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BUREAU OF ECONOMIC GEOLOGY
THE UNIVERSITY OF TEXAS
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GEOLOGIC QUADRANGLE MAP NO. 19

Fall Prong Quadrangle
Kimble, Gillespie, and Mason Counties, Texas

By

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May 1956

GEOLOGY OF THE FALL PRONG QUADRANGLE, KIMBLE, GILLESPIE, AND MASON COUNTIES, TEXAS

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GENERAL SETTING

Fall Prong quadrangle is in the marginal portion of the Edwards Plateau near the southeastern corner of the Llano region. Almost three-quarters of the quadrangle is Edwards Plateau and the rest is valleys of the Llano basin cutting back into the plateau.

The geology of the Fall Prong quadrangle is shown on a planimetric map; the only topographic map available is the reconnaissance 30-minute Kerrville quadrangle. Elevations ranging between 1,723 and 2,245 feet were determined during traversing for control, but the lowest elevation was not reached. However, it is estimated that the relief within the quadrangle is about 545 feet, ranging between about 1,700 and 2,245 feet.

The quadrangle is entirely within the Llano River drainage basin and is mostly tributary to James River via Little Devils River, important branches of which are Fall Prong and White Oak Creek. Salt Branch in the northwestern corner flows directly to James River, and a small area in the southeastern part of the quadrangle drains into Threadgill Creek and reaches Llano River via Beaver Creek.

The Fall Prong quadrangle is well up on the southwestern side of the Llano uplift and is covered by Cretaceous rocks which crop out over the entire quadrangle except in the northwestern part where Cambrian and Ordovician rocks appear. One fault formed during the Ouachita orogeny (Barnes, 1948) is exposed. The Cretaceous rocks are essentially horizontal and may dip as much as 6 feet per mile southeastward in most of the quadrangle. Broader discussions of the stratigraphic, structural, economic, and geophysical problems of the region are in references cited below. This publication on the Fall Prong quadrangle is one of a series of similar publications, an index to which is shown on the opposite page. The reader is referred to the index map to locate other quadrangles mentioned in the present text.

GEOLOGIC FORMATIONS

PALEOZOIC ROCKS

ORDOVICIAN SYSTEM (LOWER ORDOVICIAN)

Wilberns Formation (Upper Part)

Only the Lower Ordovician part of the Wilberns formation is known to crop out within the quadrangle. Just north of the quadrangle along James River 57 feet of rock belonging to the Riley formation and 619 feet belonging to the Wilberns formation have been measured; the thickness of the various units is as follows:

	Thickness (feet)
Wilberns formation	619
San Saba member	284
Point Peak shale member	188
Morgan Creek limestone member	127
Welge sandstone member	20
Riley formation—	
Lion Mountain sandstone member	57

San Saba member.—The upper part of the San Saba member crops out in the northwestern part of the quadrangle. It is in part in normal stratigraphic position beneath the Ellenburger and in part in fault contact with it. The rocks are mostly fine- to coarse-grained, yellowish-gray limestone; one 18-inch, dark yellowish-orange dolomite bed; and near the top a small amount of aphanitic, light-gray limestone.

In the James River section the first significant sandstone in the San Saba is about 36 feet beneath the top of the member and may be the same one that is in fault contact with Ellenburger rocks near the road.

Granule intraformational conglomerate composed of one-fourth-inch aphanitic granules in a fine-grained matrix is common. Glauconite is mostly rather scarce but in a few beds is rather abundant. The beds are mostly thin with a few as much as 6 inches thick.

No fossils were collected from the San Saba member within the quadrangle, but several collections have been made from it in the James River section a short distance to the north.

Ellenburger Group
Tanyard Formation

Threadgill member.—About 40 to 50 feet of white-weathering, mostly aphanitic limestone belonging to the lower part of the Threadgill member crops out near the northwestern corner of the quadrangle. The limestone is light gray in part mottled by darker shades of gray and yellowish gray. The beds are mostly between 2 and 10 inches in thickness. Some fine- to very fine-grained beds especially in the lower part contain pinpoint specks of glauconite. One dolomite bed in the lower part is about 2 feet thick, fine grained, pale yellowish brown, and weathers to light brown.

Gastropods such as *Ophileta*, *Gasconadia*, and *Lytospira* are numerous on bedding surfaces, but no fossil collections were made.

MESOZOIC ROCKS

CRETACEOUS SYSTEM (LOWER CRETACEOUS)

Shingle Hills Formation

Hensell sand member (Barnes, 1948).—The Cretaceous rocks in the Fall Prong quadrangle are essentially horizontal, except in the northwestern part of the quadrangle where they dip perhaps as much as 6 feet per mile southeastward. The thickness of the Hensell sand can be estimated if the elevation of the lowest point at its base and the elevation of the base of the overlying unit are known. The lowest elevation on the base of the Hensell is estimated to be 1,723 feet in the northwestern part of the quadrangle. The base of the Glen Rose in the same area is 1,901 feet, giving an outcrop thickness of 178 feet for the Hensell. Additional beds are probably present in the subsurface in the southern part of the quadrangle because the surface on which the Hensell rests slopes in general southward.

