

Preface to the digital version of Building Stones of Downtown Chattanooga

Building Stones of Downtown Chattanooga, a 63 page booklet by the late Rock Wilson, provides detailed descriptions of building stones at 39 downtown locations. The booklet also provides an overview of igneous, sedimentary, and metamorphic rocks, the stone industry, and the geology of the Chattanooga area.

This digital version of the booklet is as faithful as possible to the original. The text was reproduced using a flatbed scanner and "ocr" (**o**ptical **c**haracter **r**ecognition) software. Tables and illustrations are digital reproductions. Photographs were scanned and were digitally retouched.

The entire booklet is contained in 3 "pdf" (**p**ortable **d**ocument **f**ormat) files that require Adobe Acrobat Reader.

bsdc.pdf (160 K) includes the text, tables, and line-drawing illustrations.

bsdc_figures.pdf (440 K) includes figures 1 through 8.

bsdc_photos.pdf (1 M) includes photographs of the 39 locations.

This booklet was written in 1979. Chattanooga has changed dramatically during the past 22 years; some of the buildings described in this booklet have been modified; some have changed names; and many new buildings have been built. This digital version of the booklet has not been updated with respect to its content.

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The Author

Robert Lake Wilson, in writing *Building Stones of Downtown Chattanooga*, has drawn upon his own understanding of the geology of the Chattanooga area and knowledge of the early historical development of the city. Dr. Wilson was born in Gallipolis, Ohio. He received an A.B. in geology from Wheaton College, Illinois; an M.S. from the State University of Iowa, and a Ph.D. from the University of Tennessee, Knoxville. During World War II he served three years in the Army Air Corps and was a commissioned aerial navigator. For several years Dr. Wilson was a regional geologist in the Department of Conservation for the state of Tennessee. Since 1955 he has held a faculty position at The University of Tennessee at Chattanooga as Professor of Geosciences.

He has written numerous articles on the subject of geology, including *Geology of Hamilton County* and *Guide to the Geology along the Interstate Highways in Tennessee*.

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**Building Stones
of
Downtown Chattanooga**

Robert Lake Wilson, Ph.D.

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INTRODUCTION

The growing energy crisis has necessitated a reduction in our consumption of fuel. The increasing expense of travel makes it progressively more difficult to send students great distances to visit points of geologic interest. This booklet, building Stones of Downtown Chattanooga, provides an array of interesting possibilities for anyone interested in the subject of geology, the geologic history of the Chattanooga area, or the architectural development of the downtown area.

The first section briefly describes the three major classes of rocks and tells something of their mode of formation. Following this is a chapter that describes the common quarrying and finishing characteristics of the various building stones.

The rocks of the Chattanooga area which served as an early source of building materials are described in chapter three which gives a summary of the geologic history of the city. This is followed by a section on the history of the building of the downtown area, from the first wooden structure to the modern skyscraper. The major portion of the booklet is devoted to a description of a walking tour of the downtown area. Some 39 locations are described in detail. The final chapter gives a fully detailed description of each type of stone encountered during the tour for the serious-minded student of geology.

A world of construction stones is literally at our doorstep. The stones used in the construction of the buildings of Chattanooga represent all three major rock types: igneous, sedimentary, and metamorphic. They were selected with great care by the architects and builders, and at great expense were shipped from many distant lands as well as from throughout the United States.

Each building is a unique geologic museum and can supply the student with information about certain types of stone as well as some characteristics of the city's architectural development. After you have made use of this walking guide you should have a better understanding of different kinds of rocks. This basic knowledge can then serve as a basis for study of the earth's history.

ACKNOWLEDGMENTS

In acknowledging the contributions of others, I must first mention the collective efforts of several of my students who supplied me with valuable information on many of the buildings. I am indebted to Rose Solomon for many of the photographs and to Dr. William Black, Department of Geoscience, The University of Tennessee at Chattanooga, for editorial assistance and suggestions. Mr. Joe Peters, chief engineer of the Cold Spring Granite Company, Cold Spring, Minnesota, provided details of the Minnesota "Granites".

EARTH MATERIALS

The earth has been in existence for billions of years. One of the main tasks of the geologist is to synthesize its rather complex history throughout this long period of time. Man has been around for only a very short time compared to the total age of the earth. Our understanding of what happened long ago is based upon deciphering the record left in the rocks.

Rocks are composed of minerals which in turn are made up of the same elemental particles as all other matter in the universe. A rock is simply a solid portion of the earth's crust which has a certain recognizable appearance and composition. Rocks differ from place to place primarily because they have been formed through several different processes and from various materials. Geologists classify rocks on the basis of the manner of formation. Three major types are recognized: igneous, metamorphic, and sedimentary. (Figure 1)

IGNEOUS ROCKS

Any rock that has been formed from material which has cooled and solidified from a molten or melted state is called igneous.

Liquid or molten rock is found deep inside the earth and is called "magma". When the molten material moves within a few thousand feet of the surface, it cools very slowly and large crystals separate out of the magma. These coarse-grained crystals may form a gabbro or granite, depending upon the chemical composition of the melt.

On the other hand, if the same molten rock or magma flows out on the surface of the earth (it is then called "lava"), it will cool rapidly and the resulting rocks will be very fine-grained. The surface extrusive equivalent to the deep seated granites is rhyolite.

Magma with a composition of diorite or gabbro at depth forms basalt when erupted to the surface. In certain instances there is virtually an instant cooling of the magma or lava on the surface and no crystals are formed; a volcanic glass results which is called obsidian.

In general, igneous rocks are an assemblage of silicates, and the amount of silica (SiO_2) they contain can be used as a basis of classification. The rocks with a silica percent of 65 or more are known as acidic and contain free silica in the form of quartz. Rocks which contain 55 percent or less silica are considered basic. A classification based upon the amount of silica and position of formation is shown in Table I.

Figure 1.

TABLE I — CLASSIFICATION OF IGNEOUS ROCKS

	ACIDIC (FELSIC) 65-75% Silica	INTERMEDIATE 55-65% Silica	BASIC (MAFIC) 45-55% Silica
Extrusive (Volcanic) Fine-Grained	Rhyolite Pumice Obsidian	Andesite	Basalt
Intrusive (Plutonic) Coarse-Grained	Granite *Granodiorite *Quartz Monzonite	*Diorite *Syenite	**Gabbro

* Commercial term "Granite"

**Commercial term "Black Granite"

SEDIMENTARY ROCKS

Sedimentary rocks are formed from accumulations of loose rock particles or chemical precipitates which have later become hardened into rock. These particles are produced by the various geological processes of weathering and erosion of pre-existing rocks. The average granite is composed essentially of quartz, mica, and feldspar and will weather into a sediment composed of hard, chemically resistant, quartz; the feldspar breaks down into clay; and the resistant mica breaks down into small flakes. Sedimentary rocks may be classified with respect to the size of the grain and the composition of the material, as in Table II.

TABLE II — CLASSIFICATION OF SEDIMENTARY ROCKS

NAME	NATURE OF FRAGMENT	SIZE (mm)
Conglomerate	Consists of rounded fragments held together by a natural cement.	256
Breccia	Consists of broken angular fragments held together by a natural cement.	2
Sandstone	A bedded rock with grains held together by a natural cement.	2
Oolitic Limestone	A rock containing small spheroidal calcareous grains.	1/16
Shale	A fine-grained sedimentary rock, compact and finely bedded.	1/16
Mudstone	A fine-grained sedimentary rock, compact breaks in massive chunks or compact blocks.	1/256
Limestone	A bedded rock composed mainly of calcium carbonate.	2
Dolomite	Composed mainly of the double carbonate of calcium and magnesium.	
Travertine	A calcareous deposit formed from saturated limy water.	1/256

They are formed primarily at the surface of the earth either in water or in air. Since they are always at or near the surface, they have not been subjected to very high temperatures or pressures.

Most sedimentary rocks contain bands or layers which are an indication that they were formed by successive depositions of mineral and organic matter. Nearly all the world's fossils are found imbedded within sedimentary rocks. Usually the sedimentary particles have been cemented together by minerals or chemicals, but some are still loose and uncemented such as in sand and gravel. In ocean basins we find areas of loose unconsolidated sediments ranging from fine lime-rich mud to coarse gravels. If these become buried beneath other sediments, the resultant lime-rich rock is called limestone, while the fine grained muds may become shale, and the sandy portion near shore or on the beach may harden in layers of sandstone. A mixture of sand and gravel usually forms the sedimentary rock called conglomerate.

METAMORPHIC ROCKS

Rocks which have been changed by pressure and/or high temperatures so that they are altered in shape, composition, or form are called metamorphic. The original minerals may be recrystallized or new stable minerals may be produced. Most metamorphic rocks were altered deep within the earth and are associated with the great uplifts responsible for our great mountain systems. The process of metamorphism does not completely melt the rocks, but their original minerals are recrystallized into denser, more compact and often banded varieties. This banding may be the result of a more or less parallel rearrangement of the grains. New minerals may be created by reactions with hot liquids or through a rearrangement of the chemical components of the rock. Some metamorphic rocks like gneiss show a pronounced banding, while others like marble and quartzite are typically not banded but are massive.

There are two major types of metamorphism. One results from direct contact with the heat from intrusive igneous rocks and is called CONTACT or THERMAL METAMORPHISM. When confined by overlying rocks, particles of calcium carbonate (CaCO_3) and fossil fragments in limestone are slowly recrystallized into roughly uniform crystals of calcite. Thus the original limestone is changed into marble. In true marble all traces of organic structures (i.e. fossils) are lost.

The second type of metamorphism is called REGIONAL METAMORPHISM, associated with mountain building and related deformation. Flake-shaped minerals tend to re-orient at right angles to the pressure. Some recrystallization takes place and new minerals, mainly chlorite and mica, also grow at right angles to the direction of the pressure. Slate, which takes its name from the French word *esclat*, which means splinter, is one of the most common metamorphic rocks.

It has a grain (slaty cleavage) along which the rock may be easily split. The classification of metamorphic rocks is based upon the original nature of the rock and this type of banding or foliation.

