

GUIDE TO STONES USED FOR HOUSES OF WORSHIP IN NORTHEASTERN OHIO

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INTRODUCTION

Stone has been the preferred material for houses of worship since ancient times. Great stone structures such as the Parthenon in Athens, the Temple of Solomon in Jerusalem, and the Gothic cathedrals of Western and Central Europe immediately come to mind as classic examples of sacred structures. Stone has often been considered as being more ecclesiastically appropriate than wood or other materials for churches and other sacred structures. Traditionally in Hungary, for instance, only churches made of stone could be dedicated (Derse'nyi et al., 1991, p. xv). The strong preference for stone is in part due to a desire for the finest, longest-lasting, and most prestigious materials. This preference is also probably due to the use of stone for the most famous houses of worship and the many biblical metaphors referring to stone. Stone structures also have certain desirable acoustical properties (Humphrey and Vitebsky, 1997, p. 74).

The use of stone has been prevalent for houses of worship in Northeastern Ohio. As one can see while traveling through the area, or while perusing the pages of Armstrong, Klein, and Armstrong's 1992 *Guide to Cleveland's Sacred Landmarks*, the majority of the architecturally significant churches in the region are constructed with stone. These sacred structures contrast strongly in composition, as well as height and mass, with the surrounding houses, which are usually constructed of wood. This pattern is not unlike that of ancient Greece or of medieval Europe.

These great stone structures stand as important landmarks and anchors of neighborhoods today. They also serve as vivid reminders of what the people who built these structures found important. These stone churches and temples are also among the most beautiful structures found in the urban setting. As such, they provide inspiration to those who live around them, whether or not they belong to the congregations of those churches and temples.

Of course, wood and brick also have a strong tradition. Wood has traditionally been used for various Protestant denominations in the United States and brick has been the preferred material for churches in Poland (and for Polish churches in Cleveland) since Gothic times. Overall, however, stone has been the preferred material; other materials have been used when economics dictated the use of less expensive materials.

The importance of sacred structures in the urban environment and their impact on

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neighborhoods and individuals is perhaps most apparent when one of these stone structures is threatened with demolition. The threatened razing of Cleveland's Fifth Church of Christ Scientist has met with much opposition in the past few years (Stainer, 1992; Litt, 1995). (As of late 1999, the church was empty and damaged in part, but still standing.)

Although there is a fair body of literature on stone used for houses of worship in Northeastern Ohio, much of this information is scattered. Specifications and architectural drawings are often lost or do not provide adequate information on stone used. The plans for Cleveland's East Mount Zion Baptist Church, for example, simply note "stone" where a quite distinctive green serpentinite was used for the church. The plans do not provide any clue as to the provenance of this stone. Also, oral traditions regarding the origin of various stone (and there are many of these) may or may not be correct.

The purpose of this guide is to serve as an introduction and field guide to the stone used for Northeastern Ohio's sacred landmarks. Both exterior and interior stones are described. Locations are given so that visitors can find various interior features. Finally, interesting facts having to do with the stones are given in a remarks section and references to sources used in compiling this information are noted.

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TYPES OF STONE USED FOR SACRED STRUCTURES IN NORTHEASTERN OHIO

A wide variety of stone types have been used in the construction of houses of worship in Northeastern Ohio. Some of this stone is from this region, but other types are from various places around the world. Stone used in Northeastern Ohio's sacred structures includes examples of all three of the major rock types: igneous rocks, such as granite; sedimentary rocks, such as limestone and sandstone; and metamorphic rocks, such as marble and slate. These stones have been used in many different ways, ranging from exterior facing and columns to interior flooring and statuary.

Throughout the centuries and all over the world, exteriors of many types of sacred buildings have been made of stone. Due to the high cost of transporting stone, it usually came from nearby quarries, or from quarries located near bodies of water. In medieval times in Europe, transportation over long distances by land was extremely expensive. Transportation by water was preferred. Some cathedral authorities in western Europe had their own boats for stone transport (Coldstream, 1991, fig. 23).

In Northeastern Ohio, stone used for the major parts of the exterior of buildings was originally local. The Berea Sandstone was the most important of these stones, being used for Cleveland's St. John's Historic Episcopal Church (1838), Cleveland's Old Stone Church (1855), and many other structures. Berea Sandstone was quarried in a number of localities in northeastern Ohio, but the stone used for most houses of worship came from Berea or the South Amherst area quarries. Berea Sandstone, with its subtle stratification, also has a distinctive character. The Sharon Conglomerate, another local stone, was used for Akron's St. Vincent Church (1867). The stone for the church was quarried nearby, in Akron. Later, stone was brought to northeastern Ohio from western Ohio (Cleveland's St. Patrick Roman Catholic Church, 1870s) and northcentral Ohio (East Cleveland's Greater Friendship Baptist Church, 1926), as well as Indiana, Massachusetts, Michigan, Minnesota, New York, Pennsylvania, Tennessee, and Vermont. In the 20th century, *Indiana limestone* became the predominant stone used for sacred structures in this area. This stone was chosen because of its physical properties, including its crushing

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strength and lack of imperfections (see, for example, Schweinfurth in Perry (1967)). It was also known as a freestone, that is, it could be cut in any direction because of its uniformity. And because it was softer than sandstone, it could be cut and carved more easily.

Importation of stone from outside of northeastern Ohio relied on the development of suitable systems of transportation. Early on stone was transported via the Ohio & Erie Canal; later, stone was shipped via railroad (Hannibal, 1998). The canal stimulated the growth of Berea Sandstone quarries along the Cuyahoga Valley. The railroad was an even greater impetus to quarries both in Ohio and elsewhere. Much stone was shipped from northeast Ohio's Berea Sandstone quarries in the south Amherst area and elsewhere by railroad. In addition, the Salem Limestone quarries of southcentral Indiana expanded their production greatly when the railroads were developed.

Because far less stone was used for interior objects than for exterior walls, interior materials were more often obtained from distant locales. Even after steam and internal combustion engines replaced draft animals, this same pattern held. Stone used for interior objects and decoration of houses of worship in northeastern Ohio comes from North America, Europe, and Africa. The amount and variety of stone used in the interior of church structures can be roughly correlated to denomination, with those denominations preferring stark interiors or wood furniture having less stone than those with a tradition of interior ornamentation. Protestant churches are often in the former category, while Catholic churches are most often in the latter. Some of the stone types used in the interior of churches may well have been chosen because of a link with religious traditions. Roman travertine, quarried at Bagni di Tivoli just east of Rome, for instance, is the quintessential Roman stone used for the great churches of Rome including St. Peter's Basilica. The cost of importing this stone from Italy for exterior use, however, may have been prohibitive. Nor would travertine have stood up well in the moister and more extreme climate of northeastern Ohio. However, this travertine is used on the interior of several churches, including Cleveland's St. John's Cathedral.

Carrara marble likewise has a long tradition, being used for statuary and other fine uses dating back to the time of the ancient Romans. At that time it was known as *Lunense*. Its properties, including white color, lack of foliation ("flaws"), very fine grain size, and homogeneous nature, led to its being considered the finest stone for sculpture. It also did not hurt that

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Michelangelo used it for his *Pieta*. *Carrara marble* is widely used for interior objects in contemporary sacred structures, particularly altars and sculptures. The baptismal font of the Church of the Savior United Methodist Church (Cleveland Heights) is made of this stone as is the original main altar at St. Colman's Roman Catholic Church (Cleveland).

Many other types of stone used in the interior of these sacred structures are from Italy, partially because of Italy's strong tradition of stone use for interior ecclesiastical architecture. This prevalence is also due to the strength of the Italian stone trade and Italy's position in the Mediterranean, which allows ease of shipment of stone by water. Stone may also have a link to the ethnic group who founded a particular church. *Connemara marble*, a famous stone from Ireland, for example, is used in St. Colman's Church.

Some stone has a very special connotation. *Porta Santa* stone, used in St. James Roman Catholic Church (Lakewood), is a stone named for the *Porta Santa* (holy gate), a special doorway of St. Peter's Basilica in Rome. *Old Convent Siena*, used in St. Michael the Archangel Church (Cleveland), is named for the Old Convent Quarry in Siena, which was owned by monks at Monterenti, Italy (McClymont, 1990). *Jerusalem limestone* used for the cornerstone of the Church of the Savior and the altar of Trinity Episcopal Cathedral reflects both ancient tradition and linkage with Solomon's temple, as well as more recent Masonic tradition.

Even faux stone (painted plaster and other types of imitation stone) used in ecclesiastical structures has a long tradition. Many famous European churches, especially those of the Baroque tradition, make use of faux stone for interior walls, pillars, and other features. These faux stone designs, in turn, are often based on real stones.

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ARCHITECTURAL STYLES AND STONE USE

Based on the sampling of sacred structures covered here, there seems to be little relationship between the type of stone used for the exteriors of sacred structures and architectural styles of those structures. The two most used types of stone, Berea Sandstone and *Indiana limestone*, were used for structures having a variety of architectural styles. Berea Sandstone, for instance, has been used for Byzantine, Romanesque, Gothic, Neoclassic, and Italian Renaissance structures. And *Indiana limestone* has been used for houses of worship in the same variety of architectural styles. Although many structures are based rather closely on European types, the stone used is invariably different. Cleveland's Trinity Episcopal Cathedral, for example, is a fine English Gothic structure, but it is made of domestic *Indiana limestone*. The use of particular types of stone for church exteriors also transcends religious denominations: both Berea Sandstone and *Indiana limestone* are used for structures erected by a variety of denominations. In fact, the same types of stone are used for contemporaneous secular structures.

The use of brownstone for Pilgrim Congregational Church (Cleveland), however, is closely tied to its architectural style, as brownstone was often used for such Richardsonian Romanesque structures. The original Society for Savings Building and, especially, the Old Arcade in downtown Cleveland are other examples of Richardsonian Romanesque structures using similar reddish sandstones. The serpentinite used for Cleveland's East Mount Zion Baptist Church (completed in 1908) is unusual, but part of a trend at the end of the nineteenth and early twentieth centuries. Other churches made of similar serpentinite can be found in Columbus (Broad Street United Methodist Church, completed in 1885), Chicago (the Pulman "Greenstone" United Methodist Church, dedicated in 1882), and Pennsylvania (West Chester's Church of the Holy Trinity, constructed in 1870). These serpentinite churches do share some Romanesque architectural features.

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REUSE OF STONE FOR SACRED STRUCTURES

There have been excellent examples of the use of previously used stone for sacred structures in northeastern Ohio. Cleveland's St. Ann Church utilized stone columns and other structures from hotels in Cleveland and New York, while Cleveland's St. Francis Church used exterior stone from the Old Cleveland Post Office. In both cases, this was done for economic reasons. Lakewood's St. James Church and Cleveland's St. Ignatius Church may include stone pillars that were manufactured in Roman times.

WEATHERING

Aspects of weathering, that is, physical and chemical changes in stone, are briefly noted in this work. Weathering of building stone is complex. The body of literature on this topic has increased greatly in recent years, and the field is not without controversy. With a few exceptions, for example Mostafavi and Leatherbarrow (1993), the role of weathering in the enhancement of a stone structure has not been appreciated. In the past, and still today, many sacred structures have been needlessly subjected to harsh cleaning methods, including sandblasting. A dark patina on silica-cemented sandstones, for instance, adds to the historic look of structures, does not seem to do them any harm, and could conceivably act to protect their exteriors. Many sandstone churches in the Cleveland area were cleaned in the 1980s and 1990s, most notably the Old Stone Church in downtown Cleveland. A dark patina on some other rock types, especially limestones and marbles, however, often is indicative of problem areas that should be attended to.

