## GEOLOGY OF THE WENDEL QUADRANGLE, KIMBLE, GILLESPIE, AND KERR COUNTIES, TEXAS

## VIRGIL E. BARNES

### GENERAL SETTING

and the only topographic map available of members seems logical. However, invisualize calichification beneath the unis the reconnaissance 30-minute Kerris the reconnaissance 30-minute Kerrstead of introducing a new name, altered limestone in the bed of the high, flat-topped divide in the westrangle is about 270 feet, ranging be-

tween 2,020 and 2,290 feet. River occupies about one-third of the mite vary in composition, texture, thick-quadrangle. Hollow and Johnson Creek.

some of the stratigraphic, structural, ity suitable for the manufacture of arti- between Pedernales River and U. S. locality 1-30A, contains Gryphaea and The top of the Honeycut formation economic, and geophysical problems of facts, and because it was used exten-highway No. 290. A section measured a few oysters. the region. This publication on the sively by the aborigines is mostly re- here is described below. in the present text.

## GEOLOGIC FORMATIONS MESOZOIC ROCKS CRETACEOUS SYSTEM

(LOWER CRETACEOUS)

Fredericksburg Group

Polomite-microgranular, light olive-gray...

Dolomite-microgranular, very light gray, and light olive-gray.....

Dolomite-fine grained, light olive-gray, a few greenish gray (5G 6/1)

subsurface and are probably very simiduce such structures and could conceiv- In the eastern end of the pit the Prong. Reports of other localities concrete facing secondary roads. Such material an excellent reservoir and impure sands

eastern part. A small area in the north- variation is clearly shown on aerial top of the section up the west branch fossils are as follows: west corner drains into Threadgill photographs by vegetational banding. of White Oak Creek to the first pas-Creek and thence into Beaver Creek The hard limestone beds in the seand Llano River. A small area in the quence weather slowly and have only finding appreciable outcrop except for southwestern part of the quadrangle is a thin soil covering or are bare and some honeycombed limestone near the in the Guadalupe River drainage basin nearly void of vegetation. The softer road. To the east of the creek an occaand reaches the river by way of Rough beds develop a more adequate soil and sional bed of white limestone is exare thickly vegetated mostly by a scrub posed along the hillside; one of these The Wendel quadrangle is on the oak identified by Cuyler (1931) as heds contains an abundance of gastrosouthwestern side of the Llano uplift, "Quercus fusiformis Sargent (mountain pod molds. Accumulations of chert in

similar to that in north-central Gillespie tion, and appears to be horizontal. Pul-blocks in the vicinity.

rangle is shown on a planimetric map, these units should have about the rank folds. At this point it is difficult to water level at some period in the past. preserved specimens.

stead of introducing a new name, ville quadrangle. Elevations ranging between 2,041 and 2,284 feet were deter-tween 2,041 and 2,284 feet were dete Edwards limestone.—The outcrop of Edwards limestone is gently sloping, to flow by changes in barometric pres-The quadrangle is drained in diverse the Edwards limestone within the Wen- and it is almost impossible to measure sure, and caverns must be present to drains is not breached, supports a rank as complex as the outcrop in the Llano directions with about half of the draindel quadrangle is about 350 feet thick, and describe a section that is more form a reservoir sufficient to furnish growth of grass, and is mostly in naruplift.

by Dr. Ralph Imlay. The collection was are black. guadrangle and is centered in the southness of beds, and hardness; and this

A traverse was continued from the made in a road material pit, and the

Ophiuroid fragments Protocardia sp. Tapes cf. whitei Böse Cyprimeria cf. texana (Roemer) Turritella seriatim-granulata

Anchura sp. are essentially horizontal. References bands are free of it. Some of the chert A small exposure of Edwards lime the silica is in the form of beekite. lower portion to the Chappel limestone saddle schist. cited below deal more broadly with in the Edwards limestone is of a qual-stone is situated along Ranch Road 385 Another collection from Kimble County, of Mississippian age.