TABLE III — CLASSIFICATION OF METAMORPHIC ROCKS

NAME	ORIGINAL ROCK OR SEDIMENT	
Marble	Limestone or calcareous sediments.	NON-
Quartzite	Quartz sandstone or sandy sediments.	FOLIATED
Serpentine	Olivine-rich highly fractured rock	
<hr/>		
Slate	Fine-grained sediment. Slight deformation.	
Schist	Characterized by wavy or undulatory rock cleavage. Can form from shale, sandstone, or slate	FOLIATED
Gneiss	Coarse-grained consists of alternating light and dark bands. Can form from any coarse-grained igneous rock.	

CHARACTERISTICS OF BUILDING STONE

QUARRYING METHODS

In most instances the deposit of stone does not form a natural outcrop but is covered by an overburden of decomposed rock, clay, and soil. This material has to be stripped away to expose the stone. If enough water is available, the most economical way to uncover the stone is by the hydraulic method.

Huge, earth-moving machines now make it possible to remove great thicknesses of loose overburden at a relatively low cost. Some of the major advances in methods of extraction of stone over the past few centuries have been the use of electrical derricks in place of steam or hand operated hoists. Crowbars, sledge hammers, plugs and feathers*, wedges, and drills are still widely used. Mobile channeling machines and wire or chain saws along with compressed air drills are the main developments in recent years.

In the more massive stones like granite, a special type of cutting is employed. A small jet burner with a high velocity and temperature exhaust flame (like a blowtorch) is directed at the stone. As the flame nozzle is moved back and forth it causes a continuous flaking action which results in a deep channel being cut in the stone.

In general most quarrying methods are not complex; however, due to the lack of adequate geological knowledge, deposits are sometimes not properly worked. Lack of information caused by inadequate drill data may result in the quarry face being worked in the wrong direction, or waste rock being dumped on good stone or derricks being erected in the wrong place.

*A feather is a strip of iron curved on one side to fit the wall of the drill hole and flat on the other to fit a wedge. The feather and the wedge are inserted in the drill hole and a plug placed between them. The plug is lightly tapped until a fracture appears in the stone.

CUTTING AND POLISHING

Rough-cut blocks are transported to finishing areas, where various masonry works such as primary slabbing, secondary sawing, polishing, sandblasting, and finally hand carving, occur. (Figure 2)

In some cases the surface of the block may be left as quarried or, by using an ax or pinhammer on the surface, a rough or axed finish is obtained. A 4-pointed chisel used with a

Figure 2.

pneumatic hammer produces a "clay-tool" finish. With a wooden mallet and a comb tool, a "combed" finish is obtained. It has become popular to flame treat granite by moving an acetylene torch over the granite's smooth surface, thereby causing the stone to flake and leave an attractive, uneven surface. These finishes require hand labor and are usually more costly than simple polishing.

In the stone trade, rock names are used very loosely. Under "granite", for example, are included not only true granite, but also other crystalline igneous rocks of deep-seated origin such as granodiorite, granite-porphry, porphyritic granite, syenite, gabbro, diorite, diabase and dolerite. In this report, to differentiate between true granite and the term "granite" as used in the trade, quotation marks are used with the latter.

In the building trade the term marble is applied to any calcareous rock which is capable of taking a good polish, and which is suitable for ornamental work or for construction purposes. The stone must be of a desirable color, dense, free of cracks or impure layers, thick bedded, and be of fine texture. The two most important properties of marble are appearance and strength. The coloration in almost all marble is due primarily to small amounts of aluminum, potassium, iron, nickel, and copper, with trace amounts of barium, titanium, chromium, manganese and lithium. Calcite and dolomite, which are carbonates of calcium and magnesium, are the major constituents of most marble varieties. The calcite marbles contain in excess of 96 percent calcium carbonate. The varieties with pure white backgrounds are more than 99% calcium carbonate. The strength of marbles results from the mineral constituents and arrangement of the grains as well as its molecular structure. Impure stone does not weather uniformly nor wear well. As the unstable minerals break down, they leave weathered residues which stain the surface. The cohesive strength of the stone is also reduced due to uneven thermal expansion of differing mineral grains. Loosely cemented marbles are porous, absorb dirt, weather rapidly and do not possess great natural strength. These conditions exist in most crystalline limestones and dolomites, as well as breccias and conglomerates. Some serpentines and travertines, normally too weak for outside use, are polished and used for ornamental purposes.

The following procedure is used to attain a highly polished surface which is characteristic of ornamental marble: the rough sawed stone is placed on a rubbing machine which removes all quarry and saw marks by rubbing the surface with a slurry of fine quartz sand. This is followed by a series of buffers covered with felt and fine abrasives. This process usually begins with emery powder, and the final high sheen is produced by buffing with a mixture of aluminum oxide and sulfur dust.

Travertine, which is often listed as a type of "marble", is a variety of calcium carbonate commonly formed as an encrustation around the mouths of hot and cold lime-bearing springs. Travertine is often loosely aggregated, porous, easily weathered and not naturally strong. It has a spongy soft texture, so the cavities or openings commonly collect dirt and are difficult to clean;

therefore, it is not commonly used on the exterior of buildings. Sandstones range from easily worked types to very tough, hard-to-work quartzitic types. They consist predominantly of quartz grains with small percentages of feldspar and mica particles and clay. The individual grains are usually held together by a cement. Although the mineral quartz is very hard and durable, the overall strength of the sandstone depends on the cementing material. Silica and iron oxide provide the strongest bond; calcium carbonate (calcite), the weakest. The quartzite consists almost entirely of quartz, and the silica cement which bonds it together is as strong as the quartz grains themselves. Upon fracture the stone breaks across grains and not around them as it does in sandstone.

SELECTING THE CORRECT STONE

Commonly a building or dimension stone is judged by only three characteristics: (1) its natural beauty, (2) its ease to work or quarry, and (3) its durability. Normally the stone should be free from fractures and should not contain any minerals which when exposed to the ravages of the weather will break down or alter chemically. Hardness is not a necessity unless the stone is to be used for flooring or steps. The durability of a natural building stone is dependent upon its chemical and physical properties, mineralogical composition, grain-size and texture, and the climate where it is used. In many cases the builder needs to have information on water absorption, porosity, compressive strength, and thermal expansion. Since the introduction of reinforced, concrete-framed, high-rise structures, the use of load-bearing stone has virtually ended. Natural stone is used today almost entirely in the form of thin slabs (or veneers) on both internal and external walls.

In many cases it is possible to alter the appearance of the stone either through polishing or sand blasting. When a granite is polished it tends to bring out the darker minerals in the stone, sandblasting brings out the light features. Often a combination of these two operations on the same stone will produce a nice contrast. A summary of the types of stone currently found in Downtown Chattanooga and their source is given in Table IV.

One of the recent trends in construction is the introduction of aggregate panels. These panels consist of various types of crushed natural stone or gravel set in a matrix of concrete. The size and shape of the panel can be controlled by the designer. The appearance of the finished product can also be altered by sandblasting and several other techniques which expose the aggregate. Two of the newest structures in downtown Chattanooga, the Krystal Building at 100 West Ninth Street and the TVA Credit Union at 715 Market Street, are constructed of precast concrete.

The concrete contains various sizes of gravel or pebbles to give the appearance of a conglomerate or sandstone.

TABLE IV
SUMMARY OF ROCK TYPES AND SOURCES OF STONES CURRENTLY FOUND IN
DOWNTOWN CHATTANOOGA

IGNEOUS	SEDIMENTARY	METAMORPHIC
Granite Canada Georgia Minnesota New York North Carolina South Carolina South Dakota	Limestone Alabama Indiana Tennessee Missouri Dolomite Tennessee	Marble Alabama Belgium Georgia France Italy Vermont Greece
Anorthosite New York Sweden	Sandstone Alabama Ohio Tennessee	Gneiss Minnesota
Quartz Monzonite Minnesota	Conglomerate Tennessee	Serpentine Italy Vermont Greece
Gabbro South Africa Wisconsin	Travertine Italy	Slate Virginia
Granodiorite Minnesota		

IMITATION "STONES"

Several buildings in Chattanooga consist of synthetic materials. Some of these artificial stones are close to the real thing, but most are easily recognized and upon weathering rarely bear any resemblance to real stone. Some of the common varieties in downtown Chattanooga include permastone, scagliola, granux, terrazzo, and terra cotta. The interior columns of the Hamilton County Court House are composed of scagliola.

From the early 16th century an artificial marble (scagliola) has been in wide use. It is a colored plaster with small fragments of stone. When highly polished, the finished product may resemble many of the more rare and exotic marbles.

Permastone is an imitation sandstone which is formed from a paste of sand and cement. Yesterday's Restaurant on Patten Parkway is faced with permastone.

Granux is a preformed stone composed of crushed granite chips. The polished stone slabs closely resemble granite. The exterior facing of Lovemans is of granux.

Currently one of the most widely used artificial stones is terrazzo. It is composed of marble chips which are polished to a high luster and set in a lightweight epoxy mix. Locally it has been used on the floors of the Criminal Justice, American National Bank and the Chattanooga Bank buildings.

Terra cotta means "baked earth" in Italian. It is a decorative type of clayware made from crude clay which may contain 50 percent or more of sand or chalk. Iron compounds and other minerals may make up to 10 percent of the finished product. This mixture is then pressed into plaster-of-paris molds in the desired shape and size. It can be glazed to produce a stone with several distinct colors. Major portions of the exterior of the Chattanooga Bank, the James, Maclellan and Electric Power Board Buildings are composed of terra cotta. The use of this building material prompted some unknown author to give the following advice:

When scanning a building with
geologic eye
And mounting frustration makes
you want to die
Your information seems so
factual
Because the stone looks so
natural
But, it really doesn't look like
it oughta
Then be careful, it may be
terra cotta.

CHATTANOOGA'S GEOLOGIC SETTING

The greater Chattanooga area occupies parts of two distinct physiographic regions. These are the Cumberland Plateau to the west and the Valley and Ridge on the east. The Cumberland Plateau surface is underlain by 330 million year old Pennsylvanian aged sandstones, conglomerates, coal and shale. The slopes of the higher mountains are composed of older limestones and shales of the Mississippian System. These relatively pure limestones were formed in shallow and warm ancient seas. Locally these provide resources for the crushed stone and cement industry.

