MONTHLY REPORT

NOVEMBER 1957

MINERAL INDUSTRIES LABORATORY
1430 DEVINE STREET
COLUMBIA, SOUTH CAROLINA

DIVISION OF GEOLOGY
STATE DEVELOPMENT BOARD

DEPARTMENT OF GEOLOGY
UNIVERSITY OF SOUTH CAROLINA

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ANNUAL MEETING OF THE CAROLINA GEOLOGICAL SOCIETY

The Carolina geological Society held its annual meeting on Saturday and Sunday, November 16-17, 1957. This organization is somewhat different from the usual professional society in that its annual activities are confined to a day and a half week-end field trip and a banquet on the Saturday evening. The geologists of South and North Carolina thus have the opportunity to examine together in the field the rock types and structures of the units that extend across both states.

The field trip was held this year in the Atlantic Coastal Plain of South Carolina, and was very ably organized by George Siple of the Ground Water Branch of the U. S. G. S. Mr. Siple guided the party to representative outcrops of Cretaceous and Cenozoic rocks of South Carolina. The units examined were the Tuscaloosa formation, Black Creek formation, Peedee formation, Black Mingo formation, Santee limestone, Cooper marl, and Castle Hayne limestone. A visit was made to the quarry and cement plant of the Giant Cement Company at Harleyville, South Carolina. About 80 persons were present on the field trip and at the banquet. The group was spirited in spite of considerable rain and high water.

The officers elected for the following year are as follows:

Thomas L. Kesler, President
Henry S. Johnson, Jr., Vice President
E. Willard Berry, Secretary-Treasurer (Permanent)
Steve Conrad, Chairman, Membership Committee

THE CERAMICS LABORATORY AT CLEMSON COLLEGE

Clemson College at Clemson, South Carolina has one of the best equipped ceramics laboratories in the country. Gilbert C. Robinson, Head of the Department of Ceramic Engineering, has developed this laboratory into an important instrument for the industrial development of the State. The equipment of the laboratory includes a complete X-Ray unit, a spectrograph, an electron microscope, differential termal analysis equipment, and a variety of kilns and testing devises. Thus Mr. Robinson and his staff are able to carry out the most complete tests on ceramic materials.

The Department of Ceramic Engineering at Clemson has worked closely with geologists in the State. Many projects have been joint undertakings in which the geologist pursued the field studies and collected specimens, and the Clemson personnel carried out the laboratory studies. These joint projects have included studies of the slates, kaolin, brick clays, glass sands, pyrophyllite, barite, and sericite of South Carolina.

U. S. GEOLOGICAL SURVEY MAPPING

The United States Geological Survey has begun a geologic mapping project in North Carolina at Concord. W. C. Overstreet and Henry

Bell began field work last year in an area where mafic dikes cut the syenite ring dike that has been considered by some to be the youngest member of the plutonic complex in the Charlotte Belt of the Piedmont. The area presently being mapped extends eastward from near Concord and includes the western edge of the Slate Belt. Deposits of gold have been known and mined for many years in this area, and small deposits of tungsten are of interest to prospectors.

In conjunction with the geologic mapping, reconnaissance studies are being made of the heavy minerals present in alluvium and upland sand and gravel deposits. Geochemical studies are being made of the copper, lead, zinc, and tungsten content of alluvial clays. Airborne radiometric and magnotometer studies are expected to contribute greatly to the understanding of the geology of the area.

MONAZITE DEPOSITS OF SOUTH CAROLINA

By

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Monazite, a heavy mineral containing thorium, a possible substitute for uranium in nuclear reactors, is more widespread in occurrance in South Carolina than is commonly known. This mineral was first discovered in this region in about 1875, and from then until 1900 it was rather extensively mined in placer (stream) deposits in western South

Carolina between Greenville and Gaffney. The Thorium so obtained was used in the manufacture of lamp fixtures, hence the market was limited.

In 1952, commercial placer deposits of monazite, together with other valuable minerals, were discovered on Horse Creek near Aiken, South Carolina, and about a quarter of a million dollars worth of mining and concentrating equipment has been operating there for over four years. Mining operations ordinarily don't operate for over one year without profit. Meanwhile it is reported that equally good deposits are present along creeks and rivers north of Aiken, for example along Shaw Creek and South Fork of Edisto River. Similar deposits may be expected elsewhere in the state.

These placer deposits in South Carolina are most inconspicuous on the surface. They appear as just another of the swampy brushy wooded creeks which are so common to this region. To determine the tenor of these placers it is necessary to sink test holes and collect cuttings from two or five foot intervals down to a depth of about 30 feet. This isn't as simple as it sounds, because at about 5 to 10 foot depths loose sand saturated with water flows like mush into drill holes and tends to confuse the results of sampling. With proper methods, however, reliable samples can be obtained.

Of course, all stream beds do not carry commercial concentrations of heavy minerals, in fact most do not. It isn't easy to locate those that do. Ultra-modern radiation detection instruments, not the common geiger counters, give indications, but still test holes are needed to determine the kinds and percentages of the different minerals actually present.

Investigations by the writer have determined the widespread occurrence of monazite in upland soils and gravel beds far from the larger creeks and rivers. The writer has examined these upland soils and gravel beds in many places (perhaps 50 or more) and has run heavy mineral analyses on samples from each locality. There are few, if any of these soils and gravel deposits which fail to show some monazite. Locally, the amount is relatively high (not meaning commercial) but the interesting thing is that the monazite is there. For example, even the 20 or 30 feet of deep red soil blanketing the campus of the University of South Carolina in the heart of Columbia contains some monazite. Elevation above sea level does not seem to be a controlling factor. Somewhere somehow, in the developing of these upland soils and gravels a source of monazite existed.

The presence of monazite in upland soils and gravels suggests that these deposits are a possible source of the monazite found in some modern stream deposits. As the upland soils and gravels were eroded by running water monazite would tend to lag behind and be concentrated in placer deposits along creeks and rivers. Where all conditions were favorable monazite accumulated in amounts sufficient to allow economic recovery today.