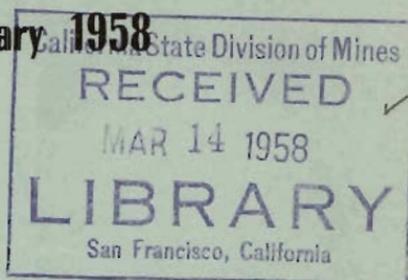


MONTHLY BULLETIN

January 1958



*Mineral
Industries Laboratory*

**1430 Devine Street
Columbia, South Carolina**

**DIVISION OF GEOLOGY
State Development Board**

**DEPARTMENT OF GEOLOGY
University of South Carolina**

HEAVY MINERAL BEACH PLACERS OF THE SOUTH CAROLINA COAST

By

James Neiheisel

Concentrations of heavy minerals occur along the beaches of the South Carolina coast where wind and wave action are favorable for their formation. These natural concentrations contain 80 percent or more heavy minerals, range in length from 1 to 5 miles, in width from 20 to 150 feet, and attain thicknesses of from 3 inches to 3 feet. The coastal islands containing the more sizable quantities of these natural concentrates are in order of decreasing abundance of heavy minerals: Bull Island, Capers Island, Isle of Palms, Edisto Island, Fripps Island, Dewees Island, and Hilton Head Island (Fig. 1). Ore minerals of titanium, zirconium, and thorium approximate the following percentage of the heavy minerals fraction: ilmenite, 55 percent; rutile, 3 percent; leucoxene, 4 percent; zircon, 8 percent; and monazite, 1 percent. Gangue minerals consist of epidote, hornblende, staurolite, kyanite, garnet, tourmaline, and very minor amounts of others.

BULL ISLAND

On Bull Island, there is an accreting beach that is approximately 6 miles long and 400 feet wide. The northern end of the island is the only area now undergoing erosion. Heavy mineral concentrations occurring along the back-shore of the middle stretch of the island are

Note: Deposits shown are those containing
80 % or more heavy minerals

**AVERAGE PERCENTAGES OF
HEAVY MINERAL FRACTIONS**

Ilmenite -	55 %
Leucoxene -	4 %
Rutile -	3 %
Zircon -	8 %
Monazite -	1 %
Other -	29 %