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ORGANIZATION OF THIS GUIDE

This publication describes stone used for selected houses of worship, chosen to represent a diversity of stone types and usages. Descriptions are based on diverse sources, primarily brochures and other information from individual church congregations. Except in the case of sacred structures that are no longer extant, I have visited all of the structures in order to verify information and make other observations. In most cases, both exterior and interior stone are described. In some cases, for instance when little stone is used in the interior of a particular house of worship, only the exterior stone is described. A small part of the information in this publication has previously appeared in Hannibal's (1992) article on ecclesiastical geology.

Because this publication is likely to be consulted by users of differing backgrounds, names for stone used by the stone industry and by architects, as well as that used by geologists, is listed when known. If two sets of stone names are known, commercial names (e.g., *Indiana limestone*) are given first, with the names of formal geologic rock units (e.g., Salem Limestone) given next in parentheses. Both sets of names are typically given when a stone name is first used. Commercial names are italicized. In all cases, the initial letter of each word of formal geologic rock unit names (e.g., Berea Sandstone) are capitalized. In a few cases, the geologic rock unit name and the commercial name may be the same. Berea Sandstone, for example, has often been referred to by that name by both geologists and by those who sold the stone. However, Berea Sandstone from particular localities has also been sold under other names, such as *Birmingham Warmtone Buff sandstone*. This name refers to rock quarried from the Berea Sandstone at Birmingham, Ohio. Also, the term "marble" is used in this work to indicate commercial "marbles," which include both true geological marbles (calcareous or dolomitic metamorphic rocks) and other stone, such as limestones (calcareous sedimentary rocks), which can be polished like marbles. To avoid confusion, true geological marbles are indicated as "true marbles."

For the most part, colors noted in this guide have been determined using the Geological Society of America Rock Color Chart (Rock-Color Chart Committee, 1991).

Predominant architectural styles are briefly noted at the heading for each sacred structure.

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However, many northeastern Ohio houses of worship combine two or more styles. Those who would like more information on architectural styles should turn to Armstrong, Klein, and Armstrong's guidebook (1992) or related works. Armstrong's (1990) essay on architectural styles, which puts Cleveland's sacred landmarks into a context of ecclesiastical architecture, is also highly recommended. More information on Cleveland's sacred structures can be found in "Cleveland Sacred Landmarks 1830-1930: a pilgrimage" (www.csuohio.edu/ce/csl/reception.html).

Key references that make note of stone used in the structures discussed are listed at the back of this publication. A glossary of geological and architectural terms, many taken from Hannibal and Schmidt (1992) and Hannibal and Davis (1992), can be found at the end of this monograph.

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AMASA STONE CHAPEL

10900 Euclid Avenue, Cleveland, on the campus of Case Western Reserve University; built 1910-1911, dedicated 1911. English Gothic.

Exterior: The exterior is clad with *Indiana limestone* (Salem Limestone) quarried in South Central Indiana. *Indiana limestone* is composed almost entirely of small fossils of marine organisms. The fossils can be seen in this and other buildings made of *Indiana limestone* with close inspection (a magnifying lens is useful). The stone for this chapel is finished with fine dove work and is laid down in courses of somewhat varying heights.

Interior: Interior stonework, including entranceways, window frames, columns, piers, and arches, are fashioned from *Indiana limestone*. The statue "Philanthropy" in the south of the church is fashioned from a fine-grained, white true marble, probably (since it is white, fine-grained, and was carved in Rome) *Carrara marble*. It has a base made of a mottled yellow-orange, yellow-brown, cream, and white marble, probably *Siena marble*.

Remarks: The name of the chapel has nothing to do with its being constructed of stone; the name is in honor of Amasa Stone, whose carved sandstone likeness (salvaged from the 1866 Union Depot) is mounted above the exterior of the southeast entrance to the chapel. The rather stark interior of this chapel reflects a nineteenth-century view of English Gothic churches, whose structures have been stripped of colorful statuary since the Reformation.

References: Armstrong, Klein, and Armstrong, 1992.

BETHANY LUTHERAN CHURCH

6041 Ridge Road, at the northeast corner of the intersection of Ridge Road and Renwood Drive, in Parma, built in 1957. Neo-Romanesque.

Exterior: Bethany Lutheran is faced with a dolomitic limestone that is set as random coursed ashlar with split-faced finishes. Some blocks are cut and installed in the same orientation as in the quarry; others are set on edge. The contrasting orientations of the blocks add texture to the facade of the church, especially when seen in raking light. The blocks' color vary from very pale orange to light gray to pale yellowish brown.

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Remarks: The stone used for this church is a dense, dolomitic limestone. This stone is either *Lannon stone* or a stone very similar to *Lannon stone*, which is quarried in the Lannon area, Waukesha County, Wisconsin. *Lannon stone* was used for some of Chicago's classic churches (Lane, 1981, pp. 193, 200) and was often used for churches in the Midwest in the 1950s (Don Mikulic and Joanne Klussendorf, personal communication, 1998). Stylolites are prominent in many blocks. Those in blocks set in the orientation found in the quarry (or upside down) are seen in cross-section. Those in blocks set on edge are seen in top or bottom view, exposing a very irregular surface. Here and there are very stable blobs of pyrite, very dark in color. Only rarely are there any iron stains leaching from these blobs. There are occasional small, crystal-filled vugs in the stone ranging in size from a few millimeters to four centimeters. The stone has a very sugary texture) due to weathering. There is also a small amount of scaling in places. However, the stone is still in good shape. The adjacent school building utilizes similar stone; some blocks in the school structure have horizontal fossil trackways preserved in them.

CHURCH OF THE COVENANT PRESBYTERIAN CHURCH

(originally Euclid Avenue Presbyterian Church), 11205 Euclid Avenue, Cleveland; built 1909-1911. Gothic Revival.

Exterior: This church is built of *Indiana limestone*. The stone has a smooth finish and is set in a coursed to random-coursed pattern. Stone in this building is structural rather than ornamental: there is no steel or brick skeleton (Anonymous, 1954, p. 9). This is unusual, especially for such a large structure.

Interior: Interior walls, piers, and many other features are constructed of *Indiana limestone*. Most of these, with the notable exception of the stone frame of the south doorway, are painted. Steps at the entrance to the chancel are a fossiliferous light yellowish-brown limestone. The chancel floor is covered with tile with borders of *Verde Antique*. There is also a central diamond-shaped inlay of *Red Levanto marble*, a purple, red, green, and white brecciated ophicarbonate rock (a metamorphic rock composed of serpentine and calcite) quarried in Eastern Liguria, Italy. This diamond also has a *Verde Antique* border. A plaque in the floor indicates that a fragment of stone

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from St. Giles Cathedral, Edinburgh, Scotland, lies beneath the altar table.

The stained glass windows on the west side of the church include images of stoneworkers.

Remarks: *Indiana limestone* is a freestone. Since it is composed of the mineral calcite, it is also relatively soft and easy to carve. However, it is also susceptible to acid rain, which in time can dull sculptural details.

References: Anonymous, 1954.

CHURCH OF THE CONVERSION OF ST. PAUL

(formerly St. Paul's Protestant Episcopal Church), Euclid Avenue and East 40th Street, Cleveland; completed in 1875. Victorian Gothic.

Exterior: *Buff Amherst sandstone* (Berea Sandstone), quarried just south of Amherst, Ohio, was used for this church. The stone at the base of the church is laid in courses; stone used for most of the remainder of the exterior is random coursed. Most of the stone has a rock faced finish. There are many finely carved sandstone details associated with columns and other features of this church. In general, the stone used for the exterior has held up very well, but the backsides of some of the columns have preferentially weathered.

Interior: Flooring in the narthex, nave, and aisles is terrazzo. Most of the terrazzo is composed of white and other very light-colored limestone chips imbedded in gray cement. The white limestone chips are fossiliferous. There are also strips and geometric designs made of orange-colored and very dark gray to black terrazzo. The orange terrazzo is composed of chips of red-orange limestone (*Verona marble* or a similar stone) set in a darker red-orange cement. The original main altar and the side altar are fashioned out of a beige limestone rich in fossil foraminiferans and also containing some stylolites. The statue bases on the flanks of the original altar are also made of this stone. Statues of angels on these two bases are carved from a fine-grained, uniformly white marble. (Other angels are plaster.) The platform beneath the side altar is composed of a different gray limestone. The new altar and the pulpit are marbleized wood (faux stone), painted to match the original altar.

Remarks: A number of other churches in the Cleveland area were built using *Buff Amherst* stone,

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especially churches built around the turn of the century. Many of those existing in 1900 are listed in the 1900 catalog of the Cleveland Stone Company.

References: Payne, 1876, p. 140-142.

CHURCH OF THE SAVIOR UNITED METHODIST CHURCH

2537 Lee Road, Cleveland Heights; dedicated 1928. Gothic.

Exterior: The facing of this church is granite quarried at Weymouth (between Boston and Plymouth), Massachusetts. This stone is basically light gray and yellow-brown, but is somewhat darker and bluer towards the base. The colors of the blocks were originally chosen so that the effect would be an upward lightening in color. This particular granite contains quartz and plagioclase and orthoclase feldspar, as well as black, iron, and magnesium-rich minerals. This mineralogical composition indicates that it is a true geological granite. This particular granite is known for its color variations. This stone is seam faced, that is, the blocks were cut from planar sheets of stone that were split apart, rather than cut. This results in blocks with relatively smooth, but somewhat irregular surfaces. Thus, the stones have a more "natural" look than do stones with cut surfaces. The stone is set in a random ashlar pattern. Stone used for the base of the church, the upper portion of the bell tower, around the entranceway and windows, and other trim is *Indiana limestone* of two types: "*Old Gothic*," a coarser-grained variety, and "selected," a finer-grained variety. *Old Gothic* contains a variety of features and textures and is used to give new buildings an aged look. The limestone used for the base of the church is set in courses, in contrast to the random ashlar pattern of the granite blocks above. Sinuous, elongate trackways (trace fossils) are visible in the limestone steps of the entrances. The cornerstone is *Indiana limestone*, with an inset piece of very light-colored *Jerusalem limestone* (stone from the Bi`na Formation) from the subterranean quarries known as King Solomon's quarries, located in Jerusalem. The roof is covered with slate quarried in western Vermont. The slate includes the following commercial color varieties: unfading mottled green and purple, clear purple, unfading green, mottled gray black, weathering green, and rustics. The unfading varieties tend to remain

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the same color over time; the weathering types change color in time due to natural weathering. There is also sandstone flagstone, either Berea Sandstone or *Euclid bluestone*, around portions of the church grounds.

Interior: Pillars, arches, and window frames are *Indiana limestone*. The baptismal font is *Carrara marble*, a famous white marble quarried in the Carrara area of Italy. This particular variety has light gray veining. The window-like stone mural of a cross in the tower vestibule (1928) is fashioned from stone from around the world. The upright part of the cross is composed of (from bottom to top): red *Numidian marble*, quarried in northern Africa; *Brazilian onyx*; and *Languedoc marble*, a mottled red-and-cream colored marble quarried in south central France. The arms of the cross are *Killarney Red*, a red and white marble from Ireland. To the side of the cross, from top to bottom, are a white marble with gray streaks from the United States; triangular pieces next to the arms of the cross are yellow *Siena marble* from Italy; and next to the arms and above is *Skyros marble*, a white marble with brown veining from Greece. Below these are *Paonazzeta* (or, possibly *Pavonazzeto*) *marble*, a white and gray marble from India; *Hejahn marble*, a dark gray marble from Turkey; *Famosa marble*, a mottled red and gray marble quarried in the Wetzlar area of western Germany; and *Verde Antique* from Switzerland. And at the center of the bottom is *Monte Aurata*, a dark gray, red, and white marble from Uruguay.

