

MINERAL RESOURCE SURVEY
Circular No. 10

A mineral resource survey of Texas has been started by the Works Progress Administration, the Bureau of Economic Geology of The University of Texas acting as sponsor. The purpose of the survey is to assemble information and make it available to the public. Through a separate project, sponsored by the State Planning Board, the results of the survey, as they are received in Austin, are being assembled for publication. The mineral resource survey is helping in the location of mineral products, from some of which it is reasonable to suppose industries of value to the State may be developed. The following report is based on work in Burnet County.

REPORT ON THE BUILDING STONE DEPOSITS IN BURNET COUNTY, TEXAS
by Virgil E. Barnes

Burnet County has such a large variety of building stone spread over such a wide area that it was impossible, during the present investigation, to examine more than a few of the many deposits. In the following report, the building stones are discussed briefly in order of geologic age, beginning with the younger formations.

Mesozoic Building Stone

Along Oatmeal Creek and the South Fork of the San Gabriel, flaggy members of the Trinity formation of Cretaceous age have been used for building. The rock is of rather a drab color, but otherwise seems to be a very serviceable stone.

The Church of Christ, originally the Oatmeal School, a building 30 x 60 feet with walls 12 feet high, is reported to have been built in 1866. The rock for this building was quarried along Oatmeal Creek.

The ledges of suitable stone in the Cretaceous are only a few feet in thickness and could not be quarried except where exposed in stream beds. This stone can be recommended for use only where a pleasing color effect is not desired.

Paleozoic Building Stone

Ellenburger Limestone

The best interior building marble of Burnet County is in the Ellenburger limestone of Cambro-Ordovician age. This 2000-foot formation has a wide areal extent and contains an extremely large number of building stone types.

Several Ellenburger areas are located in the county. However, the one extending from Burnet southwestward was the only one studied. Much of this area is covered by flaggy limestone unsuitable for quarrying; some areas have closely spaced joints along which platy minerals have developed, and other areas of cavernous and cherty materials are numerous. Some of the stone has the right physical qualities, but does not have a pleasing color. Shades ranging from white through gray and buff are the predominating colors. Shades of red are common and in one outcrop a delicate mottled purple is present. To prevent confusion, the trade name "marble" will be used in the rest of this discussion about Ellenburger limestone.

McGill and adjoining property.—One and one-quarter miles south of Burnet on the old Marble Falls highway along the Houston and Texas Central Railroad is an area of pink marble. The marble varies somewhat in color, ranging from pink to red, the latter containing mottles and dendrites of black manganese oxide. Within the area covered by the accompanying pace-compass map several marbles colored other than pink were found. To the north along the creek, buff, gray, and white marbles are present, and some pink marble is also present. To the south, pink, gray, and buff marbles are common with the southernmost outcrop being white with stylolites and pencil-line streaks of red. The last mentioned outcrop is only a few square feet in extent and from all appearances is an excellent marble. It is very similar to one type of marble on the Holland property about one-half mile to the south.

The main mass of pink marble outcrops for a length of 350 feet and a width of 75 feet. It is also exposed in a road ditch, and during the present examination test pits were dug increasing the area of known pink marble.

In one pit to the west of the center of the main outcrop, white marble was found. This pit went through about 4 feet of Trinity formation, mostly a limy white clay, which in part was altered to caliche.

Most of the Trinity exposed in bluffs along the creek is an iron oxide cemented sand. It has been suggested that the coloring for this marble came from this source. If this is true, the deposit would extend only to a shallow depth. The writer believes the color is pre-Trinity and that the deposit may extend to a commercial depth. Before installing the quarrying equipment, however, core drilling should be done to determine the thickness and character of the stone.

The marble is in reality a microscopic-grained dolomitic limestone. It is brittle and contains some cavities which, near the surface, are filled by infiltrated mud. So far as seen, the rock is free of chert. Joints are wide enough spaced so that blocks of building size should rake up a large percentage of the deposit. The undersized material could be used for terrazzo, for concrete aggregate, and for road surfacing material.

The deposit is very favorably located in reference to transportation, but is not so well situated for quarrying. The creek's course (see map) could be straightened and dikes erected to keep surface water out of the quarry. The depth should be determined by core drilling before the deposit is opened.

It is recommended that this deposit be investigated from the standpoint of establishing production.

Holland property.—On the Mormon Mill road 3.4 miles from the Burnet County Courthouse and about one-half mile west of the Houston and Texas Central Railroad is a large outcropping area of marble. The accompanying pace-compass map of the Holland property shows the area of outcrops as well as a few other features.

This outcrop is a northerly inclined dip slope of Ellenburger limestone about 600 x 1700 feet in area from which most of the soil has been removed. The slope increases about 20 feet in elevation to the south. The entire outcrop, except for a small area at the eastern end, is composed of uniform textured rock with widely spaced joints. The easternmost exposure is of cherty rock with closely spaced joints.

The central area, outlined on the accompanying map, is entirely devoid of soil, and solution along joints has made openings to a depth of 6 feet or more. This solution may be limited in depth by the level at which surface drainage can conduct waters away, or it may extend much deeper into caverns which have subterranean outlets.

The marble is of several shades. Buff is common and is a very pleasing rich-colored rock that should have a ready sale. White is present and is a beautiful rock. In places, it is seamed by pencil-line red streaks and by stylolites, making a very decorative stone. Stone of this type was taken from the locality designed on the map to be used as the Texas contribution for the Washington monument. Some of the white marble is mottled by purple, giving a truly royal appearing stone.

Four core drill holes were made on this property. The core was not available for examination.

Trenching to expose the marble surface uncovered some unusually large blocks of marble. In an east-west trench a block 47 feet between joints was found. The same block exposed in a north-south trench is at least 57 feet across. The northern joint was not found.