Rocks older than Cambrian, or 600 million years old, are not exposed at the surface in Chattanooga. These older rocks, primarily metamorphic slate, quartzite, and igneous granite, are deeply buried by a veneer of younger sedimentary rocks mentioned above. The older rocks are exposed as a result of folding and faulting and can be seen at the surface in the Great Smoky Mountains of North Carolina and Tennessee and in the Blue Ridge Mountains.

In the Chattanooga area a careful study of each rock unit, together with the dominant forms of life present preserved as fossils, allows geologists to piece together a fairly complete picture of the ancient environment. For example, tidal beach flats have a characteristic type of fine-grained sediment and certain typical forms of life, whereas an offshore barrier island is characterized by a completely different sediment type and group of organisms. A study of the ancient rocks of the Chattanooga area is summarized in Table V. The study is a result of many years of work by numerous geologists. In Cambrian times, the Chattanooga area was characterized by a shallow near-shore environment. This slowly changed to a series of tidal flats and by the end of the Cambrian period, the area was a shallow sea in which fine lime muds were being deposited as in the Bahamas today. Throughout the entire Paleozoic era, each change in the environment was reflected by a corresponding change in the type of rock and the character and abundance of life forms.

ANCIENT SHORELINES

The limestones and shales of the Conasauga Group contain evidence of Cambrian sea life. Small horseshoe crab-like organisms called trilobites were abundant on the sea floor. These animals, along with brachiopods, small shellfish, and other soft-bodied animals not readily preserved, formed the major portion of the ancient fauna.

TABLE V
GENERALIZED STRATIGRAPHIC SEQUENCE FOR
THE CHATTANOOGA AREA

System/Age	Geologic Formation	Thickness	Environment and Lithology
Pennsylvanian	Vandever Formation	250 ft.	Humid, tidal marsh, lagoon and barrier island; land-derived sediments.
	Newton Sandstone	120 ft.	
	Whitwell Shale	75 ft.	
	Sewanee Conglomerate	180 ft.	
	Signal Point Shale	100 ft.	
	Warren Point Sandstone	250 ft.	
325 Million years	Raccoon Mountain Formation	100 ft.	
Mississippian	Pennington Formation	500 ft.	Shallow marine shelf and semi-arid tidal flat; carbonates with land-derived sedimentary wedges. Arid tidal flat, deposits passing upward into shallow marine shelf. Carbonate silt and sandy sediments to the south and east.
	Bangor Limestone	400 ft.	
	Hartselle Formation	20 ft.	
	Monteagle Limestone	300 ft.	
	St. Louis Limestone	100 ft.	
	Warsaw Limestone	100 ft.	
	350 Million years	Ft. Payne Formation	
Devonian	Chattanooga Shale	25 ft.	Shallow, anoxic marine basin; fine land-derived clay.
410 Million years			
Silurian	Rockwood Formation	600 ft.	Barrier islands and lagoons, with silty and sandy slope and platform deposits.
430 Million years			
Ordovician	Shellmound Formation	150 ft.	Shallow marine shelf passing eastward into tidal flats; land derived and alluvial carbonates.
	Leipers Limestone	30 ft.	
	Inman Formation	60 ft.	
	Chickamauga Supergroup		
	Nashville Group	600 ft.	
455 Million years	Stones River Group	900 ft.	
Cambro-Ordovician	Knox Group		Shallow marine and tidal flat carbonates.
	Mascot Dolomite	400-600 ft.	
	Kingsport Formation	250 ft.	
	Chepultepec Dolomite	1200 ft.	
500 Million years	Copper Ridge Dolomite	1000 ft.	
Cambrian	Conasauga Group	2000 ft.	Alluvial deposits grading northeastward into shallow marine tidal flats; land-derived silt and sand together with carbonate deposits.
	Rome Formation	1000 ft.	
600 Million years			

Figures 3, 4, and 5.

During the Ordovician period some 450 million years ago, the environment shifted gradually from a muddy sea bottom to shallow platform on which the thick carbonate beds of the Knox Group were deposited. The trilobites and brachiopods of the Cambrian seas were joined by bryozoa, mollusca, algae and other marine organisms. Ordovician rocks contain fossil communities which show the same relationship to each other and to various sediments as do their modern counterparts. Finding such ancient communities of organisms whose ecological requirements can be duplicated in modern seas indicates similar conditions in the past (See figure 3).

During the Ordovician period the shoreline continued to shift back and forth and the Chickamauga rocks represent an ancient tidal flat. Brachiopods, bryozoa and cephalopods became the dominant life forms during this interval. Although the rock units represented in this area are thousands of feet thick, the evidence is that at no time were the seas deep. From the depositional features of the rocks and the nature of the fossils, it appears that the great thickness is a result of the gradual filling of a slowly subsiding ocean basin.

VOLCANOES OUT OF THE PAST

About 455 million years ago, the eastern portion of North America was subjected to volcanic activity. From the Tennessee highlands to the east of Chattanooga a series of volcanoes burst forth. Ash from the volcanoes was carried westward by the wind and dropped into the Ordovician seas around Chattanooga. Several the thin clay-rich layers formed by the alteration of the volcanic particles can be seen in local exposures along the lower slopes of the western side of Missionary ridge. These ash layers, or bentonites, are easily recognized within a limestone sequence by their yellowish green color. With subsequent weathering, the limestone directly beneath each ash bed was replaced by silica leached from the overlying ash to form a thin bed of dark green chert. Because each layer was deposited everywhere at the same time, these beds provide excellent time markers. By Late Ordovician time, the volcanic activity to the east had sub sided. Marine deposition became restricted by the early Silurian to a series of isolated basins. These basins contained bacteria which actively precipitated iron-rich sediment. The resulting seams of iron provide the ore for the steel industry in Birmingham, Alabama, and were important in the early industrialization of Chattanooga.

CORAL REEFS AND COAL SWAMPS

The rocks indicate that throughout the remainder of the Paleozoic Era the seas periodically advance and retreated across the Chattanooga area. During the Devonian period, about 375 million years ago, the sea became stagnant and enclosed to the extent that a blanket of black mud was spread across the sea floor. The stagnant nature of this water greatly reduced the number of organisms. The blanket of black mud covers most of what is now the southeastern United States and is called the Chattanooga Shale. In his Chattanooga Folio, (1891), C. W. Hayes named it the Chattanooga Shale and described it from exposures at Cameron Hill in downtown Chattanooga.

At the beginning of the Mississippian period there was a gradual change in the environment from that of a restricted seaway to that of a shallow, warm, open ocean, somewhat like the modern Bahamas. Limestones rich in fossils, including corals and sea lilies, were deposited. Features characteristic of shallow water deposition are common.

The shoreline began to fluctuate again and the carbonate sequences of the Mississippian gave way to shale which in turn was overlain by a series of off-shore barrier bars, deltas, and channel sandstones (Figure 4). Landward from this shoreline were vast swamplands dominated by large scaley-barked trees and ferns. These swamps also contained primitive reptiles, amphibians, snails and gigantic insects. As the vegetation fell into the swamp it was protected from decay by rapid burial and stagnant water. In time, the wet mat of plant debris was transformed into thick deposits of peat. With further compaction, and the gradual escape of the more volatile materials from the plant tissues, the peat slowly changed into coal. Increasing pressure and compaction, the result of deep burial, gradually increased the carbon content of the coal. In the area, there are many coal seams which average three to four feet in thickness. Therefore, tremendous quantities of plant material must have been present, for the ratio of thickness of uncompacted peat to coal is about 10 to 1.

MOUNTAIN FORMATION

At the close of the Paleozoic Era, about 220 million years ago, great compressive forces acted upon the rock strata, which had been accumulating for nearly 400 million years in the shallow, slowly subsiding trough known as the Appalachian Geosyncline. Folding and subsequent uplift formed a series of parallel folds and faults over much of the area (Figure 5). For the next 200 million years this area was subjected to intense weathering and erosion by running

water. A mighty river, now named the Tennessee, flowed over this surface and slowly began to carve out such prominent landmarks as Lookout and Signal Mountains and Missionary Ridge. As the emerging land surface was elevated the river became trapped where it had flowed across a portion of the Cumberland Plateau. This formed a water gap through Walden Ridge at Chattanooga. This gap provided easy access and was the major reason for the selection of this site as a town by the early settlers.

EARLY DEVELOPMENT OF DOWNTOWN CHATTANOOGA

PERIODS OF GROWTH

The earliest buildings in downtown Chattanooga built before the Civil War were constructed entirely of wood. During the war there were many temporary structures. A lack of capital during the reconstruction days seriously limited the growth and development of the downtown area. One of the earliest stone buildings was The Old Stone Church which was built in 1882 at the corner of McCallie and Georgia Avenues. The first brick structure was built in 1887. In the period before 1900 builders, hampered by a lack of adequate transportation, relied almost entirely on local stone. The Adams Block (1890), Second Presbyterian Church (1891) and the Dome Building (1892) are examples of the earlier uses of local stone.

Around 1900, rail connections had been established northward from Chattanooga, and many of the buildings during the next decade reflect the use of the more massive load-bearing stone from Indiana. The Old Post Office and City Hall were completed during this period.

For the next twenty years (1910 - 1930) construction in downtown Chattanooga made extensive use of terra cotta. The Maclellan Building, James Building, Chattanooga Bank Building, and the Electric Power Board were all built during this time.

After 1930, new construction in the downtown area used numerous types of natural stone from many parts of the country as well as from foreign sources. In the early years natural stones were used in a load-bearing capacity, but the modern trend has been to use natural stone only as exterior or interior panels. In the past few years there has been an increasing use of natural stone in pre-cast aggregate panels. The Chattanooga-Hamilton County Bicentennial Library and the Krystal Building are prime examples of this type of construction. Several of the buildings presently under construction (1979) also employ precast aggregate panels.

A major force in the development of downtown Chattanooga was R. H. Hunt who, for some 40 years, was the most widely known architect in the South. Numerous buildings in the city are his creations: the Hotel Patten (now Patten Towers), the Chattanooga Bank Building, Memorial Auditorium, City Hall, the Federal Building, Maclellan Building, James Building, Hamilton National Bank (now First Tennessee), and the Hamilton County Court House.