Remarks: The stone buildings of ancient Jerusalem were fashioned from stone from the Bi'na Formation, the source of the cornerstone of this church. Church records show the close involvement of Masons (members of the American Masonic Brotherhood) with this church. Masons have long been interested in King Solomon's Quarry, and are known for bringing portions of the stone quarried there to the United States. (See, for instance, Anonymous, 1902).

References: Kilmer, circa 1978; articles in *The Chimes* (the church bulletin) in the 1920s.

EAST MOUNT ZION BAPTIST CHURCH

(formerly Euclid Avenue Christian Church), East 99th Street and Euclid Avenue, Cleveland; constructed 1905-1908; dedicated 1908. Romanesque.

Exterior: Most of the exterior of the church is green serpentinite quarried in the West Chester

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area, Chester County, southeastern Pennsylvania. The large rock-faced blocks are set as random ashlar. Serpentinite is a type of rock rich in serpentine minerals; the chief green mineral in this particular serpentinite is probably antigorite, a brownish-green serpentine mineral. Most trim is Berea Sandstone from Northeastern Ohio, but *Indiana limestone* is also used around some windows. Since its installation, the Berea Sandstone, once the lighter-colored of the two rocks, has become the darker due to natural weathering and pollutants. However, it has held up extremely well. In contrast, the serpentinite has not stood up to weathering as well; portions of the exterior of the green blocks have sloughed off. This weathering is mitigated some, however, by the thickness of the stone blocks. The serpentinite has also changed color somewhat. Older weathered surfaces tend to have a yellower cast than recently exposed surfaces.

Interior: The pillars and material used around the baptism pool are faux marble, more or less imitation *Siena marble*.

Remarks: Use of serpentinite is highly unusual in the Cleveland area. This serpentinite has been widely used closer to its origin in Pennsylvania (see Stone 1932, p. 105-107). There is also a serpentinite church in Columbus, the Broad Street Methodist Church (1885). The best known serpentinite church in the United States, however, may be the Pullman "Greenstone" United Methodist Church in Chicago (1892; see Lane, 1981, p. 44).

Many of the churches made of serpentinite are Romanesque in style. The revival of the Romanesque style in the late nineteenth and early twentieth centuries was often accompanied by a taste for polychromy and thus serpentinite. The limited use of serpentinite is probably related to changing tastes in architectural fashions as well as the relative instability of the stone over time.

Most of the serpentinite churches have similar deterioration problems. (See Melvin and McKenzie, 1992, for a discussion of the problems of serpentinite deterioration of the Broad Street Church). The weathered serpentinite used for the exterior of East Mount Zion Baptist Church strongly contrasts with the serpentinite (*Verde Antique*) used for interior ornamentation in other churches (see, for example, St. James Church). When polished and kept from the elements, serpentinite holds a deep green sheen.

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EPWORTH-EUCLID UNITED METHODIST CHURCH

1919 E. 107th Street; constructed 1926-1928, completed in 1928. Neogothic.

Exterior: This large church is faced mostly with *Plymouth granite*, quarried in New England. This stone is composed primarily of white feldspar and quartz. It is from the Grenville Series, a grouping of very ancient rocks (Buddington, 1934, p. 218). Some of the stone is light gray in color; other, mostly weathered, stone is orange and darker gray. Some blocks have fair amounts of the golden-colored mineral pyrite and it is the weathering of this pyrite that has caused some of the orange coloration. From a distance, this stone looks very similar to that of the Church of the Savior, but differs some in mineral composition. The stone is random coursed. Some trim, primarily that used to cap low walls and railings, is *Indiana limestone*; other trim and statues are made of what is euphemistically called "art stone." This is a misleading term for a type of cast concrete. A newer addition for the church office is partly faced with *Tennessee Crab Orchard stone*, a sandstone that is similar in coloration to the original stone used for the church. There is some sandstone flagstone, *Euclid bluestone* or Berea Sandstone, around the church.

Interior: Narthex flooring is red tile, green slate, and gray and pink *Tennessee marble*. Tennessee "marble" is limestone quarried in eastern Tennessee from the Holston Formation. Prominent stylolites are seen in this stone. Green slate is also used for the aisle flooring trim. The steps and platform of the chancel are gray *Tennessee marble*, with inlays of green slate and a small amount of black stone. The baptismal font is white true marble.

References: Anonymous [no date].

EPWORTH MEMORIAL METHODIST EPISCOPAL CHURCH

Prospect and Wilson (now East 55th Street), Cleveland; constructed 1891-93, now demolished. Romanesque.

Exterior: "Marble" from Gouverneur, northwestern New York, from the Grenville Series (Buddington, 1934, p. 218) was used for this church. The bluish-gray stone was a coarsely

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crystalline, and at least partly metamorphosed, limestone known commercially as a marble. Rock-faced blocks were used for the church. Green slate was used for the roof while red slate covered the large octagonal dome.

Interior: Red interior columns were said to resemble Scotch granite.

Remarks: The architect described the stone used for this church as having "a very fine crystalline effect."

References: Badgley, 1899.

FAITH UNITED PRESBYTERIAN CHURCH (UNITED PRESBYTERIAN CHURCH)

12601 Detroit Avenue, Lakewood; completed 1905. Romanesque.

Exterior: Very light gray, Paleozoic age limestone said to be quarried in Pennsylvania was used for this church. The slightly irregular, rock-faced blocks are partly set in courses and partly random coursed. The limestone contains abundant fossils of brachiopods, horn corals, and other animals. The most diagnostic is the brachiopod *Echinocoelia*, which indicates that the stone is Middle Devonian in age [Tom Dutro, U.S. National Museum of Natural History, personal communication, 1991]. Limestone was quarried in several Pennsylvania counties; it is difficult to pinpoint the location of the quarry that supplied this stone. Trim, including railings, is sandstone. Some sandstone has dove-work. There has been some minor deterioration of the limestone and the sandstone. The outermost portions of many of the limestone blocks have weathered away, cracks have developed in many limestone blocks, and parts of the sandstone have exfoliated.

FIFTH CHURCH OF CHRIST SCIENTIST

(no longer used as a house of worship), 11623 Lake Avenue, Cleveland; built circa 1927. Neoclassical.

Exterior: *Birmingham Warmtone Buff sandstone* (Berea Sandstone) quarried in Birmingham, Erie County, Ohio was used for this church. Most of the stone is set in courses. The most interesting

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use of stone is that around the upper portions of the windows. Here blocks of stone have been selected so that natural bedding features of the stone create a radiating pattern. The stone on the drum beneath the dome was poorly mortared and this portion of the church was painted over in a yellowish color in 1991.

Interior: The lobby has walls and pillars faced with *Saint Genevieve Golden Vein marble* (limestone from the Grand Tower Formation), quarried in Missouri, and flooring of pink *Tennessee marble* (limestone from the Holston Formation), quarried in eastern Tennessee. Floor trim, bases of pillars, and balusters are a black limestone with white streaks (veins and stylolites), possibly from Europe. The front (west) hallway has wainscoting of *Saint Genevieve Golden Vein*, with a border of black limestone along its base. The *Saint Genevieve marble* in both the lobby and the front hallway contains large corals, including horn corals several centimeters in diameter and colonial forms that are composed of groups of many smaller cylindrical individuals.

Remarks: This church has been featured in advertising literature (see, for example, Anonymous, 1928). The congregation left this church building in the late 1980s, and the building has subsequently been threatened with demolition (Litt, 1995). Part of the building was damaged in 1998 to facilitate the plugging of an abandoned gas well that was leaking beneath the church (O'Malley, 1998). There has been other damage as well.

References: Anonymous, 1926a; Litt, 1995.

GESU ROMAN CATHOLIC CHURCH

2470 Miramar Boulevard, University Heights; constructed 1955. Romanesque.

Exterior: Two local varieties of *Indiana limestone* (Salem Limestone) are used for the exterior: gray *Indiana limestone* for the trim and *Indiana Oolitic limestone* for the entranceway. These two varieties look very similar, however. The limestone at the entranceway is set in large rectangular blocks. There are also carvings sculpted in limestone on the back of the church, on the towers, and at other places. Pink granite is used for the entrance platforms. This stone contains large (2-3 centimeters long) crystals of feldspar. There also are panels of dark-colored "granite"

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(technically this stone is probably a syenite) above the front doors. This stone is primarily composed of iridescent bluish-gray crystals of feldspar.

Interior: The narthex walls are light beige-colored *Roman travertine*, quarried in Italy. The floor of the narthex is terrazzo, with borders of mottled red limestone, possibly *Tennessee marble*. Most of the terrazzo panels are very light-colored, consisting of chips of *Georgia marble* embedded in a light beige cement. Most chips are white, but some are pink or gray. Golden-colored terrazzo panels are used for borders. These are said to consist of chips of *Giallo Siena marble* (a golden yellow marble with dark veining, quarried in Italy) set in a light beige cement. Some of the golden yellow limestone chips contain oolites (spherical features that appear circular in cross section) and fossils. The red limestone used for wall borders contains fossil sea-lily stem fragments and bryozoans. The statue of the Christ Child in the room for adults with children, just off the narthex, is sculpted from unpolished *Giallo Siena marble*. The flooring of the nave and aisles is like that of the narthex. Shrines of the Jesuit martyrs and the Sacred Heart are made from *Giallo Siena marble*. The statues are unpolished. Borders along the walls of the aisles and wainscoting in the sanctuary is *Giallo Siena*. Flooring of the sanctuary is *Siena marble*: square panels of *Giallo (yellow) Antico Tipo Convent marble*; square borders of *Giallo Siena marble*, with a richer color than *Giallo Antico* and with dark veining; and bands and steps of *Bianco Argento Siena marble*, a white marble with silver-gray and some golden-yellow veining. The pulpit and the baptismal font are *Giallo Siena*. The main altar is *Bianco Argento Siena marble*. The reredos, the panel behind the main altar, is *Giallo Siena marble*. The body of Christ on the cross, located above and just behind the altar, is carved of *Onice del Portogallo marble*, an onyx from Portugal. The onyx is white and off-white in color. Side altar statues of the Blessed Virgin and St. Joseph are *Bianco marble*, a white true marble from Italy. The panels behind these statues are made of *Giallo Siena Unito marble*, a brecciated, slightly lighter marble than *Giallo Siena*.

References: Anonymous, 1960b.

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GREATER FRIENDSHIP BAPTIST CHURCH

(formerly First Evangelical and Reformed Church), 12305 Arlington Avenue, East Cleveland; built in 1926. Romanesque-Gothic.

Exterior: *Briar Hill sandstone* (Massilon sandstone), a Pennsylvanian age rock quarried in northwestern Coshocton County or another nearby county in Northcentral Ohio was used for exterior facing. The headquarters of the Briar Hill Company are in Glenmont, Ohio. The sandstone is predominantly medium-grained and ranges in color from light and golden brown to red. Much of the sandstone is covered with a dark patina. The stone is set in as a random coursed ashlar. Much of the stone is subtly rock faced.