The Hensell sand varies widely in color and composition throughout the area, being influenced to some extent by the type of rock being transgressed. Within the quadrangle it rests on portions of the San Saba member of the Wilberns formation and of the Threadgill member of the Tanyard formation. In the subsurface within the quadrangle it is likely that the Hensell rests on all units of the Lower Ordovician and several units of the Cambrian.

The upper boundary of the Hensell sand is rather sharp in the northeastern part of the quadrangle where it is in contact with the Walnut clay, but westward the boundary is not clear cut in many places where the Hensell is in contact with Glen Rose beds. The Glen Rose limestone is absent in the northeastern part of the quadrangle because of lateral gradation of the limestone of the Glen Rose to terrigenous sediments of the Hensell sand.

The Hensell sand is in general very poorly sorted and ranges from coarse material such as boulders, cobbles, pebbles, and granules through the various sand sizes to silt and clay. No conglomerate was mapped within the quadrangle, but outcrops of it are present along Little Devils River a short distance from the western edge of the quadrangle.

Angular granules are common in the lower part of the Hensell sand; upward the Hensell is finer grained, containing much silt and clay. In the western part of the quadrangle the upper part of the Hensell is very calcareous. The Hensell sand varies widely in color with reds and grays predominant. The red material tends to be more abundant in the lower part of the Hensell, but even here there is considerable material of gray, yellowish-gray, and greenish-gray color.

The Hensell is so little indurated that it readily breaks down and forms gentle slopes except immediately beneath the Glen Rose and Comanche Peak limestones. Some of the Hensell is cultivated but not as much as is cultivated farther east.

A section along the west side of Little Devils River about 2,000 feet west of the western edge of the Fall Prong quadrangle and about 9,500 feet south-southwest of the mouth of Fall Prong is described below. The section is exceptionally well exposed in a bluff but in part is inaccessible.

Glen Rose limestone member.—The Glen Rose limestone is 33 feet thick in the Little Devils River section, 23 feet thick in the northwesternmost outcrop in the quadrangle, 15 feet thick a mile to the east, and disappears one-half mile farther east. Southward along Little Devils River but still west of the quadrangle the Glen Rose limestone thickens, and in the subsurface in the southern part of the quadrangle it may be as much as 60 feet thick. The variation in thickness is caused by the lateral gradation of the limestone and dolomite beds of the Glen Rose to terrigenous materials of the Hensell.

The contact between the Glen Rose limestone and the Hensell sand is arbitrarily placed at the bottom of the lowest bench-forming limestone or dolomite. In following the contact, as carbonate beds come or go, the contact is lowered or raised to the base of the next one. In mapping, however, it is almost impossible to decide at which point the carbonate beds cease to exist, so the basal boundary of the Glen Rose is not mapped as a series of steps but is gradually rounded off from the base of one to the base of the next.

Most of the contact was traced on aerial photographs between observed points with the aid of a stereoscope, and since the terrace of any one carbonate bed gradually merges with the general slope as it dies out, it is easy to raise or lower the contact to the next one. The Glen Rose—Hensell contact is poorly exposed within the Threadgill quadrangle, being situated in a steep portion of the topography where much colluvial material is creeping downward from the Comanche Peak and Edwards limestones. The terraces in the Glen Rose are not as well developed within the quadrangle as they are in eastern Gillespie County; therefore, the stereoscope is of less value in tracing the lower boundary. The Glen Rose limestone is terminated eastward in the northern part of the map; the point chosen for its termination is purely arbitrary.

The Glen Rose limestone in Gillespie County consists of alternating beds of limestone, dolomite, clay, and sand or better stated, beds having various proportions of these materials and in addition silt. In the Fall Prong quadrangle the Glen Rose consists mostly of dolomite and silty clay. All of the Glen Rose limestone is described in the Little Devils River section, and 9 feet of it is described in the Fall Prong section given below.

Fredericksburg Group

Included within the Fredericksburg group of the Fall Prong quadrangle is about 300 feet of Edwards limestone, about 32 feet of Comanche Peak limestone, and about 2 feet of Walnut clay. The boundaries of the units are gradational, and in this quadrangle Thompson's (1935) observation that these units should have about the rank of members seems logical. However, instead of introducing a new name, Fredericksburg could easily be dropped from group to formational rank, especially since the U. S. Geological Survey excludes the Kiamichi clay from the Fredericksburg group (Wilmarth, 1938, p. 776),

Walnut clay.—The Walnut clay is about 2 feet thick in the section along Fall Prong, and in the western part of the quadrangle in the vicinity of Little Devils River it is represented by an accumulation of *Exogyra* at the base of the Comanche Peak limestone. In the northeastern part of the quadrangle it rests directly on the Hensell sand, and in the rest of the quadrangle it rests on Glen Rose beds. The Walnut clay is shown on the map by a solid color line.

