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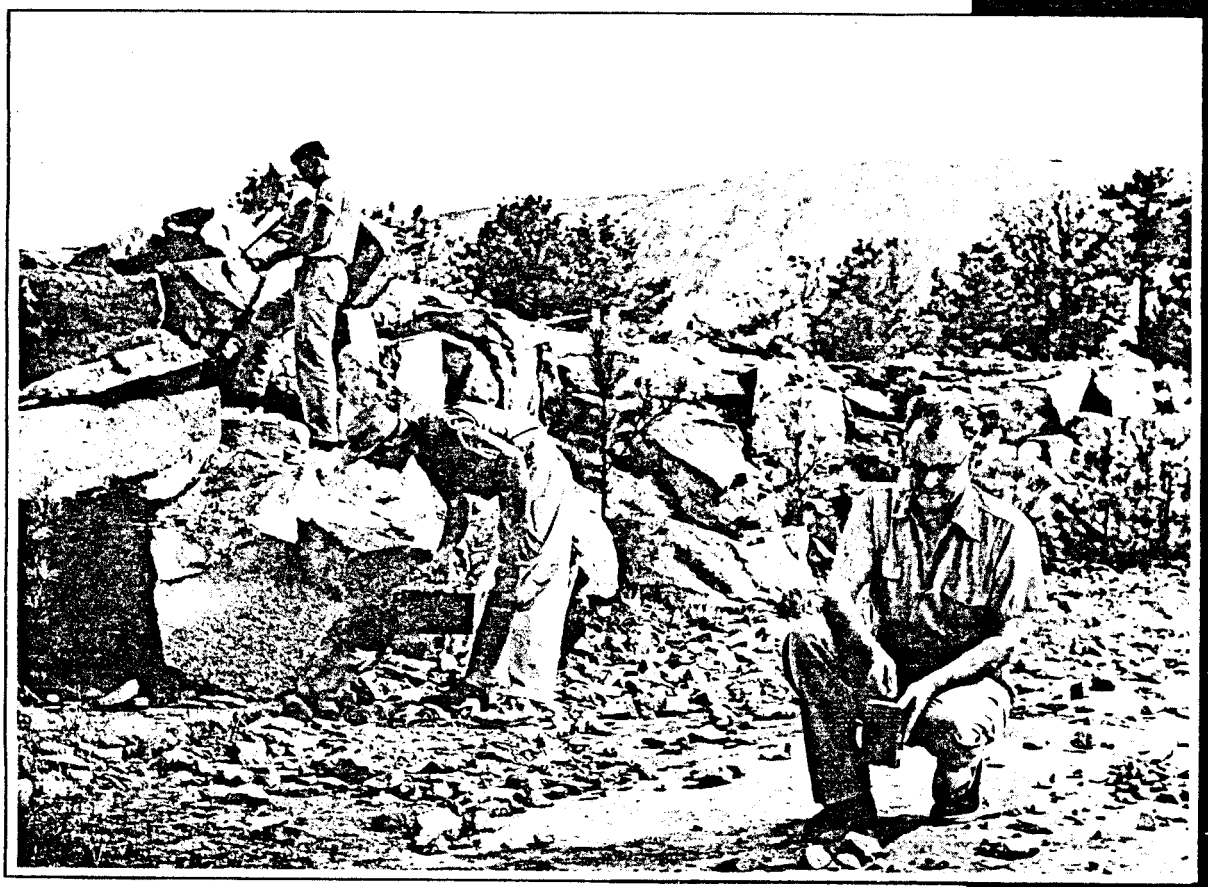


Prospecting for uranium near Stone Mountain illustrating (left to right) the use of the Scintillator, Nucleometer, and single tube portable Geiger counter.

therefore issue prospecting and mining permits to any citizen of the United States who has made proper application.

The BLM prospecting permit grants the same privileges as the Forest Service prospecting permit but, in addition, grants a preference right which means that during the life of the prospecting permit, the permittee may make application for a mining lease, which application shall have preference over any others for all or part of the same area. It does not grant the right to mine, remove and sell ores or minerals.

The Bureau of Land Management Mining Lease Form 4-1100 grants the right to mine, remove and sell minerals in a specific area for a fee plus royalty payments to be determined by the Bureau of Land Management.

Applications for prospecting and mining permits should be made in writing direct to the Bureau of Land Management, Dept. of Interior, Washington 25, D. C., not through the Forest Supervisor. Forest Service application forms should **not** be used.

The application should include:

a. The names of the minerals or mineral ores which the applicant desires to prospect or mine.

b. The National Forest, county, and state in which the area desired lies.

c. Survey description and acreage of area desired with tie line to known government corner or well known natural or cultural feature.

d. A statement of the applicant's interest, direct or indirect, in leases or permits for similar mineral deposits, or in applications therefor, on Federally-owned acquired lands in the same state, identifying by serial number the records where such interests may be found.

Since much of the land in the Chattahoochee National Forest was acquired subject to reservations or outstanding mineral rights, it is advisable to contact the Forest Supervisor before submitting an application to the Bureau of Land Management. He can advise as to whether or not the United States owns the minerals. Also it will expedite handling of an application if the Forest Supervisor is furnished a copy of the application, since upon receipt of the application in the Bureau of Land Management, that Agency requests the Forest Service for a report on the area applied for.