The best material collected is silici- feet, and the top of the Gorman forma- The known mineral resources of the Wendel quadrangle is one of a series of similar publications, an index to of similar publications, an index to the south and east and may be present the south and east and may be present to the south a which is shown on the opposite page. The reader is referred to the index map

The reader is referred to the index map to locate other quadrangles mentioned to locate other quadrangles mentioned to locate other quadrangles mentioned morthern Gillespie County. Vegetational morthwest corner of the pit is hard, pelecypods were seen. The fossils are The elevation of a near-by, but topo- land, the most important nonmetallic morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles. Of the wender quadrangle. Of the wender quadrangle. Of the wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are wender quadrangles mentioned morthwest corner of the pit is hard, pelecypods were seen. The fossils are well as the pit is hard, pelecypods were seen. The fossils are well as the pit is hard, pelecypods were banding ranges throughout the Edwards white except for a little yellowish- in part matted into a siliceous mass graphically higher, gravity station is resources are construction materials. within the quadrangle, and if gypsum orange discoloration along joints, con- and in part weather free. Some silici- 2,195 feet, and a rod station not far within the quadrangle, and if gypsum orange discoloration along joints, conoriginally had been present in amounts originally had been present in amounts or a secondary or a se

stone. The Comanche Peak limestone derlying bed. Calichification of the ably correspond to the cross sections noted in the southwestern part of the Pennsylvanian age beneath the Creta- has been used for base-course material and the Welnut clay are present in the address of exposed beds is known to pro- seen in the hard limestone. and the Walnut clay are present in the edges of exposed beds is known to proseen in the hard limestone.

Quadrangle and in the vicinity of Fall ceous. Cambrian and Ordovician rocks in highway construction and for survaries between sand that would make

Part 1: U. S. 896, 1244 pp.

of the Ellenburger group is at 1,720 MINERAL RESOURCES

The O. W. Killam No. 1 Gibson well are associated with Packsaddle schist and large gravity minima are associated with Rown Mountain granite (Romberg and Barnes, 1944, and subsequent unpublished data). Diorite was encountered in the Rowntree No. 1 Kott well in the Spring Creek quadrangle. It is coarse-grained crinoidal limestone below 281 parts per million.

Eight of the wells are either in or near Harper and appear to obtain water from the same horizon about 60 feet above the base of the Edwards limestone of central Texas: Univ. Texas Pub. 4301, Jan. 1, 1943, pp. 35-46.

[1948] Ouachita facies in above the base of the Edwards limestone of central Texas: Univ. Texas Pub. 4301, Jan. 1, 1943, pp. 35-46.

[1948] Ouachita facies in the Spring Creek quadrangle. It is appear to obtain water from the same appear to obta

elevation of 2,147 feet. An elevation of

lar to their outcropping equivalents in ably have produced these. In a creek horizontal beds of the Edwards lime-taining petrified wood and silicified fos-corner of the Fall Prong quadrangle to is of some value for surfacing secondary that will hold little water. If permeable Wendel quadrangle is entirely within adjacent quadrangles. The boundaries bed at a similar stratigraphic horizon stone are truncated by caliche beds in sils were not investigated. One of these the north. To the east at a point rather roads but has little value for base-course sands connect from the Wendel quadrangles. the Edwards Plateau province and is of the units of the Fredericksburg group south of U. S. highway No. 290 and a the regolith which are not parallel to is in Kimble County south of the highsituated southwest of the Llano region. are gradational, and for this quadrangle, short distance west of the quadrangle the ground surface. It is likely that the way and north of locality 5-12A and the Rowntree No. 1 Kott well entered Ranch Road 385 had been built less Hensell, it could contain considerable The geology of the Wendel quadThompson's (1935) observation that the limestone is likewise thrown into caliche formed in response to groundfrom the description may contain wellthe Honeycut formation. From this than a year when a freeze destroyed water. meager information it is suggested that large portions of its surface. Better Little is known about the rocks be-

rocks of Pennsylvanian, Mississippian, material is available in some zones in neath the Cretaceous, but the Owens

Little Devils River, reaching the Llano
River by way of James River. White Oak

The lower part of the Edwards making a current for considerable lengths of limited to gravity data. The lower part of the Edwards making a the lower part of the Edwards making a current for considerable lengths of limited to gravity data. The lower part of the Edwards making a the lower part of the Edwards making a current for considerable lengths of limited to gravity data. The lower part of the Edwards means the lower part of the Edwards making a the lower part of the Edwards means the lower part of the lower part of the Edwards means the lower part of the Edwards means the lower part of the lower part of the Edwards means the lower part of t Creek, Fall Prong, and Burr Oak Draw are the chief tributaries of Little Devils are the chief tributaries of Li River. The head drainage of Pedernales mite, and chert. The limestone and doloRiver are the content in buttaries of Little Devils

within the quadrangle, only one of the Edwards limestone, and the remainwhich, locality 20–22B, was examined of both the alluvium and the Edwards limestone, and the remainof the quadrangle, and some of the dip of the gravity values is southwestward, and they seem to be shaping up to a probable minimum in the quad-SUBSURFACE GEOLOGY rangle to the southwest. In the area in 1936 stood between 46 and 221 feet several thousand feet. of outcropping pre-Cambrian rocks of below the surface. The total solids Gryphaea mucronata Gabb