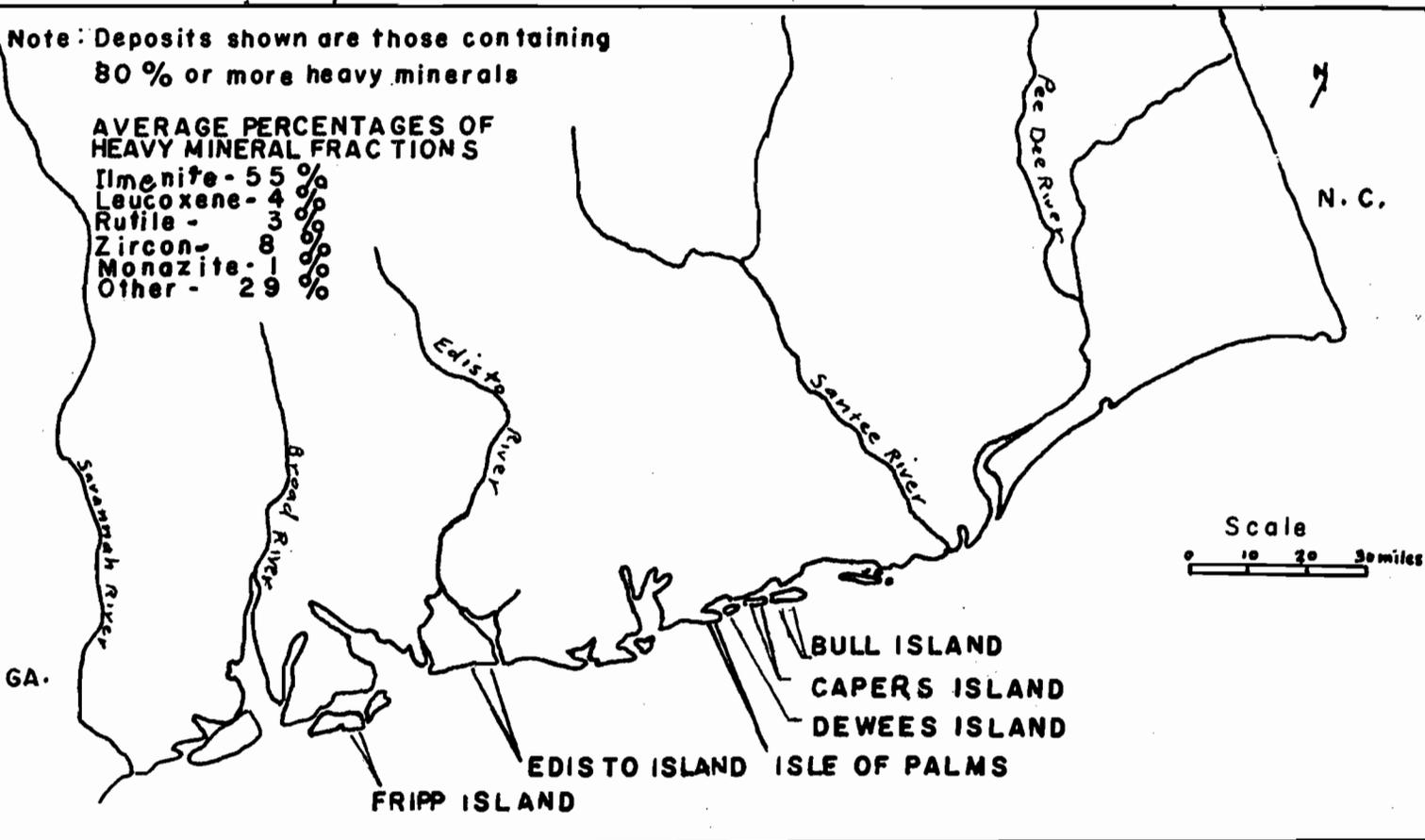


FIGURE 1: BEACH PLACERS ALONG THE SOUTH CAROLINA COAST

the thickest and most extensive of any along the South Carolina coast. This bermed back-shore area contains beds of natural heavy mineral concentrates 1 to 3 feet thick and having an average width of 70 feet over a distance of 3 miles along the beach. About 150,000 tons of heavy mineral concentrates is estimated to be present in this canoe shaped deposit. The heavy minerals fraction constitutes about 80 percent of the total sand, and the percentage of ore minerals in the heavy minerals fraction is (based on eight samples) as follows: ilmenite, 63 percent; rutile, 2 percent; leucoxene, 4 percent; zircon, 10 percent; and monazite, 1.5 percent. Gangue minerals in decreasing order of abundance are epidote, staurolite, hornblende, kyanite, tourmaline, garnet, and magnetite.

Capers Island

Capers Island is south of Bull Island and separated from it by Price Inlet. It is approximately 3 miles in length and is eroding in the center with accretion taking place at both ends. Heavy mineral concentrations occur in the upper foreshore beach in the eroding central two miles of the island. Densely vegetated wave cut foredunes, and trees occurring many yards out in the tidal zone, are typical. Heavy mineral concentrations in this area have an average width of 50 feet and range in thickness from 1 to 2 feet. Tenor and mineral components of this deposit are similar to those for the deposit on Bull Island.

Dewees Island

Dewees Island is to the south of Capers Island and is about 2 miles long. Accretion is taking place on the beach along the northern end of the island, and active erosion is in progress on the beach along the southern end. Heavy mineral concentrations occur along the southernmost mile of beach. These are similar to the deposits on Capers Island except that the beds of natural concentrates are thinner on Dewees Island. Tenor and mineral components of the deposit are similar to those for the deposits on Bull Island and Capers Island.

