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425 STATE CAPITOL

ATLANTA, GEORGIA

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D O L O M I T E S A N D M A G N E S I A N L I M E S T O N E S
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By

A. S. Furcron

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DOLOMITES AND MAGNESIAN LIMESTONES IN GEORGIA*

By

A. S. Furcron

INTRODUCTION

Dolomites and magnesian limestones are wide-spread in Georgia but the principal deposits occur in Palezoic rocks of the northwestern part of the State, and in the Whitestone-Marble Hill Belt.

This article will discuss very briefly the general location of these rocks. A thorough discussion of the distribution and location of the deposits may be found in the references here included, and in the files of the Georgia Department of Mines, Mining and Geology. Numerous chemical analyses are in our files. Typical analyses of Georgia dolomites will be given here.

DEFINITION OF DOLOMITE

The mineral dolomite $(Ca,Mg)CO_3$, when pure, contains 47.9 per cent carbon dioxide (CO_2), 30.4 per cent lime (CaO), and 21.7 per cent magnesia (MgO). In terms of carbonates, this represents calcium carbonate ($CaCO_3$), 54.35 per cent, and magnesium carbonate ($MgCO_3$), 45.65 per cent.

Commercial dolomite, however, cannot be expected to be as pure as the above formulae indicate. Our dolomites occur in thick beds interlayered with other forms of stratified rock; they vary in composition with locality and with the formations involved. The per cent magnesium carbonate also exhibits a wide range, so that it is possible to have gradation from pure

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dolomite to magnesian limestone and marbles, or to high calcium limestone and marbles which contain very little magnesium carbonate. Most of the rocks described in this article are magnesian limestones and dolomitic limestones rather than true dolomites.

Dolomite may be difficult to distinguish from limestone in the field. Where cold dilute hydrochloric acid is applied to the limestone, a vigorous effervescence takes place. Dolomite does not effervesce under similar conditions, although an examination with hand lens usually reveals a few bubbles of carbon dioxide immediately after the acid is applied to the stone.

In the Gainesville Belt, blue marbles are low in magnesia; whereas, the light gray stone is usually dolomitic. In the Whitestone-Marble Hill Belt, the white, compact, fine-grained stone is usually dolomite. Pink or coarsely crystalline marbles are generally low in magnesia.

USES OF DOLOMITE

At the present time dolomite in Georgia is used mostly as ground agricultural lime. A considerable amount is ground and sold by Willingham-Little Stone Company of Whitestone, Georgia, and by the Ladd Lime and Stone Company at Cartersville. The farmers are using more and more ground dolomite upon their land, where it serves to sweeten the soil and make plant food available; the magnesia content also adds an element essential to the plant's well-being. Certain plants, for example, tobacco, require considerable magnesia.

In order to meet Federal requirements, farmers who cooperate with the Department of Agriculture are required to use limestone or dolomite which contains a calcium carbonate equivalent of at least 90 per cent. The calcium carbonate equivalent of a limestone represents the number of pounds of pure calcium carbonate required to produce the same amount of neutralization as one hundred pounds of material. For example, if the calcium carbonate equivalent of a dolomite or limestone is 85, one hundred pounds of that limestone has the same neutralizing value as 85 pounds of pure calcium carbonate. The $CaCO_3$ content of the rock may be determined by multiplying CaO content by 1.7847; MgO may be converted to $MgCO_3$ if multiplied by 2.0914.

The Willingham-Little Company at Whitestone in addition to the above products, markets terrazzo chip aggregate and aggregate for cast stone. The whiteness of the Whitestone dolomite renders it especially applicable to such uses. The fine dust from the dolomite at Whitestone is sold as an asphalt filler, and considerable crushed stone is sold as aggregate for road and concrete work. Some of this stone is used for fluxing material at the Atlantic Steel Mills in Atlanta. Among other uses for dolomite may be mentioned furnace lining, glass manufacture, mortars and plasters, and chemical uses. Dolomite from Pickens County was extensively used in Atlanta as a source of carbon dioxide for carbonated water and soft drinks. It was preferred to limestone because Epsom salts ($MgSO_4 \cdot 7H_2O$) could be recovered as a by-product. Later development in the production of carbon dioxide has rendered this process more or less obsolete.

Siliceous limestones and marbles are suitable for the manufacture of rock wool. Such rocks should contain around 40 to 65 per cent combined carbonates. Too much magnesia makes the glass too viscous. Experiments carried out in the laboratory of the State Division of Mines, Mining and Geology by W. C. Hansard show that magnesia content from 3 to 10 per cent is favorable for the manufacture of rock wool. Dolomite or limestone may be combined successfully with granite waste, fullers earth, slate, shale, etc., in rock wool manufacture.

Since we entered the war there has been renewed interest in dolomite as a possible source of magnesium salts. Dolomite suitable for such uses should be pure and should contain a high percentage of magnesium carbonate. For example, the ferrosilicon method of producing metallic magnesium recently has revived interest in dolomites which are applicable to that process.

Several proposed methods for producing magnesium salts and possibly the metal are: (1) Selective calcination of dolomites whereby only the magnesium carbonate is decomposed and subsequently dissolved away from the calcium carbonate. (2) Treatment of dolomites with calcium chloride solution whereby magnesium replaces the calcium to produce a magnesium chloride solution from which the metal may be extracted by electrolysis of the fused anhydrous salt.

DISTRIBUTION OF DOLOMITE

The Piedmont and Crystalline areas of the State contain several marble belts within which dolomites are found. Magnesian limestone and dolomite occur in the Gainesville marble belt where outcrops may be found from Flowery Branch in Hall County northeastward through Habersham County to the South Carolina line. The marbles of this belt vary considerably with locality. In some places, they are schistose and contain considerable silica; in other localities they are dolomitic but the blue micaceous limestones of the belt usually are low in magnesia. These marbles were burned for lime before and after Civil War times.

An important marble belt enters Georgia in Fannin County in the region of Mineral Bluff and extends southward east of Blue Ridge, Cherrylog, Ellijay and Talona in Gilmer County; Talking Rock, Jasper and Tate in Pickens County to the vicinity of Canton in Cherokee County. An isolated occurrence may be found in Haralson County near the Alabama line. In the vicinity of Tate and Marble Hill, famous for the production of Georgia marble, the stone is frequently high in calcium and low in magnesium. In the vicinity of Whitestone, dolomites crop out and are extensively used for agricultural and other purposes.