The O. W. Killam No. 1 Gibson well
Protocardia securiformis (Cragin)

The O. W. Killam No. 1 Gibson well
the Llano uplift, large gravity maxima
are associated with Packsaddle schist
lion, with all wells except one being

and Cretaceous rocks crop out in all of the quadrangle. Rocks of Ordovician the quadrangle. Rocks of Ordovician the appears the quadrangle. Rocks of Ordovician the country corner in Kim
The Edwards surface is mostly rocky

The Edwa and Carboniferous age are probably at from the presence of hard limestone to be excellent for the manufacture of defined superimposed maximum exists

to obtain water from near the base of defined superimposed maximum exists

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to obtain water from near the base of defined superimposed maximum exists

to obtain water from near the base of defined superimposed maximum exists a depth of less than a thousand feet beds and chert. The chert has a fairly flint implements. Much of the flint to the west of the well, it is likely that to the west of the well, it is likely that below the surface. The Cretaceous rocks
general distribution but some outcrop
shows evidence of having been worked.

store of Pennsylvanian age and the
a large diorite mass intruded Packraphy of the Upper Cambrian, Llano
raphy of the Upper Cambrian, Llano the Kimble and Kerr County portions of the quadrangle except that a spring raphy of the Upper Cambrian, Llano uplift, Texas: Bull. Geol. Soc. Amer., vol. 58, pp. 109-124.

County, its removal would have allowed verulent limestone is at the same ele
Locality 5-13A, about three-quarters 2,260 feet stated by Mr. B. L. Raborn Building stone.—Some limestone beds Wells, drillers' logs, and water analythe overlying beds to collapse, destroyvation on the eastern side of the pit.

of a mile to the southwest of locality

local ing the continuity of the banding. The pulverulent limestone is a product 5-12A, is very near to the horizon from should be 2,160 feet. Samples from this able thickness to be used for ledge-Along Fall Prong above but near the of weathering and appears to be latwhich collection 5-12A was obtained. well, submitted by Mr. Raborn, are stone in building. Some of these beds
The Cretaceous rocks are essentially gypsum horizon the beds are disturbed erally equivalent to the hard limestone In this area in addition to large slabs described below.

are hard, of light color, and should flat, and since the Glen Rose thickens special reference to north-central The only rocks of the Fredericksburg mostly by folding. It is uncertain in the northwestern corner of the pit. of rudistids there is a great quantity of The Owen No. 1 Tatsch well in the make a very attractive building stone.

Special reference to north-central southward the Hensell sand will slope Texas: Bull. Amer. Assoc. Petr. Geol., group cropping out within the quad- whether such a disturbance could be The pulverulent limestone contains Dry Branch quadrangle a short distance Road material.—Caliche derived from in that direction. The outcrop area of vol. 19, pp. 1508-1537. rangle belong to the Edwards lime- caused by irregular solution of an un- Gryphaea and a few oysters which prob- the Wilmarth, M. G. (1938) Lexicon of

and Ordovician age may underlie the the Edwards limestone and should be No. 1 Tatsch well in the Dry Branch Cretaceous of the quadrangle. Consider- used when the highways are recon- quadrangle a short distance to the south drilled into a thick series of sandneither the highest nor the lowest elevation was reached. However, it is estimated attributed at the structures.

It is also possible that units of the present within the quadrangle. Some the structures.

It is also possible that units of the depressions when the present within the quadrangle. Some the present within the quadrangle. The present within the quadrangle and present within the quadrangle and present within the quadrangle. The present within the quadrangle and present within tion was reached. However, it is estiquadrangle, much of the surface of the up and release air. The air is caused of the upper portion of the Edwards is likely that the pattern of the Paleo-ever, are of value for crushed rock. November 21, 1950) that a slight amount of water was encountered at 280 feet; that between 500 and 1,000 feet the sands contain large quantities age going westward and northward to age going westward and northward to age going westward and northward to and there is perhaps another 40 feet than a few feet thick. One section in the air necessary to maintain the air row belts and patches considered too.