SOURCES OF STONE

Much of the early stone used in the construction of buildings in Chattanooga came from one large quarry located practically in the center of town. The Stone Fort quarry was located along 11th Street and extended east from Market Street past what is now Newby Street. The old photo taken around 1892 shows the Stone Fort quarry in operation (Figure 6). A narrow-gauge railroad was used to move the blocks from the quarry site. The major portion of the stone came from eastward-dipping beds of Chickamauga Limestone which formed a prominent hill just southeast of downtown Chattanooga. The height of the quarry face exposed in the hill can be estimated from the top floor of the Post Office and Court House at 11th and Lindsay visible in Figure 6. To the left edge of the picture is a corner of the Plaza Hotel, still standing on Market Street at Georgia Avenue.

Nearly all of the stone which was removed from the Stone Fort site consisted of a dense, light-gray, limestone with numerous fossil fragments. These middle Ordovician limestone beds are a portion of the Chickamauga super group which was named for exposures along Chickamauga Creek in north Georgia.

From the time of the Civil War through to the early 1900's, the Stone Fort quarry was the major source of building stone for downtown Chattanooga. Examples of its use can still be seen in the walls around The University of Tennessee at Chattanooga (Figure 7) and the Hamilton County Court House. The entire facade of the buildings in the Adams Block on the east side of 7th Street between Georgia Avenue and Cherry Street came from this quarry. One of the most impressive examples of the use of this stone is at the entrance to the Confederate Cemetery on East 5th Street across from UTC (Figure 8). It was built in 1901.

During this same period stone was quarried on the Joshua Beck farm across the river in what is now North Chattanooga. The old quarry site is just behind the present location of the Chattanooga Golf and Country Club. This stone, which is from the Pond Springs Formation of middle Ordovician age, furnished foundations for numerous downtown buildings. It is best preserved in the tower of the Old Stone Church at the corner of McCallie and Georgia Avenues. The original church was completed in 1885. All the stone was brought across the river by ferry, since the Walnut Street Bridge was not opened until 1890. Much of the stone from the original structure has been reworked into the parking area which occupies the site of the old sanctuary.

In 1890 sandstone from Sewage, Tennessee, on the Cumberland Plateau, was used in the construction of the Second Presbyterian Church at the corner of 7th and Pine Streets.

Around the turn of the century transportation facilities had improved a great deal and the demand for building stone had increased. To meet the increased demand, limestone of

Figures 6, 7, and 8.

Mississippian age (about 345 million years old) from Bedford, Indiana, was shipped in by rail. One of the first buildings constructed of Bedford Limestone was the Old Post Office and Custom House on East 11th Street. It was begun about 1890 and the final addition completed in 1909. It was soon followed by the construction of City Hall in 1908 and the Hamilton County Court House at Fountain Square in 1913; both structures are also composed of Bedford Limestone.

CHATTANOOGA'S FIRST GLASS BUILDING

The Melton Building, which is located at the corner of 8th and Broad Streets, is a most unusual structure. The lower floor was constructed from a very friable red sandstone from Southern Ohio, while the upper two floors are of brick. In the basement of this building are a series of large arched windows which extend along the Broad Street side. Most of the windows have been bricked up but several are still visible. The present Melton Building was built sometime around 1890, but the foundation indicates that a previous structure once occupied this site. Records indicate that indeed a most unique building was once located on the corner of 8th and Broad Streets. Today we are impressed with the all-glass Blue Cross building at 801 Pine Street, but in 1880 Percy C. Wilson, a local plate glass retailer, built his Glass Store on this site. The building was four stories high, and along the 8th and Broad Street sides consisted entirely of plate glass. Each of the upper stories had a full balcony, and the basement extended under the entire building. In order to assure adequate illumination in the basement, Mr. Wilson excavated the area in front of the basement covered the space with a glass paneled sidewalk. This procedure allowed light to enter through large windows in the basement which opened out under the glass sidewalk. This site which has on occasion been cited as an example of "Underground Chattanooga" was nothing more than a building with a glass sidewalk. This glass business flourished in Chattanooga until March 1886 when flood waters reached a depth of over 10 feet along Broad Street and the floating debris apparently destroyed the Glass Store.

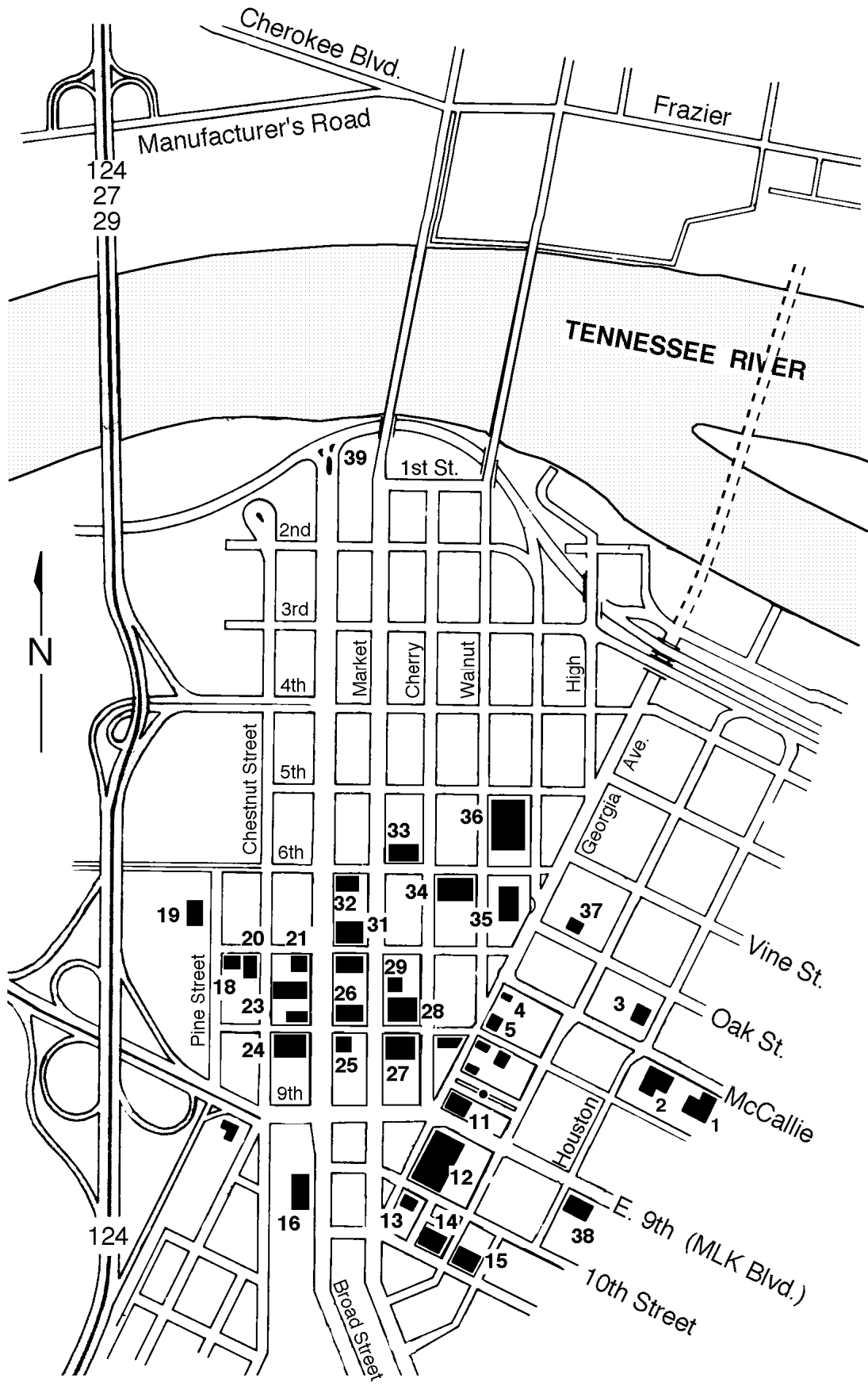
TABLE VI — GEOLOGIC TIME CHART

Geologic age		Time Millions of years	Major events
Ceno- zoic	Quaternary	0	Carving of Tennessee Valley
	Tertiary	50	Italian travertine deposited
Mesozoic Era	Cretaceous	100	Italian and French marble formed
	Jurassic	150	
	Triassic	200	Uplift of Appalachian Mountains
Paleozoic Era	Permian	250	Georgia granites formed
	Pennsylvanian	300	Tennessee and Alabama sand- stone deposited
	Mississippian	350	Bedford Indiana and Alabama limestone formed
	Devonian	400	
	Silurian	450	Virginia shales changed to slate
	Ordovician	500	Deposition of Tennessee "marble" Vermont marble formed
	Cambrian	550	
Precambrian		600	Canadian and North Carolina granites formed
		3500	Formation of Minnesota granites, Bushveld Complex ("Black granite"), Morton gneiss formed

The following map gives the location of the various buildings selected for study on our field trip. The numbers on the map correspond to the numbers in the text and are also keyed to the photographs. The total walking distance is about three miles. Plan to allow at least half a day if you want to make the tour at one time.

Numbers 1-37 are all in the general area bounded by McCallie Avenue, Chestnut and 5th Streets. The South Central Bell building on East 9th Street (number 38) and Ross's Landing near the Market Street Bridge (number 39) can best be reached by automobile.