Magnesian limestones and dolomites are common in the Paleozoic areas of northwest Georgia (See geologic map of Georgia).

Shady dolomite of Lower Cambrian area is medium-grained, coarsely crystalline dolomite which crops out near the eastern borders of the Paleozoic area. Exposures are uncommon and occupy small areas. Much of the formation is covered by residual soil.

The most wide-spread dolomite, the Knox dolomite (Ozarkian-Ordovician) is thick-bedded, gray dolomite which yields after weathering large amounts of gray chert in small and large masses. Good out-crops of unweathered dolomite are not common but, because this formation is very thick and wide-spread, numerous fresh exposures may be found in the region. For example, rocks may be studied in Bartow County, principally on the highway between Cartersville and Rome. Good exposures occur just west of Kingston. Other exposures might be listed, such as in the region of Graysville, Catoosa County; the north side of Mill Creek on the T. A. G. railroad at Kensington, Walker County, etc. Good exposures occur at a quarry operated by the Ladd Lime and Stone Company, two miles southwest of Cartersville, Georgia. Knox dolomite occurs with other highly folded rocks. Its thickness has not been accurately determined. In the Rome area, Hayes[10] believed that the formation is between 4000 and 5000 feet thick.

Certain facies of the Chickamauga limestone of Ordovician age contain considerable magnesia locally; and Fort Payne chert of Mississippian age is locally nearly all limestone or dolomite; but the principal and most wide-spread deposits of dolomite occur stratigraphically in and below the Knox dolomite.

Magnesian limestones occur in the Coastal Plain area of Georgia. These deposits are described in the final section of this article.

DOLOMITES AND MAGNESIAN MARBLES IN THE CRYSTALLINE ROCKS OF GEORGIA

THE GAINESVILLE MARBLE BELT

Outcrops of marble in this belt are known from the vicinity of Flowery Branch in Hall County northeastward into South Carolina near the Stephens-Habersham county line.

Since the marbles of this belt have not been described in other publications and since the belt occurs in crystalline rocks far removed from other sources of lime, the individual deposits will be described in greater detail than deposits of certain other sections of the State.

Outcrops are found in the valleys or in the valley walls of the streams. On the uplands, marble is not found, probably because the soluble constituents have been weathered out. The marbles consist of gray dolomite and magnesian limestone, blue marbles and calcareous schists. They show more or less mica and free silica in the form of quartz, which tend to lower the carbonate content. The marbles are interlayered with mica schist, phyllites and quartzite, that dip usually at steep angles toward the southeast.

Marbles have been burned for lime at a number of places along the belt, particularly near Gainesville in Hall County and along Panther Creek in Habersham County.

Description of Outcrops

Gray marble crops out along a branch just east of the highway at Flowery Branch in Hall County. Shallow test pitting indicates a width of 125 feet or more; the marble was cored to a depth of 100 feet in 1941, at which depth the bit was still in marble. Marble has been reported along the branch above and below this locality.

Marble was quarried in the past just south of Gainesville, near Chicopee, in Hall County, on the east side of the Southern Railroad. These quarries are poorly exposed at the present time. According to Maynard [6], the limestone or marble strikes N. 77° E. and dips 10° to 20° to NW. Two quarries were opened at this locality by the C. L. Deal Manufacturing Company. Based on the two analyses given by Maynard, this stone averages 29.01 per cent CaO, 17.02 per cent MgO, and 10.51 per cent SiO_2.

Several outcrops of blue and gray marble occur upon the property of W. O. Ramsey in Hall County, two miles southeast of White Sulphur Springs. Marbles occur along the stream about one-half mile N. 35° west of the dwelling house. Coarse, granular micaceous marble occurs in a large cliff where it is separated from other marble outcrops to the east by sandstone and biotite gneiss. A blue non-magnesian marble crops out in the nose of the hill immediately across a small branch from the dwelling house. An analysis of this blue marble shows: 79.54 per cent $CaCO_3$, 3.26 per cent $MgCO_3$, and 16.91 per cent insoluble residue. These limestones have been used as sources of lime in the past.

Dolomitic marble is associated with talc in the property of W. M. Ramsey, six miles northeast of Gainesville near White Sulphur Road. Testing on the marble deposit by R. L. Harris in 1941 indicated a width of 150-200 feet of marble with 5-30 feet of overburden. The deposit is said to extend through the property for a distance of one-half mile. A sample of light gray, compact, fine-grained marble contains a calcium carbonate equivalent of 77.74 per cent.

Marble is more wide-spread in this belt than surface outcrops indicate. A well recently dug on the property of M. G. Reynolds, one-half mile southeast of Airline School on the White Sulphur Springs to White Sulphur Station road, revealed a blue crystallinelimestone or marble near the bottom of the well, and 100 feet below the surface. Only mica schists can be found in the surface outcrops at this locality.

Outcrops of marble and calcareous schist re-occur in the belt at the Hall-Habersham county line to the west. Also, blue crystalline limestone and schistose limestone crop out with a width of several hundred yards near an old grist mill and in the rapids and falls of Mud Creek. The beds dip 15° to 30° south 50° east. Analysis of this stone shows 11.75 per cent calcium carbonate, 6.58 per cent magnesium carbonate and insoluble residue, chiefly silica, of 67.99 per cent. This analysis indicates calcareous schist rather than a marble, but the rock is difficult to sample and is weathered on the outcrop.

Marble crops out on the land of M. Parson, two and one-half miles west of Alto, Narramore District, on the road crossing Little Mud Creek, Hall County. Two samples of this rock collected by R. L. Harris showed a calcium carbonate equivalent of 68.60 and 67.73 per cent respectively.

A rock occurs in Hall County on Little Mud Creek about four miles from Yonah Station. This property is also known as the Old Van Herran property. The stone shows calcium carbonate content 53.18 per cent, magnesium carbonate 1.59 per cent, and insoluble residue, chiefly silica, 40.47 per cent. Three samples of marble from the property of George Colbert, Alto, Route 1, collected by R. L. Harris, gave a calcium carbonate equivalent of 52.80, 54.72 amd 74.12 per cent respectively. Some trenching was done on the property in the early part of 1942. Two beds of marble, each 100 feet or more wide, are reported from this property.