Isle of Palms

The Isle of Palms is south of Dewees Island and is separated from it by Dewees Inlet. Accretion is taking place along the whole 6 mile length of the island. Natural heavy mineral concentrations occur $\frac{1}{2}$ mile south of the northernmost headland and extend about 1 mile south along the beach; the average width is 30 feet and the average thickness 3 to 6 inches. These concentrations extend from mean high water mark into the backshore area. In cross section the deposit appears wedge shaped and tapers off gradually to the south. An estimated 15,000 tons of heavy mineral concentrates is present in this deposit. Except for a slight decrease in the abundance of ilmenite to about 55 percent of the heavy mineral fraction, tenor and mineral components of this deposit are similar to those of the deposits on the islands to the north.

The northern portion of the Isle of Palms contains approximately 1000 acres of undeveloped land containing a series of dunes and beach

ridges. Analyses of more than 50 samples taken between the surface and the water table at regular intervals along a grid pattern indicate an average heavy mineral content of about 8 percent and an estimated 850,000 tons of recoverable heavy minerals for the sands above water table. The principal mineral components are: ilmenite, 31 percent; rutile, 2 percent; leucoxene, 3 percent; zircon, 5 percent; and monazite, 0.3 percent. Gangue minerals are in decreasing order of abundance epidote, hornblende, staurolite, kyanite, garnet, and tourmaline.

Edisto Island

Edisto Island is between the mouths of the North and South Edisto Rivers. The beach is approximately 10 miles long and 250 feet wide. Erosion is evidenced by mud flats and trees extending into the tidal zone. Botany Bay Beach, in the northern portion of Edisto Island, is approximately 3 miles long and currently undergoing rapid erosion. Heavy mineral concentrations occur along its entire length in the upper foreshore area. The widths of these concentrations range from 10 to 40 feet, and in places extend for a distance of 80 feet into the marsh area. Thickness of this deposit ranges from 3 inches to 2 feet in an undulatory manner. Percentages of ore minerals in the heavy minerals fraction are: ilmenite, 65 percent; rutile, 3 percent; leucoxene, 6 percent; zircon, 12 percent; and monazite, 0.5 percent. Epidote and hornblende are present in lesser abundance than on the islands to the north.

Fripps Island

Fripps Island is eroding on the ends and accreting in the center. Heavy mineral concentrations are present over about 2 miles of beach extending south from a point about $\frac{1}{2}$ mile south of the northern headland. The average width of the deposit is 100 feet, and the thickness ranges from about 1 inch at the southern end of the deposit to about 6 inches at the northern end. Percentages of ore minerals in the heavy mineral fraction are similar to those for the deposit on Edisto Island.

Other Coastal Islands

Smaller concentrations of heavy minerals occur on Sullivans Island, Hunting Island, Prichards Island, and the northern portion of Hilton Head Island. Monazite is practically absent on Sullivans Island. Several thin layers or beds of heavy mineral concentrates commonly occur at varying depths in the bermed backshore of many of the beaches along the South Carolina coast. Many of the dunes and beach ridges across the islands contain heavy minerals, and the tone of the gray color of the dunes is generally proportional to the amount of heavy minerals present.

Summary

Heavy minerals in concentrations ranging from 3 to 100 percent are present in the beach sands of South Carolina. At locations where wind and wave action were most favorable, sizable concentrations of heavy minerals have been formed. In the better deposits the heavy mineral fraction constitutes 80 percent or more of the total sand.

Ore minerals of titanium, zirconium, and thorium are present in these deposits in appreciable quantities and constitute a potential source of these materials.

LIGHT COLORED BRICK IN SOUTH CAROLINA

by

L. R. Whitaker
Carolina Ceramics Company

The manufacture of brick in South Carolina has a history as old as the permanent settlements of the state. The clays along the coast were moulded by hand into brick at this early date, dried in the open air, and fired in field kilns using wood as a fuel. Some of our ancestors from Europe were familiar with the process of brick making, and they began producing brick a short time after settling the state. These brick were used for pillars and chimneys in the better homes and commercial buildings.

