The Search for Devil's Eye

Explore the Colorado River
Follow the Early Geologists of Texas
with the Texas Memorial Museum

Credits:

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The personal narrative was largely unedited.

Annotations were added by Ann Molineux as an aid to the reader who may not be conversant with geological terminology

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The Search for Devil's Eye:
Maps and myths of the Colorado River.

Abstract

"The Search for Devil's Eye" would open in the midst of the late nineteenth-century mapping frenzy, in an era of internal exploration that led to a massive expansion in our knowledge of the internal regions and resources of the United States. In 1888, with approval from the State of Texas, E.T. Dumble (the State Geologist), R.T. Hill (a professor in the Geology Dept of UT), and R.A.F. Penrose (former employee of the Anglo-Canadian Phosphate Company) embarked on the third geological survey of the State. In 1889 some of their efforts to unravel the geology of the Gulf region of Texas led them from Austin to La Grange via the Colorado River, and provided Texans with a wealth of vital information about potential resources. During their explorations, they sampled rock beds, interacted with settlers, argued with each other, and generally produced a delightful record of the daily experience of exploration and mapping of one of Texas's most important rivers. Many of the geological and historical treasures detailed and collected by these early explorers are available to visitors to the Texas Memorial Museum. With the help of KLRU, we could bring these treasures to life.

Cinematography

"The Search for Devil's Eye" will trail a group of modern voyagers paddling a canoe down the Colorado River, following the route and itinerary of those early explorers. Fossils, the original note-books and reports, scholarly papers, maps, and aerial and ground photographs will help reconstruct this never-before exposed part of Texas history.

Audience

"The Search for Devil's Eye" would bring to local KLRU audiences, visitors to the TMM, and students at the University of Texas a unique perspective on how our knowledge of Texas geology and waterways developed through the ingenuity and blunders of early explorers and scientists. Following in their wakes will highlight the process of charting Texas' geological past, and the role of the river in sustaining the cities along its path. We hope to educate our audience and to stimulate an interest in the history and geology of the Texas Rivers. We have chosen to focus on the Dumble Survey down the Colorado River. A successful response to production of this first documentary could pave the way for a larger series on the Texas "River Trails", recounting the adventures of these and other scientists on the Rio Grande, the Brazos, and the Sabine Rivers.

Detailed Outline

The title "The Search for Devil's Eye" signifies both the original exploration and "search" for geo-logical evidence *and* our modern attempt to reconstruct or "search for" the original sites of field collection. We know these sites, such as "Devil's Eye", only from the explorers' written descriptions and given mileage from a known geographical or human location. Unlike some historical documen-taries that opt to "smooth" over missing or incomplete parts of the historical timeline, we envision making the difficulties of reconstruction of this journey an integral part of the tale. "Searching" for the original Devil's Eye draws attention to the real problems involved in verifying the science of early exploration: river banks have eroded, names have disappeared from maps, weather patterns and human development have wrought profound change in the topography of the river. The very process of searching is a graphic demonstration of the effects of natural- and human- influenced river channel changes, including urbanization, flooding, and dams. Debris high in the trees, the high water mark

on the bridge at Smithville, and a look at the USGS river gauge data tell us the enormous range in river flow, even after the Colorado was dammed. Stressing the "trail's" gradual disappearance sheds light on the river's renewal, change, and migration, and it brings into focus the importance of collecting, recording, and studying our local landscape.

Dumble left the survey after 1895 to work for the Southern Pacific Railroad and its subsidiary, the Rio Bravo Oil Company. Penrose left the survey after less than two years. In later years he worked with several other geological enterprises, traveled widely to study ore deposits, and is renowned for his role in the Geological Society of America. Hill, regarded by many as "the Father of Texas Geology", produced seminal works relating to the geology of the state which are still relevant today. How these men related to each other and to the settlers of the time leads us into scandal and scientific impropriety, injury and abandonment.