The Walnut clay, described in the sections given below, is composed of clay grading upward into an impure nodular limestone. The clay is very calcareous, silty, sandy, fossiliferous, and mostly yellowish gray. It is too thin to influence noticeably the vegetation and culture of the area. No fossil collection was made from the Walnut within the quadrangle.

Comanche Peak limestone.—The Comanche Peak limestone is 31.5 feet thick in the Fall Prong section and 32 feet thick in the Little Devils River section; the thickness elsewhere within the quadrangle probably varies little from these figures. The Comanche Peak limestone grades downward into the Walnut clay and upward into the Edwards limestone. The contact with the Edwards limestone is arbitrarily placed at the base of a very thin-bedded limestone which is thought to correlate with a similar zone containing some chert in central Gillespie County.

The Comanche Peak limestone contains much argillaceous material especially in its basal portion. The lower part of the Comanche Peak tends to be nodular, is mostly fossiliferous, and is in part burrowed. The upper part of the Comanche Peak is mostly well bedded and in the Little Devils River area is mostly dolomite.

The Comanche Peak limestone is softer than the overlying Edwards limestone and harder than the underlying Walnut, Glen Rose, and Hensell; consequently, it has eroded into a steep slope which is characteristic of its outcrop throughout the quadrangle. The Comanche Peak limestone has a distinctive vegetation cover especially on north slopes which shows clearly on aerial photographs as a black band. A narrow-leaf oak identified by Cuyler (1931) as "*Quercus texana* Sargent (Texas oak)" is the dominant tree on the Comanche Peak limestone.

In mapping the Comanche Peak limestone, points at which its boundaries cross roads were placed on aerial photographs. In addition points of contact were mapped at many places between roads and on all outliers. On portions of the aerial photographs for Gillespie County having stereoscopic coverage and on all photographs for Kimble County the boundaries were traced under the stereoscope; where stereoscopic coverage was lacking for Gillespie County, the boundaries can still be very closely approximated by following the black band mentioned above.

The Comanche Peak limestone is described below in the sections measured along Little Devils River just west of the quadrangle and along Fall Prong. The Comanche Peak limestone is fossiliferous especially in its basal portion, and indications of fossils are common in some of the upper beds. Fossils from one collection, locality 19–17A, a little more than a mile southeast of the Gillespie County corner, have been identified by Dr. Ralph Imlay as follows:

Monopleura pinguiscula White
Toucasia texana (Roemer)?
Arctica sp.
Pecten (Neithea) duplicicosta Roemer

Edwards limestone.—The Edwards limestone is estimated to be about 345 feet thick between the falls on Fall Prong and Herman triangulation station. The lower boundary, as explained above, is gradational and is chosen at the base of a thin-bedded zone which is thought to correlate with a similar zone in central Gillespie County.

The Edwards limestone in the Fall Prong quadrangle is composed of a variety of rock types including limestone, dolomite, and chert. The limestone and dolomite vary in composition, texture, thickness of beds, and hardness; this variation is very clearly shown on aerial photographs by banding, because of the segregation of the vegetation into bands of marked difference in density. The outcrop of the Edwards limestone has an average density of vegetation greater than that of the Glen Rose and the Hensell. The hard limestone beds in the sequence weather slowly and have only a thin soil covering and are consequently nearly void of vegetation. The softer beds develop a more adequate soil and are thickly covered with growth, most of which is a scrub oak identified by Cuyler (1931) as "*Quercus fusiformis* Sargent (mountain scrub oak)."

Above the abrupt slope of the Comanche Peak limestone the Edwards limestone flattens out into gently sloping surfaces except where oversteepened by undercutting along major streams. It is consequently almost impossible to measure and describe a section of the Edwards limestone except in its lower portion where stream action is strongest.

The Edwards surface is mostly rocky from the presence of hard limestone beds and chert. The chert has a fairly general distribution, but some outcrop bands are free of it. Some of the chert in the Edwards limestone is of a quality suitable for the manufacture of artifacts and because it was used extensively by the aborigines is referred to as flint.

Within the Fall Prong quadrangle there is little evidence of the presence of gypsum such as is seen in much of northern Gillespie County. Banding is undisturbed throughout the Edwards within the quadrangle, as seen on the aerial photographs; if gypsum originally had been present its removal would have allowed the overlying beds to collapse, destroying the continuity of the banding.