4. Reference to Forest Service Maps:

Applicants are welcome to refer to Forest Service maps which show locations of National Forest Lands and topographic features. Such maps are kept in the following National Forest offices:

Forest Supervisor's office, Gainesville, Ga.

District Ranger's offices in LaFayette, Blue Ridge, Dahlonega, Blairsville, Clarkesville, and Clayton, Georgia.

Preliminary Report on Seismic Investigation in Tift and Atkinson Counties, Georgia

University of Wisconsin
Department of Geology

February 21, 1955

George P. Woolard

1. Field Program:

In carrying out the seismic study of the gravity and magnetic "high" in Tift County the Geophysics branch of the Department of Geology of the University of Wisconsin made two series of seismic measurements in South Georgia. The first of these measurements was conducted during the period September 8 to September 30, 1954 and the second during the period November 14 to December 10, 1954. The work was not carried out on a continuous basis because (a) a field crew was not available until the end of August upon completion of the seismic refraction work being conducted in the offshore area under the auspices of the Navy; (b) operating difficulties were encountered that had not been anticipated, and (c) all of the men had to get back to school to resume their studies. However, the crew did work two weeks beyond the University registration date in an effort to complete the study, and, had conditions such as we had encountered previously in other localities been found, this should have been possible. However, a basic change in the subsurface geologic section found in Georgia made operations more time-consuming, expensive and difficult than had been anticipated. Whereas our studies elsewhere in the Coastal Plain with comparable depths of sediments had seldom required more than one to two days for a reversed seismic-refraction profile giving the depths, true velocity values for the principal subsurface lithologic units and their structural orientation along the azimuth of the observations, it was found in south Georgia that the time factor was increased by a factor of over three. Further, the records were much more difficult to interpret. The very much larger requirements in explosives in particular and the consequent problem of shooting without arousing the local populace as well as expense made a change in procedure advisable. Refraction measurements were therefore discontinued after the first week and the program changed to reflection measurements.

2. First Series of Operations:

The first measurements were in the nature of tests conducted near Pearson in Atkinson County at the site of the deep well drilled by the Sun Oil Company and abandoned as a dry hole. The depth of the basement determined seismically checks well with 5% of that reported by drilling. However, for the reasons cited above, it was decided refraction measurements were not feasible. At the Pearson site, the one set of refraction measurements required 22 shots representing a total of 824 pounds of explosives. The overall spread re-

quired to reach the basement complex with a geophone spread of 1000 feet with 12 pickups was 20,035 feet (nearly four miles); at the end points, it was necessary to fire charges in excess of 150 pounds of TNT in order to obtain a record.

At Tifton, where an open-ended refraction test was made, 651 pounds of explosives were required to shoot in the one direction. Reflection tests at Pearson were, in general, unsatisfactory, but those at Tifton appeared to be good.

3. Second Series of Operations:

The second series of measurements were all reflection studies and were carried out with the most modern equipment available, the Texas Instrument Company High Resolution Reflection apparatus. This equipment was made available on a loan basis by the Houston Technical Laboratory, the manufacturing subsidiary of Texas Instrument, and Geophysical Service, Inc., an operating subsidiary of Texas Instruments, made available a shot hole drilling rig and water truck to expedite the measurements. Although satisfactory records were secured, it was not possible to use an open spacing between sites as originally planned as correlations could not be carried much more than a half mile between sites. As the purpose of the investigation was to determine if there was structure associated with the gravity and magnetic "high" near Tifton, this limitation meant that only a partial profile could be established with the funds available. The traverse occupied was located so as to cross the peak area of the gravity structure where it was felt that the measurements would have the best chance to show if there is any physical deformation of the basement rock surface associated with the anomaly area. Ten sets of reflection depth measurements were made in addition to the one refraction measurement in this area. Operations were not broken off until all available funds had been completely expended. Figure 1 shows the location of the measurements relative to the gravity anomaly structure.

4. Preliminary Results (Refraction Measurements):

Pearson:

The location of the reversed refraction depth measurement made near Pearson is shown on the map of Figure 2. The results obtained here can be summed up as follows:

1. A surface layer having a velocity of about 5250 feet/second and a thickness of about 165 feet.
2. A second layer having a velocity of approximately 10,000 feet/second which accounted for the bulk of the sedimentary section.
3. A third layer having a velocity of about 16,700 feet/second identified as the crystalline basement complex which had a calculated depth of 4384 feet at the north end of the spread and 4103 feet at the south end. At the extrapolated position of the Sun Oil Company well, the basement depth determined seismically was 4290 feet which checks very closely with the drilled depth of 4282 feet. On the basis of these measurements, the basement surface slopes upward 280 feet toward the south in four miles.

Figure 2 shows the travel-time graph secured and the deduced geology.

Tifton:

The refraction measurements at Tifton could not be reversed because of the highly developed cultural nature of the area. However, on the basis of a study of the results obtained on individual shots as compared with the overall gross plot of values, it would appear that the basement surface is essentially flat and not sloping as observed at Pearson. The results were as follows:

1. A surface layer having a velocity of about 1500 feet/second.
2. A second layer having a velocity of about 6000 feet/second.
3. A third layer having a velocity of 9400 feet/second.
4. A fourth layer having a velocity of about 20,000 feet/second.

