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GEOLOGICAL ACTIVITIES IN SOUTH CAROLINA
DURING 1958

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PROJECTS

DURING 1958 THE DIVISION OF GEOLOGY OF THE SOUTH CAROLINA STATE DEVELOPMENT BOARD CONTINUED ITS PROGRAM OF STUDYING THE GEOLOGY AND MINERAL RESOURCES OF THE STATE. AN ADDITIONAL FULL TIME GEOLOGIST, L. N. SMITH, WAS ADDED TO THE STAFF IN AUGUST, BRINGING THE PERMANENT STAFF TO TWO GEOLOGISTS AND ONE SECRETARY. MUCH OF THE PROJECT WORK CURRENTLY UNDER WAY IS BEING DONE ON A PART TIME BASIS BY GEOLOGISTS FROM THE FACULTY OF CLEMSON COLLEGE, DUKE UNIVERSITY, THE UNIVERSITY OF SOUTH CAROLINA, AND OCCASIONALLY FROM OTHER SCHOOLS. PROJECTS ACTIVE OR SEMI-ACTIVE DURING 1958 ARE DESCRIBED BELOW.

LIMESTONES AND MARLS OF SOUTH CAROLINA. -- THIS STUDY IS DIVIDED INTO TWO PHASES, THE PIEDMONT-BLUE RIDGE PHASE AND THE COASTAL PLAIN PHASE. DURING THE FIELD SEASON OF 1957 AN ATTEMPT WAS MADE BY J. W. CLARKE, THEN OF THE UNIVERSITY OF SOUTH CAROLINA, TO TRACE THE METASEDIMENTARY ROCKS OF THE KINGS MOUNTAIN AND BREVARD BELTS ACROSS THE STATE AND TO VISIT AND APPRAISE ALL THE KNOWN OUTCROPS OF CARBONATE ROCKS IN THE PIEDMONT AND BLUE RIDGE PROVINCES. THE RESULTS OF THESE INVESTIGATIONS ARE TO BE GIVEN IN A REPORT NOW BEING PREPARED BY CLARKE FOR PUBLICATION BY THE DIVISION OF GEOLOGY, SOUTH CAROLINA STATE DEVELOPMENT BOARD. AMONG THE THINGS OF INTEREST BROUGHT OUT DURING THESE INVESTIGATIONS WAS THE PRESENCE AS FAR SOUTHWEST AS ABBEVILLE COUNTY OF DOLOMITIC AND HIGH-CALCIUM MARBLE AND OTHER LOW RANK METASEDIMENTARY ROCKS THOUGHT TO CORRELATE WITH ROCKS OF THE KINGS MOUNTAIN BELT. IN OCONEE COUNTY A LARGE DEPOSIT OF HIGH-CALCIUM MARBLE WAS DISCOVERED IN A SERIES OF METASEDIMENTARY ROCKS LITHOLOGICALLY VERY SIMILAR TO ROCKS OF THE SOUTHWESTERN EXTENSION OF THE KINGS MOUNTAIN BELT IN ABBEVILLE COUNTY. THROUGHOUT THE STUDY, THE LITHOLOGIC SIMILARITY, GENTLE FOLDING, AND SHALLOW DIPS OF WHAT MAY BE A THICK CONTINUOUS SEQUENCE OF METASEDIMENTARY ROCKS EXTENDING ACROSS MUCH OF THE PIEDMONT BECAME APPARENT.

GEOLOGY OF THE IRMO QUADRANGLE, SOUTH CAROLINA.

-- S. D. HERON, JR. OF DUKE UNIVERSITY AND H. S. JOHNSON, JR. OF THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD, UNDERTOOK A LIMITED AMOUNT OF FIELD WORK DURING 1958 TO EXPAND AND PREPARE FOR PUBLICATION HERON'S ORIGINAL GEOLOGIC MAP OF THE IRMO QUADRANGLE, SOUTH CAROLINA - MAPPED BY HERON AS PART OF HIS WORK FOR THE MASTER OF SCIENCE DEGREE IN GEOLOGY AT THE UNIVERSITY OF SOUTH CAROLINA IN 1949. THE CAROLINA SLATE (PALEOZOIC (?)) IN THE QUADRANGLE WAS DIVIDED INTO FELSIC AND MAFIC SUBDIVISIONS, AND PARTICULAR ATTENTION WAS PAID TO STRUCTURE. ONE OF THE RESULTS OF THIS WORK WAS THE DELINEATION OF A LARGE GENTLY PLUNGING OPEN FOLD IN THE CAROLINA SLATE. THIS ENCOURAGES THE VIEW THAT STRUCTURE AND STRATIGRAPHY OF THE CAROLINA SLATE GROUP CAN BE WORKED OUT IF LITHOLOGY AND STRUCTURAL TRENDS ARE MAPPED IN CAREFUL DETAIL. "GEOLOGY OF THE IRMO QUADRANGLE", INCLUDING MAP AND SHORT TEXT, WAS PUBLISHED BY THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD IN OCTOBER 1958.

