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# WALKING THE FORTY ACRES

BUILDING STONES – PRECAMBRIAN TO  
PLEISTOCENE

UNIVERSITY OF TEXAS  
AT AUSTIN  
GEOLOGY LIBRARY

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Cordova Shell  
Limestone

The University of Texas at Austin  
Retired Faculty-Staff Association

## Foreword

In the course of the 14 stops into which this tour is divided you will be invited to look at quite a variety of building stone. To help sort it all out, five separate charts are provided in this guide:

- Chart I** Map of Stops
- Chart II** Varieties of Stones for each building
- Chart III** Rock types
- Chart IV** Geological time-table
- Chart V** Terra Cotta Plaques on W. C. Hogg Building

It will be useful to bear in mind, at the outset, that most of the buildings on this tour show two main types of building stone (among a dozen or more types in all): granites for the foundations, steps, and entrance walks, and limestones for the wall-facings and trimmings of the upper portions. You will observe from the geological time-table (Chart IV) that the granites are oldest, being separated from the most recent material (travertine) by a billion years. However, all four of the main geological eras are represented.

## The Tour

A leisurely walk on the Forty Acres can bring unusual, impressive thoughts about the age of the stones used to construct the buildings. As shown on the enclosed map, the narrative-sequence is clockwise, starting with the Biology (Botany) Building immediately north of the Main Building. Exterior stones only are dealt with here and these comments are restricted to the original area bounded by what University of Texas students once called the "Perip" -- Guadalupe to Speedway and 21st Street to 24th Street. This is about a one-hour stroll.

**Stop 1.** Biology Building (now housing only Botany) and Painter Hall (formerly the Physics Building, now housing Botany, Home Economics and Computer Science). The bases, entrance steps, and door-sills are made of Pearl Gray Granite (See Chart III for composition, age and source). Above the base of Biology Building are sized blocks of Leuders Limestone, but above the base of Painter

Hall are sized blocks of Cordova Cream Limestone. Although the two limestones look much alike the Leuders is much older, being about three times the age of the Cordova Cream Limestone. The Cordova Cream Limestone is a common building stone on the campus because of the ease of sizing and shaping it and nearness to Austin for quarrying it. Of special interest are the two ornamental medallions of Numidian Red Marble above the north entrance to Painter Hall. This stone may have come from Algeria or Libya but its quarry site and geological age are at present not known.

**Stop 2.** Welch Hall (Chemistry). The original Chemistry Building, erected in 1929, has twice been added to and the last of these additions was completed in 1974. The Cordova Cream Limestone here shows three stages of weathering and you can observe the decreasing prominence of the bedding or lamination from the first building to each succeeding addition. A spray of acrylic and silicone helps retard the weathering and tends to decrease the weathering pattern. The Pearl Gray Granite is used in the base, entrance steps and door sills.

**Stop 3.** Student Services Building, W. C. Hogg Building, and Computer Center. Student Services, which older residents will recall as the Speech/Journalism Building and very old residents will recall as the Civil Engineering Building, was built in 1904. This makes it the oldest among the structures located on the original Forty Acres. The base and window trim is of Cordova Cream Limestone, as are also the frescos high on the building. This relieves the monotony of the gray-yellow bricks which are the chief building material. The south entrance has steps of the Pearl Gray Granite.

When the W. C. Hogg Building (formerly Geology Building) was built in 1933 the specifications called for Pearl Gray Granite for the base. Normally this granite is quarried west of Austin in the Llano region, but a similar granite quarried near Stone Mountain, Georgia, was tendered as the low bid so the base of this building is not of Texas stone. It is almost impossible to detect the difference between the Texas gray granite and Georgia gray granite. The entrance steps and door sills are also made of the Georgia granite. The facing of the building and window trim are made from Leuders Limestone, which does not show the cross lamination and bedding that one sees in the Cordova Cream Limestone.