- | | |
|-------------------------------------|---------------------------------|
| 1. First Presbyterian | 21. Fowler Brothers |
| 2. Interstate Life and Accident | 22. Maclellan Building |
| 3. First Centenary United Methodist | 23. James Building |
| 4. Old Stone Church Tower | 24. Pioneer Bank |
| 5. Dome Building | 25. Melton Building |
| 6. North American Royalties In | 26. Chattanooga Bank Building |
| 7. Sts. Peter and Paul | 27. Lovemans |
| 8. Adams Block | 28. American National Bank |
| 9. Ross Hotel | 29. Eckerd Drugs |
| 10. War Memorial | 30. First Tennessee Bank |
| 11. Volunteer State Life | 31. Miller Brothers |
| 12. Federal Building | 32. First Federal |
| 13. Emerson Building | 33. Electric Power Board |
| 14. Old Post Office | 34. Criminal Justice Building |
| 15. City Hall | 35. Hamilton County Court House |
| 16. Bicentennial Library | 36. Provident Life and Accident |
| 17. Downtowner Motor Inn | 37. Department of Education |
| 18. Second Presbyterian | 38. South Central Bell |
| 19. St. Paul's Episcopal | 39. Ross's Landing |
| 20. United Bank it | |



1

FIRST PRESBYTERIAN CHURCH

554 McCallie Avenue

The First Presbyterian Church was designed by Stanford White of New York and built in 1910 along pure Roman Architectural lines. The giant Ionic columns and steps are solid Georgia marble and the sculptured and richly ornamental friezes are composed of fine Italian marble. The front steps and the wall on the east side of the Sanctuary consist of Georgia (?) granite.

2

INTERSTATE LIFE AND ACCIDENT

540 McCallie Avenue

Built in 1951, the upper five floors of the Interstate Life and Accident Building are of Bedford Indiana limestone. The first floor is composed of Morton Minnesota "swirl granite" or granite gneiss. Radiometric analyses have indicated that this stone is 3.5 billion years old. The interior lobby is greenish banded Pearl Danby marble from Danby, Vermont; doorways and base trim are dark green serpentine, called Verde Antique "marble" from Vermont; steps and floor of the lobby are gray strolitic Tennessee marble. The wall along McCallie Avenue consists of light gray Ordovician limestone from the Stone Fort Quarry. Interior panels around the elevators in the new wing completed in 1975 are Italian travertine. The fountain in the lobby is made of Morton gneiss with a background of white Georgia marble.

3

FIRST CENTENARY UNITED METHODIST CHURCH

401 McCallie Avenue

First Centenary United Methodist Church, built in 1972, was designed by Harold Wagner. The exterior consists entirely of ever textured light gray oolitic lime stone from the Rockwood quarry near Russellville, Alabama. Close inspection of these vertical slab shows abrupt changes in grain size. The adjoining Kate Lyle West Chapel built in 1951 from Bedford Indiana Limestone has begun to show some evidence of weathering as the result of exposure to the elements and the effect of pollution. A new educational wing completed in 1978 also consists of Alabama limestone.

4

OLD STONE CHURCH

McCallie and Georgia Avenue

The Old Stone Church was built in 1882 from Chickamauga Limestone. Parking lot walls contain portions of the stone from the original sanctuary which was demolished in 1977. The sandstone pillars around the doorway are much more resistant to weathering than the steps and trim which are composed of oolitic limestone. The original quarry was located on the Beck Farm in North Chattanooga, just behind the Chattanooga Golf and Country Club. Since the Walnut Street bridge was not completed until 1889, the stone had to be brought across the Tennessee River on a barge.

5

DOME BUILDING

East 8th and Georgia Avenue

Designed by D'Lemos and Cordes of New York, it was purchased by North American Royalties Inc. in 1970 and completely refurbished into a modern office building in 1978. Lower floor consists of light brown, very fine-grained silty dolomite which closely resembles some of the strata found locally in the Sequatchie Formation of Ordovician age. The original color of the stone is not visible as it has been covered by a gray sealer. The entrance way has been decorated with a distinctive light colored Italian Marble called Dolcetto Perlato. The Dome Building was completed in 1882 by Mr. Adolph S. Ochs and used to house the Chattanooga Times.

6

NORTH AMERICAN ROYALTIES INC.

200 East 8th Street

The exterior of the North American Royalties Inc. consists of Bedford Indiana limestone. A splendid example of Greek Renaissance architecture, it was designed by R. H. Hunt and was built in 1904 as the Carnegie Building which for 15 years housed the Chattanooga Public Library. It was purchased in 1969 by NAR and converted into by a modern office facility.

7

STS. PETER AND PAUL'S CATHOLIC CHURCH

214 East 8th Street

Cornerstone as well as altars of Sts. Peter and Paul's are polished Tennessee pink "marble". Basement wall is composed Chickamauga Limestone from the Stone Fort Quarry. Arches and doorways are Bedford Indiana limestone. Designed in 1962 by the New York Architect Elliott L. Chisling. A ledge of light brownish siltstone can be seen near the base of each pillar.

8

ADAMS BLOCK

7th Between Georgia Avenue and Cherry Street

The entire Adams block is faced by limestone quarried from the Chickamauga Super group of Middle Ordovician Age. It was built around 1890 from stone quarried in the Stone Fort Quarry located just east of Market Street in downtown Chattanooga.

9

ROSS HOTEL (and YESTERDAY'S RESTAURANT)

816 Georgia Avenue

The Ross Hotel was built in 1925. The lower corner of the restaurant is faced with permastone — an imitation "sandstone" which was installed about 1965.

10

WAR MEMORIAL

Patten Parkway

The War Memorial on Patten Parkway, Hamilton County's tribute to those who died in World War II, was designed by architect Harrison Gill and dedicated in 1950. It consists of blocks of light gray Georgia granite with walls and steps of 300 million-year old Pennsylvanian sandstone from Crossville, Tennessee.

11

VOLUNTEER STATE LIFE

9th and Georgia Avenue

The base of the outside pillar of the Volunteer State Life Building are composed of Swedish Blue Pearl granite or anorthosite. The interior walls are paneled in pink Tennessee "marble" with borders of Sienna Italian marble. The dark irregular lines, which are so prominent in the panels of Tennessee "marble", are called stylolites and are the insoluble residues left over as the rock dissolved irregularly along and across the bedding planes.

12

FEDERAL BUILDING (Post Office)

Georgia Avenue

Designed by R. H. Hunt in 1937 who utilized a wide variety of natural stone in the building. The exterior walls of the Federal Building are of White Cherokee Georgia marble over a base of 300 million year old Stone Mountain granite. The carved eagles near the entrance, as well as the steps, are also Stone Mountain granite. Dark gray St. Laurent "marble" from southern France forms the columns in the main lobby as well as the base on every floor. The walls in the main lobby as well as along the stairways are panels of brownish gray Ste. Genevieve golden vein "marble" from Missouri. Fossil remains of bryozoans and coral are visible throughout this stone. The 3rd and 4th floors are lined with pink Tennessee "marble" from Knoxville. Large fossil cephalopods can be seen in these polished sections. The stairs and reinforcement around each doorway are deep green serpentine, which is commercially called Verde Antique "marble" from Vermont. Floors are composed of terrazzo.

13

EMERSON BUILDING

100 Georgia Avenue

The Emerson Building was built in 1957 near the site of the Stone Fort Quarry. The exterior is paneled in a course-grained granite porphyry from Minnesota. The interior walls consist of pink Tennessee "marble" from Knoxville. Stylolitic seams are very evident in the marble.

14

CITY HALL

100 East 11th Street

Completed in 1908, City Hall has a classic style and Grecian columns which reflect the taste of its designer R. H. Hunt. The exterior is faced with Bedford limestone from Indiana. The steps are Stone Mountain granite and the interior walls are decorated with pink Tennessee "marble". On the opposite corner from City Hall is the Pound Building. Since it is an all brick structure, it was not included in this study; however, it is worthy of mention because of its unusual nature. The Pound was the city's first skyscraper. Built in 1906, it is eight stories high and was built without steel reinforcements. It consists entirely of brick and is one of the nation's tallest all-brick structures. Tennessee "marble", with numerous stylolites can be seen along the entrance way.

15

OLD POST OFFICE

31 East 11th Street

Construction of the Post Off began in 1890. The final addition was completed in 1909. Built completely from Bedford Indiana hr stone, it is a classic example of the Richardsonian Romanesque school of architecture. The steps and trim are composed of Tennessee "marble" and show the wearing effect of time.

16

CHATTANOOGA-HAMILTON COUNTY BICENTENNIAL LIBRARY

1001 Broad Street

Aggregate panels consisting of crushed Georgia marble and Tennessee Crab Orchard sandstone form the exterior of the new Chattanooga-Hamilton County Bicentennial Library. The floor of the entrance way is paved with Virginia slate. Designed by Derthick and Henley, the library was completed in 1976.

17

DOWNTOWN MOTOR INN

901 Carter Street

The exterior wall of the Flaming Sword Restaurant constructed 1965 is composed of native sandstone from Signal Mountain. The same type of stone can be seen piled in front of the City Park Garage.

18

SECOND PRESBYTERIAN

700 Pine Street

Dedicated in 1891, Second Presbyterian Church is of Gothic design. This structure consists of native sandstone from Sewanee, Tennessee. Some individual blocks show inclined bedding which was formed by sand deposited on an ancient beach. The Educational Building, which adjoins the sanctuary, has Indiana Bedford limestone as trim. The main sanctuary was designed by R. H. Hunt.

19

ST. PAUL'S EPISCOPAL

905 West 7th Street

Built in 1886 and designed H. Halsey Wood of New York, St. Paul's characterizes early English architecture. The base of the Saxon Tower is composed of limestone from the Stone Fort quarry. Steps and walls are capped with oolitic Bedford Indiana limestone. Stone used in the construction of the Key-Anderson Hall, built in 1978, was recycled from the stone used in the Old Stone Tower.

20

UNITED BANK

701 Chestnut Street

First floor exterior of the United Bank consists of granite gneiss or Minnesota "Swirl Granite" from Morton, Minnesota.

21

FOWLER BROTHERS

701 Broad Street

Built in 1890, Fowler Brothers was extensively remodeled in 1939. At that time a facade of Belmont Rose granite from Peter-borough County, Ontario, Canada, was added over the original brownish sandstone from Northern Ohio which is still visible on the upper three floors.

22

MACLELLAN BUILDING

721 Broad Street

The Maclellan Building was built in 1924 to the design of R. H. Hunt. The interior is finished in light gray stylolitic "marble" from Knoxville, Tennessee and pink Tennessee "marble" in the doorway. Exterior is terra cotta.

23

JAMES BUILDING

735 Broad Street

Designed by R. H. Hunt and Company in 1907, the James Building was the first modern office building constructed in Chattanooga. The entrance ways contain brownish red carnelian granite from Milbank, South Dakota, while the interior is finished in Manposa Danby Clouded Vermont marble. The dark streaks in the marble are due to small grains of biotite.