MINERALS INDUSTRY OF SOUTH CAROLINA.

-- THE PURPOSE OF THIS PROJECT IS TO ASSEMBLE ALL AVAILABLE PUBLISHED INFORMATION ON THE MINERALS INDUSTRY OF SOUTH CAROLINA FROM THE COLONIAL PERIOD TO THE PRESENT. M. J. GREEN CONTINUED PART TIME LIBRARY RESEARCH FOR THIS PROJECT DURING 1958.

HEAVY MINERALS IN SOUTH CAROLINA BEACH SANDS.

-- FIELD AND LABORATORY WORK FOR THIS PROJECT WERE COMPLETED BY JAMES NEIHEISEL DURING 1958, AND A REPORT WAS PREPARED FOR EVENTUAL PUBLICATION BY THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD. TO OBTAIN BASIC INFORMATION ON THE DISTRIBUTION AND CONCENTRATION OF HEAVY MINERALS IN SOUTH CAROLINA BEACH SAND, SAMPLES WERE TAKEN AT APPROXIMATE 2 MILE INTERVALS ALONG THE COAST FROM THE NORTH CAROLINA LINE TO THE GEORGIA LINE. THESE SAMPLES WERE TAKEN TO DEPTHS OF 2 TO 3 FEET FROM POINTS NEAR THE MEAN HIGH TIDE MARK. NATURAL CONCENTRATIONS OF HEAVY MINERALS PRESENT IN SOME PLACES WERE ALSO SAMPLED. IN THE LABORATORY, HEAVY MINERAL PERCENTAGES WERE MEASURED AND THE MINERAL CONSTITUENTS IDENTIFIED.

OBSERVATIONS OF EROSION AND ACCRETION ALONG THE BEACHES SUGGEST THAT THE COAST IS RELATIVELY STABLE AT THE PRESENT TIME AND THAT WIND AND TIDE HAVE GREATER EFFECT ON THE BUILDING UP AND TEARING DOWN OF PRESENT DAY BEACH AREAS THAN DO SHIFTS IN SEA LEVEL. ALSO OF INTEREST IS THE FACT THAT ALONG

THE SOUTH CAROLINA COAST HEAVY MINERALS ARE MOST PREVALENT ON THE BEACHES SOUTH OF THE MOUTHS OF THE PEE DEE AND SANTEE RIVERS. THIS SUGGESTS THAT THESE RIVERS, BOTH OF WHICH DRAIN LARGE AREAS OF IGNEOUS AND METAMORPHIC ROCK, ARE PROBABLY THE PRINCIPAL SOURCES OF HEAVY MINERALS IN THE SANDS ALONG THE PRESENT DAY SOUTH CAROLINA COAST.

GEOLOGY AND MINERAL RESOURCES OF UNION COUNTY, SOUTH CAROLINA. -- INTERMITTENT FIELD WORK WAS CARRIED ON BY H. S. JOHNSON, JR., DURING THE EARLY PART OF 1958. LATER IN THE YEAR THE PROJECT WAS DECLARED TEMPORARILY INACTIVE BECAUSE OF THE PRESS OF OTHER WORK. TO DATE ABOUT 10% OF THE COUNTY, PRINCIPALLY THE SOUTHEASTERN PART, HAS BEEN MAPPED BY RECONNAISSANCE METHODS ON A SCALE OF ONE INCH TO THE MILE.

THE OLDEST ROCKS IN THE SOUTHEASTERN PART OF THE COUNTY ARE A LAYERED SEQUENCE OF METASEDIMENTARY AND POSSIBLY META-IGNEOUS ROCKS, PREDOMINANTLY HORNBLENDE GNEISSES AND ROCKS OF DIORITIC COMPOSITION. BEDDING IS DISTINGUISHABLE IN THESE ROCKS AT MANY PLACES, AND GENTLE OPEN FOLDS AND SHALLOW DIPS APPEAR TO BE COMMON. THESE OLDER HORNBLENDIC ROCKS HAVE BEEN INTRUDED AND PARTIALLY ASSIMILATED BY GRANITE SO THAT MUCH OF THE AREA IS NOW UNDERLAIN BY A VERY COMPLEX MIXTURE OF IGNEOUS AND METASEDIMENTARY ROCKS RANGING FROM LAYERED HORNBLENDE GNEISS TO COARSE-GRAINED PORPHYRITIC GRANITE.

NEAR SANTUCK IS A ROUGHLY CIRCULAR AREA, APPROXIMATELY 4 MILES ACROSS, OF MEDIUM-GRAINED PINK GRANITE COMPOSED ESSENTIALLY OF QUARTZ AND POTASH FELDSPAR. THIS MAY BE A STOCK OF RELATIVELY YOUNG GRANITE OR POSSIBLY A CORE-LIKE ZONE IN THE GRANITE THAT IS WIDELY INTRUSIVE INTO THE OLDER METASEDIMENTARY ROCKS OF THE SOUTHEASTERN PART OF THE COUNTY.