The cast reliefs around the base of the second floor (Chart V) were applied when the building was designed for and first occupied by the Geology Department. These unique terra cotta plaques include replicas of trilobites, crinoids, corals, dinosaurs, dragon flies, mineral crystals, fish, clams, fossil logs and even the first bird, Archeopteryx. When the new Geology Building was built these plaques were not moved because of lack of funds.

The inscription on the south face of W. C. Hogg Building is a line from Tennyson's poem In Memoriam -- O EARTH WHAT CHANGES HAST THOU SEEN -- applicable not only to Geology but to all the activities involving the University.

The Computer Center has a base of Pearl Gray Granite but the steps on the east side are of coarse-grained Pink Granite (from near Marble Falls, Texas). The main facade of this building is a combination of Cordova Cream Limestone and Cordova Shell Limestone.

**Stop 4.** Waggoner Hall and Garrison Hall are not quite architectural twins but they show identical building stones: Pearl Gray Granite at the base, steps and door sills and Leuders Limestone above to be finished off with bricks.

**Stop 5.** Business-Economics Building and Graduate School of Business are relatively new buildings and show a departure from the Mediterranean styles of Biology, W. C. Hogg, Garrison, and Waggoner Halls. Pink Granite was used in the base and steps of the Business-Economics Building with small amounts of trim in Cordova Cream Limestone. Most of the building is faced with brick. The large pink feldspar crystals are very noticeable in the steps to the building. The wall facing of the Graduate School of Business is the youngest building stone on campus, being Travertine from Tivoli, Italy. The same facing was used on the L. B. J. Library.

**Stop 6.** Batts, Mezes, and Benedict Halls were planned and constructed as connecting parts of a six-unit mall taking its uniform design from the Music Building (now already Old Music Building). All of the buildings on the east side of the main mall have Pink Granite bases, walks, steps and door sills. Cordova Cream Limestone trim and Cordova Shell Limestone are the main wall facings. The uniform

pedestals of the four statues (two Confederate generals, Lee and Johnston, and two Texas political figures, Reagan and Hogg) are made from Pink Granite and Cordova Cream Limestone. The pedestal of the Washington statue is made of Pearl Gray Granite and the Woodrow Wilson and Jefferson Davis statues are on a Cordova Cream Limestone base. These statues facing the mall look down on a vast stream of students passing between classes each day. Likewise the Littlefield Fountain is made from Pink Granite.

**Stop 7.** Old Music Building, Calhoun Hall, and Parlin Hall have exterior walls that correspond to those across the mall to the east. Parlin Hall was originally known as the English Building. These buildings all have Pink Granite bases, steps and entrances with Cordova Cream Limestone and Cordova Shell Limestone above. Calhoun Hall has patio and walks on the ground floor of Vermont Gray, Blue and Purple Slate.

**Stop 8.** Harry Ransom Center is faced mostly with slabs of Cordova Shell Limestone in which displays of the Cretaceous clam Trigonia are outstanding. Small amounts of Cordova Cream Limestone are used as trim. Pink and Pearl Gray Granites are used in the walkways east of the building. This is a good place to view the use of the Cordova Shell Limestone as wall stone around the south, west and northern parts of the Forty Acres.

**Stop 9.** Sutton Hall is one of the earlier buildings, having been built in 1917. ("Early" on the contemporary Forty Acres means prior to about 1930.) It was renovated in 1980 to accommodate expansion in Architecture. The Pearl Gray Granite at the base is overlain with Leuders Limestone and brick above. Pearl Gray Granite was used for the benches on the south side of the building.

**Stop 10.** Battle Hall and West Mall Office Building have Pearl Gray Granite at the base and Cordova Cream Limestone above. Pink Granite has been used for entrances and the steps on the south side of Battle Hall. Battle Hall was first used to house the University Library; since the present Main Building was constructed this building has been given over to various uses such as Graduate School Offices, Music Library, Art Department and History Library.