24

PIONEER BANK

801 Broad Street

The Pioneer Bank Building was completed in 1962. The exterior is dark-gray granodiorite or Cold Springs Minnesota "granite". Several large xenoliths or exotic areas are visible in the polished surface. The interior of the bank makes extensive use of light brown Italian Travertine "marble". Pillars are composed of white Grecian marble. Floors are made of a marble chip terrazzo.

25

MELTON BUILDING

The Melton Building (now Figgy's Sandwich Shop) was built around 1886 on the site of the old Glass Store. The original sandstone is very friable and has been covered by paint to reduce the rate of erosion and weathering.

26

CHATTANOOGA BANK BUILDING

11 West 8th Street

The base of the Chattanooga Bank Building is composed of Minnesota Diamond pink granite, but the major part of the structure is finished in terra cotta. Entrance way on Market Street is white Georgia marble, while the interior walls are lined with Tennessee "marble". Dark, wavy, strolitic seams are very prominent. Floors are terrazzo.

27

LOVEMANS

800 Market Street

The facade of Lovemans is made of Granux, a synthetic granite, which is one of the more natural types of imitation stone. The best clue for the recognition of imitation stone is that the stones are all alike; natural stones are never all alike.

28

AMERICAN NATIONAL BANK AND TRUST COMPANY

736 Market Street

Established in 1912, the American National Bank, moved to this site in 1915. A modern building was constructed in 1928 and was replaced by the present structure in 1968. The lower two stories contain flame-finished gabbro or dark "granite" from Wisconsin. Interior pillars are white Alabama marble. Highly fractured dark green Vert Tinos marble from Greece in the lobby staircase, and light brown Italian travertine, form the interior walls. The floors are marble-chip terrazzo.

29

ECKERD DRUGS

710 Market Street

Built around 1882, this structure originally served as headquarters for the C. N. Snow Stove and Tinware Company. Front portion consists of unpolished blocks of Georgia marble.

30

FIRST TENNESSEE BANK

701 Market Street

A modern office building was erected by the Hamilton National Bank on this site in 1905. The present structure was completed in 1966. It consists of Opalescent Minnesota "granite", really a quartz monzonite. The distinct large crystals clearly visible in the polished surface are plagioclase feldspar which makes up almost half of the rock. The lobby floor is made of Tennessee "Crab Orchard" sandstone. Interior panels near the elevators on the upper floors consist of white Alabama marble.

31

MILLER BROTHERS

629 Market Street

Remodeled in 1967, the facade of Miller Brothers exhibits anorthosite or Cold Spring Green "granite" from Sable Falls, New York, as well as a light-colored pegmatitic granite from Rockville, Minnesota. Slabs of Tennessee "marble" can be seen along the walls at the entrance.

32

FIRST FEDERAL

901 Georgia Avenue

Designed by Derthick and Henley, First Federal makes use of panels of white Georgia marble on the exterior as well as interior surfaces. This building was completed in 1978.

33

ELECTRIC POWER BOARD

537 Cherry Street

Built in 1940 the Electric Power Board Building exhibits one of the least attractive uses of the imitation stone terra cotta.

34

CRIMINAL JUSTICE BUILDING

5th and Walnut Streets

Completed in 1976 the upper floors of the Criminal Justice Building are of light gray oolitic limestone from Russellville, Alabama. The lower three floors are gabbro or black "granite" from the Transvaal in South Africa. The lobby floor and steps consist of a light gray Georgia marble.

35

HAMILTON COUNTY COURT HOUSE

Fountain Square

Designed by R. H. Hunt (1913), the exterior of the Hamilton County Court House consists of Bedford Indiana limestone. The walls around the building are limestone from the Stone Fort Quarry. Interior walls are pink and gray stylolitic Tennessee "marble", while the fake pillars consist of gypsum, glue, and coloring matter forming an imitation marble called Scagliola. Although they look like real marble, these imitation marble columns are badly cracked and slightly discolored.

36

PROVIDENT LIFE AND ACCIDENT

Fountain Square

Designed by Otto Eggers and Daniel Higgins of New York City, the original east wing of the Provident Building was completed in 1972. The newer west wing was added in 1976.

The exterior consists almost entirely of White Cherokee Georgia marble. The retaining walls and steps are gray granite from Mt. Airy, North Carolina, while the basal trim of the building is Tidal Gray granite gneiss from Lithonia, Georgia. Tennessee River rock is used in the front walks. The lobby contains a base of dark gray St. Laurent marble from Southern France. The entrances are lined with highly fractured serpentine or dark green Monte Verde "marble" from the Italian

Alps. Some of the private rooms contain Pink and Gray Georgia marble. The lobby area also has a greenish Vermarco Light Cloud marble from Vermont and terrazzo floors.

37

DEPARTMENT OF EDUCATION

319 Oak Street

The Hamilton County Department of Education has a base and arches of Bedford Indiana Limestone while the entire facade consists of blocks of pink sandstone from Sand Mountain, Alabama. The building was constructed in 1929 as a part of the original First Baptist Church. The main sanctuary was demolished in 1968. Cavities in the sandstone are the result of the incorporation of softer materials like shale or coal into the sediment which later weathered out leaving voids.

38

SOUTH CENTRAL BELL

East 9th Street

The new communications center of South Central Bell makes extensive use of slabs of 300 million year old "Congaree Granite" from the Liberty Hill pluton at Kershaw, South Carolina. The upper part of the building consists of concrete aggregate panels. The architects were Saggus, Vaught, and Spiker of Atlanta and it was completed in 1973.

39

ROSS LANDING

Paving blocks used along the landing are cobble stones which consist of Georgia granite from Stone Mountain, Georgia.

ADDENDUM

No attempt was made to include all the major buildings in the downtown area. The ones selected were chosen on the basis of the variety and types of natural as well as synthetic building materials. In case your favorite building did not receive proper attention in the walking tour you may find it in the list which follows.

CIVIC FORUM

Market and Broad at Tenth (1979)-Derthick and Henley-Precast concrete slabs of Alabama river gravels.

KRYSTAL BUILDING

100 West Ninth (1978) - Selman T. Franklin - Precast concrete slabs of North Carolina river gravels.

TVA FEDERAL CREDIT UNION

715 Market (1978) - Derthick and Henley - Precast concrete slabs of South Carolina river gravels.

READ HOUSE

West Ninth (1926) Holabird and Roche of Chicago - Terra Cotta with sections of Minnesota granite. On the Chestnut Street side are panels of Italian travertine. Normally because of its characteristic softness and porous nature the use of travertine is confined to interior surfaces.

TIVOLI THEATRE

709 Broad 1(1921) - C. W. and George L. Rapp of Chicago - Terra cotta. The only natural stone is in the box office which contains white marble over green verde antique.

PATTEN TOWERS

1 East 11th (1908) - P. H. Hunt -Pressed Brick over white Georgia Marble.

DETAILED DESCRIPTIONS OF CHATTANOOGA'S BUILDING STONES

IGNEOUS ROCKS

GRANITE

Georgia

The carved eagles at the entrance to the Federal Building, the steps of City Hall, and the cobble stones used in the paving of Ross Landing consist of Stone Mountain granite. This granite is light gray, oligoclase, microcline, and muscovite, along with minor amounts of dark biotite. Minor accessory minerals include zircon, apatite, epidote, and garnet. Mass spectrometer measurements made at Oak Ridge National Laboratory indicate that the granitic magma crystallized a minimum of 290 million years ago (Late Paleozoic). Subsequent cooling, uplift and erosion brought the granite to the surface. There is little variation in the composition of the granite except for an occasional tourmaline-rich pod.

North Carolina

The retaining wall and steps around the garden area in front of the Provident Life and Accident Building are composed of the medium-grained, light gray Mt. Airy granite. The small black specks are the dark variety of mica (biotite), known as a biotite granite. The major part of the stone is composed of light gray to white orthoclase feldspar. Bluish-gray crystals are quartz. The Mount Airy granite was formed as a part of the Southern Appalachian Piedmont about 400 hundred million years ago. The quarry is located along U.S. 52 in a massive, 75-acre dome near Mt. Airy, Surry County, in the western Piedmont of North Carolina. The stone is a light-gray color and contains around 30 percent each of orthoclase and plagioclase along with 26 percent of quartz. Some of the dark streaks reflect small concentrations of biotite. Because the molten rock cooled very slowly the stone has attained a uniform color and quality, valuable properties which make it a widely used construction material.

Minnesota

The Precambrian rocks of the Canadian Shield are extensively quarried in Stearns County, Minnesota. In this area of Central Minnesota, Precambrian crystalline rocks occur under a thin veneer of unsorted debris left by the ice sheets, called glacial till. Most of the present production is centered around the town of Cold Spring which is the home of the Cold Spring Granite Company, one of the country's largest and most diversified suppliers of natural building stone.

The Diamond Pink granite is a porphyritic (crystals of two distinct sizes) granite. The orthoclase feldspar crystals (or phenocrysts) may be as large as two or three inches across. Minor amounts of hornblende and biotite give the stone a "peppered" appearance. The quarry is located northeast of Cold Springs toward the town of St. Cloud. The basal trim around the Chattanooga Bank Building consists of polished slabs of Diamond Pink granite.

South Carolina

Quarried in Kershaw County, South Carolina, the Liberty Hill granite quarried near Flat Rock is one of the finest dimension stones in the South. This light-gray, course-grained granite is widely used in the monumental and building industry. Under the microscope, this stone contains microcline and untwinned potassium feldspar. Some of the crystals show distinct marginal zonation. The darker minerals include large biotite, some which are partly altered to chlorite. Well-formed crystals of apatite, zircon, and amphibole are also present in minor amounts. This crystallized 300 million years ago. The South Central Bell communications center on East 9th Street is almost entirely faced with this stone.

South Dakota

This Precambrian granite is part of a belt which extends from Milbank, Grant County, South Dakota southeastward along the valley of the Minnesota River. The stone was exposed by the scouring effect of meltwater during the last great -ice age within the last million years. This pink granite has been used around the entrance to the James Building.