On the basis of the low velocity value, the surface layer is unconsolidated material above the water table. The second layer corresponds to that mapped at Pearson, presumably the Miocene, and has a thickness of 243 feet. The third layer, accounting for the bulk of the section, is presumably the same as at Pearson. The fourth layer, identified as the basement complex, occurred at a depth of 5723 feet.

Figure 3 shows the travel-time graph and the deduced geologic section.

Figure 4 shows the location of the seismic measurement in the Tifton area.

Table I summarises the refraction results for both Pearson and Tifton.

TABLE I

Refraction Results

Pearson, Georgia:

Horizon	Velocity Values	Geologic Equivalent	Depth From Surface	Sea Level Elevation	Well
	N 5,900 '/sec			204 ft	
V_1		Miocene (?)	Surface layer		202 ft
	S 5,350 '/sec		0	205 ft	
	N 10,120 '/sec		165 ft	+39 ft	
V_2		Eocene and Cretaceous			
	S 9,900 '/sec		163 ft	+42 ft	
	N 17,100 '/sec		4,384 ft	—4,180 ft	
V_3		Crystalline Complex			
	S 16,670 '/sec		4,103 ft	—3,898 ft	
	Extrapolated value at well site		4,290 ft	—4,088 ft	—4,080 ft

Tifton, Georgia:

V_0	1,500 '/sec	Weathered layer	Surface layer	+388 ft	
V_1	5,990 '/sec	Miocene	10 ft		
V_2	9,400 '/sec	Eocene and Cretaceous	243 ft	+145 ft	
V_3	20,600 '/sec	Crystalline Complex	5,723 ft	—5,335 ft	