The height of quarry face that can be developed, since the relief is only 20 feet, will depend on the depth to ground water level and the depth to which good building stone extends. Whether or not ground water level was reached in the core drill holes is unknown.

Miscellaneous localities.—Four miles west of Burnet along the Hoover Valley road, some large boulders and small areas of outcrop were noticed to the east of the road. This Ellenburger area may contain some good building stone. Time was not available to study this outcrop.

A pink marble outcrops on the same road about 5 miles from Burnet. It might be used for terrazzo, but could not be used for building stone because of closely spaced joints.

One hundred and fifty feet east of the south switch point of Sudduth switch is a pit 20 x 40 feet and 5 feet or more deep in pink Ellenburger. The rock is a pleasing color and may be suitable for terrazzo. It is entirely unsuited for building stone because of innumerable cavities and joints.

Just upstream from the point where Texas highway No. 66 crosses Honey Creek is an outcrop of white and slightly colored Ellenburger that appears to have all the qualities of good building stone. Time was not available for a detailed examination of this ledge.

Wilberns Formation

A gray limestone of Wilberns age outcrops about 1½ miles southeast of Fairland. It is exposed on a steep slope about 30 feet in height. The marble is horizontally bedded with bedding plane joints from 6 inches to 2 feet apart. The rock could be used for dimension stone. It contains a small amount of glauconite that might prove objectionable even though the outcropping stone does not have a displeasing appearance.

The Wilberns formation was not studied elsewhere in the county so its possibilities as a building stone are little known.

Cap Mountain Formation

West of Texas highway No. 66 near Sudduth switch, some glauconitic limestone has been quarried. The glauconite has weathered to a somber limonitic-brown, making a rather unpleasing dull-colored rock. Special uses for such a stone might be found. It does furnish a contrast for other rock where many varieties are used in the same wall.

Precambrian Building Stone

Packsaddle Schist

In the Packsaddle schist are several bands of metamorphosed limestone, or true marbles, in which the constituent grains reach as much as a quarter of an inch in size. These marbles are the familiar grays and whites so much used in monumental work.

The main area of Packsaddle schist in Burnet County contains only two thin bands of marble so far as could be ascertained. In both outcrops the marble is less than 5 feet thick and consequently is not of commercial thickness.

Just north of Hoover Valley in the vicinity of Peter Creek is an area of Packsaddle schist containing much marble. This marble outcrops along the road to Burnet.

Several bands of marble are present. The northernmost one was trenched and the following section exposed:

	Thickness in feet
Granite, fine grained and pink	4
Marble, in part coarse grained, containing some greenish minerals probably actinolite, vesuvianite, and mica . . .	20
Marble, impure and shaly	10
Schist, in part light colored and splintery and near the northern edge somewhat carbonaceous, but not graphitic .	20
Granite, fine grained and pink	15

The metamorphic rocks at this point strike N. 78°W. and have a vertical dip. The granites are sills that follow the bedding of the schist. The marble is impure and consequently is not of commercial grade.

The best appearing marble mass is near the southern edge of the schist and is probably 100 feet or more thick. It should be investigated.

Only a few other small schist areas are present in this county. In those examined, marble was not found.

Valley Spring Schist

In the vicinity of the Southwestern Graphite Mine, several peaks of Valley Spring gneiss are made up largely of massive, uniform rock. Joint planes are wide spaced and the rock has a fair splitting ability along the fanning direction. The chief disadvantage to the utilization of this rock is its hardness.

Granite

Texas is famed for its pink granite obtained from Granite Mountain in Burnet County. The quality of stone is so well known that it need not be described in this paper. The amount present is almost unlimited.

The Texas Pink Granite Company has produced, during the past 43 years, between three and four million tons of granite. The larger volume of this granite has been used in jetty construction at Sabine Pass, Galveston, Freeport, Aransas Pass, and Port Isabel. Rock used in this manner is mostly 10 ton cap, or crest blocks, to prevent erosion of the jetties. The granite is very resistant to the action of sea water.

This granite has also been used in the construction of many buildings in Texas as well as throughout the United States. The State Capitol of Texas is constructed of it. Several courthouses of Texas are made entirely, or in part, of this stone. Many of the hotels, office buildings, and passenger stations of the larger cities of Texas have courses of this granite. Several Federal buildings have hammered base courses, platforms, and steps of this stone, an example of which is the Post Office Building at Austin, Texas. Elsewhere than in Texas this rock has been used. It was used in New York City to construct the east and Whitney wings of the Museum of Natural History, the Grand Central Terminal building, and a number of banks, hotels, schools, and office buildings; in Los Angeles to construct the Los Angeles Times building; and in Seattle to construct the Life Insurance building. A number of smaller buildings have been constructed of this stone, at intermediate points.

A considerable volume is used in the construction of memorials, monuments, and mausoleums, especially where large sized blocks are needed. This material is shipped to many points; for example, the Leif Erickson Memorial, comprising a large sculptured block, was recently shipped to Reykjavik, Iceland.

Six and one-half miles west of Burnet, near the north edge of the main area of Valley Spring gneiss, is a gray granite intruded into the gneiss. A quarry was opened in this rock, but has been abandoned because of lack of contrast between the rough and polished stone. The rock is of a very uniform texture, rather fine grained, and to all appearances should be desirable for walls and other purposes where contrast between rough and polished stone is not needed.

Recommendations

The building stone localities mentioned are only a few of these that undoubtedly are present in the county. The county's greatest mineral resource is building stone and the opening of quarries should be induced through suitable advertising. A comprehensive survey should be made of the county, detailing the areas of good building stone, and material should be collected to be placed on exhibit locally and at strategic points about the country.