FORT JACKSON NORTH QUADRANGLE, SOUTH CAROLINA. -- DURING 1958 W. K. POOSER, THEN A GRADUATE STUDENT IN GEOLOGY AT THE UNIVERSITY OF SOUTH CAROLINA, COMPLETED FIELD AND LABORATORY WORK ON THE GEOLOGY OF THE FORT JACKSON NORTH QUADRANGLE AND PREPARED A GEOLOGIC MAP AND REPORT WHICH EVENTUALLY IS TO BE PUBLISHED BY THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD. THE PRINCIPAL ROCKS EXPOSED IN THE QUADRANGLE ARE SERICITIC PHYLLITES OF THE CAROLINA SLATE GROUP (PALEOZOIC (?)); GRANITE (PALEOZOIC); DIABASE DIKES

(TRIASSIC); SAND, CLAY, AND GRAVEL OF THE TUSCALOOSA FORMATION (CRETACEOUS); AND UNCONSOLIDATED SANDS AND SPARSE GRAVELS OF TERTIARY AND/OR PLEISTOCENE AGE. OF PARTICULAR INTEREST ARE THE BLANKET-LIKE DEPOSITS OF REDDISH SANDS OVERLYING THE TUSCALOOSA FORMATION ON HIGH HILLS IN THE SOUTHEASTERN PART OF THE QUADRANGLE. THESE REDDISH SANDS ARE THOUGHT TO BE IN PART A RESIDUUM DERIVED FROM TERTIARY BEDS THAT ONCE OVERLAPPED THE TUSCALOOSA FORMATION IN THIS AREA AND IN PART A RESIDUUM DERIVED FROM THE TUSCALOOSA ITSELF. ALSO OF INTEREST ARE LONG CURVING NORTHEAST-SOUTHWEST TRENDING RIDGE-LIKE DEPOSITS OF SAND UP TO 100 FEET THICK IN THE NORTHEAST PART OF THE QUADRANGLE. THE SURFACE OF THESE DEPOSITS IS CHARACTERIZED BY A DUNE TOPOGRAPHY IN PLACES, AND THEY ARE PROBABLY PLIOCENE OR PLEISTOCENE IN AGE. THEY SEEM TO BE OF COMPLEX ORIGIN IN THAT THEY PROBABLY FORMED AS BARS AND SPITS, THE UPPER PARTS OF WHICH WERE DEPOSITED OR REWORKED TO SOME EXTENT BY WIND.

GEOLOGY AND MINERAL RESOURCES OF EDGEFIELD COUNTY, SOUTH CAROLINA. --DURING THE SUMMER OF 1958, W. T. McCUTCHEN, A GRADUATE STUDENT IN GEOLOGY AT FLORIDA STATE UNIVERSITY, CARRIED OUT DETAILED RECONNAISSANCE GEOLOGIC MAPPING IN EDGEFIELD COUNTY, SOUTH CAROLINA. LABORATORY WORK AND REPORT WRITING ARE NOW IN PROGRESS FOR A BULLETIN TO BE PUBLISHED BY THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD.

THE PRINCIPAL ROCKS IN THIS COUNTY ARE LAYERED METASEDIMENTS AND METAVOLCANICS OF THE CAROLINA SLATE GROUP (PALEOZOIC (?)); A COMPLEX OF HORNBLENDE GNEISS AND QUARTZ-BIOTITE GNEISS OF UNKNOWN AGE THAT HAS BEEN INTRUDED AND PARTIALLY ASSIMILATED BY GRANITE; GRANITE (PALEOZOIC (?)); SANDS, CLAYS, AND GRAVEL OF THE TUSCALOOSA FORMATION (CRETACEOUS); AND REDDISH SANDS, GRAVEL, AND CLAY OF THE BARNWELL FORMATION (TERTIARY). IN MAPPING, PARTICULAR ATTENTION WAS PAID TO THE CAROLINA SLATE GROUP IN AN EFFORT TO SUBDIVIDE IT AND TO MAP STRUCTURE IN IT. IN THE FIELD, FOUR DIFFERENT TYPES OF CAROLINA SLATE WERE RECOGNIZED AND MAPPED. THESE ARE SERICITIC PHYLLITE, "VARVED" SLATES, FELSIC VOLCANICS, AND MAFIC VOLCANICS. FOLDING IN THESE ROCKS WAS FOUND TO BE FAIRLY OPEN AND WITH STEEP TO GENTLY PLUNGING AXES. SLATY AXIAL PLANE CLEAVAGE IS WELL DEVELOPED IN PLACES, PARTICULARLY IN THE "VARVED" SLATES.