**Stop 11.** Goldsmith Hall and Texas Union each have Pearl Gray Granite at the base, steps and door sills with Cordova Cream Limestone and Cordova Shell Limestone on the main walls. The patio and walks around the Union Building have slabs of various kinds of stone including Vermont Slate and the northern addition to the Union Building carries on the Cordova Cream Limestone and Cordova Shell Limestone motifs.

**Stop 12.** Hogg Auditorium has materials and general treatment the same as for those buildings in the previous stop.

**Stop 13.** Academic Center and Undergraduate Library (formerly "Harry's Place") was built on the site of the Woman's Building which burned in the late 1950's. This building, really a giant study hall, has a base of black Argentine Andes Granite or California Black Granite for which we have not yet been able to ascertain the age or location of origin of either. The pillars and trim in the fountain have Green Meta-anorthosite and the remainder of the outside stone is Cordova Cream Limestone and Cordova Shell Limestone. The use of the limestone gives a fine effect in the large vertical windows on all four sides of the building.

**Stop 14.** Main Building and Tower (with a place to sit and rest on the south-facing patio). Pearl Gray Granite is used for the base and steps but the main building stone is the Bedford Limestone, one of the most durable building stones found in the United States. The Bedford Limestone is made up of immense quantities of fossil fragments including many tiny rounded Foraminifera called Endothyra baileyi. Some of the trim around the base of the Main building includes walls of Cordova Cream Limestone. While resting in the patio and sitting on limestone benches made of Craig Baker Dark Cedar Limestone you will see that slabs of Edwards Limestone and Crab Orchard Limestone make the floor of the patio. The interior front steps in the center of the building are also Edwards Limestone with large cross sections of a typical Lower Cretaceous fossil known as a rudistid. The wall trim is made from Cordova Shell Limestone. Still another very exciting tour is to visit the interior building stones of these venerable structures.

## Conclusion

Lest we be thought to fancy ourselves the first observers of local building stone, let us recall the experience of Judge A. W. Terrell (of Austin) who in 1895 visited the Holy Land. There he noticed that the limestone quarried at Jerusalem and used for Solomon's Temple "was identical with that used in the Treasury Building in Austin," adding that "since the Savior had selected such a place as Jerusalem to teach and suffer in, even here in Texas one might indulge hope for the future."

Whether or not there are any similar "sermons in stones" from what you have seen on this brief tour, the experience has offered you a quick introduction to the oldest branch of commercial geology (as witness Judge Terrell's comment). Pyramids, palaces, and temples -- stables, huts, and granaries -- all were built millennia ago from these same materials, which succeeding generations often re-used after digging them out of ruins. Taste being what it is, variety in texture and color -- both in the character of the stones themselves and in the treatment given them by the builders -- is almost certain to differ from one age to another. Sometimes the changes are comparatively slight; at other times, radical departures from all known tradition. Our campus architecture might be described as basically conservative, although not uniformly so. Perhaps the materials used are such as to help create such an impression, but the final effect comes from the treatment they have received.

Our most grateful thanks are to Dr. Fred M. Bullard for his notes on the building stones of the campus and the terra cotta plaques of W. C. Hogg Building. We are also indebted to Brenda L. Kirkland for allowing us to read her Geology 379K honors paper on "Building Stones on the Campus of the University of Texas, 1982" and to Carl Happel, Manager of Architectural Services, Technical Services, University of Texas for furnishing us information about some of the building stones.