The lower portion of the Edwards limestone is described below in a section measured along Fall Prong. The section originally described by Barnes (1944) is in part redescribed here, using the color terminology of the Rock Color Chart (1948) and distinguishing dolomite and limestone.

Another section wholly within the Edwards limestone is measured along White Oak Creek partly just within the Fall Prong quadrangle and partly in the Wendel quadrangle. The section is described in the text of the Wendel quadrangle.

No fossil collections were made within the quadrangle, and no attempt was made to find silicified fossils, although some probably exist. Some of the limestone beds of the Edwards are essentially a cemented foraminiferal sand, and fragmental fossil material is abundant throughout the Edwards limestone.

QUATERNARY DEPOSITS

High gravel.—The areas mapped as high gravel are mostly in the western and northern parts of the quadrangle. The deposits are chiefly colluvial and appear to be remnants of a much more extensive deposit that once covered much of the surface beneath the Comanche Peak scarp. In the vicinity of streams some of the high gravel deposits are stream deposits and are probably mostly reworked from the colluvium. No line of demarcation exists in border-line cases between deposits that are truly colluvium and those that are deposited by stream action. For this reason the deposits are mapped under one designation.

The high gravel is composed chiefly of pebbles, cobbles, and finer materials including some caliche. Much of the material is limestone, chert, and dolomite from the Edwards, limestone from the Comanche Peak, and siliceous material from the Hensell sand.

Alluvium.—Deposits of alluvium are mostly situated along Salt Branch, Little Devils River, White Oak Creek, and Fall Prong. Narrow belts and patches of alluvium follow many of the lesser drainages in the area but are insignificant and have not been mapped. The alluvium is composed mostly of sand and silt at the surface and of coarser materials beneath.

SUBSURFACE GEOLOGY

The San Saba member of the Wilberns formation and the Threadgill member of the Tanyard formation in the northwestern part of the quadrangle extend into the subsurface beneath Cretaceous rocks. No well data were obtained within the quadrangle, and the nearest wells are rather distant. The Rowntree No. 1 Kott well in the Spring Creek quadrangle entered the Honeycut formation of the Ordovician, and the Owen No. 1 Tatsch well in the Dry Branch quadrangle entered rocks of Pennsylvanian age. It is likely, therefore, that all units of the Ordovician are present within the quadrangle; considering the faulting which has taken place in the pre-Cretaceous rocks of the Llano uplift, it is possible that several units of the Cambrian and perhaps some of the Carboniferous are also present.

The information about the Precambrian rocks upon which the Paleozoic rocks lie is limited to gravity data. There is a gravity ridge, possibly part of a closed high, running north-south through the quadrangle. The apex of the ridge is quite sharp where it crosses the north-central border of the quadrangle. This ridge appears to be superimposed on the northwest flank of the large high in the Harper quadrangle to the southeast and appears to die out as it crosses the southeast corner of the Fall Prong quadrangle. In both the northeastern and northwestern parts of the quadrangle the value of gravity is less, indicating that gravity minima will be centered outside the border of the quadrangle. In the area of outcropping Precambrian rocks of the Llano uplift, large gravity maxima are associated with Packsaddle schist and large gravity minima are associated with Town Mountain granite (Romberg and Barnes, 1944; Barnes, Romberg, and Anderson, 1954a, 1954b, 1955). The area of low gravity values in the northeastern part of the quadrangle is associated with a minimum which includes the northern part of the Threadgill and Squaw Creek quadrangles. Town Mountain granite crops out north of the Squaw Creek quadrangle.

Diorite was encountered in the Rowntree No. 1 Kott well in the Spring Creek quadrangle. It is unlikely that the maximum is caused entirely by diorite; since a poorly defined superimposed maximum exists to the west of the well, it is likely that a large diorite mass has intruded the Packsaddle schist.

MINERAL RESOURCES

The known mineral resources of the quadrangle are limited to nonmetallic substances and water. Outside of the soil, which is mostly used for range land, the most important nonmetallic resources are construction materials.

CONSTRUCTION MATERIALS

Building stone.—Some limestone beds in the Edwards limestone, the San Saba limestone, and the Threadgill member are of suitable thickness to be used for ledge-stone in building. The limestone in the Edwards is in general softer and easier to work than the limestone in the other units. The present trend toward the use of somber stone should open a market for some of the greenish and brownish-gray stone in the Cambrian. The Threadgill stone is lighter colored but tends to be yellowish gray. Some beds in the Edwards limestone are light gray to white and are very attractive.

Road material.—Caliche derived from the weathering of Edwards limestone has been mostly used for base-course material in the construction of Ranch Road 385. Such material is of some value for surfacing secondary roads but has little value for base-course material since it causes freeze damage. Ranch Road 385 had been built less than a year when a freeze destroyed large portions of its surface. Better material is available in some zones in the Edwards limestone and in some units of the Cambrian and Ordovician just to the north of the quadrangle. Some of the Paleozoic rocks are hard enough to be used for granules.