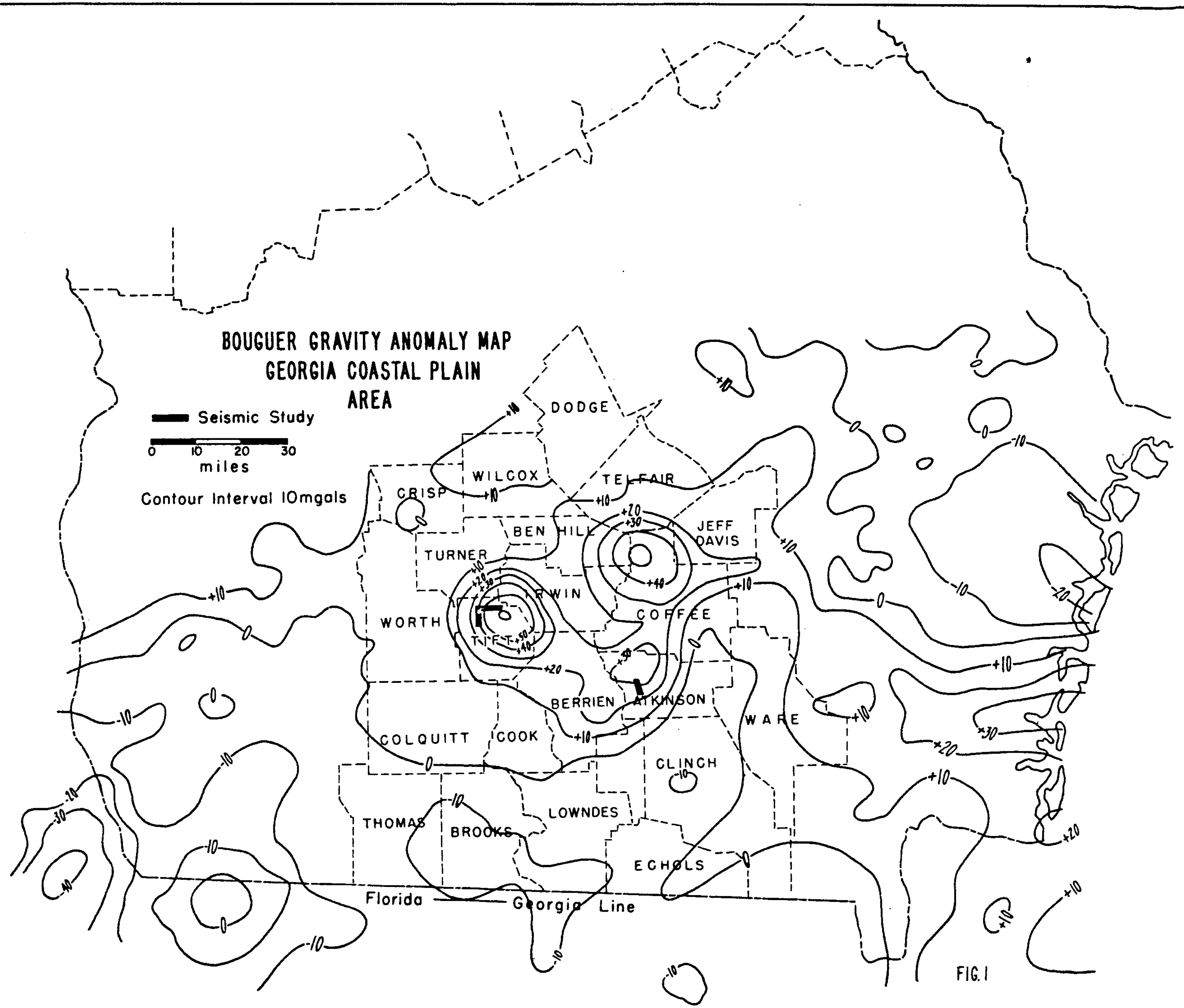
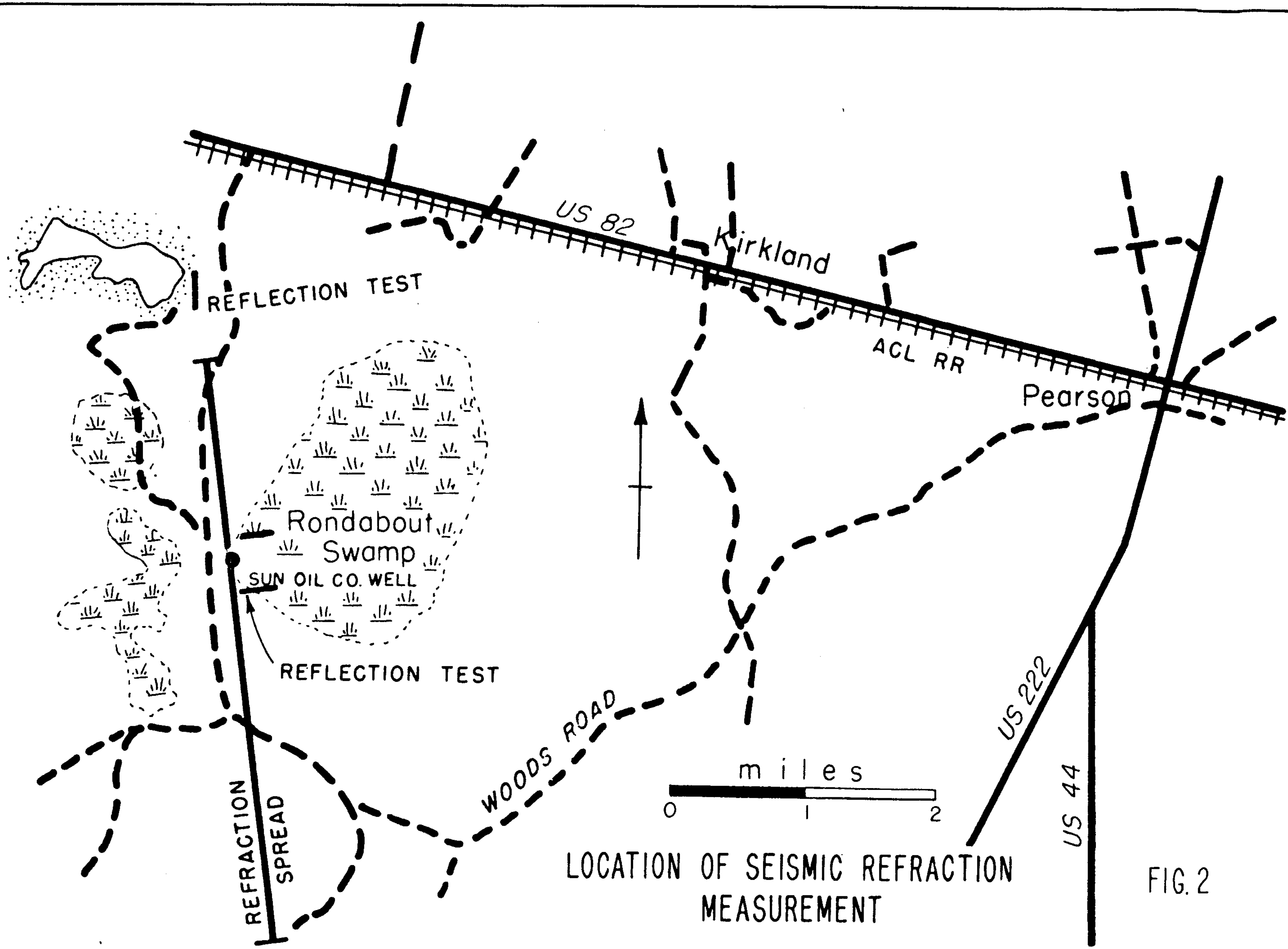

BOUGUER GRAVITY ANOMALY MAP
GEORGIA COASTAL PLAIN
AREA
Seismic Study
0 10 20 30
miles
Contour Interval 10mgals
DODGE
WILCOX
CRISP
TELFAIR
BEN HILL
JEFF DAVIS
TURNER
IRWIN
COFFEE
WORTH
TIFT
BERRIEN
ATKINSON
WARE
COLQUITT
COOK
CLINCH
THOMAS
BROOKS
LOWNDES
ECHOLS
Florida — Georgia Line