MAPPING THE CONTACT BETWEEN CRETACEOUS AND TERTIARY ROCKS IN THE SOUTHERN HALF OF THE COUNTY PRESENTED A DIFFICULT PROBLEM BECAUSE OF THE LITHOLOGIC SIMILARITY OF THE UNITS AND THE LACK OF GOOD OUTCROPS. ALONG THIS FEATHER EDGE OF COASTAL PLAIN DEPOSITS, THE BARNWELL FORMATION SEEMS TO HAVE BEEN LARGELY DERIVED BY REWORKING OF THE UNDERLYING TUSCALOOSA FORMATION.

MINERAL RESOURCES INVESTIGATED DURING THIS PROJECT WERE BLOATING SHALE, BRICK CLAY, GRANITE, GOLD, PYROPHYLLITE, AND SERICITE.

GEOLOGY AND MINERAL RESOURCES OF PICKENS COUNTY, SOUTH CAROLINA. -- IN AUGUST 1958, PROFESSOR C. Q. BROWN OF CLEMSON COLLEGE BEGAN PART TIME GEOLOGIC INVESTIGATIONS IN PICKENS COUNTY ON BEHALF OF THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD. ABOUT HALF THE COUNTY HAS BEEN MAPPED BY DETAILED RECONNAISSANCE METHODS, AND FIELD AND LABORATORY WORK ARE CONTINUING. EVENTUALLY A BULLETIN WILL BE PUBLISHED BY THE DIVISION OF GEOLOGY ON THE RESULTS OF THIS WORK.

THE PRINCIPAL ROCK TYPES IN THIS COUNTY ARE GRANITE GNEISS, HORNBLende GNEISS, QUARTZ-BIOTITE GNEISS, MICA SCHIST, AND INJECTION GNEISS. THE OVER-ALL PICTURE IN THE SOUTHWESTERN PART OF THE COUNTY IS ONE OF A THICK SEQUENCE OF FOLDED METASEDIMENTARY ROCKS. THESE GRADE THROUGH WHAT APPEARS TO BE A GRANITIZED ZONE INTO A LARGE AREA OF GRANITE GNEISS IN THE SOUTH CENTRAL PART OF THE COUNTY. IN THE NORTHERN PART OF THE COUNTY THE METASEDIMENTARY ROCKS GRADE INTO A LARGE AREA CHARACTERIZED BY INJECTION GNEISS.

STRUCTURALLY THE SOUTHWESTERN PART OF PICKENS COUNTY APPEARS TO BE AN AREA OF A MAJOR FOLD WITH MANY MINOR FOLDS SUPERIMPOSED ON IT. OUTCROP PATTERNS AND THE STRIKE AND DIP OF FOLIATION AND BEDDING REVEAL A GENERAL NORTHEAST-SOUTHWEST TREND. THE AXIAL PLANE OF THE POSTULATED MAJOR FOLD APPEARS TO DIP TO THE SOUTHEAST. MINOR FOLDS ARE HIGHLY VARIABLE AND MAY BE OPEN, OVERTURNED, OR EVEN RECUMBENT. LOCALLY THE STRIKE OF BEDDING IS TRANSVERSE TO THE NORTHEAST-ERLY REGIONAL TREND. THE AGE OF THESE METASEDIMENTARY ROCKS IS UNKNOWN, BUT THEY ARE LITHOLOGICALLY SIMILAR AND ARE THOUGHT TO BE TRACEABLE INTO ROCKS ELSEWHERE IN THE PIEDMONT THAT ARE PROBABLY PRECAMBRIAN (?) THROUGH EARLY PALEOZOIC IN AGE.

AMONG THE MINERAL RESOURCES BEING STUDIED IN THE COURSE OF THIS PROJECT IS AN AREA OF SILLIMANITE-BEARING ROCK ON THE S. H. LUSK PROPERTY ON COUNTY ROAD 37 BETWEEN U. S. 123-A AND THE SOUTHERN RAILROAD. RESIDUAL BOULDERS 6 TO 24 INCHES IN DIAMETER AND COMPOSED ALMOST ENTIRELY OF SILLIMANITE ARE PRESENT ON THIS PROPERTY IN A LINE PARALLEL TO A SMALL TRIBUTARY OF GEORGES CREEK FOR A DISTANCE OF SEVERAL HUNDRED FEET. BOULDERS OF MASSIVE SILLIMANITE ARE ALSO FOUND IN ROCK PILES FROM THE CLEARED PASTURE LAND OVER MUCH OF THIS PROPERTY. POSSIBLY THESE SILLIMANITE BOULDERS REPRESENT ONLY ISOLATED PODS OF SILLIMANITE IN THE METASEDIMENTARY ROCKS OF THIS AREA. ON THE OTHER HAND, THE SILLIMANITE MAY BE PRESENT IN SUFFICIENT QUANTITY AND QUALITY TO HAVE SOME ECONOMIC POTENTIAL.

