medium	Low to medium

[1]Small -- up to 5 carats; medium -- up to 50 carats; large -- over 50 carats

[2]Low -- up to $5 per carat; medium -- up to $100 per carat; high -- over $100 per carat

Mohs' hardness	Specific gravity	Refraction	Refractive index	May be confused with	Recognition characters
6.5-7.0	3.27 -3.37	Double (strong)	1.68	Tourmaline, chrysoberyl	Strong double refraction, low dichroism
5.5-6.5	1.9 -2.3	Single	1.45	Glass	Color changes
2.5-4.0	2.6 -2.85			Cultured and imitation	Luster and structure
7.0	2.58 -2.64			Glass	Crystalline, irregularly banded
7.0	2.65 -2.66	Double	1.55	-do-	Refractive index and double refraction, transparent
7.0	2.65 -2.66	-do-	1.55	-do-	-do-
7.0	2.65 -2.66	-do-		-do-	-do-
7.0	2.65 -2.66	-do-	1.55	-do-	-do-
7.0	2.58 -2.64			-do-	Opaque, vitreous
7.0	2.58 -2.64			-do-	Uniformly banded
7.0	2.65 -2.66	-do-	1.55	-do-	Refractive index and double refraction, transparent
8.0	3.5 -3.7	Single	1.72	Synthetic sapphire, garnet	Refractive index, single refraction, inclusions
8.0	3.5 -3.7	Double	1.73	Spinel, sapphire, aquamarine, topaz, alexandrite	Weak double refraction, lack of dichroism, refractive index
6.5-7.0	3.13 -3.20	Double	1.66	Pale amethyst, morganite	Refractive index, transparent
6.5-7.0	3.13 -3.20	-do-	1.66	Synthetic spinel	-do-
8.0	3.4 -3.6	-do-	1.62	Beryl, aquamarine, quartz, topaz	Refractive index
7.0-7.5	2.98 -3.20	-do-	1.63	Peridot, beryl, corundum, glass	Double refraction, refractive index
6.0	2.60 -2.83	-do-	1.63	Glass or composition	Difficult if matrix not present, matrix usually limonitic
6.0-7.5	4.0 -4.8	Double (strong)	1.79-1.98	Diamond, synthetics	Double refraction, wear on facet edges