The three geologists left behind a tantalizing mystery—the survey was terminated prematurely and Dumble was accused of impropriety. There are clear and intentional instances of omission of information. Dumble, Penrose, and Hill are known to have reached 'Camp Disaster'. There is but a simple comment in the field notes that Hill left at that point, as did the hired oarsman. Was there an argument here between Dumble and Hill, and if so over what? Is that the origin of the name "Camp Disaster"? Or did the place get its name in some other manner? Much earlier in history Noah Smithwick overturned a dugout canoe at or near this site while trying to ferry cattle across the river in the Runaway Scrape prior to the battle of San Jacinto [Smithwick was a pioneer blacksmith who became involved in the attempt to guard the Bastrop river crossing and herd the cattle eastwards to follow the settlers who had fled Santa Anna's army in what was referred to as the Runaway Scrape. The actual site of 'Camp Disaster' is indicated in the Zachos narrative]. Even our own researhcers have had their share of trouble here; one research fellow has twice dropped his camera in the river, another sprained his ankle, and both have suffered from extensive poison ivy.

Geological exploration did not end with these early scientists. Universities and the private sector continue to unravel the fascinating geology of Texas. In about 1908 the State's role in geological and mineral research was taken over by the Bureau of Economic Geology, who continues to concern itself with the resource potential of Texas.

A Geological Preamble

The geological map of Texas depicts a patchwork of rocks representing a vast range of original environments. The massive limestone of Edward's plateau a remnant from a former sea covering the area between 130 and 65 million years ago (the Cretaceous time period). The distinctive replications of shale, sandstone and limestone of north central Texas bear the stamp of both sea and deltas when the main axis of drainage was to the northwest during the Pennsylvanian (around 300 million years ago). Plant remains attest to swamp conditions. The rocks of that time and earlier, which are now buried beneath later sediments hold the ingredients for vital energy resources such as coal, oil and gas. In the Gulf coastal zone, stretching from the great arcuate Balcones fault system to the modern coastline of today, the rocks again tell the story of seas, deltas, and rivers from about 65 million years ago to the present day. We can deduce these environments because geologists have carefully studied the characteristics of the rocks formed from sediments deposited during those times, and gleaned vital clues from life forms preserved as fossils. Without this knowledge the huge resource potential of Texas would be not have been realized and developed.

In 1891, Angelo Heilprin published *The Eocene Mollusca of the State of Texas*, based in part on the collections of Conrad and Gabb, but also drawing upon material collected by E.T. Dumble and R.A.F. Penrose during a reconnaissance of the Colorado River in 1889. Of the localities Heilprin lists, four, "Smithville, Devil's Eye, Bombshell Bluff and 'Camp Disaster'", are located at points along the Colorado River in Bastrop County. These are the type localities for many Claiborne-age mollusks [The Claiborne group encompasses several distinct rock formations that were formed during the geologic epoch called the Eocene, about 55 million to 34 million years before the present. The Eocene is one of five epochs that comprise the Tertiary time period (65-1.8 mya)].

Additional mollusks were reported by Harris and Aldrich from the same localities, and Price and Palmer described a new fauna from the mouth of Gazley Creek, near Smithville. The Dumble collections at the Texas Memorial Museum include specimens from all these Colorado River sites, as well as: Alum Creek Bluff, David Bottom, and Shipp's Ford. Duessen reported localities along the river with distances measured from Burleson's Ferry, the position of which itself is uncertain. All of these sites lie along the Colorado River within (or almost within) the boundaries of Bastrop County.

Many of these names are no longer in use, and their locations can only be determined from old maps, old field notes and descriptions. Conflicting information is reported in the literature regarding certain sites, with much confusion arising from an incomplete modern knowledge of the geology and history along the Colorado River. The famous Smithville site is still known, although it is now largely inaccessible for collection. The Gazley Creek exposures, though poor, remain identifiable and readily accessible by boat. The fossil-bearing outcrops at Shipp's Ford were reported in some detail by H.B. Stenzel. Of all the localities, the position of the one called "Devil's Eye" is the most uncertain.

The Search for Devil's Eye – a personal narrative by Louis Zachos

It's an early February morning, cool but clear. A lone fisherman is sitting on an overturned 5-gallon bucket, holding a rod and watching two more on the bank beside him, all three lines in the river. I back carefully down the steep concrete ramp, feeling like an intruder. He offers to help me get the kayak off the roof rack. I must look older than I feel, because everywhere on this river people want to help me load, unload or carry the boat. It's going to be a good day. The temperature is

warming, and should be in the high 60's later on. The river is low and flowing slowly, clear enough to see 2 or 3 feet to the bottom. The fisherman's attention is distracted by a catch, a nice bass, and he unhooks it and tosses it in the grass. I wish him well, and he tells me that he knows he isn't supposed to have a fire, but it was cold at dawn. I tell him it's fine – there's nobody around and there's no grass or litter on the bank to burn anyway. I stock the kayak with all the essentials, wade into the water and push off.