References: Anonymous, 1926b.

KIRTLAND TEMPLE OF REORGANIZED CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS

9020 Chillicothe Road (Route 306), Kirtland; built in 1836. Georgian Gothic.

Exterior: Berea Sandstone, from local quarries located just south of Kirtland, was used for much of this structure. Most of the sandstone is covered by stucco. However, sandstone set in several courses of blocks can be seen at the base of the building. Sandstone can also be seen at some other areas of the exterior, including doorways and around windows. Long sandstone quoins are also exposed. The central area of the exterior of the quoins is marked with a criss-cross pattern. Most of the remainder of the upper portion of the building is made of rubble stone; this material is completely covered by white stucco. The original stucco had outlines of faux stone blocks painted on it, making it appear as if the building was made of coursed stone. This old stucco weathered over the years and was removed in the late 1950s. The new stucco layer does not have painted outlines of blocks. Also, the original stucco had bits of glass and other material imbedded in it, which would have provided a glistening effect somewhat akin to marble.

Remarks: Brick was originally to be used for this building, but the brick to be used was judged to be of poor quality so stone was used instead. According to local tradition, the stone used for

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the church was quarried in what is now Chapin Forest Reservation of the Lake County Metroparks. Remnants of an old quarrying operation can still be seen in the lower portion of the park, along a small stream that runs downstream from Quarry Pond, which is located near the Route 306 end of the park. According to Hitchcock (1965) the site of the Temple may have been chosen because of its proximity to supplies of sandstone. Hitchcock (1965, p. 129) has also provided a discussion of various possible quarry sites.

References: Andrew, 1978; Hatcher, 1949; Hitchcock, 1965; Launius, 1986.

LINDSAY-CROSSMAN CHAPEL

(formerly Emmanuel Church), 56 Seminary Street, on the campus of Baldwin Wallace College, Berea; constructed in 1872. Gothic.

Exterior: Gray-colored Berea Sandstone from the old Berea quarries, located to the south of the present campus (just south of Bridge Street in Berea) were used for this structure. Portions of the stone are reddish-brown; this coloration is, in part, due to weathering, since broken portions of the stone show that outer surfaces tend to be redder than the inner portions of the blocks. The stone is set in courses, and most blocks are rock-faced. Stone used at the base of the church, at the corners, piers, around windows, and for the top of the tower, however, is tooled. The band of stone running below the windows has dove-work dressing. Some stone has been exfoliated. This is particularly evident in tooled blocks. Some stone blocks, including certain tooled blocks on the corners of the back of the church, and especially on the upper portions of the front of the church, exhibit honeycomb weathering, a form of weathering characterized by a grouping of pits.

Remarks: The formal geological name of this stone is in honor of the once world-famous quarries of Berea. This building was one of the original buildings on the German-Wallace College (which merged with Baldwin College to become Baldwin-Wallace College in 1913) campus. Funds from the Berea Quarries, which were closed in the 1940s, were used to construct and support the college. The sandstone exterior of this church was chemically cleaned using muriatic acid and some stone patches were added in the winter of 1990-91 during renovation.

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OLD STONE CHURCH (FIRST PRESBYTERIAN CHURCH)

Public Square, Cleveland; built in 1853. Romanesque.

Exterior: Berea Sandstone was used for this church. The sandstone is said to have been quarried by the Black River Stone Company in Carlisle Township, just south of Elyria, Ohio (Williams, 1879). The stone is also said to have been quarried at other locales, but this early reference is most likely correct. This stone has proved to be extremely durable, having withstood two major fires in the 1800s. The name "Old Stone Church" was originally used for the first stone church at this site, but the "new" 1853 church was also called the "Old Stone Church." The Old Stone Church was cleaned for the first time in 1996-97 using a complex, relatively benevolent, and extremely costly cleaning technique involving acid, water, and other materials (Piscitello, 1998). See Hannibal and Schmidt (1992, p. 8) for a pre-cleaning discussion of the reason for the black patina that formerly covered the church. The former patina may have helped to preserve the stonework, which was in very good shape for such an old structure. A stainless steel spire was installed on top of the church in 1999.

References: Hannibal and Schmidt, 1992; Piscitello, 1998; Tuve, 1994.

PILGRIM CONGREGATIONAL CHURCH

2592 West 14th Street, Cleveland; built 1893-1894. Richardsonian Romanesque.

Exterior: Most of the church is composed of a medium-grained brownish-red quartz sandstone. The architect (Badgley, 1899, p. 9) referred to this material simply as "brown stone." It is one of the types of stone traditionally referred to as brownstone, and may have been quarried in Michigan. The use of brownstone was very prevalent in Richardsonian Romanesque structures. This brownstone contains occasional concretions. This stone is covered with a dark coating, probably the result of pollutants. The front porch and the stairways leading from them to the main part of the church, as well as the stone at the base of the doorway and former doorway on the north side, are probably made of *Portage Entry Red sandstone* (Jacobsville Sandstone), quarried in the Upper Peninsula of Michigan. (The front stairs were covered with a concrete-like material

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in the 1990s.) This orange-red stone is finer-grained than the other sandstone and contains gray reduction spots. The stone blocks are rock-faced and set in courses, for the most part in alternating thicker and thinner layers. The main type of red sandstone has generally held up well, but there has been some deterioration of stone at the main entranceway and some blocks have split. Some blocks here exhibit honeycomb weathering. The *Portage Entry Red sandstone* has not held up as well. Some sandstone walkways, made of *Euclid bluestone* or Berea Sandstone, remain in front of the church.

Interior: The 1894 baptismal font is light colored onyx marble.

References: Badgley, 1899.

ST. ANN ROMAN CATHOLIC CHURCH

2175 Coventry, Cleveland Heights; built 1945-1952, dedicated 1952. Neoclassical, with some Romanesque elements.

Exterior: Most of the church is faced with *Indiana limestone* (Salem Limestone). Most of this stone is smooth faced and is set in courses. The front courses are of even width; those on the sides alternate from thin to thick. The six large columns at the main entranceway, as well as steps at the front and sides of the church, are also *Indiana limestone*. Some sandstone flagstone (probably Berea Sandstone) still remains at the base of the front stairs.

Interior: Narthex flooring is pink *Tennessee marble* (limestone from the Holston Formation) with strips of *Red Levanto*; walls are a beige limestone. Cross sections of large (up to 2 cm wide) brachiopods are preserved in this beige stone. The brachiopods have dark-colored, more or less heart-shaped outlines when seen in cross section in the stone. Other fossils, including foraminiferans, are also present in large numbers. The small room to the north of the narthex is faced with a breccia composed of extremely large angular clasts in a reddish to brownish-grey matrix. The base of the statue of Mary is a similar breccia.

The ten large fluted Ionic columns that divide the nave and aisles are fashioned from light beige limestone. They were acquired in 1925 from the First National Bank, once located at 241 Euclid Avenue, in downtown Cleveland. The columns contain some fossils. There are also

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pilasters of matching imitation marble (in reality wood). The holy water fonts are fashioned from a white marble with gray veining. These were formerly drinking fountains from the First National Bank. Wainscoting in the aisles is a light beige-colored limestone. The original main altar and the wainscoting of the apse is a gray mottled limestone. Borders in the apse are yellow *Siena marble*. The sanctuary steps and the altar are fashioned from marble recycled from the old Central National Bank in downtown Cleveland, once located at Euclid Avenue and East 4th Street. White true marble used for the entrance to the side chapel and some other areas is from the old Ritz-Carlton Hotel in New York City. A beige limestone and *Tennessee marble* are used inside the side chapel.

Remarks: The efforts of the Rev. John Powers (1876-1966) to build this church are legendary. He obtained material for the church from secular structures that were being demolished and saved them until this large church could be built. Use of columns and other stone from previous structures for church structures is an ancient tradition. Many early and medieval Christian churches used columns recycled from pagan temples and other structures (Norman, 1990, p. 32). Even the great columns of the Cathedral of Monreale in Sicily were recycled.

References: Bellamy, 1990

BERNARD CHURCH

44 University Avenue, Akron; completed 1905. Romanesque.

Exterior: This church is faced with Berea Sandstone from Peninsula, Ohio. The stone is set in courses. Dark reddish brown concretionary bodies seen just to the bottom right of the cornerstone resemble those that can be seen today in Peninsula's Deep Lock Quarry. Six granodiorite columns at the entrance have intricately carved Berea Sandstone capitals.

Interior: Flooring and the wall border along the floor of the narthex includes *Verde Antique marble*. The altar is *Italian marble*.

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Remarks: The contract for the 125 train-car loads of stone used for this church was with Frank Lukesh of the Peninsula quarries (Anonymous, 1997a). According to McGovern (1996), the St. Bernard location was the site of a quarry that supplied stone for Akron's St. Vincent Church.

References: Anonymous, 1997a.

ST. COLMAN ROMAN CATHOLIC CHURCH

West 65th Street and Colgate Avenue, Cleveland; erected 1914-1918, dedicated 1918. Neoclassical.

Exterior: Thick blocks of *Indiana limestone* (Salem Limestone), dressed in dove-work and set in uniform courses, were used for the exterior of St. Colman Church. The sculptures of the lion, winged ox, angel, eagle, and lamb on the front (west) side of the church are also *Indiana limestone*. Many fossils are visible in this stone. The front steps are gray granite; side steps are *Indiana limestone*.

Interior: Flooring and the wall border along the floor of the narthex includes *Verde Antique marble*, a mottled red marble, and a light gray marble with dark gray streaks. A mottled gray, light purple, and white marble is used for narthex wainscoting and door frames. The wainscoting is a fine-grained, white *Vermont marble* (Martin, 1928, p. 67) with greenish gray streaks (veins). *Verde Antique* is used around the floor and heating vents. The floor of the aisles is the same as in the narthex. The flooring of the nave is terrazzo. Stations of the cross are framed in a red-and-white alabaster. The baptismal font is white true marble with supporting columns made of red and green marbles. The green stone is *Connemara marble*, an opicalcite, a metamorphic rock composed of calcite and serpentine minerals, the latter of which give it a green color. There is also a rectangle of *Verona marble* embedded in the floor in front. The pulpit is white marble, with pillars of green onyx mottled with white and gold. Steps to the communion railing are *Verde Antique*. The communion railing is a white true marble and has several supporting pillars of onyx marble, varying in color from white to gold to light green. Sanctuary flooring is a marble mosaic. The marble is of several types, including red *Verona marble*, *Siena marble*, a white marble, and a green marble. The original main altar is white *Carrara marble* (Martin, 1928, p. 69) with inset

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rectangles and figures of *Siena marble*, a mottled red marble, an orange-colored marble, and onyx marble. The side altars are white marble with insets of golden and yellow-colored marble and onyx. The statues of St. Helen and St. Ann to the sides of the altar are made of white marble carved by a statuary company in Pietrasanta, Italy.

Remarks: According to a booklet (Anonymous, 1980) published on the occasion of the centennial celebration of the parish, the original main altar, communion railing, pulpit, and stations of the cross were fabricated in Dublin, Ireland. This was of special significance for the Irish parishioners.

References: Martin, 1928; Anonymous, 1980.