SILICEOUS CLAY-SHALES OF THE SOUTH CAROLINA COASTAL PLAIN. -- THESE SILICEOUS CLAY-SHALES OR "FULLERS EARTH" DEPOSITS, AS THEY HAVE BEEN CALLED, ARE WIDELY DISTRIBUTED THROUGH SOUTH CENTRAL SOUTH CAROLINA IN THE BLACK MINGO AND McBEAN FORMATIONS (EOGENE). CONSIDERABLE LABORATORY WORK HAS BEEN DONE ON THIS MATERIAL BY G. C. ROBINSON OF THE CERAMICS ENGINEERING DEPARTMENT OF CLEMSON COLLEGE. FIELD INVESTIGATIONS OF THESE DEPOSITS ARE BEING CONDUCTED INTERMITTENTLY BY L. N. SMITH OF THE DIVISION OF GEOLOGY, AND PLANS ARE TO PUBLISH EVENTUALLY A COMPLETE REPORT BY SMITH AND ROBINSON.

THE EXTENSIVENESS AND RELATIVELY UNIFORM QUALITY OF THESE DEPOSITS AND THE LIGHT WEIGHT, GOOD BLEACHING CHARACTERISTICS, AND HIGH ADSORPTIVENESS OF THIS MATERIAL GIVE THESE SILICEOUS CLAY-SHALES HIGH POTENTIAL FOR A WIDE VARIETY OF INDUSTRIAL USES SUCH AS BLEACHING CLAY, DILUENTS, AND INERT FILLER. A PARTICULARLY INTERESTING POTENTIAL USE FOR THIS MATERIAL IS TO MAKE CERAMIC SPONGES FOR THE STORAGE OF RADIOACTIVE WASTES.

BAUXITIC KAOLINS OF SOUTH CAROLINA. -- DURING THE LATE SUMMER OF 1958, S. D. HERON OF DUKE UNIVERSITY BEGAN AN INVESTIGATION OF BAUXITIC MATERIAL IN KAOLIN DEPOSITS ON BEHALF OF THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD. SAMPLES OF KAOLIN WERE TAKEN FROM SEVERAL MINES AND OUTCROPS IN THE VICINITY OF AIKEN, SOUTH CAROLINA, AND SAMPLES OF PISOLITIC CLAY WERE OBTAINED FROM SEVERAL UNDEVELOPED LOCALITIES IN AIKEN AND RICHLAND COUNTIES. ANALYSES OF SOME OF THESE SAMPLES ARE STILL PENDING, BUT SAMPLES OF PISOLITIC CLAY FLOAT CONTAINED AS MUCH AS 20 PERCENT AVAILABLE ALUMINA. AS YET NO LARGE DEPOSIT OF BAU-

XITE OR BAUXITIC CLAY HAS BEEN FOUND IN SOUTH CAROLINA. WORK ON THIS PROJECT IS NOW RECESSED INDEFINITELY.

RESULTS OF DRILLING FOR HEAVY MINERALS ON HILTON HEAD ISLAND, SOUTH CAROLINA. -- MRS. CAMILLA MCCAULEY IS CURRENTLY UNDERTAKING THE COMPILATION OF DATA RESULTING FROM U. S. BUREAU OF MINES AND NATIONAL LEAD COMPANY EXPLORATION FOR HEAVY MINERALS ON HILTON HEAD ISLAND SEVERAL YEARS AGO. HEAVY MINERALS, INCLUDING ILMENITE, RUTILE, LENCOXENE, ZIRCON, AND SOME MONAZITE ARE PRESENT IN LONG LOW RIDGES OF SAND THAT ROUGHLY PARALLEL THE PRESENT BEACH AND EXTEND A MILE OR SO INLAND. MAPS AND TABLES PRESENTING THIS DATA WILL EVENTUALLY BE PUBLISHED BY THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD.

SHORTER INVESTIGATIONS

DURING 1958 A NUMBER OF SHORTER EXAMINATIONS WERE MADE OR PARTICIPATED IN BY GEOLOGISTS OF THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD. IN MOST CASES NO FORMAL REPORT WAS PREPARED FOR PUBLICATION. THE FOLLOWING REMARKS SERVE AS AN INDEX TO THESE INVESTIGATIONS.

MONAZITE IN AIKEN COUNTY, SOUTH CAROLINA.-- PRIVATE EXPLORATION FOR HEAVY MINERALS IN AIKEN COUNTY DURING EARLY 1958 RESULTED IN THE DISCOVERY OF A DEPOSIT WHICH OCCURS OVER SEVERAL HUNDRED ACRES NEAR MCTIER CREEK IN THE NORTHERN PART OF THE COUNTY. THIS DEPOSIT IS NOT CONFINED TO THE CREEK BOTTOMS BUT RATHER OCCURS AS A GENTLY UNDULANT BLANKET WHICH HAS BEEN FOLLOWED FOR CONSIDERABLE DISTANCES OUT ON THE HILLSIDES AND INTERFLUVE AREAS. AN ARBITRARY DEPTH LIMIT OF 60 FEET WAS SET DURING DRILLING, SO THE DEPOSIT WAS NOT FOLLOWED IN AREAS WHERE DEPTHS TO THE PAY HORIZON WERE DEEPER THAN THAT. IT APPEARS FROM DRILL CUTTINGS AND ONE OR TWO SCATTERED OUTCROPS OF THE PAY HORIZON THAT THIS ZONE IS A 1 TO 3 FOOT THICK SAND AND GRAVEL LAYER AT THE BASE OF THE TUSCALOOSA FORMATION (CRETACEOUS) WHERE THIS UNIT OVERLIES A THOROUGHLY WEATHERED GRANITE. QUARTZ PEBBLES IN THE PAY ZONE ARE SUBROUNDED TO ANGULAR AND ARE CLEAR TO BLUISH OR SMOKEY COLORED, AS IS THE QUARTZ IN VEINLETS IN THE UNDERLYING GRANITE. THE PAY ZONE TYPICALLY CONTAINS ABOUT 1 PERCENT HEAVIES AND IS RICH IN MONAZITE. SOME SAMPLES ARE REPORTED TO CONTAIN AS MUCH AS 33 PERCENT MONAZITE IN THE HEAVY