A ground-water survey of Gillespie of water; that the lowest water found

SELECTED REFERENCES

INSON, G. A. (1947) Building stones

issues from the Edwards limestone near CLOUD, P. E., JR., and BARNES, V. E. the northern edge of the quadrangle (1948) The Ellenburger group of along White Oak Creek. An aquifer central Texas: Univ. Texas Pub. 4621.

SHIELD, ELGEAN (1937) Records of Board of Water Engineers, 51 pp. THOMPSON, S. A. (1935) Fredericks-

## STRATIGRAPHIC SECTIONS

								Consideration of the Considera								
White Oak Creek Section				Thickness in feet Feet above Description Interval Cumulative base			In contract of	Thickness in feet Feet above				Section Near Junction of Ranch Road 385 and U. S. Highway No. 290				
	Thickne. Interval C		Feet above base	calcite. The rock is pelleted and contains some poorly preserved foraminifera and other		Cumulati	ve oase	Description  cavities up to 6 inches in diameter, beds 12 to 18 inches thick except for some thin beds	2	al Cun	nulative	e base	Description	Interval Thickne	Cumulati ess in fee	
Fredericksburg group: 68 feet measured Edwards limestone: 68 feet measured			20 20	fossil material.  A thin section of the rock from 46.5 feet is				at 16 feet, and contains brownish black chal- cedonic chert sparingly at 17 feet.	s  -				Fredericksburg group: 13 feet measured Edwards limestone: 13 feet measured		, , , , , , , , , , , , , , , , , , , ,	
<ol> <li>Limestone—fine to very fine grained, porous, well bedded, in part honeycombed, and at 61 feet contains chalcedonic, light brownish gray chert in inch-sized fragments. The top bed is hard and white, and the top 4 feet is poorly</li> </ol>		8	60 - 68	composed of dolomite, chert, and limestone. The dolomite is microgranular and clouded by impurities, and the limestone is minutely crystalline calcite and is pelleted. The chert has replaced fossil fragments and next to the				<ol> <li>Dolomite—microgranular, porous, part of porosity cavernous, recessive, and appears to be extensively burrowed especially in middle portion. The top foot is calcareous.         A thin section from 12 feet is porous.     </li> </ol>	e e	5	9	9 - 14	The elevation of the top of the section is 2,125 feet. A few thin limestone beds and some chert are exposed in the 4-foot interval above the gravity station, elevation 2,131 feet.  1. Limestone—very fine grained to sublitho-	2	2	11
exposed.  2. Caliche—probably from a soft rock either limestone or dolomite.  3. Dolomite—microgranular, porous, and honey-		9 11	59 - 60 57 - 59	limestone has replaced dolomite. A ghost net- work of rhomb boundaries in the chert next to the limestone is visible in ordinary light.				mostly microgranular dolomite. Some of the porosity has a shape suggesting that fossils were originally present, and many of these	e s e				graphic, hard, white, beds 1 to 4 inches thick, and contains some brownish gray plates of chert which is mostly chalcedonic but also contains some white areas which are quart-			
combed from weathering of burrows. 4. Caliche—same as in interval 2.	4	15	53 - 57	Under cross-nicols the rhomb boundaries disappear in the cryptocrystalline silica.  8. Dolomite—microgranular, well bedded, beds	3	38.5	29.5- 32.5	pores have slightly larger dolomite rhombs around them.	-				zose.  A thin section of rock from 11.5 feet is			
