

Geological and Paleontological  
Survey of the  
Forney Reservoir Basin  
Kaufman and Rockwall Counties  
Texas

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# GEOLOGICAL AND PALEONTOLOGICAL SURVEY OF THE FORNEY RESERVOIR BASIN, KAUFMAN AND ROCKWALL COUNTIES, TEXAS

BOB H. SLAUGHTER AND JOHN T. THURMOND\*

## INTRODUCTION

THE FIELD WORK for this report was done during June, July, and August, 1964, by the Shuler Museum of Paleontology of Southern Methodist University under National Park Service Contract No. RO 330608. The Quaternary deposits of the East Fork of the Trinity River were mapped in the area of the basin of the proposed Forney Reservoir and the general patterns of bedrock geology outlined. All excavational and erosional exposures of terrace, floodplain, and bedrock deposits were prospected for molluscan and vertebrate fossils. Three terraces above the present floodplain are recognized.

Terrace numbers have not been assigned pending determination of the position of an intermediate terrace located downstream outside the limits of the basin; terraces have simply been designated as Low, Middle, or High. If future excavation exposes a remnant of the intermediate terrace, these provisional numbers will necessarily have to be revised.

The second terrace above the floodplain produced fragmentary but identifiable remains of a Columbian Mammoth and a small molluscan fauna. A larger but relatively insignificant molluscan fauna was recovered from deposits along a small creek near the north end of the basin.

A phosphatic zone within the Wolfe City Member of the Taylor Formation (Cretaceous) yielded 1,000 pounds of the matrix which, when quarried and processed, produced a marine fish fauna. The specimens recovered thus far are excellently preserved and will furnish research material for projects under way at the Shuler Museum.

\* Shuler Museum of Paleontology, Southern Methodist University.

## METHODS

In the absence of good topographic maps, the mapping of the terrace deposits was accomplished primarily through field observation. The bedrock geology is an extension of the work of Richards and Albritton (1948).

Clean exposures of bedrock and terrace materials are few. The cuts made by the small tributary creeks are for the most part masked with colluvium. The valleys of all small creeks at the east end of the basin seem to be filled with Recent alluvium. These deposits are interesting, but they obscure the more important deposits buried beneath them.

Borrow excavation in the vicinity of the dam was mostly lateral and did not reach the depth that we hope will prove to be fossiliferous.

Gravel size is in Wentworth Scale units, and sediment colors are those of the *National Research Council Rock Color Chart*.

## BEDROCK DEPOSITS

The Forney Basin is entirely underlain by the Taylor Formation of Upper Cretaceous age. Although Albritton and Richards (1948) recognized the Wolfe City and the Upper Marl Members of the Taylor Formation, the intervening Pecan Gap Chalk Member appears to have pinched out.

A thin (4") phosphatic lens was located in the Wolfe City Member of the Taylor in the west bank of Taylor Creek, 100 yards west of Farm Road 1140 and one mile south of Heath (map locality 1). The amount of matrix quarried and processed for vertebrate remains totaled 1,000 pounds. The preservation of some of these specimens is excellent and such that they can be sectioned. These will be studied in a current research project of the Shuler Museum on the significance of tooth histology in Pisces taxonomy. The preliminary faunal list follows:

<i>Corax</i>	Tiger Shark
<i>Lamna</i>	Porbeagle Shark
<i>Isurus</i>	Mackerel Shark
Unidentified shark	
<i>Ischyrrhiza</i>	Sawfish

Ganopristid	Sawfish (new genus and species)
<i>Eotrigon</i>	Sting Ray
<i>Enchodus</i>	Extinct teolost
Unidentified teolost	
Pycnodont	Extinct Holostean
Unidentified Holostean	

When this fauna is extended and refined, it will take its place with the few other known marine faunas as a part of a comprehensive work planned by the Shuler Museum.