MINERAL FRACTION. THE COARSE SIZE OF THE MONAZITE, THE RATHER ANGULAR QUARTZ AND ITS SIMILARITY TO THE QUARTZ IN THE GRANITE, AND THE ABSENCE OF GOLD IN THE SUITE SUGGEST THAT THE HEAVIES IN THIS DEPOSIT DID NOT COME FROM A SOURCE IN THE PIEDMONT TO THE NORTH-WEST BUT RATHER THAT THEY WERE DERIVED FROM THE GRANITE IMMEDIATELY BENEATH THE COASTAL PLAIN SEDIMENTS IN THIS AREA.

QUARTZ DEPOSIT, UNION COUNTY. -- ON THE JAMES A. BERRY PROPERTY ABOUT 9 MILES S. 85° W. OF UNION IS A DIKE OF MASSIVE QUARTZ WITH VERY FEW IMPURITIES. THIS DIKE STRIKES ABOUT N. 25° E. AND DIPS ABOUT 55° TO THE EAST. IT APPEARS TO BE ABOUT 15 TO 20 FEET THICK AND CROPS OUT INTERMITTENTLY OVER A DISTANCE OF 300 TO 500 FEET. THE DIKE IS INTRUDED INTO A LARGE STOCK OF METAGABBRO AND STANDS 5 TO 8 FEET ABOVE THE SURFACE OF THE COUNTRY ROCK IN PLACES. NEAR THE CENTRAL PART OF THE DIKE OUTCROP, A ZONE OF COARSE-GRAINED GRAPHIC GRANITE UP TO 10 FEET THICK CAN BE SEEN. THIS SUGGESTS THE QUARTZ DIKE MAY GRADE DOWNWARD INTO PEGMATITE. A SAMPLE OF TYPICAL QUARTZ ROCK FROM THIS DEPOSIT CONTAINED 99.27 PERCENT SiO_2 AND 0.049 PERCENT Fe_2O_3 .

COPPER PROSPECT, ABBEVILLE COUNTY. -- DURING EARLY 1958, PRIVATE EXPLORATION FOR SULPHIDE ORES AT THE SALUDA MINE IN ABBEVILLE COUNTY PROVIDED FURTHER INFORMATION ON PIEDMONT ROCKS. CORES SHOWED THE COUNTRY ROCK IN THIS AREA TO BE AN INTERBEDDED SEQUENCE OF QUARTZ-BIOTITE GNEISS, HORNBLende GNEISS, QUARTZ-ACTINOLITE-CHLORITE SCHIST, AND HIGH-CALCIUM MARBLE. THE MARBLE IS ASSOCIATED WITH THE QUARTZ-ACTINOLITE-CHLORITE SCHIST AND IS IN LAYERS INCHES TO AS MUCH AS 20 FEET THICK. THESE ROCKS HAVE A RATHER UNIFORM STRIKE OF N. 50° E. AND A DIP OF 25° SE. THIS DIP APPEARS TO REMAIN FAIRLY CONSTANT FOR 1,000 FEET OR MORE AWAY FROM THE OUTCROP IN THE DIP DIRECTION. NO MARBLE OUTCROPS ARE KNOWN IN THE AREA, BUT THE MARBLE IS PERFECTLY PRESERVED IN THE CORES. THE PRESENCE OF THIS MARBLE SUGGESTS THAT THESE ROCKS CORRELATE WITH MARBLE-BEARING ROCKS NEAR WARE SHOALS THAT ARE THOUGHT TO BE AN EXTENSION OF ROCKS OF THE KINGS MOUNTAIN BELT. LITHOLOGICALLY THIS SEQUENCE OF METASEDIMENTARY ROCKS IS SIMILAR TO ROCKS ON POOR MOUNTAIN IN OCONEE COUNTY.