I begin today from a Travis County park, located on the north side of the Colorado River, just east of Webberville, and just west of the Travis/Bastrop County line. In some ways it's a ratty part of the river. Construction companies mine sand and gravel from the big bends of the river between here and Austin, although they are careful, for the most part, to isolate the mining from the river itself to minimize any muddying (or maybe they're just law-abiding). It's romantic to dream of mining gold or diamonds, but around here there's money in dirt. Across the river from the park, and along the south side for maybe a mile upriver, the scenery consists of the backsides of a line of trailers and what can only be described as junkyards – old boats, concrete, rotting logs, plastic, and just plain trash. But downstream is where the Lower Colorado begins for me.

Figure 1. A turtle takes advantage of the imbricated tires.

In 1889, three geologists of the fledgling Geological Survey of Texas came this way. The young R.A.F. Penrose, fresh with a doctorate from Harvard, E.T. Dumble, and R.T. Hill. The trio started out in a boat with a rower, but lost him and R.T. Hill a little downstream of here, at a place Penrose labeled "Camp Disaster" in his field notes.

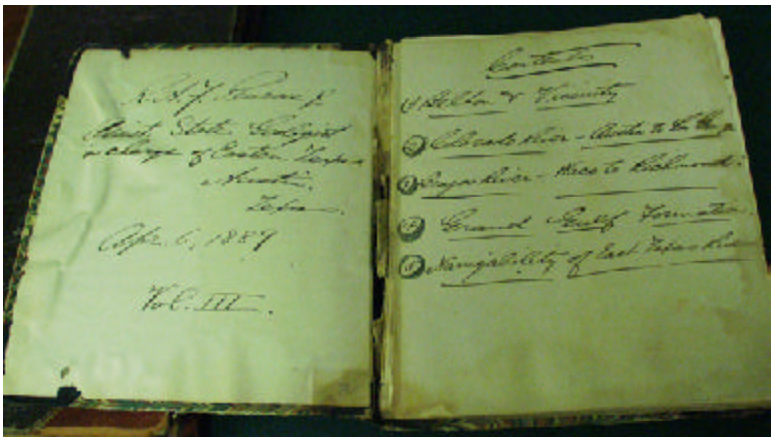

Figure 2. The field book of F.A.F. Penrose covering the Colorado River trip of 1889.

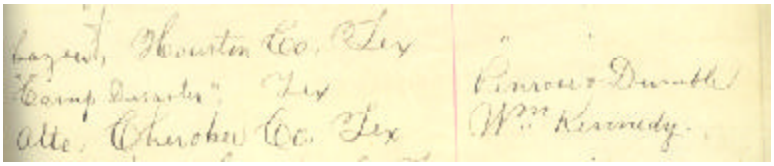

Figure 3. An entry for "Camp Disaster" in the Species Register.

There is no "Camp Disaster" on any map or in any other historic record – but I'm pretty sure it's located somewhere near the mouth of Dry Creek. Some places are just plain unlucky, and here I've dropped my expensive Nikon in the river (twice!), a friend of mine sprained his ankle, and I cannot think of any place with a thicker growth of poison ivy. Noah Smithwick described overturning a dugout canoe near here in 1836 during the Texas Revolution. There is long stretch of shallow water along the right bank here – clays of the Paleocene Kincaid Formation – in places filled with all kinds of fossils [The Paleocene is the earliest epoch in the Tertiary stretching from 65- 55 mya. The Kincaid Formation is part of the Midway Group, rocks from sediments that were deposited during the Paleocene]. This clay falls apart on drying, so nothing can be seen along the banks above water and all the best collecting is had standing knee-deep in the river and scooping fossils like a heron bobbing for fish.

It's only another sixteen miles or so to the next take-out point (under the bridge at Utley), an easy paddle/drift. Wilcox beds are cut by the river between Dry Creek and the Utley bridge. Unlike the Kincaid, which was deposited when the sea extended past here, the Wilcox was deposited by rivers and streams flowing across a widening coastal plain [The Wilcox Group is younger than the Kincaid]. In bluffs rising above Wilbarger Bend there are even beds of lignite exposed – remnants of ancient swamps. A little north of here Alcoa mines thousands of tons of Wilcox lignite to fire the generators that power the smelters that crank out the cans that contain the beer I drink as I drift with the current.