<ol> <li>Dolomite—microgranular, porous, yellowish gray but somewhat smoky, beds 4 to 8 inches thick, and at 51.5 feet contains an almost con- tinuous layer of light olive-gray chert.</li> <li>SHIFT downstream about 3,400 feet airline into</li> </ol>		18	50 - 53	mostly 4 to 10 inches thick, yellowish gray, small porosity, contains some poorly preserved <i>Turritella</i> -like fossils, and at the bottom of the interval contains brownish black chert plates 1 inch thick and 6 inches in diameter.		00.0	27.0- 02.0	13. Dolomite and limestone—microgranular dolomite at base grading up to fine grained limestone at top, well bedded, yellowish gray, resistant, and limestone is composed of fossil fragments. A thin section from 6.5 feet is microgranular dolomite without trace of or-	- 1 s	6	2	6 - 9	limestone composed of minutely crystalline calcite and a small amount of fine to medium- grained calcite, the latter associated with the abundant foraminifera and other fossils most of which are fragmental. Many clouded struc-			
the Fall Prong quadrangle, using a combination of beds for making the shift plus the chert at 46.5 feet, which is very persistent. Continue sec- tion down bluff to stream level.				A thin section of the rock from 32 feet is a dolomitic limestone. The limestone is pel- leted, and similar cloudy areas are present in the dolomitic portion. A trace of organic ma-				ganic material.  14. Dolomite—microgranular, calcareous, slightly argillaceous, yellowish gray, extensively bur-	y 6	6	8	0 - 6	tureless pellets are present of the size of the foraminifera, as well as many smaller pellets. 2. Caliche—either weathered dolomite or soft limestone.	2	4	9
<ol> <li>Dolomite—microgranular, poorly exposed, and top foot is honeycombed and contains brown- ish gray chert plates and masses, some sphe-</li> </ol>		21	47 - 50	terial is in the rock.  9. Limestone—almost pulverulent, soft, recessive, yellowish gray, and poorly exposed. At	2.5	41	27 - 29.5	rowed, massive, slightly recessive, and con- tains some spherical cavities up to 4 inches in diameter.					<ol> <li>Dolomite—microgranular; lower 2 feet be- tween medium light gray and light olive-gray and well bedded; upper 2 feet yellowish gray</li> </ol>	4	8	5
roidal ones of which reach a foot in diameter.  7. Limestone—fine grained, yellowish gray, well bedded, beds mostly 2 to 12 inches thick, and from 38 to 39 feet and 40 to 41 feet very soft to pulverulent and recessive. Chert at 35 feet is light olive-gray in outer part to olive-gray in center and is in flat plates to spheres 6 inches in diameter. Fossils project from		35.5	32.5- 47	the point where this zone reaches creek level upstream a spring issues which accounts for most of the water in White Oak Creek.  10. Dolomite—microgranular and porous. The porosity is mostly from poorly preserved fossil casts in the lower 3 feet. From 19 to 22.5 feet well bedded where weathered but massive in bluff and from 22.5 to 27 feet massive and	8	49	19 - 27	0-5 5-10 10-15 15-20	2.8 0.50 0.85 1.5	sidue	ment is	s as follows:	and extremely burrowed.  4. Limestone—fine grained, white, well bedded, in beds 6 inches to 2 feet thick, bottom foot contains fossil molds, is soft, and rest of rock is hard containing fossil fragments and some fossils.  A thin section of rock from 1.5 feet is limestone composed of minutely crystalline calcite	5	13	0 -
some of the chert spheres. At 46.5 feet yellow- ish gray chert in long plates 3 inches thick is almost the color of and hard to distinguish				burrowed.  A thin section from 24 feet is similar to the one described below from 12 feet, except				20–25 25–30 30–35	0.35 0.70 0.35				containing a trace of organic material.  The amount of insoluble residue after hydrochlo	ric acid t	reatment	is as f
from the limestone.  A thin section of the rock from 41 feet is limestone consisting of minutely crystalline calcite and a network of slightly coarser clear				that the grain size appears to be slightly larger.  11. Limestone—fine grained, yellowish gray, composed of fossil fragments, contains spherical	5	54	14 - 19	35–40 40–45 45–50 50–54 56.5–65	12.7 0.25 13.4 15.0 8.7				M	0.40 0.20 5.90		2007 5.
						179447										

