

OCCURRENCE OF FRESH-WATER LIMESTONES RESTRICTS  
PLIOCENE DEPOSITS IN SOUTHEASTERN FLORIDA

By

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On the basis of data obtained during an investigation of the geology and water resources of southeastern Florida, Garald G. Parker and C. Wythe Cooke, of the U. S. Geological Survey, made in 1944 a correlation of the shallow subsurface materials in southeastern Florida. Parker and Cooke (1944, p. 64) traced surficial outcrops of the Tamiami formation from W. C. Mansfield's (1939, p. 8) typical localities in Collier and Monroe Counties, eastward in the banks of the borrow ditch of the Tamiami Trail (U. S. Highway 41) into western Dade County, where the formation gently dips beneath younger materials. From this area, near the Everglades-Big Cypress Swamp border, the Tamiami was correlated by subsurface data obtained from test wells drilled by cable-tool rigs with the highly permeable rocks that unconformably underlie the Miami oolite of Pleistocene age in the Miami area. Mansfield considered the Tamiami to be of basal Pliocene age and tentatively placed it below the Caloosahatchee marl—also of Pliocene age.

In southeastern Florida gray fresh-water limestones containing an abundance of shell molds were first noted in cores of these highly permeable rocks from wells southwest of Miami, drilled in 1947. Subsequently, core borings from test wells west of Miami also showed fresh-water limestone intercalated with the marine limestone. Data concerning the occurrence of these fresh-water limestone <sup>beds</sup> in the Miami area are still skimpy, but strongly suggest a Pleistocene age for these deposits. Therefore, a tentative change in correlation is here presented.

Dense fresh-water limestone, gray in color, was observed in the cores of well G 551, and attributed to cavity filling, between 37 and 38 feet below mean sea level, and as a bed 0.2 foot thick at 50 feet below mean sea level. Fresh-water limestone 0.5 to 1.2 feet thick was penetrated in four core borings in Miami's southwest well field (see fig. 1) at depths between 39 and 41 feet, below mean sea level. The base of the highly permeable aquifer in these five wells is about 90 feet below mean sea level.

Cores from well G 607 adjacent to well G 608, west of Miami, contained five beds of tan-colored very hard limestone, ranging from 0.5 to 3 feet in thickness. The three uppermost beds contain an abundance of molds of fresh-water gastropods; the lower two beds contain no identifiable fossils. However, 2 miles to the west, near Krome Avenue and the Tamiami Trail, all five beds contain an abundance of fresh-water gastropods (see fig. 2). The highly permeable aquifer in this area is encountered at a depth of about 3 feet below mean sea level, and the lowest fresh-water limestone, is from 1 to 4 feet above the base of the aquifer. Cores from well G 622, 8 miles west of Krome Avenue contained three beds of fresh-water limestone, one being separable by an unconformity.