The gravel bars have now changed appearance as well. The cobbles of granite and worn shells of Cretaceous oysters have given way somewhat to petrified wood and flint [The Colorado River erodes and transports those eroded materials further downstream. Thus at any particular point in the river channel some of the constituents of gravel bars may be older than the rocks through which the river is flowing. Here we are finding older Cretaceous marine fossils and even older granites in the gravel bars when the river banks may be cut through younger Tertiary non-marine deposits]. I imagine that the Indians selected blanks for their spear points and arrowheads from among these cobbles. Often a piece of flint looks as if it had worked by hand, perhaps a core from which broad flakes of stone were struck, or a cast off blank with a defect too subtle for my eye.

From Utley to Bastrop the river flows through a flood plain populated mostly by cows.

Figure 4. An early morning dip from a sandy shore.

The Wilcox sands and clays [Another group of rocks from sediments deposited during the Eocene] are exposed here and there, spectacularly at one point with a vertical cliff of sandstone 40 feet high. William McKinstry passed this way in August, 1839, noting the ferry at Bastrop as well as shoals "familiarly known as the old San Antonio crossing" – old in 1839! The modern history of Bastrop County goes back to the original settlement of the Stephen F. Austin Colony, when Bastrop was named Mina.. It was only three years before, in March of 1836, that the "Runaway Scrape" streamed up the San Antonio Road through Bastrop as the Anglo populace evacuated Texas before the on-slaught of Santa Anna's army.

Below Bastrop, the Colorado River flows for some distance through the lignite-bearing Wilcox deposits. After a while, the left side of the river rises into tall, pine-covered hills, part of the Lost Pines region. The Lost Pines is a 70 square mile region of loblolly pine trees that were part of a continuous stretch of forest from here to East Texas during the Pleistocene. Now isolated from the eastern woods, they mark a change in the geology from the clayey Wilcox to the sandy Carrizo Formation and Newby member of the Reklaw Formation [Carrizo and Reklaw are formations in the Claiborne group, younger rocks than those of the Wilcox]. A golf course hugs the north bank of the river, adding the hazard of a nasty slice to the other hazards of water moccasins and snapping turtles. The tall hills become cliffs framing the fairways, capped by rust-stained conglomerates. These high terrace deposits are very different from the thick red alluvium I've been seeing in the banks upriver. What could have washed such a thick mass of cobbles and pebbles over the land here? These cliffs have been known since before 1840 as Iron Banks and Red Bluffs, and have been a landmark along this stretch of river. Now, with the modern improvements of golf courses and expensive houses, it has been given the improbable name of Tahitian Village.

At the mouth of Cedar Creek there is a tall bluff of brilliantly white, cross-bedded sandstone of the Carrizo Formation, also capped by a few feet of iron-red pebble conglomerate. The clean, white sand of the Carizzo is replaced a little farther on by the red-colored sands of the Newby, the lower member of the Reklaw Formation. The red coloration is caused by the oxidation of the iron-bearing mineral glauconite. Glauconite, although its exact mode of formation is still unknown, is evidence of marine waters. The sediments here, after many miles of river, were once again deposited by the sea during the great inundation of the Claiborne. Also, after many miles, I once again find fossil shells.

F.B. Plummer, in the Geology of Texas, stated "The first fossils from the Reklaw were named

by Heilprin (1890) from a collection of fossils sent him by R.A.F. Penrose, Jr., collected from Devil's Eye, a shoal in Colorado River about 8 miles southeast of Bastrop in Bastrop County."

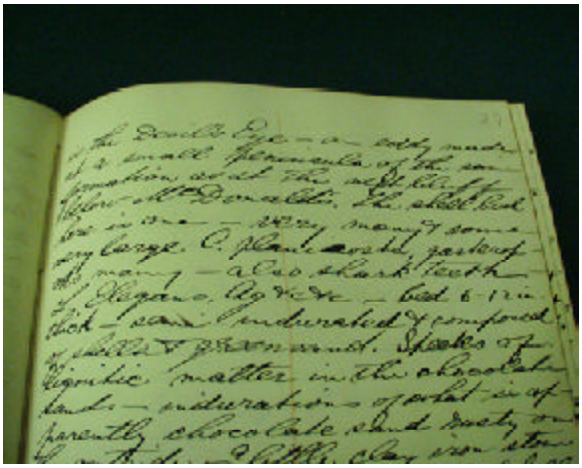

Figure 5. Penrose's notes on Devil's Eye.