Canada

Belmont Rose granite is quarried in Belmont Township, Petersborough County, Ontario, Canada. This granite is composed primarily of medium-grained pink feldspar crystals with smaller amounts of quartz and biotite. The stone is produced from a massive deposit and exhibits

uniformity in both texture and color. When Fowler Brothers remodeled in 1939 this stone was used as an exterior facade. This is a very ancient rock formed in Precambrian time, over a billion years ago.

GRANODIORITE

Minnesota

A granodiorite is very similar to a granite except that there is usually 20 percent of quartz in the rock and the plagioclase feldspar content exceeds the orthoclase feldspar. Biotite and hornblende give the dark color to the stone. The exterior of the Pioneer Bank consists entirely of Charcoal Black "granite", or granodiorite, which is of Precambrian age and is one of several quarries located in Stearns County near Cold Spring, Minnesota.

ANORTHOSITE

Sweden

The distinctive "Swedish Blue Pearl" is quarried along the border between Sweden and Norway. This particular variety of anorthosite is called larvikite. It consists almost entirely of the mineral labradorite, a plagioclase feldspar. The iridescent play of colors is the result of the reflection of light from thin lamellar inclusions within the mineral. The small golden specks are muscovite or phlogophite mica. Superficially, this stone resembles both a marble and quartzite. It has been used on the outside pillars of the Volunteer State Life Building, interior of the American National Bank, and interior base panels in the Provident Life and Accident Building.

New York

The Cold Spring green "granite" which has been used on the facade of Miller Brothers Company was quarried in the Adirondack Mountains of upstate New York near the vicinity of Sabel Falls, New York.

Composed almost entirely of plagioclase, usually a labradorite, it may contain small amounts of pyroxene and traces of dark magnetite or ilmenite can be seen. If highly polished, it may resemble marble, but if the plagioclase crystals are large enough, the characteristic striations on the crystal faces are visible. These fine lines result from twinning in the plagioclase.

GABBRO

South Africa

The so-called "black granite" of the Belfast District of Eastern Transvaal in South Africa is a zone of dark gabbroic or syenogabbro rock quarried about half-way up the main zone of the plutonic phase of the Bushveld igneous complex, a 3.5 billion year old intrusive complex famous for its gold and platinum mines. Microscopically it has been determined that the dark color of the gabbro is primarily due to an abundance of black magnetite needles within the larger plagioclase crystals. Other minerals are usually hypersthene, augite, and biotite. Hypersthene is the most abundant ferromagnesian mineral present and the rock could be designated a hypersthene gabbro or even a norite. The Belfast "black granite" is almost black on a polished surface but appears light gray on a rough one. This property is important for it makes letters on monuments and memorials stand out. The most impressive use of this stone in Chattanooga is on the lower three floors of the Criminal Justice Building.

Wisconsin

Near Mellen, Wisconsin in Ashland County is another type of "black granite". It is marketed under the trade name of Veined Ebony but is an olivine gabbro. It is almost black on a polished surface. It consists primarily of the minerals olivine, hornblende and pyroxene. It is used on the lower two floors of the American National Bank. The rough surface of the stone was caused by a special flame treatment.

QUARTZ MONZONITE

Minnesota

A quartz monzonite is an igneous rock which has all the characteristics of a granite. That is it is composed of visible equigranular crystals of quartz, feldspar and some type of mica. In most granites only one type of feldspar is dominant, usually orthoclase with perhaps small amounts of plagioclase; however, if the granite contains equal amounts of plagioclase and orthoclase it is called quartz monzonite. The opalescent "granite" is produced from the only active quarry in Cold Springs, Stearns County, Minnesota and is used throughout the First Tennessee Bank and the Chattanooga Gas Company, 811 Broad Street.

Another type of coarse quartz monzonite is used as trim on Miller Brothers. The stone is from Rockville, Minnesota, which is also in Stearns County. It contains about 70 percent feldspar, 23 percent quartz and about 7 percent biotite. The quarry is located about 10 miles southwest of St. Cloud. It is a coarse-grained stone consisting of large pale pink crystals of orthoclase in a matrix of black biotite and coarse gray quartz. Because it has widely spaced joints, the stone can be cut into large blocks. When highly polished it takes on a very distinctive appearance

SEDIMENTARY ROCKS

LIMESTONE

Indiana

This stone consists of a uniform light-gray, fine to medium-grained oolitic-limestone of Mississippian age. The quarries are located in the Salem Limestone of central Indiana, which is 50 to 60 feet thick and represents an ancient shallow marine environment. Oolites, which are characteristic of this stone, are small concentric sand-sized grains of calcium carbonate which formed in surge channels of shallow tropical seas. The rock also contains many tiny shells, some whole, but many broken into fragments. Sea lilies, clams, snails, bryozoans and corals are some of the more abundant shells. These shell fragments and oolites were washed out onto high underwater sand banks some 330 million years ago. This vast sea covered much of what is now the Midwest. These small fossil sea creatures and oolitic sands bring features to downtown Chattanooga which can be found today on the sandy beaches of the Bahamas.

The Indiana limestone belt extends some 23 miles from Bloomington to Bedford encompassing a large part of Monroe and Lawrence Counties. Since 1880, Indiana Limestone has probably been used more widely than any stone in the world. The Vanderbilt Mansion, the Empire State Building, Rockefeller Center, Metropolitan Museum of Art and the Pentagon are built of It has been used extensively in Chattanooga as trim on numerous structures and comprises a major part of City Hall, the Old Post Office, and the Old Carnegie Library (now the office of North American Royalties).

Alabama

Southwest of Russellville, Franklin County is a 25- to 40-foot thick deposit of Mississippian oolitic limestone, called the Bangor limestone. The uniform color and grade of the stone results in

part from the fact that the entire quarry operation is underground and thus relatively unaffected by weathering. The present quarry is now under nearly 200 feet of overburden which protects it from discoloration by surface waters. This belt of oolitic limestone extends for some 20 miles from Newburg to Belgreen, Alabama. Quarries in this area have been worked since 1878. Chemical analysis indicates that this limestone is over 99% CaCO₃. It is similar in many respects to the Indiana limestone; however, it is generally coarser grained. In some instances, such as on the First Centenary Methodist Church, small fossil fragments are visible in the quarried face as well as subtle changes in grain size. The upper floors of the Criminal Justice Building show another example of the use of this stone.

Both the Indiana and Alabama limestones are detrital limestones, or calcarenites. They are composed of sand-sized oolites set in a cement of clear calcite. The small oolitic grains have minute shell fragments as nuclei. The stone also may include whole Foraminifera as well as fragments of brachiopods, bryozoans, corals, and crinoids.

One of the major features of these stones is workability. When quarried they are soft and easily carved. Upon exposure to the elements the stone becomes some-what harder and more durable.

Tennessee

Middle Ordovician limestone quarried within the city limits of Chattanooga supplied the needs of the community before 1900. The major source of building stone was the Stone Fort Quarry (Figure 6) which was on the east side of Georgia Avenue between 9th and 11th Streets. The stone from the quarry consisted of Middle Ordovician limestone of the Stones River Group. The rock is light to medium gray, dense, and commonly contains traces of small marine invertebrates including bryozoa, brachiopods, and cephalopods. The stone from this site can be observed in the tower at St. Paul's Episcopal Church, the Adams Block, entrance to the Confederate Cemetery, and the walls surrounding the Hamilton County Court House, as well as many of the retaining walls on the campus of The University of Tennessee at Chattanooga.

Another source of stone was the Joshua Beck farm in North Chattanooga or Hill City as it was then called. The site of the quarry is just behind the present Chattanooga Golf and Country Club. This stone is also of Middle Ordovician age and a part of the Stones River Group. This particular formation known as the Pond Springs is medium-gray and the stone is not as durable as the stone from the Stone Fort quarry. Some of this stone shows traces of a faint pink coloration. Evidence of the silty nature of this stone can be seen in the tower of the Old Stone Church.

Marbles in Tennessee are from the Holston formation which is middle Ordovician age. These deposits consist of coarsely crystalline limestone and are unmetamorphosed. The term marble is applied by architects and builders to a wide variety of natural stones. Commercially most natural

building stone fall under one or two categories: either granite or marble. In the trade the term marble includes those stones that are suitable for polishing and have a pleasing appearance. Travertine (porous limestone), Verde antique -(serpentine) and crystalline limestone are commonly called "marble", but none are related to the geologic use of the term marble.

Geological marble is defined as -a carbonate rock which has been subjected to sufficient deformation and recrystallization (metamorphism) to completely destroy most fossils and sedimentary features. Marbles, used in this sense, also may contain traces of chlorite, mica, tremolite, graphite, or other typical metamorphic minerals.

Quarried from deposits located near Knoxville in Loudon, Blount, Union, and Knox Counties, the Tennessee "marbles" range in color from grayish-white to dark- red. Fossil cephalopods and reef- building bryozoa are abundant and beautifully preserved. Some bed- ding may be obscure so the rock appears massive and uniform, while other beds show cross-bed- ding or thin wavy lines called "crowfeet" which are stylolite seams produced by pressure solution along the bedding planes. Excellent displays of Tennessee "marble" are on the third floor of the Federal Building, the interior of the Hamilton County Court House, Chattanooga Bank Building, and the Emerson Building.

A unique type of fossil can be seen on the third floor of the Federal Building. A cousin of the chambered nautilus, this fossil is a cone-shaped cephalopod. Living members of this group include the octopus, squid, and cuttlefish. These animals inhabited the Ordovician seas some 450 million years ago. Life on earth was dominated by invertebrates: animals without backbones. A small number of fish were present, but there is no evidence to suggest any land plants or 'animals at this time.

Missouri

Extensive amounts of limestone were quarried during the 1920's and 30's from Ste. Genevieve County in southeastern Missouri. The stone is of Mississippian age and contains visible remains of bryozoa and corals. The quarries were operated by Georgia Marble and sold under the name of Ste. Genevieve golden vein "marble." The most impressive use of the stone is in the lobby and along the stairways of the Federal Building.