Sand and gravel.—Some sand and gravel is present in alluvial deposits along Little Devils River and Fall Prong. The material is usable for local building only. Much of the outcropping Paleozoic rock and some zones in the Edwards limestone are of value for crushed rock.

WATER

A ground-water survey of Gillespie County was made by Shield (1937). Only one well, 110 feet deep, was inventoried in the Fall Prong quadrangle. The water level in 1936 stood 67 feet below the surface, and the water is probably from the Hensell sand. The total solids contained are 309 parts per million. No information on ground water is recorded for Kimble County, and none was sought while mapping the Fall Prong quadrangle.

The Hensell sand varies in its quality as an aquifer. In some areas in the northern and western parts of the quadrangle it will be an easily available source of ground water, and at greater depth in the rest of the quadrangle some water may be present. In the southern and eastern parts of the quadrangle some water might be found near the base of the Edwards limestone. Southward in Kerr and Gillespie counties springs are common near the base of the Edwards limestone, but none were mapped within the Fall Prong quadrangle.

Sandstones in the Cambrian probably are present beneath much of the quadrangle but mostly at considerable depth. The Hickory sandstone contains water in many places in central Texas and probably is water bearing within the Fall Prong quadrangle. The depth to the portion of the Hickory sandstone that is water bearing is about 1,200 feet in the northwestern part of the quadrangle; southward the Hickory sandstone is deeper if the dip seen at the surface continues. However, the structure of the Paleozoic rocks is complicated, and it is impossible to predict their depth or even their presence beneath areas of Cretaceous outcrop.

The quality of the rest of the sands in the Cambrian as aquifers is unknown, but the Welge sandstone and possibly some of the sands in the San Saba limestone probably contain some water. The Lion Mountain and Welge sandstones are about 600 feet above the Hickory sandstone, and the sandstones in the San Saba limestone are another 400 to 600 feet nearer the surface.

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STRATIGRAPHIC SECTIONS

Little Devils River Section

Description	Thickness in Feet: Interval	Thickness in Feet: Cumulative	Feet above base
Fredericksburg group: 46 feet measured			
Edwards limestone: 14 feet measured			
1. Dolomite—microgranular; light olive gray; slightly argillaceous; petroliferous; porous; vuggy, some vugs as much as 4 inches in size; bottom bed 2 feet thick, blocky, rest of interval massive with an irregular nodular surface. Molds of gastropods and pelecypods in upper part.	8	8	164 –172
2. Limestone—very fine grained, mottled between grayish orange and dark yellowish orange, bedding indistinct except in upper 3 inches, intraformational conglomerate in upper part.	3	11	161 –164
3. Dolomite—microgranular, light grayish orange, mottled similar to above, somewhat argillaceous, poorly bedded, porous, weathers into rounded forms. Chalcedonic chert at top in irregular lobate masses up to 2 feet in length, tones of brown and grayish brown.	2	13	159 –161
4. Limestone—white, beds ⅛ to 1 inch thick, splits readily along bedding.	1	14	158 –159
Comanche Peak limestone and Walnut clay: 32 feet thick			
5. Dolomite—microgranular, very light grayish orange mottled between grayish orange and dark yellowish orange, somewhat argillaceous, distinctly bedded, beds very thin to 1 foot thick.	6	20	152 –158
6. Dolomite—microgranular, light grayish orange, mottled between grayish orange and dark yellowish orange, weathers medium gray, slightly argillaceous, porous, essentially one bed.	5	25	147 –152
7. Limestone — argillaceous, grayish yellow mottled, slightly sandy, massive, burrowed* throughout, burrows dolomitic, average 1 inch in diameter. Numerous gastropod casts and caprinids, a few *Exogyra*.	13	38	134 –147
8. Limestone — argillaceous, sandy, nodular, weathers recessive, yellowish gray mottled. Very fossiliferous, mostly *Exogyra*.	8	46	126 –134
Shingle Hills formation: 126 feet measured			
Glen Rose limestone member: 33 feet thick			
From 58 to 120 feet the bluff was too steep to climb, and the rock is described as seen from a distance.			
9. Clay—very calcareous, silty, sandy, light greenish gray in lower part, in upper part yellowish, darker colored, mottled, burrowed (?).	12	58	114 –126
10. Dolomite — microgranular, yellowish gray to grayish yellow with a pattern of dark yellowish orange, very argillaceous, slightly silty.	1	59	113 –114
11. Clay—calcareous, slightly silty, light greenish gray.	16	75	97 –113
12. Dolomite—microgranular, grayish yellow, argillaceous, slightly silty and sandy.	4	79	93 – 97
Hensell sand member: 93 feet measured			
13. Siltstone and clay—siltstone, poorly indurated, light greenish gray from 75 to 77.5, 79.5 to 81, 82.5 to 83.5, and 86 to 88.5 feet; remainder clay, light greenish gray.	18	97	75 – 93
14. Clay—light greenish gray except for one thin pale red streak near bottom.	6	103	69 – 75
15. Siltstone(?) — light greenish gray, bedding wavy, hackly cross break.	2	105	67 – 69
16. Clay—calcareous, silty, in part sandy, mostly light greenish gray, some pale red, a 2-inch indurated bed near middle, otherwise recessive.	10	115	57 – 67
17. Siltstone—calcareous, yellowish gray to light greenish gray, indurated, resistant forming a ledge.	1	116	56 – 57
18. Clay—calcareous and silty; mostly pale red from 33 to 46, 48 to 51, and 53 to 56 feet; remainder light greenish gray.	23	139	33 – 56
19. Clay—calcareous, silty, sandy, light greenish gray; a zone of vertical, cylindrical, white concretions near middle up to 2 inches in diameter and 6 inches long, some are compound, some are potato-shaped.	4	143	29 – 33
20. Clay — calcareous, silty, pale red, mottled yellowish gray near middle; breaks with a blocky fracture, slumps like clay.	12	155	17 – 29
21. Clay—very calcareous, sandy, light gray, recessive, somewhat concretionary.	5	160	12 – 17
22. Sandstone—very fine grained, light gray, top foot somewhat concretionary, indurated, forms one bed which thickens southward at the expense of interval 23 and incorporates interval 24.	3	163	9 – 12
23. Clay—very silty, calcareous, pink at base to light greenish gray at top, breaks with blocky fracture, recessive, pinches out to south.	2	165	7 – 9
24. Siltstone—light gray, slightly sandy, irregularly bedded, pinches out laterally.	2	167	5 – 7
25. Sandstone — silty, argillaceous, calcareous, coarsely mottled red and light gray, weathers knobby as if unevenly cemented, upper 2 feet recessive; sand mostly quartz, some chert, angular to slightly rounded, rough.	5	172	0 – 5