## CHART II

### Varieties of Stones by Buildings

Building	Date Built	Entrance Steps and Base	Main Facade and Window Trim	Walks and Benches
Biology W. C. Hogg Garrison Waggoner Sutton	1923 1933 1925 1931 1917	Pearl Gray Granite	Leuders Limestone and Brick	Concrete Tile Gray Granite
Painter Hall addition Welch Hall addition Student Serv.	1932 1958 1929 1958 1974 1904	Pearl Gray Granite	Cordova Cream Limestone and Brick	Concrete Brick
Computer Center	1960	Pearl Gray Granite Pink Granite	Cordova Cream and Cordova Shell Limestone	Concrete Brick
Business-Economics	1959	Pink Granite	Mostly Brick Cordova Cream Limestone	Concrete
Graduate School of Business	1972	Pink Granite	Tivoli Travertine	Brick
Batts Hall Mezes Hall Benedict Hall Old Musc Parlin Hall	1950 1950 1950 1941 1954	Pink Granite	Cordova Cream Limestone and Cordova Shell Limestone	Brick Concrete Pink Granite
Calhoun Hall	1967	Pink Granite	Cordova Cream and Cordova Shell Limestone	Concrete Vermont Slate
Harry Ransom Center	1970	Cordova Shell Limestone	Cordova Cream and Cordova Shell Limestone	Pink and Gray Granite Concrete
Battle Hall West Mall Office Bldg.	1910 1961	Pearl Gray Granite	Cordova Cream Limestone	Pink and Gray Granite Concrete
Goldsmith Hall Union addition	1932 1932 1960	Pearl Gray Granite	Cordova Cream and Cordova Shell Limestone	Pearl Gray Granite Vermont Slate Concrete
Hogg Auditorium	1932	Pearl Gray Granite	Cordova Cream and Cordova Shell Limestone	Pearl Gray Granite Concrete
Academic Center	1960	Argentine Andes Black Granite or Calif. Black Granite	Meta-anorthosite Cordova Cream and Cordova Shell Limestone	Terrazo Argentine Black Granite
Main Bldg. and Tower	1932	Pearl Gray Granite	Bedford Limestone Lower part with Cordova Cream and Cordova Shell Limestone trim	Crab Orchard Sandstone Dark Cedar Limestone Edwards Limestone

### CHART III

#### Rock Types, University of Texas Building Stones

Building Stone	Name	Composition	Age (my = million years)	Source
Pearl Gray Granite	Oatman Creek Granite and Stone Mt. Granite	White feldspar, clear quartz, flakes of biotite and/or hornblende	Pre-cambrian 1,045-1,020 my	Llano, Mason, Burnett Counties, Texas Northern Georgia
Pink Granite (Sunset Red) (Texas Pink)	Town Mt. Granite	Orange-pink feldspar, clear quartz, flakes of biotite and/or hornblende	Pre-cambrian 1,045-1,020 my	Llano, Mason, Burnett Counties, Texas
Black Granite	Andes Black Granite or Calif. Black Granite	?	?	Possibly Argentina or California
Meta-anorthosite	Cold Springs Green	Green plagioclase feldspar, clear quartz, biotite, pyrite, hornblende, hematite	Pre-cambrian	Joy, New York
Vermont Slate	Mettawee Formation	Clay, quartz, calcite, pyrite, graphite and rutile	Cambrian 500-570 my	Poultney, Vermont
Craig Baker Dark Cedar Limestone	Holston Formation	Coarse grained fossiliferous dark reddish limestone	Ordovician 430-500 my	Friendsville, Tenn.
Bedford Limestone (Indiana oolitic limestone)	Bedford Formation	Very fossiliferous light gray firm limestone with abundant foraminifera, <u>Endothyra baileyi</u>	Mississippian 320-345 my	Bedford and Bloomington, Indiana
Crab Orchard Sandstone	Crossville Sandstone	Fine grained quartzitic sandstone with shades of brown, tan, gray, red and yellow	Pennsylvanian 280-320 my	Crossville, Tenn.
Leuders Limestone	Leuders Formation (Wichita-Albany group)	Fine-grained dense gray limestone, fossiliferous	Permian 225-280 my	Twenty-five miles north of Albany, Texas
Cordova Shell Limestone	Walnut Formation and/or Edwards Limestone	Fine-grained fossiliferous oolitic, cross-laminated limestone	Lower Cretaceous 75-136 my	Leander and Cedar Park, north of Austin, Texas
Cordova Shell Limestone	Walnut Formation and/or Edwards Limestone	Coarse fragments very fossiliferous limestone; contains many molds of the clam <i>Trigonia</i>	Lower Cretaceous 75-136 my	Leander and Cedar Park north of Austin, Texas
Edwards Limestone	Edwards Formation	Dense, fine-grained fossiliferous limestone w/many clams called rudistids	Lower Cretaceous 75-136 my	Austin, Texas
Tivoli Travertine (Roman Travertine)	?	Pinkish-gray limestone with algal and tiny bacterial clumps; many spherical pisoliths; irregularly banded, very porous	Pleistocene or Recent; less than 2 my	Tivoli, 30 km east of Rome, Italy