ST. COLUMBA CATHEDRAL

154 West Wood Street, Youngstown; present building completed 1958. Neo-Romanesque.

Exterior: St. Columba Cathedral utilizes *Mankato Stone* (Oneota Dolostone) set as ashlar. This stone is a cream-colored grayish orange dolostone quarried in the Mankato-Kasota area of southern Minnesota. The 132-foot high campanile and the 11-foot tall statue of St. Columba, an Irish saint, are carved of the same stone. This stone has weathered since installation, with parts (often fossil burrows) weathering more than the surrounding matrix. Much of the stone ashlar slabs used for the cathedral have been cut so that what was once horizontal in the quarry is now vertical. This stone is distinctly mottled. Much of this mottling represents trace fossils, which they have become more evident over time because of weathering of the stone, resulting in differential darkening and etching. The stone used for the statue of St. Columba is set in the same horizontal orientation as in the quarry. Horizontal stratification is visible, and the circular cross sections of the cylindrical trace fossils can be seen in the statue.

Interior: *Egyptian Vein marble* and terrazzo are used in the interior of the cathedral. The baptismal font is made of *Nabresina Romano Italian marble* and the altar is made of travertine.

Remarks: The golden color of the weathered *Mankato Stone* on the front of the Cathedral in the afternoon sun is stunning, especially under a blue sky. The weathered Mankato stone also gives this rather modern church a distinguished, aged look.

References: Anonymous [no date].

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ST. ELIZABETH ROMAN CATHOLIC CHURCH

9016 Buckeye Road, Cleveland; constructed 1917-1922. Italian Renaissance.

Exterior: *Indiana limestone* (Salem Limestone), set in smooth-faced ashlar. Parishioners were given a choice of brick or terra cotta for this church, but chose stone.

Interior: The narthex contains several statues and plaques. The base of the statue of Jesus in Mary's arms is faux art marble (imitation stone). The head of Jesus is white marble. The pedestal supporting it has a base of *Black and Gold marble*, a limestone quarried near La Spezia, Italy; a top portion of *Verde Antique*; and a post of dark marble. The four large gray cylindrical pillars in the church proper are *Indiana limestone*. The top of the communion railing is a fine grained white marble with gray streaks. Pilasters in the sanctuary are *Indiana limestone*. Steps leading to the altar are white marble with gray streaks. Most of the original main altar and the two side altars are imitation marble, or "art marble." The wainscoting and altar are Italian marble.

Remarks: The use of painted, faux marble for church interiors is an old tradition. Many Baroque churches in Italy and Hungary, for instance, have such faux marble. Indeed, faux marble columns are one of the hallmarks of Baroque churches (Norman, 1990, p. 211).

ST. FRANCIS ROMAN CATHOLIC CHURCH

Superior Avenue and East 71st Street, Cleveland; built 1901-1903; dedicated 1904; and destroyed by fire in 1970. Gothic.

Exterior: Berea Sandstone (*Buff Amherst stone*), originally quarried in the Amherst area, was used for this church. The stone was set in stone-faced courses. This stone was recycled, however, from the 1901 demolition of the old post office on Superior Avenue and Public Square. This stone was hauled by the parishioners to the site of the church by horse-drawn wagon (Callahan, n.d., p. 6). Because of the origin of the stone, the church was said to have been called "the post office church" (Krumhansl, [circa 1987], p. 2).

References: Callahan, no date; Krumhansl, c. 1987.

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ST. IGNATIUS OF ANTIOCH ROMAN CATHOLIC CHURCH

10205 Lorain Avenue, Cleveland; constructed 1925-1930. Romanesque.

Exterior: Pillars at the main entrance are polished light bluish-gray granite. Some crystals of feldspar in the columns are iridescent blue. The front and side steps are also bluish-gray granite, but with a rougher finish. The stone is *Lake Placid blue granite*, quarried in Jay, New York. Exterior facing is *Bedford limestone* (Salem Limestone) set in ashlar courses. Sinuous trace fossils can be seen at various places in this limestone. Large geometric inset panels on the exterior of the church, above the level of the windows, are made from various types of marble, including *Siena marble* and *Verde Antique*.

Interior: The narthex has flooring of purple slate and several marbles, including a cream-colored, fossiliferous limestone and *Red Levanto marble*. The old baptistery has a doorway of *Red Levanto* and wainscoting of *Red Verona* with inlaid designs of *Red Levanto*. The flooring of the aisles is a cream-colored fossiliferous limestone, but also features a light red variety of *Verona marble* (a limestone quarried from Jurassic age lower red ammonitic rocks in the Verona area of Italy), wainscoting of light *Red Verona marble*, inlaid blocks of *Black and Gold (Portoro) marble*, and inlaid borders of *Red Levanto*. The baptismal font is *Yellow Verona marble*, a burrowed yellow limestone. This stone consists of lighter-colored nodules in a darker matrix. Large fossil ammonites can be found in portions of the wainscoting. The large pillars are breccia, and include one stone with white clasts and gray streaks that may be *Pavanatzo marble*, as well as *Red Levanto marble*. Others may be *Biolet Breccia* and *Jialo Mori marble*. The holy water fonts are *Yellow* and *Red Verona marble*. The sanctuary floor is a cream-colored limestone. The original main altar, side altars, and communion rails are *Yellow Siena marble*. The baptismal font is *Red Verona marble*. Aisles are mostly a cream-colored limestone with inlaid rectangular blocks of *Red Verona* and borders of *Red Levanto*.

Remarks: There were problems with the stone and poor patching is visible on several pillars. There is a possibility that some of these pillars are antique (see St. James Roman Catholic Church).

References: Anonymous, 1953.

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ST. JAMES ROMAN CATHOLIC CHURCH

17514 Detroit Avenue, Lakewood; constructed 1929-circa 1936. Romanesque.

Exterior: The exterior walls of St. James are *Indiana limestone*. The limestone is coursed, and the courses vary in thickness. Most of the stone is smooth faced; some thinner courses found on parts of the building have vertical dove work. The steps on the south (Detroit Avenue) side are of pink and gray granite, probably one of the Cold Spring Granite Company granites from Minnesota. The large columns are *Rainbow Granite* (Morton Gneiss), a banded, variegated (pink, light greenish gray, and black) stone quarried in the area of Morton, Minnesota. Technically this stone is a migmatite. The ramp is faced with pink *Tennessee marble* (limestone from the Holston Formation) capped with Berea Sandstone. There are abundant fossils of bryozoans in the *Tennessee marble*.

Interior: This church contains a variety of fine stone that is unparalleled in the Cleveland area. Narthex flooring is a very pale orange travertine with inlaid rectangular borders of *Red Levanto*, a dark red, cream, and green-colored marble. These color combinations are repeated manytimes in other areas of the building. *Verde Antique* is used at the base of the walls. The Poor Souls Shrine in the southeast corner of the church, near the entrance, has an altar of *Botticino marble* (a cream-colored limestone containing abundant coated grains that appear bloblike in cross section) and walls of *Siena marble* (a cream and gold-colored limestone quarried near Siena in Tuscany, Italy). The statue of Mary is *Carrara marble*, a true marble most famous for its use in statuary, quarried in the Carrara area of Italy. The walls of the old baptistery, the room now on the southwest side of the building, are *Tavernelle Pink* marble, a pinkish limestone, rich in foraminiferans, from Italy. The base of the walls are *Yellow Siena* and the grill is a beige limestone.

The great monolithic columns between the nave and aisles are of three types of stone: eight are *Porta Santa (Holygate) marble*, a calcareous breccia composed of light gray and pale red clasts in a gray matrix with infilled areas of white calcite; six are light *Verona Red marble*, a mottled reddish orange to light reddish brown limestone; and four are *Red Levanto*. Fossil ammonites can be found in one of the *Verona Red* pillars near the east side of the church. Bases of the pillars are *Verde Antique*, probably *Verde Tinos*, or possibly *Verde Alps*. The

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intricately carved capital tops of the columns are said to be *Rosato* (rose colored) *marble*. Holy water fonts are a yellow variety of *Verona marble*. The church has aisles floored with *Roman travertine*, quarried in Italy, probably in Bagni di Tivoli, with strips and diamonds of *Red Levanto* and *Verde Antique*. Wainscoting is *Red Verona marble* (an orange limestone), with strips of *Red Levanto* and a base of *Verde Antique*. The transept floor is *Botticino marble* with squares of *Rose Tavernelle* and *Verona marble*. The baptismal font is a beige limestone with abundant fossil fusulinids known as *Pearl Tavernelle*, or *Chiampo Perlato marble*, probably from the Vincenza area of Italy. Sanctuary walls have very high wainscoting panels of dark red *Numidian marble*, a brecciated limestone quarried in Tunisia in northern Africa. The flooring of the sanctuary is *Botticino marble* with *Red Verona* strips.

The frieze above the wainscoting in and near the apse includes spear-shaped pieces of yellow *Siena marble*. *Belgian Black marble*, a black limestone, is used for the base of the large structural pillars here. The pulpit is composed of cream-colored *Botticino marble* and has an eagle of *Red Verona marble*. The top of the communion rail is yellow marble. The chancel and chapel walls have vertical bands of *Black and Gold marble*. Statues are of white *Carrara marble*. The two side altars are a pink limestone known as *Rose Tavernelle marble*. The front of the side altars are faced with matched slabs of *Algerian onyx* from Africa. The onyx slabs are diamond matched, that is four slabs cut from a single block of stone are placed so as to create a design that is diamond shaped. There is a central, intricately carved Greek cross of *Rose Tavernelle* in the front of the side altars, and a *Rose Tavernelle* diamond in the *Botticino* floor with inlaid rectangles and strips of *Red Verona marble*. Statues of St. Joseph and Mary above the side altars are made of three types of marbles. *Giallo Tori* and *Yellow Tori* are also used in the church. The altar platform is *Botticino marble* with *Verona marble* strips. The original main altar is made of *Yellow Verona marble* with inlaid patterns of *Black and Gold marble* and *Levanto Marble*

Remarks: The use of stone in the interior of St. James is, in general, and even in some specifics, like that of the 12th century Monreale Cathedral in Sicily (see illustrations in Kronig, 1965, and McLean, 1997, p. 112). However, the exact types of stone used differ, as do the color and textures of the stones. The sanctuary walls of the Monreale Cathedral have high wainscoting of a light stone with long streaks, for instance, in contrast to the high wainscoting of dark red *Numidian marble* in St. James.

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Of all the magnificent stones used for this church, the *Porta Santa marble* is the most fascinating. The name *Porta Santa* is derived from the use of this type of marble for the *Porta Santa* (holy gate), a special doorway on the far right of the entrance side of St. Peter's Basilica in Rome. The outer doorframe of the *Porta Santa* is made of this stone. The door is only open in Holy Years. *Porta Santa marble* is also used in the Lateran in Rome and the Basilica of St. Mark in Venice. *Porta Santa* was quarried in antiquity on Chios in Greece; much of this stone was imported to Rome in the days of the Republic. The Vatican doorways are a reuse of ancient stone, as the stone has not been quarried much since ancient Roman days, and may not have been quarried at the time the columns for St. James were ordered. Thus it is possible that the *Porta Santa* pillars used here are reused antique pillars manufactured in the days of the ancient Romans and, much later, purchased on the antiquities market in Italy for use in this church. The dirty and slightly ragged condition (letter by H. C. McKee, 1934, on file in the archives of the Catholic Diocese of Cleveland) of the *Porta Santa*, and other pillars of the church when they were first received in Cleveland are additional indications that these may be antique columns. McKee noted that one of the *Porta Santa* columns was crudely patched – a condition that is not indicative of freshly carved stone. Interestingly, the Cathedral of Monreale in Sicily includes re-used antique columns.