1765-1770 Dolomite-fine grained, very light gray, and contains a small amount

of white porcelaneous chert

Limestone—sublithographic, very light gray

		SAN	MPLI
O. W. Killam No. 1 Gibson, Kimble County			Dept
	Depth in		fee
	feet	fragments from 1,785 to 1,790 feet, and contains white porcelaneous	10
Dolomite, clay and sand-all of which are greenish gray to pale red.	#00000E	chert (three samples)	1775-
The dolomite is microgranular, silty and highly argillaceous; the clay		Dolomite and limestone—the dolomite is fine grained and light olive-	
is dolomitic; and the sand is coarse grained, very poorly sorted, and		gray. The limestone is sublithographic and light gray. A small amount	
angular630-660,	780-810	of subchalcedonic chert is present	1790-
Dolomite and limestone-the dolomite is microgranular, pale red to		Dolomite-very fine grained, mostly light olive-gray, some light gray,	
greenish gray, argillaceous and silty. The limestone is extremely fine			1795-
grained and yellowish gray	840-870	Dolomite and limestone—dolomite, very fine grained and light olive-gray.	
Limestone, dolomite and sandstone—a wide variety of materials is pres-		Limestone, sublithographic and yellowish gray (two samples)	
ent including pebble-like fragments of quartz and chert indicating the		Dolomite—microgranular and very fine grained, light olive-gray, and	1000
presence of conglomerate. Some greenish gray to pale red, argilla-		contains rare white, subchalcedonic chert (two samples)	1820-
ceous dolomite may be cavings. Some medium light gray shale is		Dolomite—microgranular, very light gray and light olive-gray, and con-	1040-
present from 990 to 1,020 feet930-960,	990-1020		1850-
Shale-medium light gray and noncalcareous. A few chips of fine		Dolomite—microgranular, light olive-gray, and contains rare white, por-	1000-
grained argillaceous sandstone are present (two samples)	1020-1080	celaneous chert	1890-
Cavings	1200-1230	celaneous chert	
Shale and sandstone-the shale is medium gray, noncalcareous and the		and some sublithographic, yellowish gray limestone	1900-
sandstone is fine grained, argillaceous, and yellowish gray. Cretaceous		Dolomite-microgranular, yellowish gray, and contains some very light	
cavings are abundant Shale—medium gray	1260–1290	gray, porcelaneous chert	1910-
Shale—medium gray	1320-1410	Limestone and dolomite-mostly sublithographic, yellowish gray lime-	
Shale-medium dark gray, noncalcareous and carbonaceous (seven sam-	1440 1650	stone and a small amount of microgranular, yellowish gray dolomite	1920-
ples)Shale and limestone—the shale is medium dark gray and noncalcareous.	1440-1650	Limestone and dolomite—the limestone is sublithographic, the dolomite	
Shale and limestone—the shale is medium dark gray and noncalcareous.		is microgranular, and both are yellowish gray. Chert present is light	1040
The limestone is very fine grained and very light gray to very light olive-gray	1650_1665	gray and porcelaneous 1930-1935, Dolomite—microgranular, yellowish gray, and contains very light gray,	1940-
Limestone—extremely fine grained and very light olive-gray	1665-1690	semiporcelaneous chert	1950-
Limestone—extremely fine grained to coarse grained. About half of the	1000-1000	Dolomite and limestone—the dolomite is in part microgranular and yel-	1930-
limestone is of the type described above and the rest is of similar		lowish gray and in part very fine grained and light gray. The limestone	
color but of much coarser grain. A few of the coarser grained frag-		is sublithographic and yellowish gray	1960-
ments contain diffuse greenish areas which vaguely resemble glau-		Dolomite-microgranular and very light gray to yellowish gray	
conite. Some of the coarser grains appear to be crinoid debris. One		Limestone—sublithographic, very light gray and from 1,990 to 1,995	
fragment of a ribbed brachiopod is present (two samples)	1690-1700	feet contains very abundant, very light gray, porcelaneous chert	
Limestone-mostly fine grained, some medium to coarse grained, very			1990-1
light olive-gray to medium light gray with many pinkish specks, and		Dolomite-microgranular and yellowish gray	
contains a small amount of pyrite. The limestone appears to be in	1700 1700	2000–2005, 2010–2015, 2020–2025,	2030-2
part crinoidal (two samples)	1700-1720	Dolomite and limestone-mostly microgranular and very fine grained,	
light olive-gray; contains very light gray, semiporcelaneous chert and		yellowish gray dolomite, and some sublithographic, very light gray	2000 (
from 1,750 to 1,755 feet some subchalcedonic chert. The sample from		limestone 2050–2055, 2060–2065,	
1,730 to 1,730 feet is mostly medium gray shale cavings (five samples)	1720-1755	Dolomite—microgranular, fine grained; and yellowish gray Limestone—sublithographic, very light gray, and contains white, por-	2090-2
Dolomite—fine to medium grained, light olive-gray to light gray, and	1120 III	celaneous chert	2100-2
contains abundant white, porcelaneous chert	1755-1760	Limestone—sublithographic and very light gray. 2110-2115,	
Dolomite-microgranular, light olive-gray, and contains abundant white,		Dolomite and limestone—the dolomite is fine grained and light gray.	2120-2
porcelaneous chert	1760-1765	The limestone is sublithographic and very light gray.	2140-2
Dolomite microgranular light olive gray	1765 1770	D-1	2000