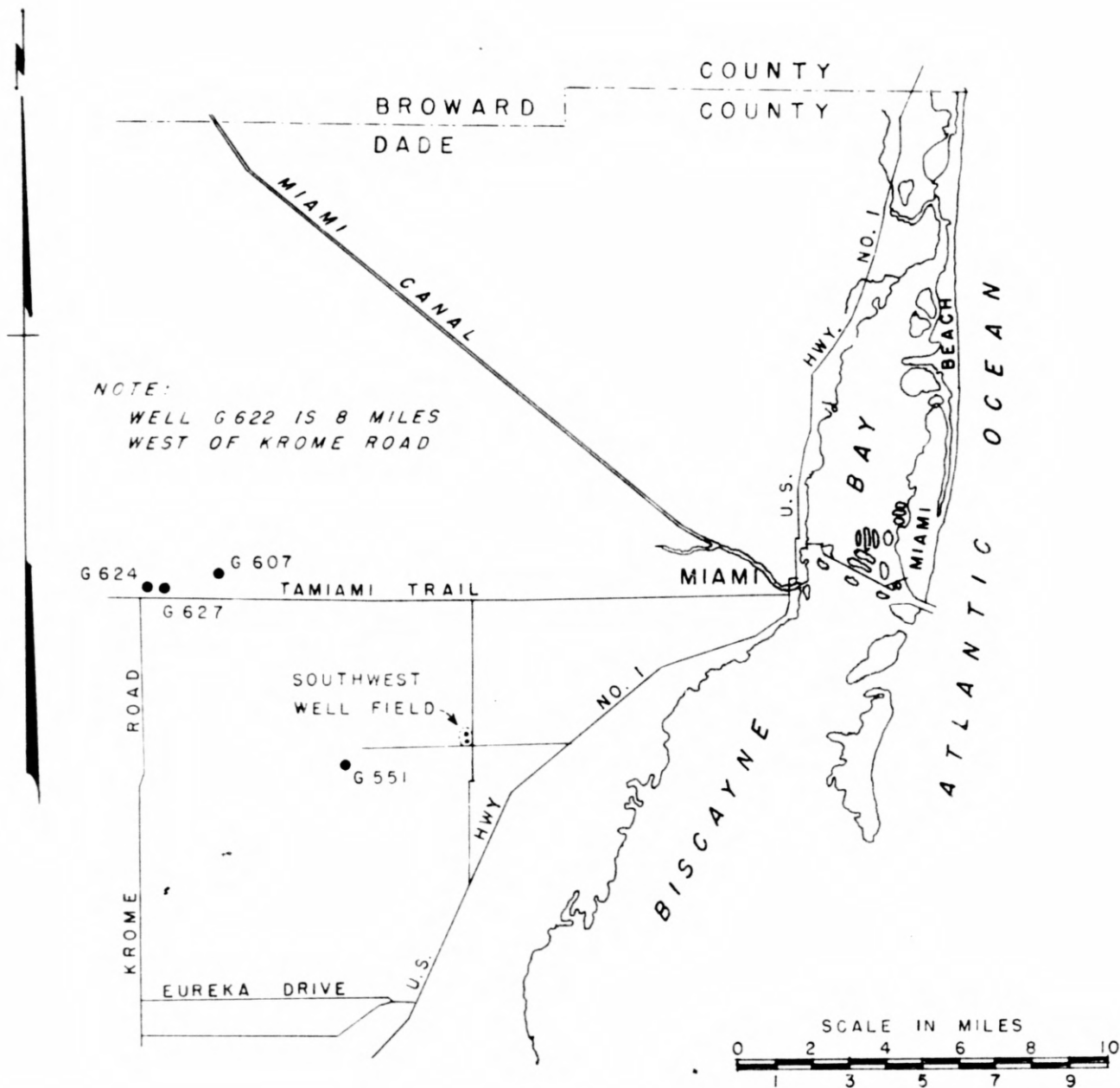


FIGURE 1. MIAMI, FLORIDA, AREA AND VICINITY

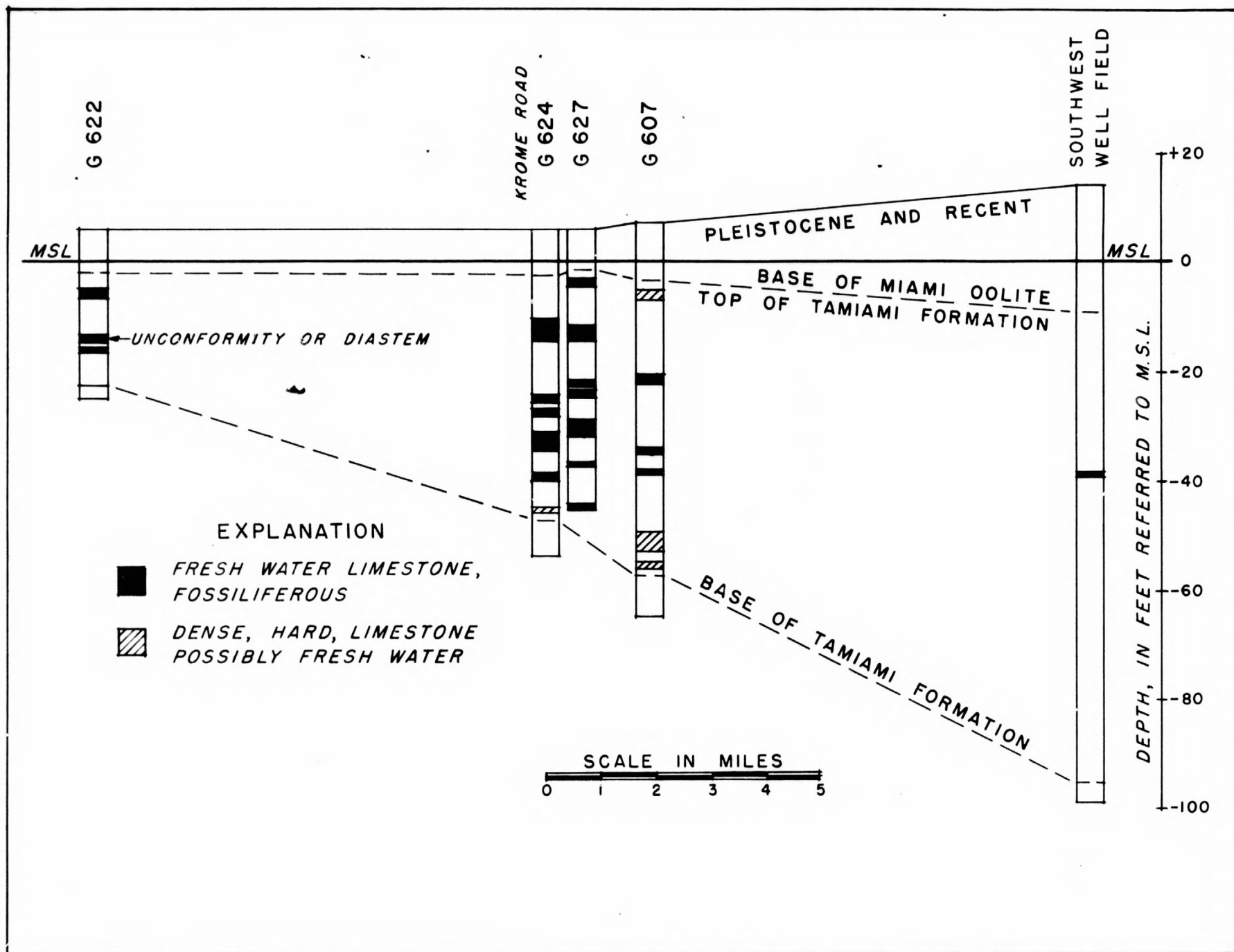


FIGURE 2

Fresh-water beds have not been reported in the Pliocene of the Atlantic Coastal Plain, and they do not occur in the Caloosahatchee marl in the outcrop area, although fresh-water shells are found, in places, mixed with marine forms. However, alternating marine ~~shell~~ beds and fresh-water marl of the Fort Thompson formation, which overlies the Caloosahatchee marl unconformably, have been tentatively correlated by Parker and Cooke (1944, p. 89) with the interglacial and glacial stages, respectively, of the Pleistocene. ~~The presence of~~ fresh-water limestones <sup>are found</sup> at depth in the highly permeable aquifer of the Miami area and to the west in the Everglades. although it does not prove, <sup>Their presence</sup> certainly suggests <sup>as used</sup> that a major part of the rocks heretofore tentatively assigned to the Tamiami formation by Parker and Cooke is not of Pliocene age but is Pleistocene-equivalent in part, at least, to the Fort Thompson formation. <sup>It also suggests</sup> that the Tamiami formation of Parker and Cooke thus should be restricted only to the basal portion, ~~of variable thickness,~~ of the highly permeable aquifer below the lowest fresh-water bed, and that the major part of the aquifer is a highly permeable and greatly thickened southward extension of the Fort Thompson formation.

#### REFERENCES

- Mansfield, Wendell C., 1939, Notes on the upper Tertiary and Pleistocene mollusks of peninsular Florida: Florida Geol. Survey Bull. 18, 69 pp., 4 pls., 2 figs.
- Parker, Gerald G., and Cooke, C. Wythe, 1944, Late Cenozoic geology of southern Florida, with a discussion of the ground water: Florida Geol. Survey Bull. 27, 119 pp., 26 pls., 4 figs.