Marble crops out upon the property of John Crawford on either side of the road to Toccoa, east of the highway near Hollywood. Light gray, cream-colored siliceous marble beds about 40 feet thick crop out in a branch in the woods on the north side of the highway. The stone is massive and strikes northeast-southwest. About one-third of a mile from the dwelling, and southwest of the above locality, and south of the highway, there is another outcrop of the marble. This stone is said to have been burned before the Civil War, and the remains of the old kiln still stands at this locality. Analysis of dolomite from the Crawford property shows CaO 20.30 percent, MgO 10.47 per cent, SiO_2 21.33 per cent; $CaCO_3$ equivalent 81.7 per cent.

Many outcrops of marble and calcareous schist occur in Habersham County, Georgia, along Panther Creek southwest of Pulaski. Marble was burned on the old Walker place. The quarry has been abandoned for sometime. The marble dips southeastward into the hill at the base of the quarry but the lowermost beds are overlain with rock debris. The upper beds in the quarry consist of mica schist and leached calcareous schist. The Billy Walker quarry was described and sampled by Maynard 6/. His sample contained 22.88 per cent CaO, 18.88 per cent MgO, and 5.74 per cent SiO_2.

Marble occurs on the Will Ellard property on Panther Creek near the junction of Panther Creek and Devil's Den Creek. The remains of the old quarry and kiln may be seen. Maynard 6/ describes a property one-fourth of a mile south of the mouth of Little Panther Creek. This outcrop was not seen by the writer but, according to the description, it should be close to or on the Ellard property. Maynard states that massive magnesian limestone is exposed over a stratigraphic thickness of at least 61 feet along the southeast side of Little Panther Creek, and about one-fourth of a mile south of its mouth. An analysis of this stone gave 27.04 per cent CaO, 15.22 per cent MgO, and 17.38 per cent SiO_2.

Marble is said to occur on the Davidson property on Panther Creek about half-way between Ellard's property and the South Carolina line. It occurs again at the Savannah River near Pulaski.

It is likely that a careful search will reveal other outcrops in this belt.

Geologic Age

The geologic age of these marbles is not known. In some localities, such as the Ramsey property in Hall County, this rock could be called a limestone although it is entirely crystalline. On the Geologic Map of Georgia[13/], these rocks are in the Brevard schist of lower Talladega and probable pre-Cambrian age.

DAHLONEGA MARBLE BELT

There is marble in the Ashland schist belt east of Dahlonega and southwest of that locality. This belt cannot now be described adequately because of a scarcity of outcrops and lack of detailed field work. Commercial marble has not been discovered in the belt which will be mentioned here briefly.

Numerous cores from Findley Cut near Dahlonega indicate that marble and calcareous schists have been injected by gold-bearing quartz veins and stringers in that locality. Captain Garland Peyton reports the occurrence of white, crystalline marble in the Dog Head vein at the northeast end of the Barlow Cut. Marble has been reported from Battle Branch Mine. J. H. Long of

Dawsonville reports the occurrence of limestone or marble below Barrettsville and just south of Auraria. It is also found near the Kin Mori Mines. Blue-banded, micaceous, impure marble and schist cross the Atlanta-Dawsonville Highway about 3.2 miles south of Dawsonville.

The age of the Ashland schist has not been determined with certainty. It is mapped as pre-Cambrian.13/.

WHITESTONE-MARBLE HILL BELT

The Murphy marble belt extends in Georgia from the vicinity of Sweetgum and Mineral Bluff near the North Carolina line, southward to a point several miles north of Canton in Cherokee County. Marble occurrences are found at numerous places along this belt which forms a large letter "S" as it crosses Fannin, Gilmer and Pickens counties, extending nearly to the middle of Cherokee County. The marble lies east of a major thrust-fault which extends across the State. Marble is mapped in Fannin and Gilmer counties as occurring between the above mentioned overthrust and a second overthrust to the west13/. According to Bayley 7/, the marble grades into calcareous and quartzose schist (Andrews schist).

Marble is found along the belt just east of Sweetgum and between Sweetgum and Mineral Bluff; it occurs east of Mineral Bluff and Blue Ridge, where it forms a continuous outcrop between these locations. Another outcrop is found about four miles northeast of Ellijay. Marble also occurs from the vicinity of Talona southward to the Pickens County line. Occurrences of marble are more or less continuous from a point east of Jasper in Pickens County southward nearly to Canton in Cherokee County. These marbles vary considerably in composition, some of them are almost all calcium carbonate and others contain as much as 43 per cent magnesium carbonate. According to Bayley 7/ no suitable sections in the district have been found which illustrate adequate relations of high magnesium to low magnesium beds. He believes that these beds are interlayered. It is significant that the belt of white talc associated with the Murphy marbles of North Carolina extends into this section of Georgia where numerous occurrences of talc are found to be associated with magnesian marbles.

Dolomitic Marble in Haralson County. - A marble belt several miles long occurs several miles north of Buchanan in Haralson County. Outcrops are found in valleys. The deposit is mapped as Murphy marble on the State Geologic Map 13/. The width and total extent of the deposit is not known but it probably is of considerable size. Some shallow test pitting was done in 1940 upon the O. B. Sanders property, Land Lot 1122, District 20, Section 3. Several pits disclosed marble at shallow depths beneath the floor of the valley.

Dolomite was replaced by pyrite in the Tallapoosa or Waldrop Mine, Land Lot 932, District 20, Section 3, in the northeast corner of Haralson County 14/. Analysis of the rock gave 28.88 per cent CaO, 19.05 per cent MgO, and 2.67 per cent SiO_2 and insoluble.

Geologic Age

Lack of fossils have made it difficult to determine the geologic age of this dolomitic marble. Bayley 7/ has placed it in the upper part of the series of rocks exposed in the belt which he believes is of Cambrian age. The State Geologic Map of 1939 places the Murphy marble in the upper portion of the Talladega series of probable pre-Cambrian age.

DOLOMITES AND MAGNESIAN LIMESTONES OF PALEOZOIC AGE IN NORTHWEST GEORGIA

Shady Dolomite

This formation of around a thousand feet in thickness lies above the basal Cambrian Weisner quartzite and underlies the Rome shale; it represents the first major break in the deposition of clastic Paleozoic sediments. Surface outcrops are practically limited to Bartow County where the formation crops out on the eastern limb of the Cartersville-Rome syncline. The formation is not known in other localities.

Outcrops of Shady Dolomite are rare; for this reason the rock thus far, has been unimportant as a source of dolomite.

Knox Dolomite

The most wide-spread exposures of Knox dolomite occur in Bartow, Polk, Floyd and Gordon counties. In this section, the dolomite is preserved in a broad syncline where surface outcrops attain a width of 10 to 15 miles in Polk, Floyd and Bartow counties. Typical exposures of this rock occur between Cartersville and Rome, where light gray soils are filled with fragments of chert. Just west of Kingston on U. S. Highway 411, there is a very good outcrop of Knox dolomite. Fresh outcrops of this rock are uncommon.