1770-1775

n		Depth in
90	Dolomite and limestone—the dolomite is mostly microgranular, some is fine grained, and both are very light gray. The limestone is sub-	feet
	lithographic and very light gray	
95	gray. The limestone is not abundant and much of it contains poorly sorted, well rounded sand	2210-22
0	Limestone and dolomite—mostly sublithographic very light gray limestone and a few chips of micrograpular, light gray dolomite. Clear	
0	rhombs of calcite are abundant.  Limestone—sublithographic, white, and sand grains are common in	2220-22
0	some chips	2230-223
0	Dolomite—microgranular to very fine grained and yellowish gray. A few sand grains are present. Very light gray, porcelaneous chert is com-	
0	mon	2240-22
	Dolomite—fine grained and medium light gray	2260-22
0	Limestone—sublithographic and very light gray	2290-229
	Dolomite and limestone—predominately microgranular, very light gray	
5	dolomite, and some sublithographic very light gray limestone	2300-23
	Dolomite-very fine to fine grained, and light gray to yellowish gray	2320-23
5	Dolomite—fine grained to medium grained and light gray	2340_23
	Dolomite-microgranular and very light gray	2350-23
5	Dolomite—fine grained, very light gray, and contains a small amount of sand and rare, very light gray, subchalcedonic chert fragments	
	Limestone and dolomite—the limestone is sublithographic and the dolo-	2370-23
5	mite is micrograpular. Post are seen link and the dolo-	0000 000
	mite is microgranular. Both are very light gray	2380-238
5	Dolomite and limestone—the dolomite is mostly fine grained and the limestone is sublithographic. Both are very light gray. A small amount	
	of white, porcelaneous chert is present, some of which is interstitial	2390-239
	Dolomite—microgranular, very fine grained, and some fine grained, all	2090-20
5	bolomite—interogrammat, very line grained, and some line grained, all	
5	very light gray, and contains a small amount of white subchalcedonic	
)	chert	2410-24
5	Dolomite—very fine to fine grained, very light gray, and contains white, porcelaneous chert. Dolomite rhombs are common in chert. Sand	
5	grains are present in some of the dolomite chips.  Dolomite—microgranular, yellowish gray, and contains white, porcela-	2420-242
,	neous chert. Dolomite rhombs and sand grains are common in the	2430-243
5	Dolomite—fine to medium grained, very light gray, and contains porce-	
;	laneous to subchalcedonic chert. The chert contains dolomite rhombs and in part appears to be interstitial	2440-244
	Dolomite—fine to medium grained, very light gray and contains in part	
	porcelaneous and in part white chalcedonic chert	2450-245
0	Dolomite—very fine grained, fine grained, microgranular; very light gray; and contains white, porcelaneous chert. A few chert fragments	
r)	contain sand	2460-246
	Dolomite-microgranular and very light gray	2480-248
	Dolomite-very fine grained, fine grained, some microgranular: very	

Description		Cumulat ess in fee			
Fredericksburg group: 13 feet measured Edwards limestone: 13 feet measured The elevation of the top of the section is 2,125 feet. A few thin limestone beds and some chert are exposed in the 4-foot interval above the grav- ity station, elevation 2,131 feet.					
<ol> <li>Limestone—very fine grained to sublitho- graphic, hard, white, beds 1 to 4 inches thick, and contains some brownish gray plates of chert which is mostly chalcedonic but also contains some white areas which are quart- zose.         A thin section of rock from 11.5 feet is     </li> </ol>	2	2	11	5	13
limestone composed of minutely crystalline calcite and a small amount of fine to medium-grained calcite, the latter associated with the abundant foraminifera and other fossils most of which are fragmental. Many clouded structureless pellets are present of the size of the					
foraminifera, as well as many smaller pellets.  2. Caliche—either weathered dolomite or soft limestone.	2	4	9	=	11
<ol> <li>Dolomite-microgranular; lower 2 feet between medium light gray and light olive-gray and well bedded; upper 2 feet yellowish gray and extremely burrowed.</li> </ol>	4	8	5	-	9
4. Limestone—fine grained, white, well bedded, in beds 6 inches to 2 feet thick, bottom foot contains fossil molds, is soft, and rest of rock is hard containing fossil fragments and some fossils.  A thin section of rock from 1.5 feet is limestone composed of minutely crystalline calcite containing a trace of organic material.	5	13	0	-	5