The use of stone for this building is much like that in St. Ignatius Church, which was designed by the same architect. There were problems with the quality of the marble work for the interior of this church, particularly with the carving of the altar, but these are not readily apparent to the visitor.

Reference: Anonymous, [1954?]; Anonymous, 1986, Weber, 1935(?).

ST. JOHN'S HISTORIC EPISCOPAL CHURCH

2600 Church Avenue, Cleveland; cornerstone laid in 1836, completed in 1838, transepts added 1866. Gothic Revival.

Exterior: This church is notable for being the oldest remaining stone church in Cleveland. It is also an early example of the use of stone for Gothic Revival Architecture. The source of the stone used for the building is also somewhat enigmatic. Most of the stone blocks used for this important historic structure are probably Berea Sandstone, but various accounts of the origin of the stone

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differ. Some of the stone may be field stone, but most appears to have been quarried. The masonry work is rather eclectic. Most stone blocks are rectangular to subrectangular, but some are irregular polygons. Blocks have a roughly tooled facing and are set in various ways: some are coursed, some are irregularly coursed, and some are random. Some of the courses are undulating. Such a treatment is sometimes described as “uncoursed.” A November 24, 1837 report in the *Ohio City Argus* (cited in Rusk, 1966) notes that the church was constructed of “unhewn rubble stone” and Gaede (1982, p. 9) has described the sandstone blocks as having “rubble shapes and split faces.” Rusk (1966, p. 57) described the stonework as “random ashlar in courses of irregular widths.” The top of the frames of some windows at street level are composed of two slabs of ripple-marked sandstone. Gaede (1982, p. 9) has pointed out the rather thick layers of mortar used between the stone blocks. The sandstone walls of this church have proven to be quite durable, surviving the 1866 fire that destroyed the interior of the church. The church's transepts were added after this fire. Portions of the stone walls had be reconstructed, however, following damage by a tornado in 1953. The sandstone blocks have darkened over the years (see *Old Stone Church (First Presbyterian Church)* for more on this topic). Sandstone sidewalks around the south and west sides of the church were removed and replaced by concrete in the late 1980s as part of a controversial city program of sidewalk replacement.

Remarks: Some sources (e.g., Gaede, 1982, p. 6) claim that the stone for this church was quarried nearby, in the Cuyahoga River. Aside from rocks found as river boulders, there would have been no nearby bedrock source to quarry along the Cuyahoga, however. There are no natural sandstone outcrops (bedrock) within a few miles of the church. As Armstrong et al. (1992, p. 100) have pointed out, this is a very early use of the Gothic Revival style in America. The rather irregular coursing of the stonework is like that of a number of Gothic Revival churches in the east, for instance the 1845-46 Chapel of the Holy Innocents in Burlington, Vermont (see Stanton, 1968, p. 52), but such irregular stonework was also used for some even earlier, nineteenth-century churches in the east. The roughly tooled and uncoursed stone is in contrast to the more refined stonework (at least as it is shown in old illustrations) of the first Old Stone Church (1831-32) in downtown Cleveland. Old engravings show the Old Stone Church as having regular courses. The rather rough style of stonework for St. Johns could be due to the utilization

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of various shapes of field stone, but may simply be a reflection of the style. By the time this church was constructed, stone could be transported to Cleveland down the Ohio & Erie Canal (the Cleveland to Akron segment was open in 1827) from points to the south.

References: Gaede, 1982; Leithold, 1973; Rusk, 1966; parish records in the Western Reserve Historical Society.

ST. JOHN'S ROMAN CATHOLIC CATHEDRAL (CATHEDRAL OF ST. JOHN THE EVANGELIST)

East 9th Street and Superior Avenue, Cleveland; rebuilt in the 1940s. Gothic.

Exterior: Light brown *Tennessee Crab Orchard stone* (Crossville Sandstone), quarried near Crab Orchard, Tennessee, is used for most of the exterior. This stone was added during the 1940s rebuilding of the cathedral. The blocks are random coursed ashlar. Red and orange swirls seen on this stone are due to iron staining. The sheen seen on sunny days is due to the presence of a large quantity of mica crystals in this stone. Trim is *Indiana limestone* (Salem Limestone). Stairs on the East Ninth Street side are gray granite. The roof is vari-colored slate from Bangor, Maine.

Interior: Many varieties of stone are used inside the cathedral. The narthex has wainscoting of beige and pink travertine. In the rear of the church proper, the wainscoting is *Breccia Pernice marble*, a mottled pink and beige brecciated limestone with white veining quarried in the Venice area of Italy. Candle holders and bases for the statues at the shrines of St. Ann and St. Joseph in the transepts are *Red Verona marble* (a nodular limestone). Their bases are a beige limestone. The shrine of the Christ Child in the south transept has a candle holder of a light gray limestone and a base of gold and brown brecciated limestone. Wainscoting around it is a beige limestone, possibly *Botticino marble*. The stone behind the statue at the shrine of Saint Theresa, in the northwest part of the church, is a fossiliferous pink and white limestone. The shrine of the Sacred Heart in the north transept has a base and wainscoting of beige travertine. The panel behind the statue is pink and white fossiliferous limestone, with fossils of rudists (extinct, tubular clams). The stone may be *Botticino marble*. Side panels are *Red Verona marble*. The new (1991) baptismal area includes a baptismal font with a bowl of *Rosa do Monte A marble*, an orangish pink marble

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quarried in Portugal. The bowl is held up by a stand consisting of a base of *Rosso Magnaboschi Fiorito marble*, columns of *Rosa do Monte A*, and a cap of *Rosso Magnaboschi Fiorito*. There is also a *Verde Antique* base around the baptismal area. The former communion rail was also fashioned from *Botticino marble*. The sanctuary steps are *Verde Antique* and a white true marble with gray veining. The sanctuary floor is a white true marble with gray veining. The cathedra (pontifical throne) is *Botticino marble* and the adjacent (spur) wall is *Loredo Chiaro marble*, a light brown breccia with purplish, cream, and green mottling. The main altar is *Botticino marble*. Beneath the altar is a "block" of breccia.

Remarks: *Tennessee Crab Orchard stone* is often referred to as a quartzite, but it is a true sandstone. The grains of this sandstone are very well cemented, making it highly durable.

References: Anonymous, 1948.

ST. JOSAPHAT UKRAINIAN CATHOLIC CATHEDRAL

5720 State Road, Parma; construction began in 1981; exterior completed in 1983. Byzantine.

Exterior: St. Josaphat Ukrainian Catholic Cathedral is mostly brick, but *Mankato-Kasota stone* (Oneota Dolostone), a cream-colored (grayish orange) dolostone quarried in the Mankato-Kasota area of southern Minnesota, is used along the base of the church, for the west doorway, window frames, and other trim. This stone contains many easily seen circular to curved, subcylindrical features, most ranging from a few millimeters to two centimeters in width. These features are fossil trackways: they have become more evident over time because of weathering of the stone, resulting in differential darkening and etching. The plaza at the west entrance to the church is probably made of *Oconee granite*, a pinkish gray granite with large crystals of feldspar, lots of black hornblende, and gray quartz, quarried in Georgia. This stone has a thermal finish, providing a roughened surface.

Interior: The baseboards in the nave and narthex are black Pennsylvania clear slate with a natural cleft finish. Flooring in the nave is a terrazzo composed of pink to dark purple stone fragments imbedded in beige and darker greenish gray cements. Panels at the base of the large structural supports, between the iconostasis and the side altars, and flanking the doors adjacent

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to the side altars, are *Rojo Alicante marble*, a moderate reddish brown limestone with white veining. *Rojo Alicante* is quarried in Alicante, Spain. It contains numerous cephalopods, including belemnites and ammonites. The cream-colored stonework of the iconostasis, including several pillars, is *Botticino marble*. The tetrapod, the main altar, side altars, and cut out designs in the church are also *Botticino*. Flooring of the bema is a beige (very pale orange) limestone, probably *Perlato Sicilia* (Cream Perla), quarried in Sicily. The steps in front of the iconostasis are a brown breccia, probably *Paradiso Brown* or a similar stone.

Remarks: See St. Columba Cathedral for another, more spectacular, use of *Mankato stone*.

ST. MALACHI'S ROMAN CATHOLIC CHURCH

2459 Washington Avenue at West 25th Street, Cleveland; built in 1945 (original church completed in 1868, restored in the early 1940s, and destroyed by fire in 1943.) Gothic.

Exterior: *Tennessee Crab Orchard stone* (Crossville Sandstone) set as random ashlar was used for the 1945 St. Malachi's Church. The trim is *Indiana limestone*. According to specifications for the building, the roofing is purple, sea green, black, gold, and unfading green slate. Now that the slate has weathered for a number of years, the colors range from shades of gold to brown to dark gray, with the latter predominant. The stone entranceway of the old church still stands to the north of the current church, on Washington Street. Two cornerstones are built into this entranceway, one from the 1868 church and the other inscribed "rebuilt from original stone 1867--75 years--1942." This stairway contains several types of sandstone, including beige Berea Sandstone from northern Ohio, and red and purple sandstones. The red sandstone with gray spheres is probably *Portage Entry Red sandstone* (Jacobsville Sandstone) from the upper peninsula of Michigan.

Interior: The windowsills are made of a gray limestone (probably *Tennessee Gray* or *Ozark Gray marble*) with fossil brachiopods. The original main altar uses three types of marble: a red and white mottled stone, a gray and white mottled "marble," and a beige-colored limestone. Side altars feature a beige nodular limestone and a brecciated limestone consisting of beige clasts in a darker matrix.

References: Hannibal, 1997; Papers in Diocese of Cleveland archives

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ST. MICHAEL THE ARCHANGEL ROMAN CATHOLIC CHURCH

3114 Scranton Road, Cleveland; built 1889-1892, dedicated 1892. Victorian Gothic.

Exterior: Berea Sandstone from northern Ohio was utilized for St. Michael's exterior. Rectangular blocks of the sandstone were set in a random coursed pattern. The stone is rock-faced and set in a random ashlar pattern.

Interior: The narthex has flooring of a white marble with gray streaks and wainscoting of red *Tennessee marble*. Pillars along the aisles have a base of pink *Tennessee marble* with prominent stylolites. The railing around the choir section is a cream-colored onyx marble with golden veining. Floor aisles are a white true marble with black streaks. Wainscoting inside the church is red *Tennessee marble*. The original (1931) stone main altar replaced a wooden altar. Its base and the steps leading to it are *Botticino marble*. The original main altar itself is made of several types of marble. The main block is *Old Convent Siena*, a golden-colored marble. The altar table is a more olive-toned golden marble, either a *Siena* or *Verona marble*. Pillars in the front of the altar are of two types. One type is *Red Verona*; the other is a black and light brown marble. Both types have bases and capital tops of white marble. The bases of the side altars are a white marble with gray streaks.

Remarks: The parishioners of St. Michael chose stone over brick for the exterior of this church (Sheehan, 1975, p. 28).

References: Swick, 1973; Sheehan, 1975.

ST. PATRICK ROMAN CATHOLIC CHURCH

3602 Bridge Avenue, Cleveland; construction began in 1871 and continued for many years. Mostly completed by 1880, but the tower was completed in the early 1900s and there have been other additions as well. Gothic Revival.