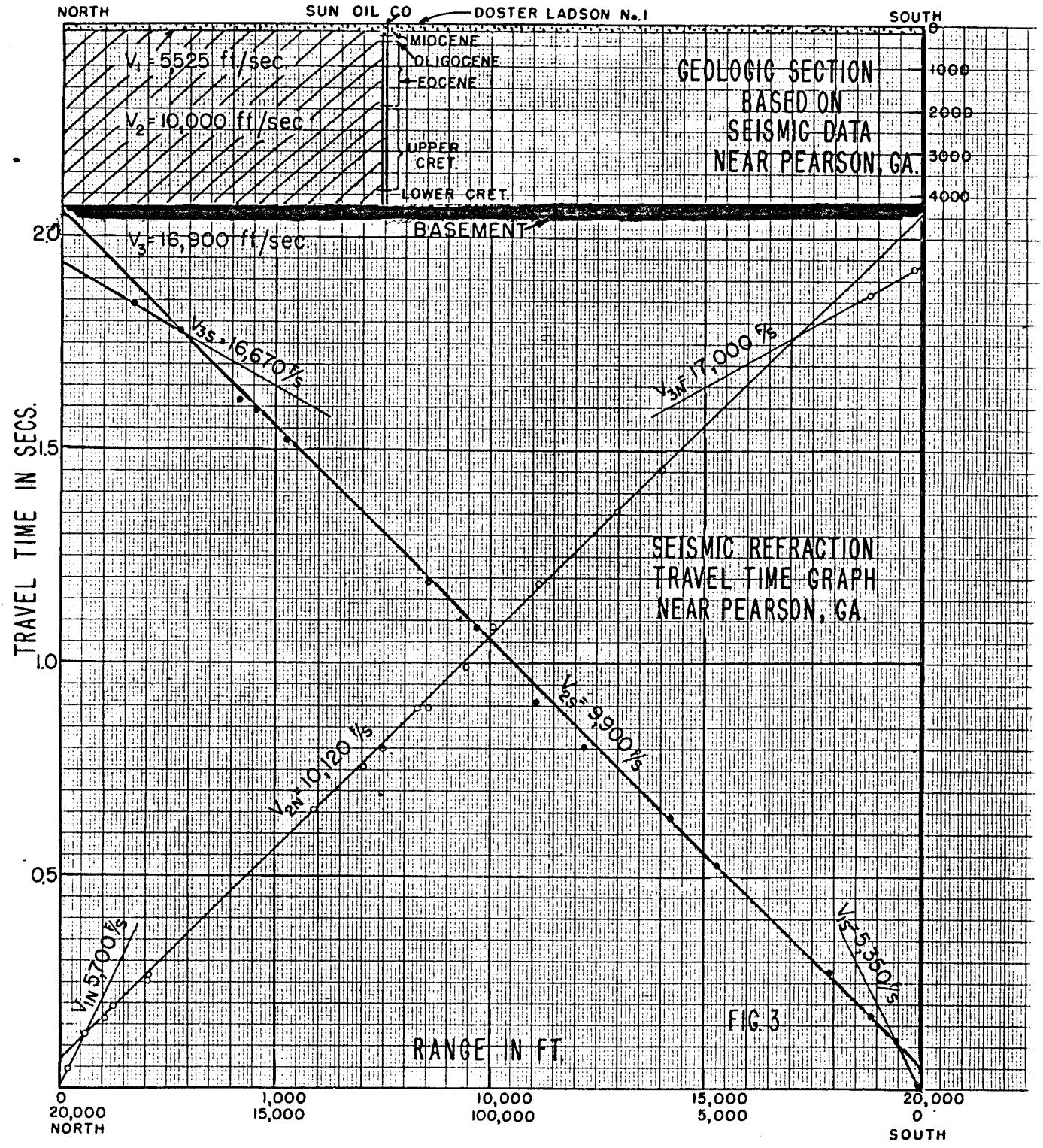
FIG. 1

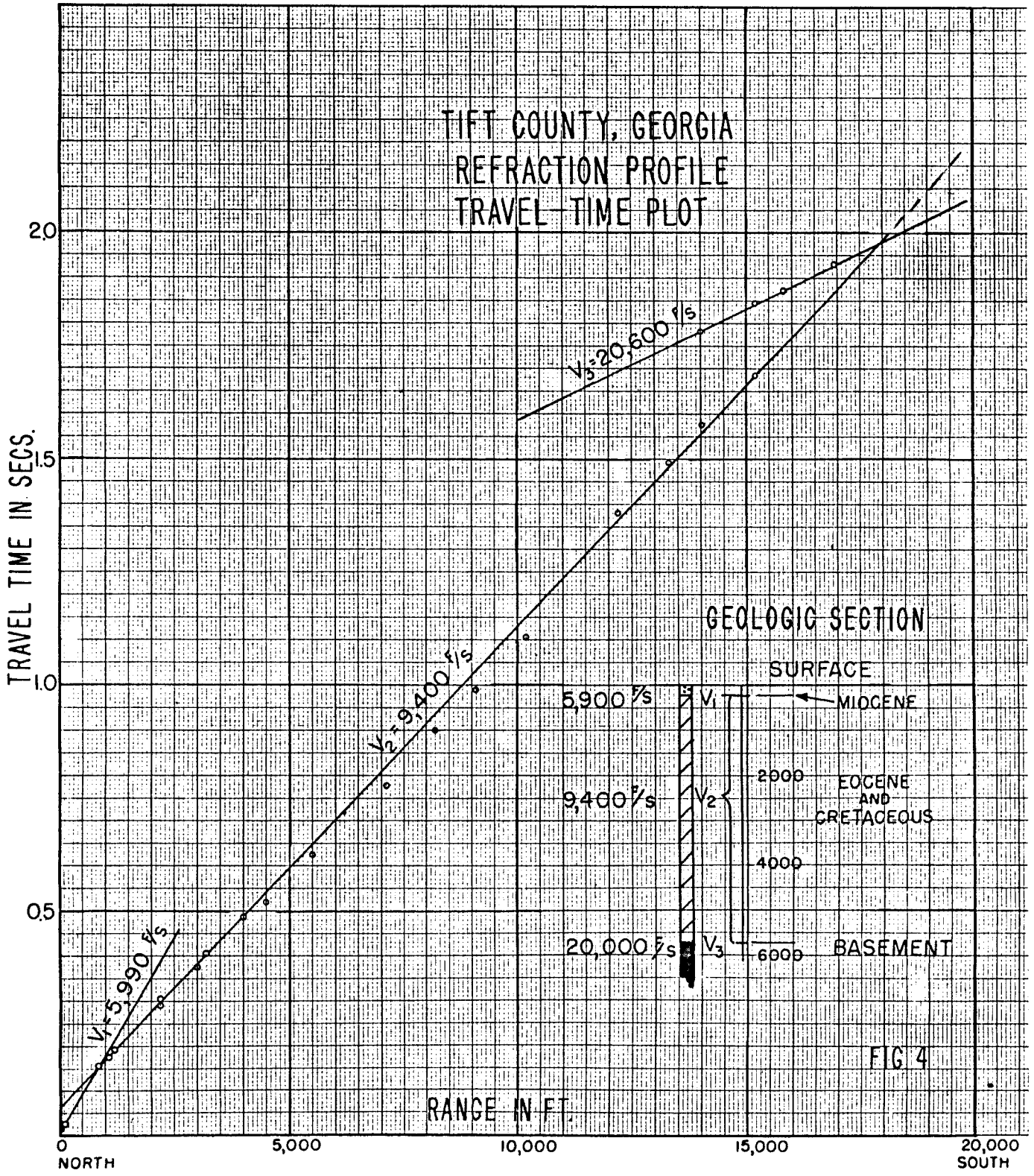


LOCATION OF SEISMIC REFRACTION MEASUREMENT

PEARSON, ATKINSON CO., GEORGIA

FIG. 2


NORTH
SUN OIL CO
DOSTER LADSON No. 1
SOUTH
MIOCENE
OLIGOCENE
EOCENE
UPPER CRET.
LOWER CRET.
V_1 = 5525 ft/sec
V_2 = 10,000 ft/sec
GEOLOGIC SECTION BASED ON SEISMIC DATA NEAR PEARSON, GA.
BASEMENT
V_3 = 16,900 ft/sec.
V_{3S} = 16,670 f/s
V_{3N} = 17,000 f/s
V_{2N} = 10,120 f/s
V_{2S} = 9,900 f/s
V_{1N} = 5,700 f/s
V_{1S} = 5,350 f/s
SEISMIC REFRACTION TRAVEL TIME GRAPH NEAR PEARSON, GA.
TRAVEL TIME IN SECS.
RANGE IN FT.
FIG. 3
0
1000
2000
3000
4000
2.0
1.5
1.0
0.5
0
20,000
NORTH
1,000
15,000
10,000
100,000
15,000
5,000
20,000
0
SOUTH


TIFT COUNTY, GEORGIA
REFRACTION PROFILE
TRAVEL-TIME PLOT
TRAVEL TIME IN SECS.
2.0
1.5
1.0
0.5
V3=20,600 f/s
V2=9,400 f/s
V1=5,990 f/s
GEOLOGIC SECTION
SURFACE
5,900 f/s
V1
MIOCENE
9,400 f/s
V2
2000
EOCENE AND CRETACEOUS
4000
20,000 f/s
V3
6000
BASEMENT
FIG 4
RANGE IN FT.
0
NORTH
5,000
10,000
15,000
20,000
SOUTH