**CHART IV**  
**Geologic Time-Table**

<b>Era</b>	<b>Period</b>	<b>Epoch</b>	<b>Time</b>	<b>U. T. Building Stone</b>
Cenozoic	Quaternary	Recent Pleistocene	2 my	Tivoli Travertine (5)
	Tertiary	Pliocene Miocene Oligocene Eocene Paleocene	65 my	
Mesozoic	Cretaceous	Upper Cretaceous	136 my	Edwards Limestone (14) Cordova Cream and Cordova Shell Limestones (1-3, 5-8, 10-14)
		Lower Cretaceous		
	Jurassic	225 my		
	Triassic	280 my		
Paleozoic	Permian		320 my	Leuders Limestones (1,3,4,9)
	Pennsylvanian		345 my	Crab Orchard Sandstone (14)
	Mississippian		395 my	Bedford Limestone (14)
	Devonian		430 my	
	Silurian		500 my	Craig Baker Dark Cedar Limestone (14)
	Ordovician		570 my	Vermont Slate (7,11)
	Cambrian			
Proterozoic	Late Pre-Cambrian		2,500 my	Texas Pink Granite (5-8, 10) Pearl Gray Granite (1-4, 9-12, 14) Argentine Andes Black Granite or California Black Granite (13) Meta-anorthosite (13)
Archeozoic	Early Pre-Cambrian			

my = Millions of years  
Numbers in parentheses are tour stops.

## CHART V

### Terra Cotta Plaques, W. C. Hogg Building (formerly Geology Building)

(For this list we are indebted to Professor Fred Bullard)

#### West Side N-S

Stegosarus (Mesozoic reptile)  
Cianis (Echinoid)  
Calcite crystals  
Quartz crystals  
Paradoxides (Cambrian trilobite)  
Diplodocus or Brontosaurus (Mesozoic reptile)

#### South Side W-E

Triceratops (Mesozoic reptile)  
Paleaster (Devonian Star Fish)  
Spirifer (Mississippian brachiopod)  
Dionoan (Devonian fish)  
Arthrodiran (Devonian fish)  
Pecten (Cenozoic clam)  
Dimetrodon (Permian reptile)  
Pervinqueria (Cretaceous ammonite)  
Mammoth (Pleistocene)  
Varanops (Cotylosaur on Sigallarian log - Permian reptile)

#### East Side S-N

Mastodon (Pleistocene)  
Tyrannosaurus rex (Mesozoic reptile)  
Dragon Fly (Meganeura monyi)  
Rhamphorhyncus (Mesozoic flying reptile)  
Irish Deer  
Amblypod (Eobasileus cornutus)

#### North Side E-W

Trachodon (Mesozoic duckbill reptile)  
Exogyra ponderosa (Cretaceous)  
Crab  
Calymene (Silurian trilobite)  
Ichthyosaur (Mesozoic swimming reptile)  
Crinoid  
Cup Corals  
Archeopteryx (First bird, Jurassic)  
Enallaster texanus (Cretaceous echinoid)  
Glyptodon (Cretaceous)



# CHART I

## Map of the Exterior Building Stone Tour of the Forty Acres