This next statement may be challenged. It is doubtful that any of the brick used in the Colonial structures were brought over from England. All the brick seen in the buildings along the coast were manufactured from local siliceous clays very near the building sites. During the Colonial period brick could be made more cheaply than it could be transported over one mile.

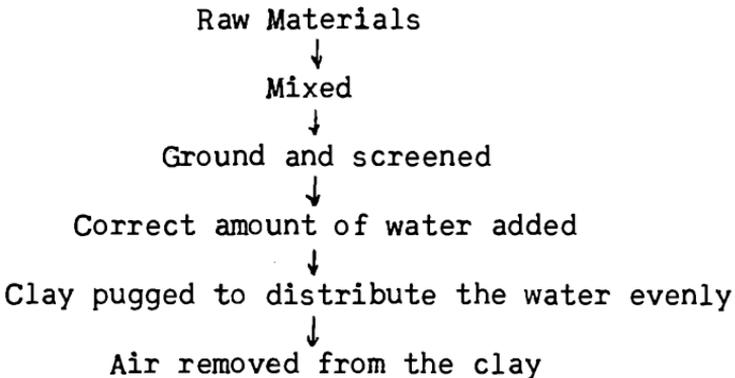
The brick industry grew very slowly; it was mainly by the establishment of small brick plants scattered over the entire State of South Carolina. As the manufacture of brick became

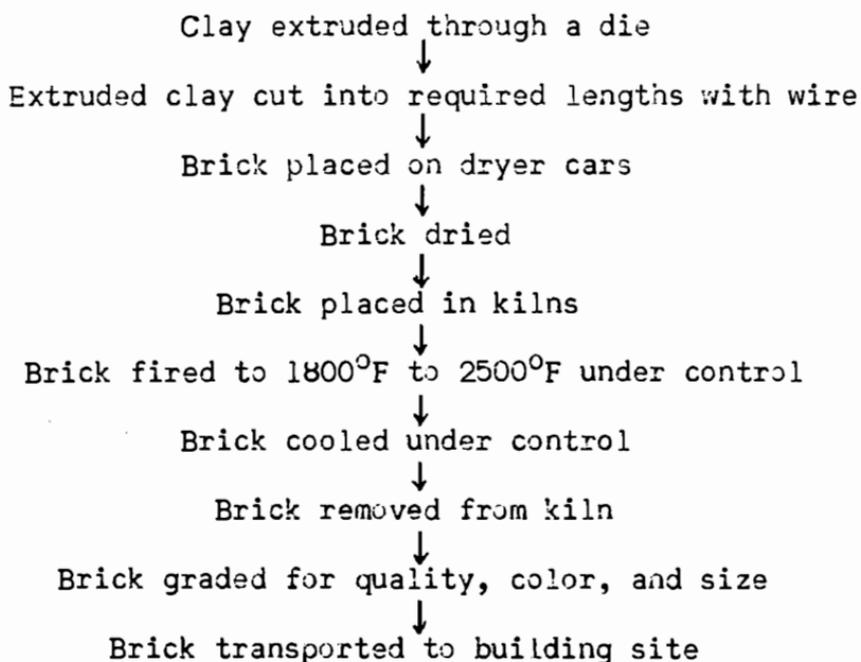
more mechanized, plants became larger and fewer in number.

South Carolina has an abundance of raw materials over the entire State from which brick can be produced. Up until the last few years the brick plants of South Carolina produced only different shades of red brick. Those brick having such colors as pink, buff, rose, cream, and gray were imported into South Carolina from such states as Ohio, West Virginia, and Pennsylvania

Several years ago the manufacture of light colored brick was begun at Carolina Ceramics Company from material in the vicinity of Columbia. The raw material used in the manufacture of these light colored brick is basically a mixture of various grades of kaolin and various types of weathered slates. There are materials available, however, that can be used to produce any color brick made in any part of the United States.

Most persons are familiar with brick, but relatively few have seen the process through which the material must progress to become brick. The flow sheet in the manufacture of brick is outlined in the following diagram:





Most persons find the manufacture of brick most interesting. Visitors are always welcome at Carolina Ceramics Company.