Near the Tennessee line in northwestern Georgia, the Knox dolomite is much folded with other rocks. Surface exposures occur on the west or downthrown side of overthrust faults.

A belt of this formation extends through Chattooga, Walker and Catoosa counties where it attains a width of at least six miles but, in Chattooga, its total exposure is greater because there the belt is divided into two parts by synclinal and down-faulted areas of younger rock[13].

A major anticlinal area of Knox dolomite extends into Georgia from Tennessee to the region between Rossville and Kingston in Catoosa and Walker counties. Two other areas crop out in Whitfield and Murray counties.

The Knox dolomite is the most wide-spread dolomitic formation in Georgia. It contains considerable chert locally which accounts for the high silica content of some analyses. The formation occurs as massive beds of gray to blue-gray dolomite. Fresh unweathered chert is usually dark gray in color but weathers to light gray fragments which are scattered throughout the soil.

The quarries of the Ladd Lime and Stone Company, two miles southwest of Cartersville, Bartow County, have been worked for many years. The stone is hard, gray to light gray dolomite belonging to the upper part of the formation. The quarry is opened in the side of a small mountain which attains a height of more than 300 feet above the surrounding territory. Brantly[15/] lists the following physical properties for the stone:

Specific gravity and porosity of Knox dolomite
at Ladd's quarry

	Gravity	Porosity
Dark stone..................	2.81 ...	0.51
Light stone.................	2.81 ...	0.55

The quarry was originally opened for the manufacture of lime. The stone has been crushed and sold as ground limestone, aggregate, ballast, furnace lining, etc.

Lime has been burned on a large scale at and near Graysville where Knox dolomite and Conasauga limestone are exposed in several large quarries.

Chickamauga Formation

This limestone was named from exposures along Chickamauga Creek east of Chattanooga, Tennessee, and also upon the Ringgold quadrangle in northwest Georgia. The original formation has been broken up into several formations but the present term is entirely suitable to the purposes of this paper. As originally used it applies to rocks which lie between the Knox dolomite and Rockwood formation of upper, middle and lower Ordovician age. Numerous belts of this formation occur in northwest Georgia. Several varieties of rocks are included in the formation, such as blue fossiliferous limestone, earthy limestone, shales and conglomerate. Gray magnesian limestone is interlayered with the blue, high calcium beds.

Light blue, heavy massive limestone of Chickamauga age is interlayered with calcium limestones in the quarry of the Southern States Portland Cement Company near Rockmart in Polk County. According to Maynard 6/, two beds of this material, 6 feet and 27.4 feet in thickness, are discarded in the quarry. Beds of dolomitic limestone also occur in a quarry that was operated by the Portland Cement Company in Polk County, at Portland, Georgia.

MAGNESIAN LIMESTONES OF THE COASTAL PLAIN AREA

True dolomites are very scarce or absent in the Coastal Plain area, but magnesian limestones have been discovered particularly in the extreme southern part of the State near the Florida line. Most of the known localities occur in Decatur, Grady, Thomas, Brooks and Echols counties.

Most of the known outcrops of magnesian limestone in this terrain are ascribed to the Chattahoochee formation of the lower Miocene age. A prominent belt, although narrow, of this limestone extends northeast and southwest, east of the Flint River from the region of Sylvester to the junction of the Flint and Chattahoochee rivers in the extreme southwest corner of the State.

A further examination of the rocks of this belt should reveal additional deposits of magnesian limestone. The combined carbonate content of these rocks is usually less than 90 per cent and will average, perhaps, 75 to 85 per cent. This is because the silica content is frequently rather high. These rocks would be entirely satisfactory for the manufacture of rock wool. Many of the outcrops, however, would produce excellent agricultural lime and, since these occur far removed from other magnesian limestones or dolomites, they must be considered as a valuable natural resource. Frequently the limestones here mentioned crop out in sinks.

ANALYSES OF THE DOLOMITES AND MAGNESIAN LIMESTONES IN GEORGIA

DOLOMITES AND MAGNESIAN LIMESTONES OF THE GAINESVILLE BELT

Table 1

Sample No.	1	2	3	4	5	6	7
Moisture at 100°C	.....	.....	.....	0.09	.....	.....	.....
Loss on ignition	36.60	40.62	.....	33.59	.....	.....	.....
Soda (Na_2O)	.....	.....	.....	.....	.....	.....	.....
Lime (CaO)	27.04	30.93	28.88	25.27	28.70	28.00	30.02
Magnesia (MgO)	9.70	18.58	18.88	11.42	9.91	16.06	17.98
Alumina (Al_2O_3)	5.65	1.60	.60	(2.20	(1.22	0.80	0.60
Ferric oxide (Fe_2O_3)	2.42	2.40	1.20	(	(	1.25	1.70
Ferrous oxide (FeO)	.62	.....	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.00	.....	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.00	.....	.02	.....	.....	tr.	.02
Phosphorus pentoxide (P_2O_5)	tr.	.....	.04	.....	.....	.04	.06
Carbon dioxide (CO_2) & org. mat.	.....	.....	44.64	.....	.....	39.65	42.79
Silica (SiO_2)	18.35	.....	5.74	.....	28.27	14.20	6.83
Insoluble residue	.....	7.12	.....	25.38	.....	.....	.....
Undetermined	.....	.....	.....	2.05	.32	.....	.....
TOTAL	100.38	101.25	100.00	100.00	100.00	100.00	100.00

1. Limestone, Panther Creek, Habersham County.
2. Marble. Habersham County, U.S. Government. Old quarry on Little Panther Creek and County Road.
3. Dolomite. Habersham County. W. L. Walker property (Billy Walker) two and one-half miles south of the mouth of Panther Creek along the southeast side of the Turnerville public road 6/.
4. Gray marble. Hall County. Near White Sulphur Station, one mile southeast of the old railroad bed.
5. Marble (Drill core). Hall County. Flowery Branch.

6 and 7. Limestones. Hall County. Deal Lime Works. Two miles south of Gainesville, near Southern Railroad 3/.