## STRATIGRAPHY AND PALEONTOLOGY OF THE TERRACES

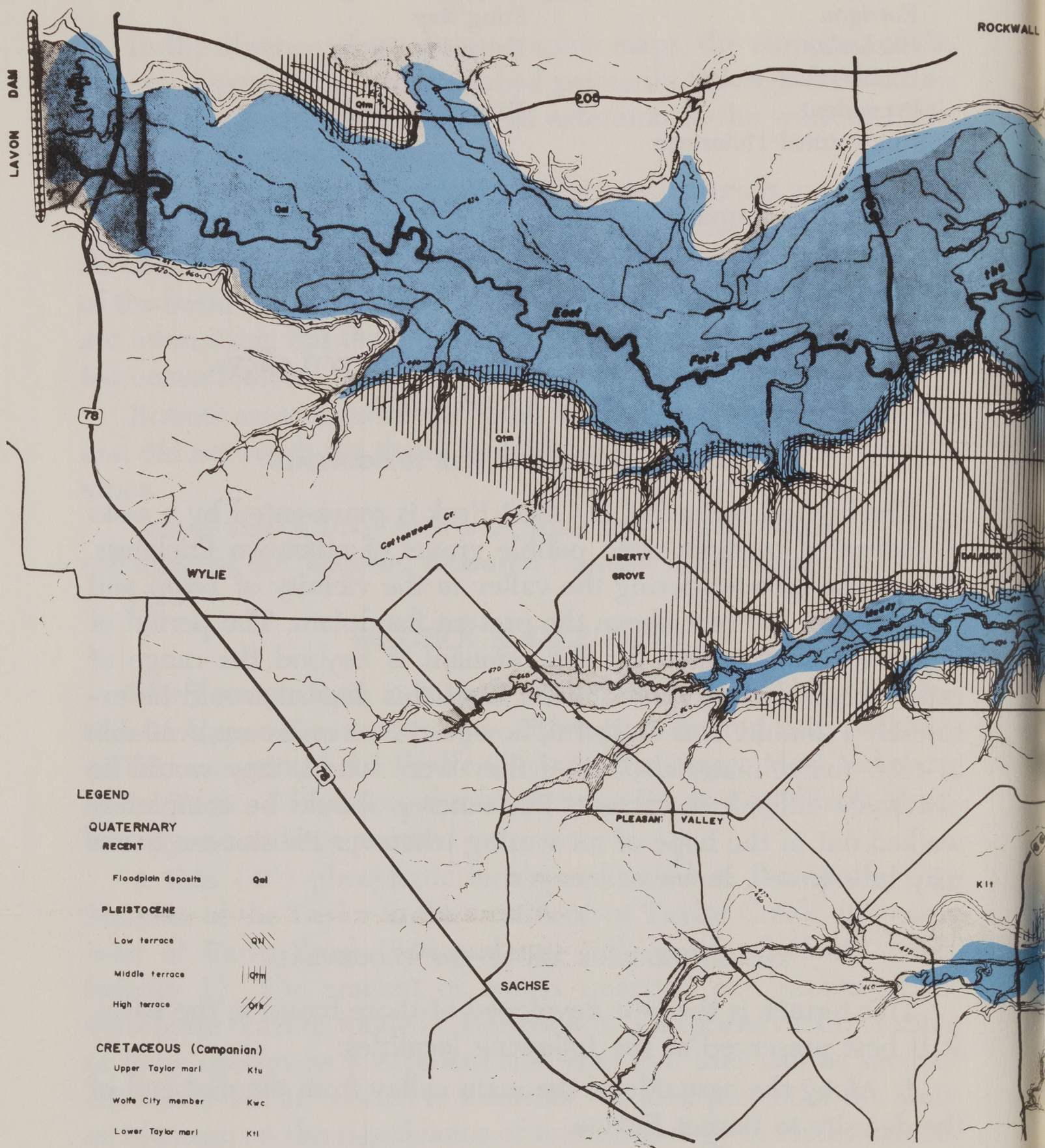
### THIRD TERRACE ABOVE THE FLOODPLAIN

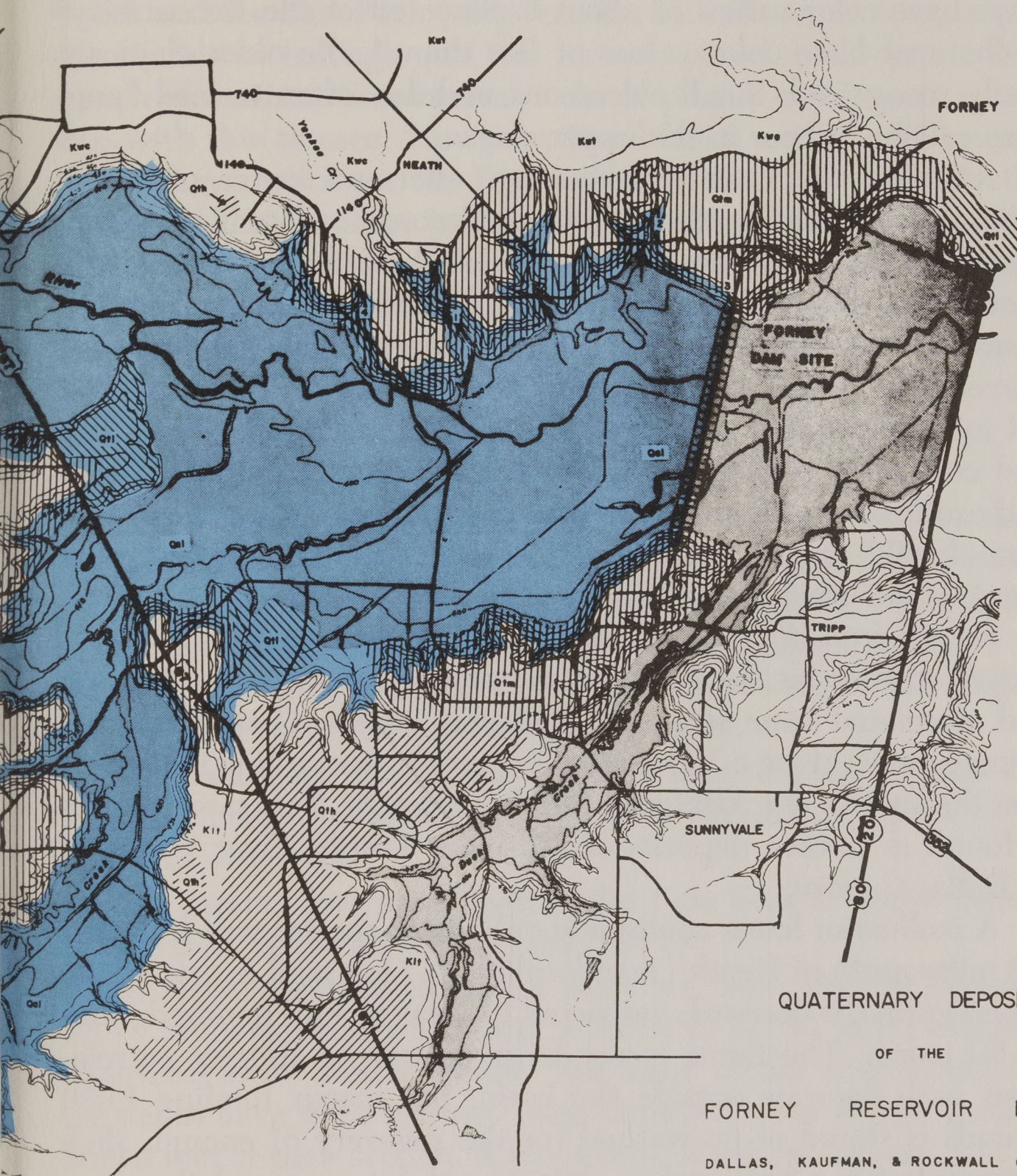
The highest terrace of the East Fork is represented by a mass of indurated medium-sized pebble gravel of unknown thickness. It caps the hills bordering the valley in the vicinity of Tripp and stands some 100 feet above the present floodplain. The period of deposition represented by this remnant is beyond the range of radiocarbon dating; thus a fauna from this deposit would be extremely valuable. It is doubtful, however, that snails are available in such coarse materials; and if they were found, they would be extremely difficult to extract. The outcrop should be completely walked out in the hope of recovering whatever Pleistocene bones may be exposed, however meager.