Fisher, Rodda, and Dietrich (1964) describe Devil's Eye as an "… island in Colorado River", and Garvie (1996) as "…former island in Colorado River." At least they seem to agree that it is somewhere between David Bottom and Kennedy Bluff. Unfortunately, no one seems to agree on where, exactly, David Bottom is located. David Bottom was one of five communities created in 1828 by seven Missouri families among the original settlers of the S.F. Austin grant. It was probably located along the north side of the river below Cedar Creek, although some current residents of the area place it five or six miles farther downriver.

In the *Colorado Navigator* (1840), William McKinstry gave a detailed description of the Colorado River between Austin and the Gulf of Mexico, based on a trip by small boat. In this record we find what may be the earliest reference to Devil's Eye – an island in the river, between Bastrop and Smithville, called Devil's Towhead. The Random House Dictionary of the English Language defines *towhead*: a sand bar in a river, esp. a sand bar with a stand of cottonwood trees.

Figure 6. A contender for Devil's Eye? The stranded boat wrapped around the cottonwood tree indicates times of much higher water.

But now we come to another problem with his description of the river – the mileages don't

add up to modern distances. This was admitted by McKinstry himself in the preface to his publication: "The distances between the different points and towns … may possibly differ a little …". The same problem is found in the field log of R.A.F. Penrose in his description of a trip down the Colorado from Austin to LaGrange. Fortunately, we can recognize some of the other landmarks noted, and thus gauge the actual distances between other points of interest.

McKinstry gives the mouth of Walnut Creek as a station. Now called Cedar Creek, this point almost certainly coincides with the present day location.

> Total distance of 7.75 miles given between Walnut Creek and Devil's Towhead.
> Total distance of 8 miles to Burleson's Ferry.
> Total distance of 3.25 miles to Gazly's Landing (Smithville).
> This gives a total from Walnut Creek to Smithville of 19 miles.
> The same measured from a modern map is 12.7 miles.

There is a significant discrepancy in the measurements (12.7 miles vs.19 miles, or 2:3). If this factor is applied to each incremental measure the following distances would be expected:

> Walnut Creek to Devil's Towhead – 5.2 miles
> Devil's Towhead to Burleson's Ferry – 5.35 miles
> Burleson's Ferry to Gazly's [sic] Landing – 2.2 miles

Penrose also gives the mouth of Walnut Creek as a station. By his measurements, Devil's Eye is 5.5 miles from the mouth of Walnut Creek. McKinstry noted that Devil's Towhead was about a ¼ mile long. Assuming that Devil's Eye was at the downstream end of the island, the two measurements are in close agreement.

In the *First Annual Report of the Geological Survey of Texas*, Penrose states that "Four miles below the beginning of this fossiliferous area we come to what is locally known as the Devil's Eye, an eddy at a low ledge …". In Penrose's handwritten field notes we have even more information: "2 miles below McDonalds Bluff is the Devil's Eye – an eddy made at a small peninsula of the same formation as at the next bluff below McDonald's."
Just upstream of this eddy he describes "many shells in the blocks of indurated greensand in the river – small shoal – dip horizontal..."

Figure 7. Beached on Devil's Eye Shoal

The river makes a sharp bend where Reeds Creek enters from the south, and a tall bluff on the

south bank exposes nearly forty feet of the Marquez member of the Reklaw – this is McDonalds Bluff. About a mile below the bluff the river bends northward again. At high water the channel splits, flowing around an island about a quarter mile in length and dotted with cottonwood trees. At low water, the left channel is a long stretch of sand, and a ledge of glauconitic sandstone forms a small set of falls entirely across the remaining channel. The sandy clay underneath is filled with fossil shells of the Reklaw.

Figure 8. Typical fossil material preserved in the Non-vertebrate collections of the Texas Memorial Museum.

Figure 9. Fossil leaves at a Yegua outcrop along the Colorado River in Fayette County.

From an aerial photograph it is apparent that the ledge marks a fault that crosses the river here. An aerial photograph from 1951 shows not only the ledge, but the extension of the fault where it again crosses the river past an eastward bend about a quarter mile downstream. The left bank here is partly eroded away by what appears to be a strong eddy. At the present time, however, the eroded section is slumped and densely overgrown. Some other time I am going to stop with shovel and pick and see if I can find any fossils to confirm that this is the missing Devil's Eye.