DOLOMITES AND MAGNESIAN LIMESTONES OF THE WHITESTONE-MARBLE HILL BELT

Table 2

Sample No.	1	2	3	4	5	6	7
Moisture at 100°C	.....	.....	.30	.40	.....	.....	.....
Loss on ignition	46.49	43.62	45.80	45.72	43.14	45.94	37.08
Soda (Na_2O)	.....	.....	.....	.....	.....	.....	.....
Potash (K_2O)	.....	.....	.....	.....	.....	.....	.....
Lime (CaO)	31.61	32.56	32.68	33.12	32.07	32.16	24.07
Magnesia (MgO)	21.06	16.63	17.24	18.10	17.33	19.10	17.24
Alumina (Al_2O_3)	(.78	.....	.00	.....	tr.	.80(	.43
Ferric oxide (Fe_2O_3)	(	.....	.25	.44	.94	.....(	
Ferrous oxide (FeO)	.....	1.11	.56	.08	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.07	.12	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.00	.....	.....	.....
Sulphur trioxide (SO_3)	.....	.....	.....	.00	.....	.....	.....
Phosphorus pentoxide (P_2O_5)	.....	.....	.....	tr.	.....	.....	.....
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....	.....	.....
Silica (SiO_2)	1.01	.....	.....	.....	6.38	1.90	.....
Undetermined	.....	.....	.....	.....	.....	.....	.....
Total insol in HCL	.....	5.94	3.87	2.36	.....	.....	.....
TOTAL	100.95	99.86	99.77	100.34	99.96	99.90	100.58

1. Marble. Gilmer County. Holt property which joins the Whitaker property. Outcrops at various places about the junction of Big and Little Turniptown creeks 6/.
2 and 3. Marble. Pickens County. Lincoln Quarry near Jasper.
4. Marble. Pickens County. Tate, Georgia.
5. Marble. Pickens County. Coggins Marble Company.
6. Marble. Pickens County. Coggins Marble Company. Carter-Tate property near Jasper
7. Marble. Cherokee County. Thickness of 15 feet along the east side of Lost Town Creek at a point about seven miles northwest of Canton and about one-half mile north of the junction of Lost Town and Shoal Creeks 6/.

DOLOMITES AND MAGNESIAN LIMESTONES OF THE WHITESTONE-MARBLE HILL BELT

Table 2 (Continued)

Sample No.	8	9	10	11	12	13	14
Moisture at 100°C	.02	.....	.....	.....	.....	.....	.....
Loss on ignition	.....	44.10	42.05	36.74	19.66	.....	43.94
Soda (Na_2O)	.....	.....	.....	.....	.....	.....	.....
Potash (K_2O)	.....	.....	.....	.....	.....	.....	.....
Lime (CaO)	33.62	34.58	33.74	37.50	58.00	33.43	30.96
Magnesia (MgO)	18.18	15.80	16.65	15.60	17.94	17.05	18.37
Alumina (Al_2O_3)	.....	(1.46	(1.40	(1.58	(1.16	(1.35	.....
Ferric oxide (Fe_2O_3)	.38	(	(	(	(		.94
Ferrous oxide (FeO)	.....	.....	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.00	.00	.00	.00	.00	.....	.....
Phosphorus pentoxide (P_2O_5)	.....	tr.	.01	tr.	tr.	tr.	.....
Carbon dioxide (CO_2)	44.72	.....	.....	.....	.....	.....	.....
Silica (SiO_2)	.....	4.06	6.15	8.58	3.24	4.29	5.86
Undetermined	.....	.....	.....	.....	.....	43.88	.....
Total insol. in HCL	2.59	.....	.....	.....	.....	.....	.....
TOTAL	99.51	100.00	100.00	100.00	100.00	100.00	100.07

8. Marble. Whitestone. - Dense, flinty white marble, mined as a source of magnesium salts. Interbedded with coarse-grained white marble, at a quarry about one mile south of railroad station, at Whitestone, Gilmer County. 7/

9, 10, 11 and 12. Marble, Pickens County. Whitestone Marble Company. Property located at Whitestone directly on the Louisville and Nashville railroad. 6/

13. Marble. Pickens County. Whitestone Marble Company. Property located on Louisville and Nashville railroad at Whitestone. This is an average analysis of three strata in the mine. 3/

14. Marble. Pickens County. Whitestone Mercantile Company, Whitestone, Ga.

DOLOMITES AND MAGNESIAN LIMESTONES OF THE WHITESTONE-MARBLE HILL BELT

Table 2 (Continued)

Sample No.	15	16	17	18	19	20	21
Moisture at 100°C	.54	.60	.....	.30	.02	.....	.....
Loss on ignition	.05	.07	44.61	45.80	.....	43.35	40.09
Soda (Na_2O)	.....	.....	.....	.....	.....	.....	.....
Potash (K_2O)	.....	.....	.....	.....	.....	.....	.....
Lime (CaO)	32.90	33.60	34.68	32.68	31.00	32.04	34.30
Magnesia (MgO)	16.90	17.16	16.10	17.23	20.54	18.00	17.02
Alumina (Al_2O_3)	.80	1.18	1.56	.....	.....	1.88	1.96
Ferric Oxide (Fe_2O_3)	.....	.....		.25	.79		
Ferrous oxide (FeO)	.....	.....	.....	.56	.....	.....	.....
Manganous (MnO)	.....	.....	.....	.07	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.....	.....	.00	.....	.....	.00	3.20
Phosphorus pentoxide (P_2O_5)	.....	.....	tr.	.....	.....	tr.	tr.
Carbon dioxide (CO_2)	44.27	45.11	.....	.....	46.78	.....	.....
Silica (SiO_2)	.....	.....	3.05	.....	.....	4.73	3.43
and Insol.	4.50	2.74	.....	.....	.....	.....	.....
Insol. in HCl	.....	.....	.....	2.87	1.14	.....	.....
TOTAL	99.96	99.92	100.00	99.77	100.27	100.00	100.00

15. Magnesian Limestone "53B". Pickens County. On road at junction of east and west branch of Long Swamp Creek.7/
16. Magnesian Limestone "51B". Pickens County. Main branch at Long Swamp Creek 3/4 mile north of junction of east and main branches.7/
17. Marble. Pickens County. Perserverance Quarry. 1 3/4 miles east of Jasper on the east side of Long Swamp Creek.6/
18. Fine-grained white marble. Pickens County. Lincoln Quarry. 1 mile east of Jasper, Long Swamp Creek.7/
19. Fine-grained sugary textured marble from cliff side of Long Swamp Creek, south end of belt.7/
20. Marble. Pickens County. Detroit Marble Company. Between Whitestone Station and the Pickens-Gilmer county line directly on the Louisville and Nashville Railroad.6/
21. Marble. Pickens County. Crystal Marble Company. On the east side of the Louisville and Nashville Railroad, 1,500 feet south of Whitestone.6/