Exterior: Most of the exterior is a pinkish to very light gray-colored Middle Devonian limestone, quarried in the Sandusky, Ohio area. The stone has been called "Sandusky limestone," (Callahan and Hickey, 1978, p. 168), "Sandusky blue limestone" or "Sandusky blue stone" (Tim

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Barrett, personal communication, 1999). Geologically speaking, it is either the Columbus Limestone, the Delaware Limestone, or a combination of both. Although this stone was sold under the name *Sandusky blue stone*, it is certainly not blue today. As Bownocker has noted (1915, p. 61), the name is a misnomer. However, the limestone at Sandusky was apparently blue or blue-gray in color when freshly quarried (see Bownocker, 1915, p. 61; Hawes, 1884a, p. 634, also 1884b).

The rock-faced stone blocks are set in courses. This stone contains many types of fossils, including large horn and colonial corals, bryozoans, sea lilies, tentaculids (fossils that resemble screws in size and shape), and brachiopods. Some fossils are up to two centimeters or greater in diameter. Much of the base of the building, the top portion of the bell tower, and original trim, for instance around windows, is Berea Sandstone. The steps are also sandstone, but these are not the original steps. Many details sculpted in Berea Sandstone, including the drove-work dressing of the windowsills and the band of sandstone near the base of the building, are still in very good shape. However, some of the lower sandstone features around the entranceways are pitted from sandblasting done in the 1990s. Outer layers of many of the limestone blocks have weathered away and the originally pitched edges of some limestone blocks are barely visible. Networks of horizontal and vertical cracks have also eroded into many limestone blocks. The pillars of the colonnade linking the rectory to the west entrance of the church are fashioned from *Indiana limestone* (Salem Limestone).

Interior: The narthex has a fine-grained, mottled true marble wainscoting with a swirling pattern of gray-green and white, possibly from Vermont. The trim is a fine-grained, light gray true marble. Flooring is true marble with gray and gold streaks. The communion railing is a fine-grained white true marble. The pulpit is white marble with insets of green marble (probably *Verde Antique*) and a base of a yellow and gray (possibly *Siena*) marble. Sanctuary trim and the base of two pillars by the sanctuary are *Verde Antique*. The sanctuary steps and flooring are made of grayish orange pink fossiliferous limestone (possibly *Tennessee marble*). Statuary is white true marble, most of which has been painted white. The original main altar is a fine-grained white marble with insets of a beige, green, and yellow mottled marble (possibly a *Siena marble*) and pillars of a white, purple, and gray marble. The base of the altar has a green breccia trim composed of clasts of dark green in a lighter green matrix. The main altar platform is white marble with gray streaks

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(veins). Side altars are a fine-grained white marble with insets and pillars made from the same material as the main altar, with the addition of insets of *Verde Antique* marble.

Remarks: According to parish tradition (recorded in Callahan and Hickey, 1978), Sandusky limestone was hauled to the church site by parishioners using an undertaker's wagon. Limestone from Sandusky, mostly Columbus Limestone, was once used extensively for churches (Bownocker, 1915, p. 62; Hynes, 1953, p. 65), but apparently not in the Cleveland area due to the closer proximity of sandstone quarries. Therefore, the use of Sandusky stone was rare. Limestone from Sandusky was used, however, for the exterior of the now-demolished 1874 First Methodist Episcopal Church, once located at Erie (East 9th) Street and Euclid Avenue (Payne, 1876, p. 142).

The Berea Sandstone trim of the church darkened within a few decades, while the limestone has been steadily eroded by acid rain, resulting in the retention of a light color. A 1903 photograph of the church (Moran, 1903) shows this contrast. The only light-colored sandstone in that photo is that used for the newly completed tower. Cleaning of sandstone parts of the church in the 1990s unfortunately reduced the contrast between the sandstone and the limestone that had been created by weathering. The tower, following one of several lightning hits over the years, was cleaned in 1992.

References: Callahan and Hickey, 1978; Hannibal, 1992.

ST. PROCOP ROMAN CATHOLIC CHURCH

3181 West 41st Street, Cleveland; 1899-1903, dedicated 1903. Because of structural problems, the tops of the bell towers and the central dome were razed in 1962. The remainder of the towers was razed in 1993. Italian Renaissance.

Exterior: Berea Sandstone. Most of the stone is rock-faced and set in courses. Portions of the stone on the front (west) side of the church are set in alternating courses of thicker, rock-faced blocks and thinner, smoother-faced blocks. Some of the sandstone has exfoliated. The front steps are also sandstone. Columns in the front of the church and an inset panel above the front door are pink granite.

Interior: The narthex has wainscoting of two types: a coarser-grained, gray true marble with dark

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gray veining (possibly *Georgia marble* (Murphy Marble)); and another, finer-grained, whiter-colored variety of marble. Wainscoting in the church is brown faux marble. The pillars in the choir loft are faux marble. The base of the walls in the transept and some other parts of the church are a coarse-grained gray and white marble. New marble altars and statuary were installed in the late 1920s and the east side of the interior was reconstructed again in 1949. The side altars are a white marble with gray streaks; their bases are a similar marble. These altars have small pillars of an orange-red limestone, mottled with white, and panels of a yellowish white marble with muted gray veining. The original main altar is true white marble. It has columns consisting of a base of golden *Siena marble* and inset panels of white and light purple breccia. The altar platform is a slightly different white marble. The colonnade behind the original main altar is composed of several types of marble. The base is *Verde Antique*. Large pillars are a yellowish breccia, smaller pillars are a white breccia with gray veining. The wall beneath the pillars and railing is golden *Siena marble* with insets of a white breccia with purplish veining. Some parts of the balustrade are plaster.

References: Anonymous, 1974; Anonymous, 1997b.

ST. VINCENT CHURCH

corner of West Vincent and Market Street, Akron; cornerstone laid in 1864, completed 1867, new addition added in the 1940s. Romanesque.

Exterior: The original stone used for this church is Sharon Conglomerate. This is a Pennsylvanian age rock unit that crops out in an east-west band that passes through Akron. It was quarried for building stone in the nineteenth century. The stone for this church is said to have come from a quarry at the site of St. Bernard Church in Akron (McGovern, 1996) or near St. Bernard from a quarry on Forge Street (Carney, 1997). Later, post-1937 additions were made with Berea Sandstone. The conglomerate contains pebbles and its bedding is striking. The Berea Sandstone used for the church lacks pebbles and has fine, horizontal stratification defined by small particles of reddish brown, iron-rich cement. The stone was cleaned in 1997 using heavy-duty detergent and water (Carney, 1997).

Interior: The altar and pulpit are made of several types of stone, including an orange breccia, *Red*

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Verona marble, and *Botticino marble*.

References: Carney, 1997

ST. VLADIMIR'S UKRAINIAN ORTHODOX CHURCH

State Road and Marioncliffe Drive, Parma; most portions completed 1967, front mosaic completed 1988. Byzantine.

Exterior: *Amherst sandstone* (Berea sandstone), quarried in the are of Amherst, Ohio, is used for the exterior of this church. The sandstone used for the arches around the windows on the sides of the church and for the arches around the entranceway is *Grey Amherst sandstone*. This stone is grayish buff colored and has prominent, irregular reddish brown streaks. These streaks are cross-beds seen in bottom or top view. Two colors of *Tawney Amherst sandstone* are used for the exterior walls. About 85 percent of this stone is gray-colored and about 15 percent is buff-colored. This stone is split-face veneer, meaning that the exposed surface has not been sawed, but instead split more or less parallel to the bedding to show its natural texture. The faces of the blocks are polygons, most four- or five-sided. The cornerstone is pink granite.

References: Anonymous, 1968.

THE TEMPLE

(Temple Tifereth Israel), Temple Israel Congregation, East 105th Street at Silver Park, Cleveland; built 1923-1924/25. Byzantine.

Exterior: *Indiana limestone* (Salem Limestone), set in alternating tall and thin courses is used for exterior cladding. The stone in the narrow courses is tooled with vertical drovework. Entrance stairs are also *Indiana limestone*. This stone has many easily visible fossils, including bryozoans, brachiopods, corals, and blastoids (a type of sea lily). Shafts of the large columns at the front entrance and smaller columns on the upper levels are a fossiliferous pink and beige limestone (probably *Tennessee marble*) containing prominent stylolites and prominent fossils (large

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orthocerid cephalopods, brachiopods, and bryozoans). The base of the large columns are fashioned from *Tennessee marble*. The columns are weathered and there has been dissolution along some of these stylolites. Some sandstone flagstone remains on the front.

Interior: Hallways are of gray *Tennessee marble*. The hallway in the south entranceway includes very fossiliferous, reddish *Tennessee marble* that contains large, prominent orthocerid cephalopods, like those illustrated by Dale (1924, p.117). The main sanctuary has benches of *Tennessee marble* (limestone from the Holston Formation) and pillars made of various stones, including *Tennessee marble* and a pink limestone.

Reference: Stanwood, 1925.

TRINITY EPISCOPAL CATHEDRAL

Euclid Avenue and East 22nd Street, Cleveland; built 1901-07, consecrated 1907. English Gothic.

Exterior: The exterior of the cathedral is *Indiana limestone* (Salem Limestone), except for a basal course and some steps of Berea Sandstone. Most of the limestone is set in courses. The adjoining Cathedral Hall complex (1895) is built of Berea Sandstone.

Interior: The narthex flooring is a blue-gray and white marble, possibly *Bardiglio marble*, with some black, gold, and white marble, possibly *Portoro marble*. *Indiana limestone* is used for interior columns and traceries and trim. The flooring of the aisles features insets of other marbles for dedications, including *Red Verona marble* and *Yellow Siena marble*. The platform of the baptistery is a breccia, with white clasts in a dark, gray-green matrix. An inlaid circle contains several marbles and limestones, including red limestone, possibly *Numidian marble*, and white true marble. The baptismal font is white true marble. The pulpit is made of *Pavonazzo marble*, a white to beige marble with dark purplish streaks, quarried in the Pietrasanto area of Italy. The sanctuary flooring and inlays are fashioned from the same materials as the baptistery. The altar is *Pavonazzo marble*, with a top slab of *Siena marble* that includes an inset block of *Jerusalem limestone* (limestone from the Bi`na Formation). This altar was originally in the Old Trinity Church, which was located on East 6th Street and Superior Avenue

References: Anonymous, no date; Hehr, 1973; Wells, 1990.

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WADE MEMORIAL CHAPEL

Lake View Cemetery, 12316 Euclid Avenue, Cleveland; 1901. Neoclassical.

Exterior: Columns and the upper portion of the exterior are made of a light gray Barre Granite appropriately named *Light Barre*, from the Barclay Quarry just southeast of Barre, Vermont. Barre Granite is technically a granodiorite. Barre Granite is durable and has a slight resemblance to marble when seen at a distance; however, when seen close up, this stone can be easily distinguished from marble, as it is speckled with dark minerals. The stone for the exterior walls is laid in courses. The lower portion of the building is *Gray Canyon sandstone* (Berea Sandstone) quarried in the area of South Amherst, Ohio, also set in courses. The name derives from the large "canyon" quarry in Amherst. The sandstone blocks are rock faced. The Berea Sandstone blocks were cleaned in the 1990s.

Interior: The wainscoting is white *Georgia marble*. True marble also lines the walls on the lower level, beneath the chapel proper. Railings, candle sticks, and light fixtures at the north end of the building are alabaster. The mosaic flooring, said to represent flowing water, is made of tesserae of white marble, green serpentinite, black limestone, possibly *Belgian Black marble*, and glass.