* "Burrowed" refers to the passage of an animal through the sediment producing a texture different from that in the surrounding material. Openings mostly did not exist, since the soft sediment closed behind the animal as it progressed. Openings that did exist were soon filled. The "honeycombed" rock so common at the surface is mostly a differentially weathered, burrowed rock.

The amount of insoluble residue, for portions of the section, after removal of carbonate minerals with dilute hydrochloric acid is as follows:

Feet above base	Percent residue
2– 7	57.8
7– 12	50.2
12– 17	41.0
17– 22	54.8
22– 27	73.5
27– 32	85.5
32– 37	72.9
37– 42	71.8
42– 47	59.5
47– 52	70.4
52– 57	46.0
57– 58	79.6
93– 97	13.1
111	45.3
113–114	27.1
124–126	39.1
126–131	11.3
131–138	13.5
138–143	7.7
143–148	5.0
148–153	5.1
153–158	6.1
158–163	4.9
163–168	2.2
168–172	1.7

Fall Prong Section

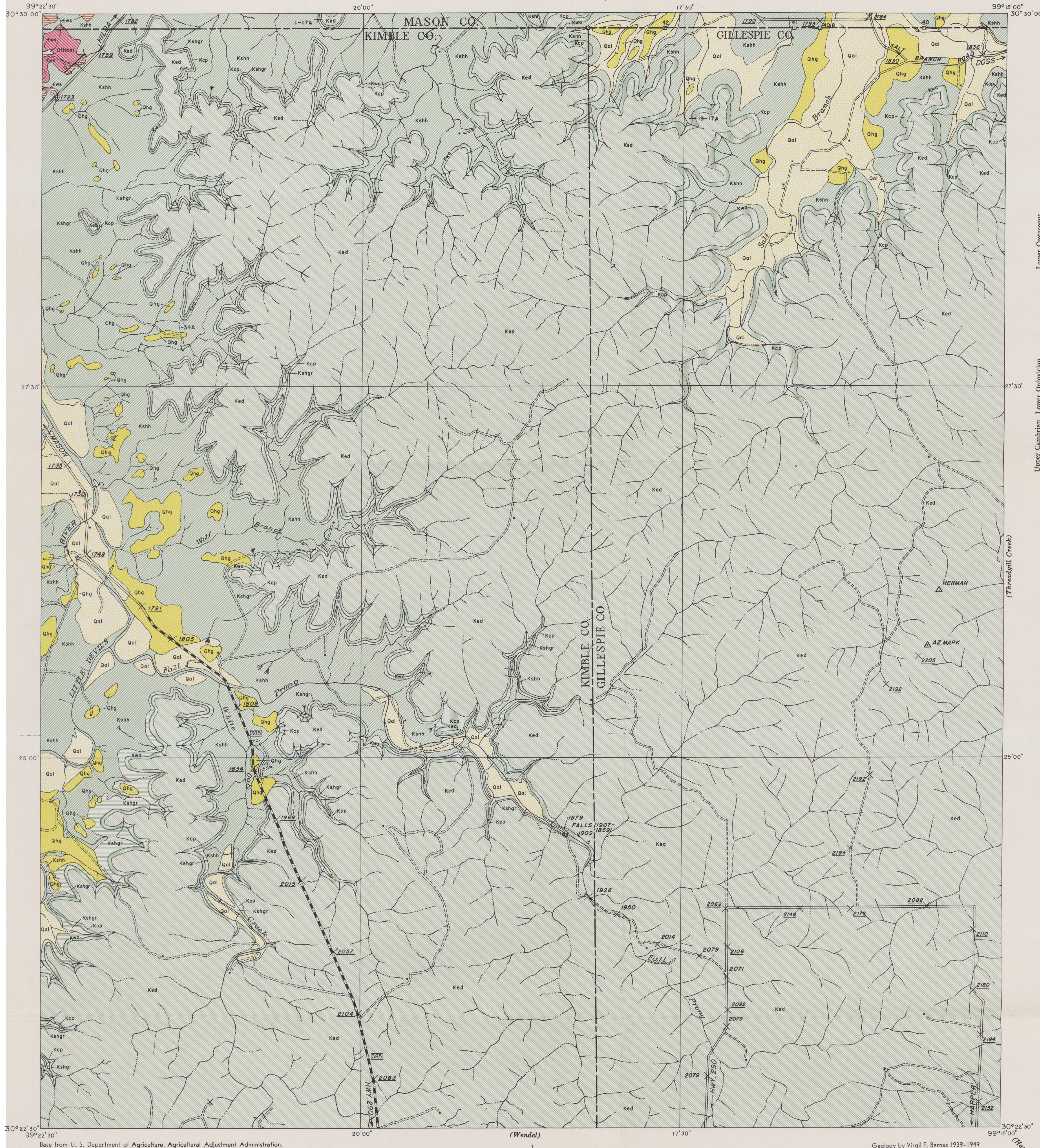
Description	Thickness in Feet: Interval	Thickness in Feet: Cumulative	Feet above base
Fredericksburg group: 68 feet measured			
Edwards limestone: 36 feet measured			
1. Limestone—extremely fine grained except for scattered microgranular dolomite rhombs, one massive bed, slightly fossiliferous. A few olive gray chert nodules.	5	5	73 – 78
2. Dolomite — microgranular, yellowish gray to light olive gray, calcitic near middle, porous with pores in part molds of fossils; two beds with break at 65 feet. Chert, olive gray to light olive gray nodules.	22	27	51 – 73
3. Limestone — microgranular to extremely fine grained, yellowish gray, some yellowish orange specks, soft, in part nodular.	4	31	47 – 51
4. Dolomite — microgranular, yellowish gray, bottom 6 inches very thinly bedded, rest medium bedded. Chert at 45 and 46 feet moderate brown, thin inconspicuous plates; at 47 feet nodules.	5	36	42 – 47