SHADY DOLOMITE

Table 3

Sample No.	1	2	3	4	5	6
Moisture at 100°C	.....	.....	.....	.....	.....	.....
Loss on ignition	46.14	43.46	44.83	44.67	44.60	45.46
Soda (Na_2O)	.08	.....	.....	.....	.07	.08
Potash (K_2O)	.10	.....	.....	.....	.15	.17
Lime (CaO)	30.30	28.78	29.60	28.86	35.86	34.08
Magnesia (MgO)	19.56	17.57	19.65	19.78	15.26	15.80
Alumina (Al_2O_3)	.24	.24	.16	2.35	.....	.....
Ferric oxide (Fe_2O_3)	1.28	.47	.11	1.40	.64	1.20
Ferrous oxide (FeO)	.....	5.76	1.73	.....	.....	.....
Manganous oxide (MnO)	.....	1.60	.52	.00	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.00	.....	.....	.07	.00	.01
Phosphorus pentoxide (P_2O_5)	.02	.03	.02	.....	.00	.01
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....	.....
Silica (SiO_2)	1.76	1.35	2.30	2.32	2.50	2.04
Clay bases	.78	.....	.....	.....	.92	.....
Barium (Ba)	.....	.00	.55	.00	.....	1.16
Insoluble	.....	.21	.50	.....	.....	.....
TOTAL	100.00	102.27	100.01	99.70	100.00	100.00

1. Limestone (Beaver)*. Bartow County. Two miles south of Sophia on the east side of the road between Sophia and Grassdale.6/ Heavy-bedded and massive, semi-crystalline and of a gray-blue to dark blue color. Stratigraphic thickness of about 30 feet, overlain by shales of Rome formation.
2. Dolomite (Shady). Bartow County. Southeast of Cartersville.
3. Dolomite (Shady). Bartow County. Paga No. 2. Southeast of Cartersville.
4. Limestone (Beaver)*. Bartow County. Cartersville, City Water Works Spring.
5. Limestone. Polk County. Marble Hill in the Town of Rockmart, just south of the Southern Railway depot.6/ Quarries are situated in the upper gray magnesian beds of Chickamauga limestone and are capped by the Rockmart shales and slates. 90.3 feet of light grayish-blue and light blue heavy-bedded limestone.

* Beaver limestone now classified with the Shady dolomite.

SHADY DOLOMITE

Table 3 (Continued)

6. Limestone. Polk County. G. W. Morgan property, Morgan Hills, just south of the road which parallels the southeast side of Uharlee Creek.6/ Upper portion of the Chickamauga limestone is exposed in three separate hills about five miles southwest of Rockmart. The limestones are heavy-bedded and gray to light blue in color.

KNOX DOLOMITE

Table 4

Sample No.	1	2	3	4	5	6	7
Moisture at 100°C							
Loss on ignition	44.84	45.32	37.98	42.57	37.53	45.23	47.01
Soda (Na_2O)	.10	.....	.....	.....	.....	.....	.....
Potash (K_2O)	.18	.....	.....	.....	.....	.....	.....
Lime (CaO)	29.46	31.30	28.40	31.02	25.60	30.26	28.56
Magnesia (MgO)	18.92	21.88	14.20	16.00	16.00	18.64	20.98
Alumina (Al_2O_3)	.....	.39	1.85	.....	.....	.....	.....
Ferric oxide (Fe_2O_3)	.62	1.11	2.40	1.52	2.60	.94	1.08
Ferrous oxide (FeO)	.....	.....	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.00	.....	.....	.01	.00	.00	.00
Phosphorus pentoxide (P_2O_5)	.02	.....	.....	.02	.01	tr.	.01
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....	.....	.....
Silica (SiO_2)	4.82	.27	15.03	5.86	15.40	3.25	1.85
Undetermined	.....	.....	.34	.....	.....	.....	.....
Clay bases	1.04	.....	.....	3.00	2.86	1.68	.51
TOTAL	100.00	99.47	100.00	100.00	100.00	100.00	100.00

1. Dolomite. Bartow County. Paul F. Akin property, one-fourth mile northeast of Cave Station and about 400 feet north of the Kingston-Cartersville road.6/ 25 feet thickness; gray, heavy-bedded and massive in appearance; fine-grained and partly crystalline with overburden of 15 feet of unconsolidated soil, chert and cherty limestone.

2. Dolomite (cherty). Bartow County. From State Highway, Rt. 41, 3½ miles southeast of Adairsville, Ga. Analysis by J. Goldstein.

3. Dolomite (cherty). Bartow County. Property of Mrs. Lucile Hick, north side of North Carolina railroad near Graysville, Ga. Analysis by J. Goldstein.

4 and 5. Dolomite. Catoosa County. Graysville Mining and Manufacturing Company, Quarry No. 1, in the western portion of the Town of Graysville and directly on the Western and Atlantic Railroad.6/ No. 4 consists of 24.3 feet of gray and grayish-white dolomite grading down to grayish-blue, dark blue and cherty gray at bottom. (12.7 feet of unsampled arenaceous gray, bluish-gray and dark blue massive and heavy-bedded dolomite underlying the dolomite of No. 4).

6 and 7. Dolomite. Catoosa County. Graysville Mining and Manufacturing Company, Quarry, one-half mile east of Graysville, Ga. No. 6 consists of 35 feet of blue and bluish-gray dolomite at eastern side of the quarry. No. 7 represents 24.4 feet of dark blue and gray dolomite 400 feet west of No. 6 in the same quarry.