The thick, massive Queen City sand above the Reklaw forms a long line of bluffs along the right bank for a mile or so above Alum Creek, and one of the more spectacular bluffs just below the mouth – a sixty foot cliff of sandstone and shale named Kennedy Bluff. Penrose stated that the same shell bed found at Devil's Eye is present above twenty feet of cross-bedded sandstone, and the TMM collections have fossils reported to be from Alum Creek Bluff. But this is another mystery. I can't find any fossils on this cliff, and it is difficult to explain how a Reklaw section could appear within the Queen City. Besides, Penrose, in his handwritten notes, locates the bluff on the south side of Alum Creek. Kennedy Bluff is on the north side of Alum Creek.

About two miles below Alum Creek, on the left (north) bank, is an exposure of Queen City sandstone. At low water levels a bed of fossiliferous greensand can be seen just below the surface. Amongst the shells I find many shark teeth. This locality was not known to Penrose, or any writers after him, but one local fisherman told me "I found some shark's teeth around there." Penrose also did not note the fossiliferous Queen City bed at the mouth of Gazely Creek, but it was described by Price and Palmer in 1928.

Figure 10. Pump station near Kirtley. Water from the Colorado is still pumped for stock and crop irrigation.

Figure 11. Further downstream the bluffs of Yegua shales near the bend in the Colorado, site of the fossil leaves shown in Figure 9.

This trip ends at the LCRA boat ramp under the State Highway 95 bridge in Smithville, but not before drifting a few hundreds yards further down to the ledge of oyster-bearing "limestone" extending nearly across the channel. The houses and manicured lawns on the right bank cover one of the classic collecting localities of the Texas Tertiary section. Paleontologists collected from the well-exposed Weches greensand for more than 50 years before the bank was stabilized by flood control and urban growth. The original wagon bridge, built around 1900, crossed downstream of the exposure, which was described in detail by H.B. Stenzel. There are no other comparable Weches outcrops within a hundred miles, and our knowledge is almost entirely dependent upon museum collections (and what little can be gleaned from the rock ledge today).

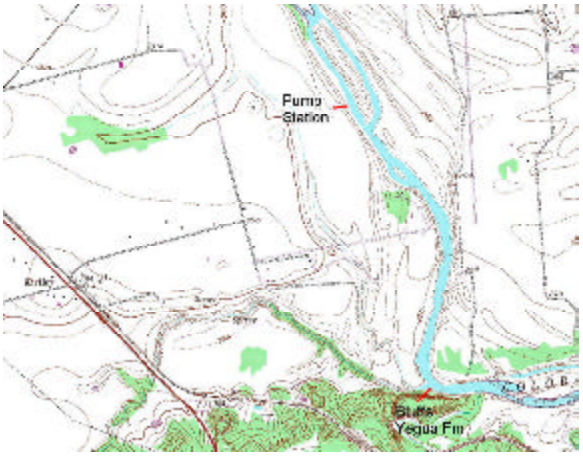

Figure 12. The map shows positions of Figs 10 & 11. USGSquad 29097h1.

The records continue past the town of Smithville, this leg of the original survey ended in La Grange.

Figure 13. Below Smithville the Colorado River continues on its way to the Gulf.

Figure 14. Penrose field diagram

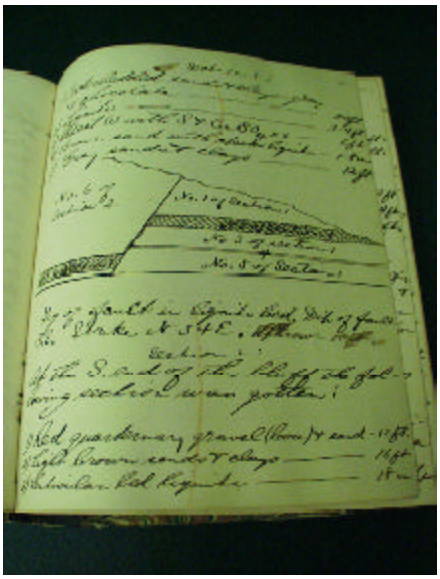

Figure 15. Hill on the Rio Grande

Figure 16. Louis Zachos investigating river bank geology