### SECOND TERRACE ABOVE THE FLOODPLAIN

This terrace is the best developed of those found in the basin. It is best preserved at the following localities:

1. Along the east side of the main valley from the east end of the damsite to Barnes Bridge.
  2. At the intersection of Chaha Road and U.S. 67.
  3. Between Muddy Creek and the East Fork, extending three miles north of U.S. 67 and continuing another four miles north on the west side of the river.
  4. East of the main river north of Squabble Creek.
- The alluvium averages 55-60 feet in thickness and is mostly





QUATERNARY DEPOSITS

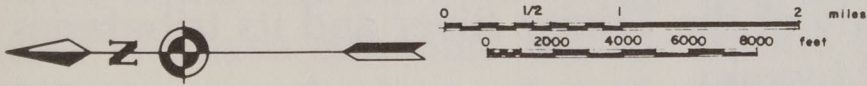
OF THE

FORNEY RESERVOIR BASIN

DALLAS, KAUFMAN, & ROCKWALL COUNTIES,

TEXAS

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SHULER MUSEUM OF PALEONTOLOGY  
SOUTHERN METHODIST UNIVERSITY  
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made of silty clays ranging in color from dark yellowish orange (10YR 6/6) to light brown (5YR 6/4). Characteristically, these clays have color values of about 6. Since all of the Recent clays of the area have color values of less than 4, the older clays are easily recognized. Small calcareous nodules, often termed "pop-corn caliche," occur in the upper clays.

Although the East Fork drainage offers no source of quartz sand, cross-bedded sands made up of Cretaceous foraminifera and *Inoceramus* prisms were seen in the north bank of a small creek on the east side of the main valley, .25 mile upstream from the damsite road (map locality 2). Foraminiferal sands and lenses of gravel were found in a deep side ravine north of Yankee Creek, 1.2 miles southwest of Heath. The gravels are small pebble size and composed principally of *Inoceramus* prisms, chips of shale, and exotic limestone and quartzite pebbles apparently redeposited from the T-3 terrace gravels. Vein calcite, probably originating in the Austin Formation upstream, also occurs.

*Fossils from the second terrace.* The only vertebrate fossils recovered thus far from the second terrace are a mammoth tooth and associated bone scraps of the same animal. There are seven enamel bands along a 100-millimeter anteroposterior line indicating that the species represented is *Elephas columbi*. This same species is found in terrace deposits of the main Trinity River upstream in Dallas County.

A molluscan fauna containing only three species was collected 1.3 miles north of Heath (map locality 3). One snail in this fauna, *Physa gyrina*, is currently restricted to areas several hundred miles to the north. The fauna is not large enough to suggest correlations with deposits outside the basin, but matrix totaling 1,000 pounds is stored to be washed for the recovery of enough shell fragments for a radiocarbon date to aid future correlation in a more comprehensive study of the Trinity River and its tributaries planned by the Shuler Museum.

#### FIRST TERRACE ABOVE THE FLOODPLAIN

The first terrace stands twenty to thirty feet above the present floodplain and is extensively dissected. Only two remnants occur within the basin: one west of Rowlett Creek and northwest of



the intersection of Locust Grove and Chaha roads south of U.S. 67 (map locality 4), the other south of U.S. 67 between Rowlett Creek and the East Fork (map locality 5). Although no exposures identifiable as belonging to this terrace were found, the shallow trench of Annison Creek seems to be of proper elevation to correlate with this terrace. However, it exhibited nothing that could be distinguished from the Recent alluvium of the basin. In the bottom of the cut there is a small exposure of buff clay, but this may be the eroded slope of the second terrace. Pollen samples were taken here to aid more detailed work on the area which may be done in the future.