Comanche Peak limestone: 30 feet thick			
5. Dolomite—microgranular, yellowish gray, some yellowish orange specks, distinctly bedded.	4	40	38 – 42
6. Dolomite — microgranular, grayish yellow, massive, porous, lip of falls at 36 feet in section.	5	45	33 – 38
7. Dolomite—microgranular, dark yellowish gray of several shades, porous, in part calcitic, massive at base to burrowed and honeycombed at top.	5	50	28 – 33
8. Limestone—yellowish gray, very argillaceous, sandy, silty, massive; burrowed with little contrast in lower part but with marked contrast in upper part where burrows are dolomitic and between grayish orange and yellowish orange; weathers differentially. Oysters common in lower foot.	12	62	16 – 28
9. Limestone—yellowish gray, very argillaceous, somewhat sandy and silty, soft, burrowed, fossils scarce, one calcite geode 2 inches in diameter.	4	66	12 – 16
Walnut clay: 2 feet thick			
10. Clay and limestone—very calcareous, light gray clay grading upward into very argillaceous, light gray limestone, both sandy, silty, burrowed. *Exogyra* and other fossils.	2	68	10 – 12
Shingle Hills formation: 10 feet measured			
Glen Rose limestone member: 10 feet measured			
11. Limestone—light yellowish gray, top somewhat darker yellowish gray, argillaceous, silty, sandy, burrowed, indurated, slightly irregular bedding; nodular from abundant poorly preserved fossils and burrows; cracks in top 2 feet filled by Walnut clay; calcite geodes up to 4 inches in diameter common.	4	72	6 – 10
12. Clay — yellowish gray, silty, calcareous, contains pyrite nodules which have oxidized on exposure.	3	75	3 – 6
13. Clay—white (not exposed in 1951).	3	78	0 – 3