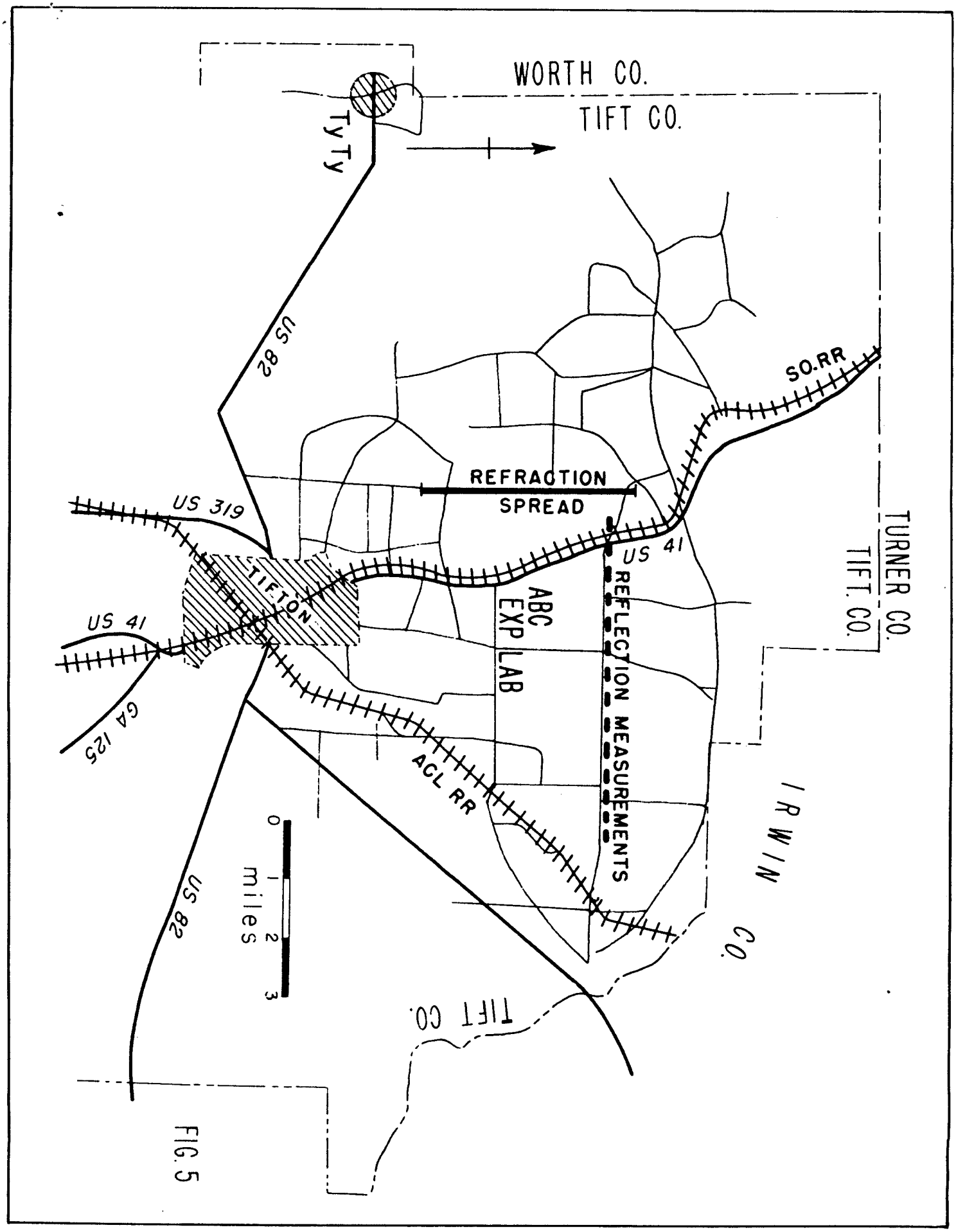

WORTH CO.
TIFT CO.
Ty Ty
US 82
SO.RR
REFRACTION
SPREAD
US 319
US 41
TIFTON
US 41
GA 125
ABC
EXP LAB
REFLECTION MEASUREMENTS
ACL RR
TURNER CO.
TIFT. CO.
IRWIN CO.
TIFT CO.
US 82
0
1
2
3
miles