#### FLOODPLAIN

The floodplain sediments are primarily medium-dark to dark grayish-black (N 3/5) loamy clay with occasional lenses and pockets of calcareous gravels composed primarily of redeposited Cretaceous fossils—especially *Inoceramus* prisms. Fragments of Austin Chalk and exotic pebbles of quartzite reworked from higher terraces also occur, though in lesser quantity.

The maximum size of the gravel (except for ephemeral deposits in small tributaries) is fine pebble (Wentworth Scale). No sand was observed.

The present low water load of the East Fork is bright yellow muds (pale yellowish orange 10YR 6/4).

At the east end of the basin there are areas slightly elevated above the floodplain which are believed to be the delta deposits of several small feeder creeks. The same creeks responsible for the deltas have since cut into these deposits, often exposing some fifteen feet of their section. A few lenses of locally derived gravels were noted but the bulk of the alluvium is dark waxy reworked soil. We have estimated the age of this deposit at approximately 500 years on the basis of similar deposits in Dallas County that have been dated both archeologically and with radiocarbon. A molluscan fauna was recovered and all identified species still inhabit the basin—facts which lend further support to the Recent age assignment. The specimens were identified by Dr. E. P. Cheatum.

## MOLLUSCAN FAUNA FROM DELTAIC DEPOSIT

- Family Bulimulidae  
*Bulimulus dealbatus* (Say)
- Family Polygyridae  
*Polygyra texasiana* (Moricand)  
*Mesodon thyroidus* (Say)
- Family Pupillidae  
*Gastrocopta contracta* (Say)  
*Gastrocopta procera* (Gould)
- Family Strobilopsidae  
*Strobilops texasiana* (Pilsbry and Ferriss)
- Family Succinediae  
*Succinea* sp.?
- Family Endodontidae  
*Helicodiscus parallelus* (Say)
- Family Helicinidae  
*Helicina orbiculata tropica* Pfeiffer
- Family Carychiidae  
*Carychium exiguum* (Say)
- Family Zonitidae  
*Rentinella indentata* (Say)  
*Euconulus flavus* (Muller)

## CONCLUSIONS AND RECOMMENDATIONS

The interesting Quaternary history of the Trinity's East Fork drainage is similar to that of the main Trinity, with minor variations. The presence of a high terrace in the basin indicates that the East Fork is older than most of the Trinity's other tributaries, for only two terraces have been noted along White Rock and Waxahachie creeks. Although it is not recognized in the Forney Basin, a few miles downstream there is a terrace level intermediate between the Forney Basin's first and second terraces. The significance of this is obscure, but it is hoped that future excavation at the damsite will expose some of this material and permit determination of its position in the sequence. Larger vertebrate and molluscan faunas are needed to prove the suggested relationships of the Forney terraces to those of the main Trinity. Such material is not currently available in the basin but may be revealed in the course of future excavations. With the survey completed and the possible sites known, maximum salvage efficiency can be accomplished through weekly progress examination by one student.

Cretaceous elasmobranch fish faunas are becoming increasingly important, and it would be advantageous to process an additional ton or so of the phosphatic lens in the Wolfe City Member to extend the fauna and furnish material for future research projects.

Matrix washing and sorting sufficient to recover ample shell for radiocarbon dating of the second terrace would be most helpful in the future comprehensive work on the Trinity River and its tributaries.

### LITERATURE CITED

- RICHARDS, ARTHUR, and ALBRITTON, C. C., 1948, Geology of the Barnes Bridge Quadrangle, Dallas, Kaufman, and Rockwall counties, Texas: Field and Laboratory, v. 16.