References: Dale, 1909, p. 68.

WINDERMERE METHODIST CHURCH (WINDERMERE METHODIST EPISCOPAL)

14035 Euclid Avenue, East Cleveland; construction began in 1908, dedicated in 1909; destroyed by fire in 1946, and rebuilt in 1949. Romanesque.

Exterior: The original stone for this church was *Hummelstown brownstone*, a reddish brown sandstone quarried in the Hummelstown area of Pennsylvania (Stone, 1932, p. 128). Other brownstone (Anonymous, 1960a), said to be from Berlin Heights (state unknown) (Davidson et al., 1966) or Holyoke, Massachusetts, was blended with this stone during rebuilding. Most of the stone is rock-faced random ashlar. The stone at the main entrance has a smooth facing and is set as random ashlar. A newer addition, on the west side of the church, has smoother, irregularly tooled blocks set as random coursed ashlar. Steps at the main entranceways are *Indiana*

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limestone. The platforms at the top of the stairs are sandstone, probably Berea Sandstone.

References: Anonymous, 1909; Anonymous, 1960a; Price, 1970; Stone, 1932.

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GLOSSARY

ammonite An extinct type of shelled **cephalopod**. It has a multi-chambered, generally coiled shell. The chambers of ammonites are separated by complexly corrugated partitions called **septa**.

ashlar Masonry consisting of stone cut into rectangular blocks.

bema The raised area of a Byzantine-style church where the altar is located.

brachiopod A marine invertebrate with a shell that superficially resembles that of a clam. The shell consists of two valves that are each bilaterally symmetrical. Unlike the shells of most clams, each valve is not the mirror image of the other.

breccia/brecciated A rock composed of large, angular rock fragments with finer-grained material in between.

brownstone A brown, reddish brown, or red sandstone used for buildings.

bryozoan A small aquatic colonial invertebrate. Forms commonly found as fossils may resemble small twigs.

calcareous Material composed at least partially of **calcium carbonate**.

calcite A generally light-colored mineral composed of **calcium carbonate**. Calcite is fairly soft and effervesces (bubbles) in weak acids. It is the principal mineral in limestone and many marbles.

calcium carbonate The chemical compound CaCO_3 . A common natural form is the mineral **calcite**.

carbonate Material, such as limestone, composed of oxides of calcium and carbon.

cephalopod A member of a group of marine invertebrates that includes octopuses, squids, and their relatives (both modern and extinct), including shell-bearing forms, such as the pearly nautilus.

chancel The part of a church in which the main or only altar is found.

clast A fragment of a rock formed by the breaking up of a larger body of rock. Clasts are often recemented together to form a **breccia**.

coarsely crystalline A term used to describe a rock in which the individual crystals are larger

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than the grains of table sugar.

colonial Said of animals that live together as an interconnected unit.

coral A marine invertebrate with a soft body and a hard external structure composed of **calcium carbonate**. Corals live attached to the seafloor, especially in shallow, tropical seas. Some corals live as separate individuals, others are **colonial** and form extensive reefs.

coursed Stone set in layers, usually horizontally and usually containing stone blocks of more or less equal height. The layers are known as **courses**.

cross-stratification The layering of sediment that is inclined at an angle to the horizontal.

Devonian Period A mid-**Paleozoic** period of geologic time. It began about 408 million years ago and lasted until about 360 million years ago.

dolomite A light-colored mineral composed of calcium and magnesium carbonate, $(\text{CaMg})\text{CO}_3$. It is fairly soft and dissolves in weak acids, but effervesces (bubbles) less than calcite. It is a common mineral in some limestones and in many marbles. The term is also used for a rock dominated by the mineral dolomite as an alternative to the term **dolostone**.

dolomitic Used to describe a rock that contains **dolomite**.

dolostone A rock composed primarily of the mineral **dolomite**.

drove work A chiseled surface consisting of more or less parallel markings.

feldspar The general name given to any of a group of common rock-forming aluminum silicate minerals that contain the elements potassium, sodium, calcium, or some combination of these. There are two major divisions: plagioclase feldspars and potassium feldspars.

field stone Rough, generally elongate, but in some cases rounded, stones that may be found on the surface in fields and that are used for building stone.

foraminiferan A type of single-celled organism with a hard supporting structure consisting of one to many chambers.

formation A particular body of rock or sequence of rock strata. It is identified by its composition and texture and its position relative to other rock units. Formal formation names consist of two parts: the name of a locality and either the word formation or the name of a type of rock (*e.g.*, sandstone, shale).

fossil Any preserved remains or trace of prehistoric organisms.

fossiliferous Containing fossils.

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freestone A fine- or medium-grained stone, typically a sandstone or limestone, that can be cut easily in any direction and that will not split in any particular direction.

fusulinid A type of **foraminiferan**, usually resembling a rice grain.

gneiss A banded metamorphic rock. The principal minerals in gneiss are usually feldspar, quartz, and mica.

granite A light-colored, coarsely crystalline plutonic rock that consists primarily of potassium **feldspars**, plagioclase **feldspars**, and quartz. Granite also may contain **mica** and other minerals. Builders and architects use this term in a broader sense to indicate any very hard crystalline rock used for building purposes.

granodiorite A **coarsely crystalline**, igneous rock intermediate in color and composition between granite and gabbro.

horn coral A solitary coral having a cup or hornlike shape. They are common in many **Paleozoic** limestones.

hornblende A dark green to black silicate mineral containing iron and magnesium; in rock, hornblende is generally distinguished from biotite by the elongate shape of its crystals compared to the flat crystals of biotite.

iconstasis A screen, typically with columns and containing icons, that separates the **nave** and the sanctuary of an Orthodox or eastern rite church.

igneous A rock that crystallized from hot, fluid rock material either below or at the earth's surface. Igneous rocks consist of interlocking mineral crystals.

limestone A **sedimentary** rock composed predominantly of the mineral calcite. Many of the rocks called "marbles" by builders and architects are actually limestones.

marble A rock resulting from the **metamorphism** of **limestone** or **dolomite**. Builders and architects use this term in a broader sense to denote any stone, typically composed of **calcite** or **dolomite**, that is capable of being polished.

marbleized Made to resemble marble. Marbleizing is commonly done by use of paints and varnishes.

metamorphic A rock derived from pre-existing rock as the result of **metamorphism**.

metamorphism The collective name for all of the various processes that alter pre-existing rock buried within the earth. The changes result from heat, from the pressure of overlying rock, from the pressures related to mountain-building activities, or some combination of these. Alterations

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that may occur in the pre-existing rock include recrystallization of minerals, formation of new minerals, and rearrangement of crystals or other particles in the rock.

mica A group of common rock-forming minerals that have a flat shape and cleave easily into thin layers or sheets. One common mica is biotite.

migmatite A rock containing both **igneous** and **metamorphic** minerals. Such rocks are often banded.

Mississippian Period A late **Paleozoic** period of geologic time. It began about 360 million years ago and lasted until about 320 million years ago.

narthex The vestibule of a church, often set apart from the **nave** by a set of doors.

nave The main, middle part of a church or similar structure. The nave may be flanked by aisles laterally and by the **chancel** and **narthex** axially.

orthocerid A type of extinct **cephalopod**, often bearing a straight, cone-shaped shell.

orthoclase A common rock-forming potassium **feldspar** ranging in color from white to red.

Paleozoic Era The large division of geologic time between the Precambrian and Mesozoic Eras. It began about 570 million years ago and lasted until about 245 million years ago.

Pennsylvanian Period A late **Paleozoic** period of geologic time. It began about 320 million years ago and lasted until about 286 million years ago.

pier A solid, vertical, square-edged masonry support.

pilaster A vertical element projecting from a wall, resembling a column, but rectangular in shape.

pitched A type of stone dressing in which the edges are cut back at a constant distance to create a framelike effect for rock-faced stone blocks. This type of dressing was originally done by hand with a pitching chisel.

plagioclase feldspar A common rock-forming **silicate** mineral ranging in color from white to gray.

plutonic An **igneous** rock, or relating to igneous rock, that crystallized below the surface of the earth. The crystals in a plutonic rock are the size of grains of sugar or larger.

potassium feldspar A common rock-forming silicate mineral characteristically ranging in color from white to pink and red, but which may be blue, gray, or green.

Precambrian All geologic time from the formation of the earth, about 4.6 billion years ago, to the

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beginning of the **Paleozoic** Era, about 570 million years ago.

pyrite A gold-colored mineral composed of iron sulfide. It is informally known as "fool's gold."

quartz A common glassy, clear to gray rock-forming mineral composed of **silica**.

quoin Stone blocks at the corner of a building that differ from the other materials used for that building. Typically quoins are rectangular blocks that are laid so that, when seen from one side, blocks with exposed sides alternate with blocks with exposed ends.

random ashlar A pattern of ashlar masonry in which rectangular slabs, usually cut to two or more sizes, are set with sides of the slabs oriented either horizontally or vertically, but in an offset pattern.

random coursed A pattern of stonework in which stone blocks of varying heights are laid in layers.

rock faced A rough type of facing, resembling a natural surface, used for the exposed side of blocks of building stone.

rock unit name The name given to a body of rock, such as a formation, at the time of its first formal geologic description.

rood screen A screen, often of wood and including a crucifix, that separates the **nave** from the sanctuary portion of a church.

rubble Irregularly shaped pieces of stone, typically used for rough construction. Field stones are often used for rubble.

sandstone A **sedimentary** rock composed of sand-sized grains (between 1/16 and 2 mm in diameter), held together by mineral cement.

sediment Matter deposited by water or wind.

septa Internal partitions within the shell or skeleton of various types of animals, for instance, within the shells of **ammonites**.

serpentine A typically green mineral, rich in iron and magnesium, found in some **metamorphic** rocks, such as *Verde Antique*.

serpentinite A rock consisting primarily of **serpentine**.

silica Silicon dioxide (SiO₂) a rather hard material common as cement in sandstones. Chert, jasper, and quartz are made of silica.

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silicate mineral A mineral containing silicon and oxygen as major constituents.

slate A rock derived from the **metamorphism** of shale. Slate is harder and more durable than shale, but breaks easily into thin layers.

stylolites Natural, irregular seams in limestone that formed where the rock was sutured back together after portions of the limestone dissolved away. Limestone is easily dissolved by weak acids. The dark color of stylolites is due to a concentration of insoluble materials that remained behind.

terra-cotta A baked clay used to make tiles, panels for building facing, and statuary.

terrazzo Flooring composed of stone chips set in a cement matrix.

tetrapod Four-legged stand or small table used in Byzantine-style churches.

trace fossil A footprint, trackway, burrow, or other indirect evidence of a prehistoric animal. Trace fossils are distinguished from body fossils.

tracery Ornamental work, commonly made of stone, surrounding and as part of a window.

trade name A manufacturer's name for a product, such as a building stone. The names *Amherst stone*, *Indiana limestone*, and *Sunset Red granite* are examples of trade names.

travertine Freshwater limestone deposited by springs, commonly with the help of bacterial activity.

vein/veining Any type of linear feature that appears to cross through a building stone.

vug A rounded, often spherical, cavity in a rock, commonly filled in part by crystals.

wainscoting The lining of an inside wall, commonly the lower three feet or so. This term is also used to refer to the material used for the lining.

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