The amount of insoluble residue after removal of carbonate minerals with dilute hydrochloric acid is as follows:

Feet above base	Percent residue
4– 6	90.4
6–10	38.7
10–15	26.7
15–20	17.5
20–25	13.2
25–30	12.5
30–35	8.0
35–42	8.9
42–47	7.9
47–50	9.5
50–55	5.3
55–60	3.8
60–65	15.5
65–73	3.3
73–78	11.8

THE UNIVERSITY OF TEXAS
BUREAU OF ECONOMIC GEOLOGY
JOHN T. LONSDALE, DIRECTOR

QUADRANGLE MAP NO. 19
FALL PRONG QUADRANGLE
TEXAS



Base from U. S. Department of Agriculture, Agricultural Adjustment Administration, aerial photographs flown by Kargl Aerial Surveys, Ltd., 1938.

Scale 1/31,680

1 ½ 0 1 Mile

5000 2500 0 5000 Feet

1 ½ 0 1 Kilometer

Datum is mean sea level

APPROXIMATE MEAN DECLINATION 1947

Geology by Virgil E. Barnes 1939–1949
Assisted by T. R. Walker and Louis Dixon
Cartography by J. A. Ayres and J. W. Macon

EXPLANATION

SEDIMENTARY ROCKS

QUATERNARY

Qal — Alluvium (*gravel, sand, and silt along stream bottoms*)

Qhg — High gravel (*gravel and sand in terraces along streams and as colluvial deposits in part changed to caliche on slopes*)

UNCONFORMITY

CRETACEOUS — Lower Cretaceous — Comanche series

Ked — Edwards limestone (*well bedded, in part cherty, in part magnesian; varies widely in composition, hardness, and thickness of beds*)

Kcp — Comanche Peak limestone (*marl and marly limestone ranging from nodular at base to well bedded at top*)

Kwa — Walnut clay (*calcareous clay grading upward into the marl of the overlying member; contains a profusion of Exogyra texana*)

Shingle Hills formation:

Kshgr — Glen Rose limestone member (*alternating beds of limestone, dolomite, and clay, some of which are arenaceous*)

Kshh — Hensell sand member (*sand, silt, and clay, predominantly red and gray*)

UNCONFORMITY

ORDOVICIAN — Lower Ordovician — Ellenburger group — Tanyard formation

Ottcol — Threadgill member (*calcitic facies, thinly to thickly bedded*)

DISCONFORMITY

CAMBRIAN — Upper Cambrian — Wilberns formation

Cws — San Saba limestone member (*granular, thinly to thickly bedded, sparingly glauconitic, in part sandy, predominantly gray*)

Known fault (U, upthrown side; D, downthrown side)

Observed and inferred contact

Locality of fossil collection

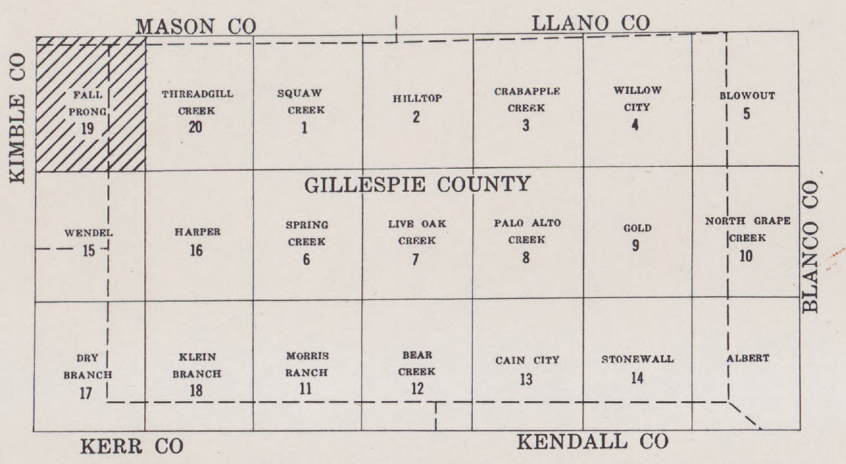
Tank (*earth-dammed pond for water storage*)

Windmill

Alidade elevation of gravity station

Alidade elevation

Line of described section



INDEX TO QUADRANGLE MAPS, GILLESPIE COUNTY

Roundtree
1-Knott

GEOLOGIC MAP OF THE FALL PRONG QUADRANGLE, KIMBLE, GILLESPIE, AND MASON COUNTIES, TEXAS

1956