POOR MOUNTAIN, OCONEE COUNTY. -- PRIVATE EXPLORATION DURING 1958 FOR HIGH-CALCIUM MARBLE AT POOR MOUNTAIN IN OCONEE COUNTY HAS PROVIDED NEW INFORMATION ABOUT THE GEOLOGY OF THE BLUE RIDGE SCARP AND THE ROCKS OF THE NORTHWESTERN EDGE OF THE PIEDMONT. WHITE MEDIUM-GRAINED MARBLE IN BEDS UP TO 30 FEET OR SO THICK IS INTERBEDDED WITH SEVERAL HUNDRED FEET OF PORPHYROBLASTIC QUARTZ-BIOTITE GNEISS, CHLORITE-ACTINOLITE SCHIST, HORNBLLENDE GNEISS, AND MICA GNEISS. AT THE TOP OF THE SCARP THIS BEDDED SEQUENCE IS NEARLY FLAT-LYING. AT THE FOOT OF THE SCARP, THESE SAME BEDS ARE PRESENT WITH A NORTHEAST STRIKE AND A FAIRLY UNIFORM 25° DIP TO THE SOUTHEAST. EXPOSURES ARE ALMOST TOTALLY LACKING ALONG THE LOWER PART OF THE SCARP BECAUSE OF SOIL COVER, SLUMP, AND HEAVY VEGETATION. CORE FROM HOLES IN THIS IMMEDIATE AREA, HOWEVER, CONTAINED TENSION FRACTURES AND TINY DISPLACEMENTS NOT FOUND IN THE ROCKS AT THE TOP OF THE SCARP OR THOSE 1,000 FEET OR SO OFF TO THE SOUTHEAST OF IT. THE FRACTURES SUGGEST A POSSIBLE NORMAL OR STEEP REVERSE FAULT NEAR THE BASE OF THE SCARP. TENTATIVE CORRELATIONS BETWEEN THE ROCKS AT THE TOP OF THE SCARP AND THOSE JUST TO THE SOUTHEAST OF IT INDICATE THAT ANY FAULT THAT MIGHT BE PRESENT AT THE BASE OF THE SCARP WOULD PROBABLY NOT HAVE MORE THAN 100 TO 200 FEET DISPLACEMENT IF THAT MUCH.

THE METASEDIMENTARY ROCKS AT POOR MOUNTAIN ARE LITHOLOGICALLY AND STRUCTURALLY VERY SIMILAR TO THOSE AT THE SALUDA MINE (DESCRIBED ABOVE) IN ABBEVILLE COUNTY. THIS SUGGESTS THAT MUCH OF THE SOUTH CAROLINA PIEDMONT MAY BE UNDERLAIN BY A THICK SEQUENCE OF FOLDED METASEDIMENTARY ROCKS AND THAT THE NORTHEAST-TRENDING BELTS INTO WHICH THE PIEDMONT IS COMMONLY DIVIDED MAY BE ZONES OF DIFFERENT METAMORPHIC RANK RATHER THAN ROCKS OF DIFFERENT AGE AND DIFFERENT ORIGIN.

NEWLIN BENTONITE DEPOSIT, JASPER COUNTY. -- ON THE SOUTH BANK OF THE COOSAWHATCHIE RIVER ABOUT 2 MILES SOUTH-SOUTHEAST OF THE TOWN OF COOSAWHATCHIE IS A 5 TO 20 FOOT THICK BED OF BENTONITE-LIKE CLAY OVER AN AREA OF ABOUT 400 ACRES. THE DEPOSIT IS OVERLAIN BY 1 TO 12 FEET OR SO OF SAND AND MUCK OVERBURDEN AND IN MANY PLACES IS CAPPED BY A 1 TO 8 INCH THICK LAYER OF HARD CREAMY WHITE CHERT-LIKE CAPROCK. ABOUT 20 DRILL HOLES SPACED OVER A 650 ACRE TRACT ROUGHLY OUTLINE THE DEPOSIT AND INDICATE THAT IT CONTAINS SEVERAL MILLION TONS OF GOOD CLAY OVER 5 FEET

THICK. AROUND THE EDGES OF THE DEPOSIT, THE CLAY BED THINS AND BECOMES SANDY. LABORATORY TESTS OF THE CLAY INDICATE THAT IT IS A "SOUTHERN BENTONITE" AND THAT IT IS EXCELLENT FOR FOUNDRY BONDING CLAY AND FOR OIL CLARIFICATION.

COOPER MARL. -- DURING THE SPRING OF 1958, H. S. JOHNSON, JR. AND OTHERS MADE SEVERAL EXAMINATIONS OF COOPER MARL (EOGENE) IN EXCAVATIONS FOR WATER TUNNELS IN THE VICINITY OF CHARLESTON, SOUTH CAROLINA. THE RELATIVE HOMOGENEITY, EASE OF EXCAVATION, AND IMPERMEABILITY OF THIS FORMATION MAKE IT IDEAL FOR A WIDE VARIETY OF INDUSTRIAL AND MILITARY UNDERGROUND INSTALLATIONS.