FIG. 5

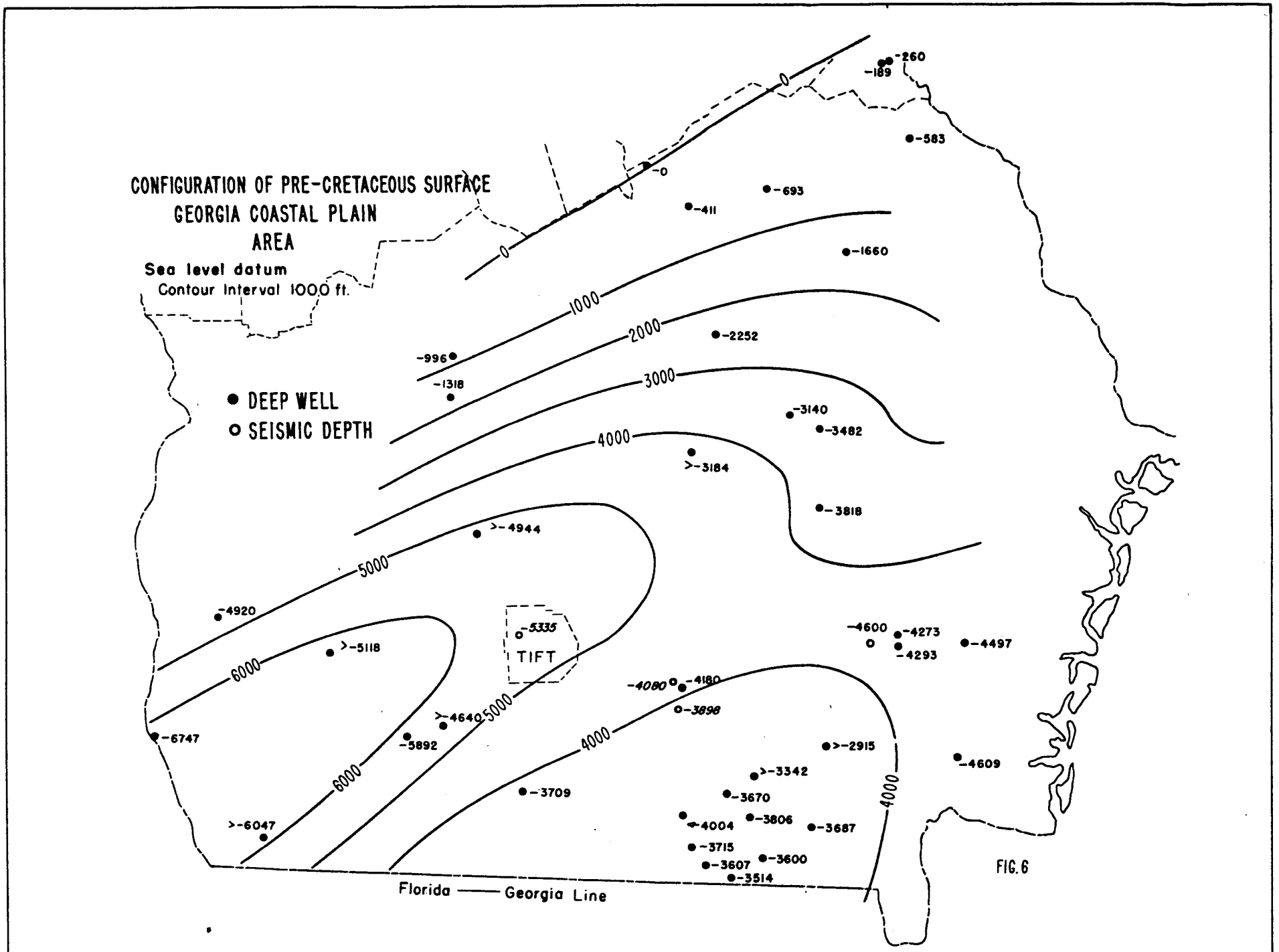

CONFIGURATION OF PRE-CRETACEOUS SURFACE
GEORGIA COASTAL PLAIN
AREA
Sea level datum
Contour Interval 1000 ft.
● DEEP WELL
○ SEISMIC DEPTH
0
1000
2000
3000
4000
5000
6000
-260
-189
-583
-693
-411
-1660
-2252
-996
-1318
-3140
-3482
>-3184
-3818
>-4944
-4920
>-5118
-5335
TIFT
-4600
-4273
-4293
-4497
-4080
-4180
-3898
>-4640
-6747
-5892
>-2915
-4609
>-3342
-3709
-3670
>-6047
-4004
-3806
-3687
-3715
-3607
-3600
-3514
Florida —— Georgia Line

FIG. 6

5. Comments on Refraction Results:

The occurrence of only one seismic discontinuity above that identified with the crystalline basement complex indicates that the lithology below about 170 feet at Pearson and 240 feet at Tifton is fairly homogenous, or if several types of lithology are present, the layers are thin and interbedded. The log for the well near Pearson (See Georgia Geol. Surv. Circular 3, 1953) indicates Miocene (Hawthorn shale and marl) to a depth of 250 feet at which point the Suwannee formation (limestone) was encountered. Unfortunately, the detailed driller's log, describing the lithology encountered in this well, is only available for the section below 720 feet. It is, therefore, not known what causes the seismic break at 170 feet. The description from the log below 720 feet shows interbedded sands, shales and marl all the way to the basement which is described as a schist.

The notably higher basement velocity value found at Tifton over that encountered at Pearson, which is about average for the basement complex, suggests possible ultrabasic rocks in the Tifton area. This interpretation would be in agreement with the indications of dense rocks of basic composition suggested by both the gravity and magnetic data. That the anomaly area does not appear to be a structurally positive one is brought out by the greater depth to basement at Tifton as determined by the refraction measurements. This conclusion is also substantiated by contouring the basement surface relief indicated by the available well data. Such a map (Figure 5) shows that the Tifton anomaly lies near the axis of a basement trough. Whether there is local relief or not it is hoped will be brought out by the reflection measurements.

6. Reflection Results:

As the reflection measurements are still being computed, no results are included for these measurements in this preliminary report.

7. Cost of Investigation:

Field work	
Salaries for crew of 5 men:	
Sept. 15-30	$ 714.17
Nov. 14-Dec. 10	1,421.50
Explosives	475.09
Photographic and other supplies	84.08
Truck expenses (4 vehicles) actual	305.16
	$3,000.00

George P. Woollard,
Professor of Geophysics and Engineering

Georgia Marble Company Elects John W. Dent President

James R. Cowan, president and executive head since 1941 has passed away and John Dent of The Georgia Marble Company, has been elevated to the position of chairman of the board.

Also announced was the election of John W. Dent as president of the company, said to be the largest marble company in the world.

Two new directors also have been named. They are Frank C. Owens, president of Draper-Owens Company, Atlanta realtors, and Mrs. Margaret Tate Benton, of Monticello.

The Marble Company has just renewed its lease, beginning in 1959, on the S. C. Tate Estate properties in and near Tate for another 25 years. The original lease by members of the Tate family was made to the Company in 1884, and has been renewed twice before.

At the end of the new lease, the total lease terms will have run for 100 years from the same family to the same company.

The Georgia Marble Company has in the past few years greatly expanded its operations. Its business is now at the rate of 10 million dollars annually. The stock of the company is largely owned and controlled in Atlanta. The company has plants in Tate, Nelson, Marble Hill and White Stone, Georgia; Knoxville, Tennessee; St. Genevieve, Missouri; Russellville, Alabama, and Rutland, Vermont.

Pacific Tin Enters Feldspar Production

Pacific Tin Consolidated Corporation, of New York City, is entering feldspar mining and processing in the Southern Appalachians, having agreed to purchased Feldspar Flotation Corporation, of Spruce Pine; Feldspar Milling Co., Burnsville, North Carolina; Feldspar Corporation, of Erwin; and Appalachian Minerals Company, of Monticello, Georgia. The four feldspar firms are owned by C. P. Rogers, of Tryon, N. C., and W. F. Deenen, of Johnson City, Tenn. Carroll P. Rogers, Jr., manager of the Feldspar Flotation Corporation, will be general manager of the four plants under the new ownership, will be general manager of the four plants under the new ownership, and there will be no changes in personnel or policies. The four firms employ about 175 persons, and produce about 25% of U. S. ground feldspar.—E. & M. J. March 1955.