KNOX DOLOMITE

Table 4 (Continued)

Sample No.	8	9	10	11	12	13
Moisture at 100°C	.....	.....	......	....	.....	.....
Loss on ignition	30.44	44.54	56.23	44.07	45.37	41.91
Soda (Na_2O)	.....	.....	.....	.....	.....	.....
Potash (K_2O)	.....	.....	.....	.....	.....	.....
Lime (CaO)	31.37	33.62	24.70	34.33	31.59	29.50
Magnesia (MgO)	14.74	14.89	13.90	18.85	20.72	16.30
Alumina (Al_2O_3)	.....	.....	.....	.....	.....	3.59
Ferric oxide (Fe_2O_3)	1.00	1.10	1.68	.85	.72	1.55
Ferrous oxide (FeO)	.....	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....	.....
Sulphur trioxide (SiO_3)	.....	.....	.....	.....	.....	.....
Phosphorus pentoxide (P_2O_5)	.....	.....	.....	.....	.....	.....
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....	.....
Silica (SiO_2)	22.03	5.00	2.96	.57	.16	7.15
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

8 - 12. Dolomite. Bartow County. Ladd Lime Company, Seaboard railroad about two miles southwest of Cartersville.6/
From top to bottom these are as follows:
(8) 10 feet of grayish-blue dolomite containing a three-inch layer of chert at a point three feet above the bottom.
(9) 22 feet of gray dolomite.
(10) 21 feet of grayish-blue and dark blue dolomite.
(11) 5.8 feet of grayish-blue dolomite.
(12) 21.9 feet of gray dolomite; quarry floor.

13. Dolomite. Bartow County. Howard Hydraulic Cement Company on the Western and Atlantic Railroad at Cement Station.6/ Black, fine-grained, compact dolomite intimately veined with coarsely crystalline calcite. Some thin seams of black flint, about one-half inch thick occur but not abundant.

Table 4 (Continued)

Sample No.	14	15	16	17	18	19
Moisture at 100°C	.....	.....	.....	.....	.....	.....
Loss on ignition	40.81	44.30	44.97	44.05	41.58	44.55
Soda (Na_2O)	.....	......	.....	.....	.....	.....
Potash (K_2O)	.....	.....	.....	.....	.....	.....
Lime (CaO)	28.62	31.50	31.20	33.12	27.28	30.16
Magnesia (MgO)	16.60	18.30	17.80	16.60	17.60	18.70
Alumina (Al_2O_3)	......	.....	.....	.....	.....	.....
Ferric oxide (Fe_2O_3)	1.28	.90	1.32	.92	.90	.68
Ferrous oxide (FeO)	.....	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....	.....
Sulphur trioxide (SiO_3)	.03	.01	.01	tr.	.02	.02
Phosphorus pentoxide (P_2O_5)	.02	.02	.02	.02	.02	.02
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....	.....
Silica (SiO_2)	8.54	3.60	3.40	3.43	11.76	4.64
Clay bases	4.10	1.37	1.70	1.46	.82	1.23
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

14-19. Dolomite. Catoosa County. Hale Quarries directly on the Western and Atlantic Railroad about $1\frac{1}{2}$ miles southeast of Graysville.6/

121.3 feet thickness. Heavy-bedded and massive dolomite from gray to dark blue to grayish-blue containing small amounts of chert which is somewhat arenaceous. At bottom, white and bluish flint with dolomite, fluorite and barite.

KNOX DOLOMITE

Table 4 (Continued)

Sample No.	20	21	22	23	24
Moisture at 100°C	.....	.....	.....	.....	.....
Loss on ignition	44.53	41.17	45.30	.....	.....
Soda (Na_2O)	.08	.....	.....	.....	.....
Potash (K_2O)	.16	.....	.....	.....	.....
Lime (CaO)	29.24	35.69	33.05	31.16	35.00
Magnesia (MgO)	19.46	16.21	18.09	18.37	16.00
Alumina (Al_2O_3)	.....	1.05	1.87	(2.20	2.86
Ferric oxide (Fe_2O_3)	1.60	2.00	.76	(	2.60
Ferrous oxide (FeO)	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.00	.....	.....	...00	.....
Phosphorus pentoxide (P_2O_5)	tr.	.....	.....	4.29	15.40
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....
Silica (SiO_2)	4.22	3.88	Not Recorded	43.98	38.13
Clay bases	.71	.....	.....	.....	.....
TOTAL	100.00	100.00	100.00	100.00	100.00

20. Dolomite. Floyd County. J. Scott Davis property, Vans Valley along the west side of the hill to the northwest of the Davis residence.

21. Hard dolomite (ballast rock). Polk County. Southern States Portland Cement Company, Rockmart, Georgia.

22. Knox dolomite (Cherty dolomite). Walker County. Kensington, north side of Mill Creek on T. A. G. Railroad.

23 & 24. Dolomite. Bartow County. Clifford Lime and Stone Company, 3 miles northwest of Kingston on a spur track of the Western and Atlantic Railroad.[6] The entire exposure belongs to the Knox dolomite formation. The dolomite being largely crystalline and of a bluish-gray or light color and breaking with an uneven fracture. The analysis of No. 23 shows the general chemical character of the entire exposure except the chert which was omitted in sampling. No. 24 shows the chemical composition of the natural cement strata which consists of 7.17 feet of cement rock.

CHICKAMAUGA FORMATION

Table 5

Sample No.	1	2	3
Moisture at 100°C	.....	.....	.02
Loss on ignition	39.22	44.60	39.98
Soda (Na_2O)	.....	.07	.....
Potash (K_2O)	.....	.15	.....
Lime (CaO)	38.50	35.86	42.72
Magnesia (MgO)	8.23	15.26	8.10
Alumina (Al_2O_3)	2.59	.....	.78
Ferric oxide (Fe_2O_3)	1.51	.64	.84
Ferrous oxide (FeO)	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....
Sulphur trioxide (SO_3)	.....	.....	.....
Phosphorus pentoxide (P_2O_5)	.....	.00	.....
Carbon dioxide (CO_2)	.....	.....	.....
Silica (SiO_2)	7.38	2.50	5.94
Clay bases	.....	.....	.....
Undetermined	2.57	.....	1.62
TOTAL	100.00	100.00	100.00

1. Red and greenish limestone. Walker County. Chickamauga Development Company, on the Central of Georgia Railroad in Chickamauga.