NANNY'S MOUNTAIN, YORK COUNTY. -- AT NANNY'S MOUNTAIN (ALSO CALLED FERGUSON'S MOUNTAIN) GOSSAN CROPS OUT AT INTERVALS ALONG ABOUT 4,000 FEET OF RIDGE. THE COUNTRY ROCK IS MICACEOUS QUARTZITE OR SILICIFIED SLATE AND PHYLLITE. THE MINERALIZED ZONE STRIKES N. 50° W. TO N. 30° E. AND DIPS 65 TO 85° TO THE SOUTH-EAST. THE SPARSE REMNANTS OF UNWEATHERED ROCK PRESENT IN THE OUTCROP INDICATE THAT PYRITE IS THE PRINCIPAL IF NOT THE ONLY SULPHIDE MINERAL PRESENT. EARLE SLOAN, HOWEVER, REPORTED IN HIS CATALOGUE OF THE MINERAL LOCALITIES OF SOUTH CAROLINA (1908) THAT THREE CORE HOLES DRILLED INTO THE EASTERN SIDE OF THE MOUNTAIN NEAR ITS BASE "REVEALED SOLID PYRRHOTITE FROM 40 TO 50 FEET THICK."

MEADOWWOODS METAGABBRO (?), UNION COUNTY. -- FIFTEEN MAGNETOMETER READINGS TAKEN ACROSS A LARGE BASIC STOCK IN SOUTHWEST UNION COUNTY REGISTERED A MAXIMUM RANGE OF 1720 GAMMAS FROM THE LOWEST TO THE HIGHEST READING. THESE READINGS WERE RELATIVE TO A BASE STATION WITH AN ACTUAL READING OF OVER 1,000 GAMMAS. MAGNETITE AND SPARSE SULPHIDES ARE DISSEMINATED THROUGH THE ROCK AND MAY BE PRESENT IN CONCENTRATIONS IN MAGMATIC SEGREGATIONS.

GREGORY SERICITE DEPOSIT. -- ON THE PROPERTY OF T. J. GREGORY ABOUT A MILE NORTH OF THE HAILE MINE IN LANCASTER COUNTY ARE SEVERAL DEPOSITS OF VERY WHITE QUARTZOSE SERICITE. THESE SERICITE DEPOSITS APPEAR TO BE OF GOOD QUALITY AND OF CONSIDERABLE SIZE. A THIN VENEER OF COASTAL PLAIN SEDIMENTS COVERS THE SERICITE IN PLACES.

BLOATING SHALE, EDGEFIELD COUNTY. -- RESULTS OF EXPLORATION FOR BLOATING SHALE IN EDGEFIELD COUNTY DURING 1958 WERE INCONCLUSIVE. ROCKS OF THE CAROLINA SLATE GROUP THAT BLOAT WELL ARE INTIMATELY MIXED WITH ROCKS THAT DO NOT BLOAT SUFFICIENTLY WELL TO BE USEFUL FOR LIGHTWEIGHT AGGREGATE.

REPORTS

REPORTS PUBLISHED BY THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD DURING 1958 ARE AS FOLLOWS:

- (1) BULLETIN 2 - CATALOGUE OF THE MINERAL LOCALITIES OF SOUTH CAROLINA (REPRINT) BY EARLE SLOAN, 504 PAGES.
- (2) BULLETIN 23 - SILICA FOR GLASS MANUFACTURE IN SOUTH CAROLINA - BY B. F. BUIE AND G. C. ROBINSON, 41 PAGES.
- (3) GEOLOGY OF THE IRMO QUADRANGLE - BY S. D. HERON, JR., AND H. S. JOHNSON, JR. (MAP AND BRIEF TEXT).
- (4) RAW MATERIAL SOURCES FOR GLASS MANUFACTURE IN SOUTH CAROLINA - BY L. N. SMITH (MAP AND BRIEF TEXT).

THESE REPORTS ARE NOW AVAILABLE FROM THE DIVISION OF GEOLOGY, STATE DEVELOPMENT BOARD, BOX 927, COLUMBIA, SOUTH CAROLINA. IN VARIOUS STAGES OF PREPARATION AT THE PRESENT TIME ARE REPORTS DEALING WITH CARBONATE ROCKS IN THE PIEDMONT, EOCENE STRATIGRAPHY OF CENTRAL SOUTH CAROLINA, HEAVY MINERALS IN BEACH SANDS, MICA DEPOSITS, AND A GUIDE TO THE GEOLOGY OF THE COASTAL PLAIN.

MONTHLY BULLETIN

SINCE SEPTEMBER 1957, THE DIVISION OF GEOLOGY HAS PUBLISHED A MONTHLY REPORT OR BULLETIN DESIGNED TO DISSEMINATE INFORMATION AND TO SPUR GEOLOGIC THINKING IN SOUTH CAROLINA. WITH THE ISSUE OF NOVEMBER-DECEMBER, 1958, THIS PUBLICATION WENT ON A BI-MONTHLY SCHEDULE. ARTICLES INCLUDED IN THIS BULLETIN THROUGH 1958 ARE AS FOLLOWS:

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