# as follows:

## grains being nuclei for oolites. Sand grains are common in the fine grained dolomite olomite-microgranular and very light gray... Dolomite-microgranular, some very fine grained, very light gray, and contains a small amount of white, porcelaneous chert. A few chips of quartz druse are present (two samples)\_

Dolomite and limestone—the dolomite is microgranular and very fine grained, and both are very light gray. The small amount of lim. stone present is sublithographic and light olive-gray. A few of the dolomite chips contain years fine cond.	
chips contain very fine sand	
white, porcelaneous chert which is in part interstitial. A small amount	
Dolomite—microgranular and very fine grained, very light gray, and some quartz druse is present from 2,580 to 2,585 feet. 2570-2575,	
Dolomite—microgranular and very fine grained, very light gray, and contains very fine sand in some of the dolomite chips	
Dolomite-microgranular, very light gray, highly sandy	2600 2605
Dolomite-microgranular and very fine grained	2610-2615
Dolomite-microgranular, very light gray and some chips contain sand	2620-2630
Dolomite-microgranular and very fine grained	2630-2635
Dolomite—microgranular and very fine grained, both being very light	2640-2645
Dolomite-fine to very fine grained, some microgranular; and contains	2040-2043

gray	2640-2645
Dolomite—fine to very fine grained, some microgranular; and contains a small amount of white, porcelaneous chert. Sand is common in the fine grained dolomite	
Dolomite—fine grained and microgranular, sand is abundant, quartz druse is common, and white, porcelaneous chert is rare.	
Dolomite and limestone—mostly microgranular and fine grained dolo- mite containing some vuggy porosity. The limestone is sublitho- graphic. Both are very light gray (two samples)	
Dolomite—mostly very fine grained, yellowish gray, vuggy, in part sandy, and quartz druse is common	
Dolomite—very fine grained, vuggy, light olive-gray, and contains a small amount of white porcelaneous chert which has dolomite rhombs in it (two samples)	
Dolomite-microgranular to fine grained, light olive-gray, and in part sandy	
Dolomite—very fine grained, in part vuggy, and light olive-gray	
Dolomite-microgranular, yellowish gray, and sand is present in a few	2785-2790
Dolomite-microgranular to very fine grained, fine grained; and yellow-	2790-2795
Dolomite—microgranular to fine grained, light olive-gray, and sand grains are present in some of the microgranular chips.	

## GEOLOGIC QUADRANGLE MAPS THE UNIVERSITY OF TEXAS BUREAU OF ECONOMIC GEOLOGY No. 15 WENDEL QUADRANGLE 99°22'30" 99°15'00 **EXPLANATION** SEDIMENTARY ROCKS Ked Edwards limestone + 1-16A Locality of fossil collection Fossils noted but not collected (earth-dammed pond for water storage) Windmill X 2217 Alidade elevation of gravity station X 2091 Alidade elevation Line of described section Harper - JUNGTION 2175 290 2249 2235 2178 2178 2178 2178 21863 2195 OW KILLAM WOLF GIBSON KIMBLE CO. KERR CO. 99°22'30" 99° 15' 00" Base for Gillespie County from U. S. Department of Agriculture, Agricultural Adjust ment Administration, aerial photograpps flown by Kargl Aerial Surveys, Ltd., I Assisted by T. R. Walker and Louis Dixon and for Kimble and Kerr counties from U. S. Department of Agriculture, Soil Conservation Service, aerial photographs flown by Park Aerial Surveys, Inc., 1939–1940. Cartography by J. A. Ayres and J. W. Macon 5000 2500 0 Datum is mean sea level GILLESPIE COUNTY SPRING LIVE OAK PALO ALTO CREEK CREEK KENDALL CO KERR CO APPROXIMATE MEAN DECLINATION 1947 INDEX MAP

GEOLOGIC MAP OF THE WENDEL QUADRANGLE, KIMBLE, KERR, AND GILLESPIE COUNTIES, TEXAS