2. Light blue, heavy-bedded limestone. Polk County. 90.3 feet thick from quarry at Marble Hill, Rockmart, Georgia.

3. Limestone screenings from Southern States Portland Cement Company quarry, near Rockmart, Polk County.

MAGNESIAN LIMESTONES IN THE COASTAL PLAIN FORMATIONS

Table 6

Sample No.	1	2	3	4	5
Moisture at 100°C	.....	.....	.....	.....	.....
Loss on ignition	.....	.....	.....	.....	.....
Soda (Na_2O)	.03	.14	.16	.....	.....
Potash (K_2O)	.15	.16	.10	.....	.....
Lime (CaO)	25.88	17.82	24.26	17.65	12.21
Magnesia (MgO)	15.01	10.72	13.06	13.73	11.55
Alumina (Al_2O_3) / Ferric Oxide (Fe_2O_3)	3.14	2.52	6.44	2.13	4.70
Ferrous oxide (FeO)	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.....	.....	.....	.....	.....
Phosphorus pentoxide (P_2O_5)	.09	.03	.06	.....	.....
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....
Silica (SiO_2) and Insol.	17.17	40.23	20.34	37.65	49.96
Undetermined	38.52	28.38	35.58	28.84	39.37
TOTAL	100.00	100.00	100.00	100.00	100.00
Calcium carbonate	48.53	31.82	43.36	31.51	21.19
Magnesium carbonate	31.41	22.50	27.40	28.70	24.15

1, 2 & 3. Limestone. Brooks County. Devils Hopper, G. W. Halloway property, lot 447, 13th district, 2 miles northeast of Barwick.6/

1. Brownish, compact, hard limestone; similar to stone of bed 5 of the Water Falls sink; (Grady County). Weathers to soft, yellow, arenaceous material; breaks easily; 3 feet. Medium, hard, light cream-colored argillaceous limestone; weathered product, deep cream-colored clay; 15 feet.
2. Soft, white, argillaceous limestone with black veinlets, probably manganese; weathers to yellowish argillaceous material.
3. Hard, cream-colored, compact limestone, weathers to brown, arenaceous material.

4 & 5. Limestone, Decatur County. H. H. Nossbaum, Miller Hydro Company, near Bainbridge, Ga.

MAGNESIAN LIMESTONES IN THE COASTAL PLAIN FORMATIONS

Table 6 (Continued)

Sample No.	6	7	8	9	10
Moisture at 100°C	.....	.....	.....	.....	.....
Loss on ignition	.....	.....	.....	37.84	.....
Soda (Na_2O)	.46	.82	.36	.....	.33
Potash (K_2O)	.12	.25	.18	.....	.28
Lime (CaO)	26.74	23.86	27.66	27.90	23.88
Magnesia (MgO)	16.47	15.46	14.43	15.32	14.60
Alumina (Al_2O_3) / Ferric oxide (Fe_2O_3)	2.16	3.16	3.28	1.34	2.80
Ferrous oxide (FeO)	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.....	.....	.....	.....	.....
Phosphorus pentoxide (P_2O_5)	tr.	.04	.70	.....	.06
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....
Silica (SiO_2) and Insoluble	14.68	17.04	15.32	16.54	21.88
Undetermined	39.37	39.37	38.07	1.06	36.17
TOTAL	100.00	100.00	100.00	100.00	100.00
Calcium carbonate	47.74	42.60	49.36	49.79	42.68
Magnesium carbonate	24.74	32.46	30.18	32.04	30.50

6. Limestone. Decatur County. Along the Atlantic Coast Line Railway, from 1 to 1¼ miles southwest of Recovery. 3/
7. Limestone, Decatur County. Lot 265, district 31, 2 miles northwest of Faceville. Mrs. B. B. Bower property, Bainbridge, Georgia.
8. Limestone. Echols County. J. I. Peterson property. Along the Allapaha River, 3½ miles below the bridge at Statenville, on the west bank of the river. 3/
9. Same. Analysis by J. Goldstein.
10. Limestone. Grady County. Forest Falls or Limesink, 8 miles north of Whigham. 3/
    Soft, white argillaceous limestone with brownish, concentric bands and apparently brecciated, hard, white compact limestone in a matrix of soft, white, argillaceous limestone. Irregular, brownish bands run through aggregate and matrix without break.

MAGNESIAN LIMESTONES IN THE COASTAL PLAIN FORMATIONS

Table 6 (Continued)

Sample No.	11	12	13	14	15
Moisture at 100°C	.....	.....	.....	.....	.....
Loss on ignition	.....	.....	.....	.....	.....
Soda (Na_2O)	.37	.....	.31	.04	.06
Potash (K_2O)	.23	.....	.35	.04	.04
Lime (CaO)	19.44	29.60	25.26	27.60	28.32
Magnesia (MgO)	14.08	17.43	14.95	16.67	17.30
Alumina (Al_2O_3) / Ferric Oxide (Fe_2O_3)	2.04	1.30	2.00	1.60	1.20
Ferrous oxide (FeO)	.....	.....	.....	.....	.....
Manganous oxide (MnO)	.....	.....	.....	.....	.....
Titanium dioxide (TiO_2)	.....	.....	.....	.....	.....
Sulphur trioxide (SO_3)	.....	.....	.....	.....	.....
Phosphorus pentoxide (P_2O_5)	.04	.05	.04	.66	tr.
Carbon dioxide (CO_2)	.....	.....	.....	.....	.....
Silica (SiO_2) and Insol.	30.65	7.22	20.12	12.40	10.59
Undetermined	33.15	44.20	36.97	41.59	42.49
TOTAL	100.00	100.00	100.00	100.00	100.00
Calcium carbonate	34.74	52.90	45.10	49.24	50.44
Magnesium carbonate	29.40	36.60	31.65	25.00	36.30

11. Limestone. Grady County. Little Limesink. 5 miles north of Whigham. 3/ Soft, white argillaceous limestone; pisolitic structure; probably weathered phase of limestone with concretionary structure.
12. Limestone. Grady County. Jas. Blackshear place, 8 miles south of Cairo, in the escarpment on the east side of Ochlocknee River, 200 yards south of Bonnet Lake. 3/
13. Limestone. Thomas County. McKinnon property, 5 miles east of Thomasville, ¼ mile south of the 5-mile post on the Boston road and ¼ north of the 5-mile post on the Atlantic Coast Line Railroad. 3/
14. Limestone. Thomas County. Mitchell property, in the steep slope of an old limesink, 7 miles west of Thomasville and ½ mile north of the Thomasville-Boston public road, near the eastern boundary of the Mitchell property. 3/
15. Limestone. Thomas County. R. G. Mitchell place, ½ mile west of the Thomasville-Springhill road, 7½ miles south of Thomasville. 3/

B I B L I O G R A P H Y

Additional information and analyses of dolomites and magnesian limestones of Georgia may be obtained from the following reports as well as from the files of the Georgia Division of Mines, Mining and Geology.

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2. McCallie, S. W. Roads and Road Building Materials of Georgia: Georgia Geol. Survey Bull. 8. 1901. 264 pp., 27 pl., and 1 map.

3. Brantly, J. E. Limestones and Marls of the Coastal Plain of Georgia: Georgia Geol. Survey Bull. 21. 1917. 289 pp., 18 pl., and 1 map.

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