SANDSTONE

Alabama

Quarries near Flat Rock on Sand Mountain provided sandstone for the original First Baptist Church at the corner of Georgia and Oak Streets. The Educational Building was added in 1929 and now serves as headquarters for the Hamilton County Department of Education. This Pennsylvanian conglomeratic sandstone was a portion of an ancient barrier beach deposit. Waves and currents washed away everything but the grains of quartz sand. An occasional storm brought larger quartz pebbles or even fragments of shale or coal onto the beach. The softer of these materials have later weathered out and left large voids in the stone. The reddish color is due to iron oxide cementing agent which probably was added during a later period of uplift and erosion.

Tennessee

"Tennessee Quartzite", as it is sometimes called, is a medium-to fine-grained sandstone of Pennsylvanian age. The major quarries are located around Crossville. The uniform fine- to medium-grained nature of this stone indicates that it was formed in a low energy environment, probably a lagoon. There are two major colors: brown, found in the upper portions of the quarry; and gray, the natural color of unweathered stone. From a geologic point of view, this rock is a sandstone. Medium-bedded at 2 to 3 inches thick, it is ideal for construction purposes. The major use of this stone locally is in the walls and benches of the Hamilton County World War II Memorial on Patten Parkway, the floor of the lobby of the First Tennessee Bank, and the new Civic Forum.

Ohio

Several of the buildings in the downtown area were built around 1900 from sandstones which have no local counterparts. Extensive research has indicated that the probable source of this sandstone was either Mississippian or Pennsylvanian rocks found in North em Ohio. This sandstone was used in the construction of the upper floors of Fowler Brothers, as well as the Melton Building.

CONGLOMERATE

Tennessee

Conglomeratic sandstone from Sewanee, Tennessee, was used extensively in the construction of the Second Presbyterian Church. This stone consists almost entirely of sand-sized quartz grains set in a silica cement. The numerous cross-beds or inclined beds indicate that it was at one time an ancient tidal delta associated with an off-shore barrier beach. The Sewanee conglomerate is Pennsylvanian aged and upon close inspection you will see numerous small, rounded, white pebbles of quartz which probably accumulated along a migrating beach step or as a large channel fill. The quartz pebbles are highly iron-stained and were most likely derived from a much older and highly metamorphosed terrain to the north and east.

TRAVERTINE

Italy

Although often called "marble", travertine is simply a very pure form of limestone. Thermal spring waters usually contain large amounts of calcium bicarbonate. Upon reaching the surface these waters lose most of the dissolved carbon dioxide (gases) and the calcium carbonate in solution readily precipitates as a thin layer of calcite. Quarried near the village

of Tivoli about 18 miles northeast of Rome, Caho Travertine is widely used throughout the United States. Tivoli, from which we get the name travertine, was the ancient town of Tibur. The Romans enjoyed the sulphur baths of Acque only 5 miles west of Tivoli. Extensive terraces were built around the temple of Hercules Victor, the chief deity of Tibur, and the town was built upon these terraces. During the height of the Roman Empire, Tivoli was a holiday resort for wealthy citizens of Rome. The city also boasts the most intricate gravity-fed water system in the world which still serves the fountains of the Villa d'Este, built in 1550.

Due to the soft and porous nature of travertine it is usually used as interior panels. The American National Bank, Pioneer Bank, and the new wing of Interstate Life have made extensive use of the stone.

METAMORPHIC ROCKS

GNEISS

Minnesota

The Morton Gneiss was used on the Interstate Life and Accident Building and the United Bank. The geological name is taken from the town of Morton in Renville County, Minnesota. "Gneiss" is the name of a common metamorphic rock characterized by broad zones or bands of light- and dark-colored minerals. Most of the bands in the Morton gneiss are decidedly pinkish and are formed primarily of feldspar and quartz. Some crystals of these minerals are several inches in diameter. The darker minerals of finer grain and texture are biotite and hornblende. These four predominant minerals are also the essential mineral constituents of granite, and for that reason the Morton gneiss is referred to as Minnesota Valley "granite" or Minnesota "swirl granite" in recognition of the flamboyantly curved banding of the rock. This feature is commonly taken to mean that the rock at some stage in its history was "plastically" deformed. Possibly some of the banding was induced during emplacement of the rock in a molten or "flowing" condition. On the other hand, the large grains and individual crystals bear evidence of having been somewhat crushed and rolled out.

The most interesting feature of the Morton gneiss is its geologic age. The Morton gneiss is the oldest known rock formation in the entire western hemisphere. Careful radiometric analyses of zircon in the rock have been made by the U. S. Geological Survey and University of Minnesota. These analyses provide an age determination of over 3.5 billion years for the Morton gneiss. Modern estimates of the age of the earth's crust range from 4.5 to 5.0 billion years. Therefore, the Morton gneiss, although surely not part of the primal crust of the earth, is very, very old even in the geological sense. By contrast, the oldest known rock in Tennessee, the Cranberry gneiss, is just over a billion years old.

SERPENTINE

Vermont

Often referred to as "marble", the rock serpentine is a magnesium silicate and may contain dark specks which are crystals of the minerals magnetite, chromite or pyrite. The rock is generally a deep-green color but it is often cut by veins of dark green to black olivine, pyroxene or hornblende and occasional streaks of white, secondary vein quartz. Serpentine commonly occurs

wherever there are large masses of ultrabasic igneous rocks. It is found in layers or lenticular masses in metamorphic regions as the result of chemical alteration of highly magnesian igneous rocks. Distributed under the trade name Verde Antique, this "marble" is quarried at Rochester, Vermont. Because of its superior durability it is often recommended for use in floors, stairs, or even on exterior panels. Its use locally is in the stairs and reinforcement around the door-ways of the Federal Building.

Italy

Quarried on the steep slopes of Mount Aver in the Italian Alps, the Monte Verde "marble" consists of light and dark green serpentine cut by occasional veins of white quartz. The stone displays much of the intense deformation which caused its formation. Angular and brecciated fragments give it a spectacular and distinctive appearance. The lobby of the Provident Building provides an excellent example of this stone.

Greece

A serpentinous "marble" it is mostly dark green with light green and white calcite veins. The stone is quarried on the tiny Greek Island of Tinos which is a part of the Eastern Cyclades. Known as Vert Tinos it is used throughout the lobby of the American National Bank and Trust Company.

MARBLE

Georgia

Georgia marbles characteristically are medium to coarse grained and are of Paleozoic age. Named for their dominant colors, the major types which are quarried near Tate in Pickens County are known as Cherokee, Etowah, Creole, Silver Gray and Mezzotint. Cherokee marble ranges from pure-white to white with light gray veining. Etowah is all pink with varying amounts of green veins. Mezzotint is gray with dark-gray to black veins. Silver Gray is a uniform gray. Creole is white with numerous dark-gray to black veins. The veining (really a layering) is the result of slight compositional differences. The grays and blacks are caused by disseminated grains of sulfides and graphite. Golden brown colors are due to the mineral phlogopite, while greens result from chlorite, biotite, or tremolite. The pillars of the First Presbyterian Church, the exterior of the Provident Building, and the exterior of the Federal Building are examples of the use of Georgia marble.

Vermont

Quarried in Rutland County, Vermont, marble deposits are the sedimentary remains of the shells of small marine animals which were deposited in Ordovician seas some 440 million years ago. Later deformation and hydrothermal (hot water) solutions have altered the original rock so that where originally there were spiral-cigar-shaped gastropods, now only various shapes and sizes of calcite crystals remain interspersed with traces of organic material, thus adding various colors.

Most of the Vermont marbles are medium to fine grained and are produced from an underground quarry located at the town of Danby. As is true of the Georgia types, the Vermont marbles are named for their coloring. The various types of Danby marbles include Plateau (white with gray green streaks), Pearl (grayish white with subtle veins of darker gray and green), Montclair (white with occasional streaks of light tan or gold), Mariposa Clouded (white background with bold streaks and veins of gray-green), and Imperial (almost pure white with faint clouds of tan, gold, or gray). Vermont marbles are widely used in the interiors of the Interstate, the Maclellan, the Provident, and James Buildings.

Belgium

The distinctive Bleu Beige Belgium Marble is quarried near the village of Bioul in the district known as Entre-Sambre-et-Meuse. The formation is nearly 200 feet thick and is quarried on five levels. The dark-gray to black color in the stone is the result of the deposition of large amounts of carbon. Fractures have been filled by pure white calcite. This stone is extensively used as interior trim in the Provident Building.

France

Most of the distinctive dark marble called St. Laurent, which is commonly used around the base of interior walls, as in the Provident Building, is quarried near the village of Laurens in southern France. It is used extensively in the Provident as well as the Federal Building. It is a dark-gray to black stone with scattered white and reddish-gold veins.

Italy

The delicate light-colored Dolcetto Perlato, sometimes called Perlato d'Italia, marble is quarried from the hills surrounding the small Sicilian village of Trapani. This small Mediterranean seaport is about 50 miles southwest of Pa lermo. This Cretaceous-aged marble shows a distinctive texture

created by pearl-like fossil shells interlaced by darker veins. It can be seen in the entrance of the refurbished Dome Building

Greece

Pure white marble used on the interior pillars and walls of the Pioneer Bank is quarried on the small Greek island of Naxos in the Central Cyclades. It is believed to be a place frequented by Dionysos. The island owes its name to Naxos, mythical son of Poseidon.

Alabama

The Sylacauga Marble Member of the Talladega Slate crops out in Talladega County in a northeastward-trending belt which begins at the Coosa County line and extends for a distance of nearly 19 miles through Sylacauga to a point two miles southeast of Sycamore. The stone may be a fine-grained translucent white or cream-tinted with thin layers of green phyllite. The marble is sandwiched between two phyllite beds of Ordovician age. The Commercial Loan Department of the American National Bank, as well as the upper interior floors of the First Tennessee Bank Building, are decorated with white Alabama Marble.

SLATE

Virginia

Thin bedding, durability, and smooth texture make slate an ideal stone for roofs and floors. The entrance to the Chattanooga-Hamilton County Bicentennial Library is covered with slate from Buckingham County, Virginia. Here late Ordovician shales were folded and slightly metamorphosed. This belt of slate extends in a northeast-southwest direction for some 12 to 15 miles. The actual quarry site is located just west of Arvon in northeastern Buckingham County, Virginia.

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