U N I V E R S I T Y O F T E X A S
BUREAU OF ECONOMIC GEOLOGY
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The mimeograph circulars issued from the Bureau of Economic Geology contain the record of cores and cuttings from wells received and described in the Bureau. In some instances drillers logs and other data are given although it is usually impracticable to include logs of all wells, the logs given being selected as representative of the county or area to which the circular relates. The elevations given are for the most part those reported with the drillers log. In some instances the elevation given, as indicated, is that obtained from the location of the well on the topographic map. In all cases the elevation is to be regarded as approximate only.

E. H. Sellards.

WELL RECORDS OF BELL COUNTY

Bell County is located at the northeast side of the Llano uplift and at the inner margin of the gulf coastal plain, the eastern part of the county being within the coastal plains area. The geologic formations at the surface in this county are those of the Lower and Upper Cretaceous; the western part including somewhat more than one half of the county is within the Lower Cretaceous region while in the eastern part of the county Upper Cretaceous formations are at the surface. The Balcones zone of faulting passes through the county, although here the amount of displacement is much less than in the somewhat south of the east. The rate of dip which in the western part of the county is slight, is greatly accentuated east of the Balcones fault zone.

The Lower Cretaceous in that part of Bell County west of the Balcones fault zone varies in thickness from 800 to 1200 feet, the lesser thickness being in the western part of the county. Underneath the Cretaceous are rocks imperfectly determined. A number of wells have been drilled into these rocks, the record of which are given. East of the Balcones zone of faulting where the dip eastward became rapid, the Cretaceous thickens as the younger formations come into the section, and in this part of the county no wells have been drilled through to the rocks below the Cretaceous.

In this paper well records will be given for the western part of the county only. East of the Balcones zone of faulting no wells have been drilled entirely through the Cretaceous and as the present study is concerned chiefly with the position of pre-Cretaceous formations records on wells in the eastern part of the county will not be included. For some of the wells a large number of samples were received in the Bureau and described in detail. In such cases the detailed description has been given in this paper for certain representative samples, while for other samples there is given only the first descriptive sentence. Where a part of the description is omitted this fact is indicated.

William Bacon 1, Nolan-Bell Oil Company

Located 3 9/10 miles west of Nolansville and 6/10 miles south of the public road. (6 4/10 miles east of Killeen). Elevation by aneroid barometer from benchmark at Nolansville 820' T D. 1170'. Casing record: 15" to 470'; 12½" to 750'; 10" to 2962'; first water at 165'; second water at 310' and "salt water" at 815'.

Drillers Log

	Depth in Feet From	To	Thickness
No record	0	426	426
Gray lime at	426		
No record	426	470	44
White and gray limestone, 36' cavity as 470	470	518	48
Blue shale, probably	518	590	72
No record	590	676	86
Limestone	676		
Hard gray limestone	676	686	10
Limestone	686	700	14
Shale	700	710	10
Gumbo	710	715	5
No record	715	768	53
Limestone	768		
Lime and gumbo at	787		
Gumbo shale and slate	808		
Shale	812	815	3
Lime	817		
Sand	845		
White clay and gumbo	862		
Conglomerate, lime shale and gumbo caving	862	885	23
Conglomerate	885	896	11
Gumbo, tough, slow drilling, no caving	905		
Gumbo, caving	905	925	20
Gumbo, dark color	925	928	3
Gumbo, black and hard to drill	928	935	7
Slate and gumbo	935	962	57
Log incomplete T. D.	1170		

Log made from noted supplied by the driller, Mr. W. B. Knight. Mr. Knight states that a crevice was found in the limestone at the depth of 470 feet into which twelve wagon loads of rock were dumped which did not fill the crevice. An 18 foot log was then put into the hole and disappeared. Two joints of casing were required to reach through the crevice, the opening being 36 feet.

Description of samples by E. B. Stiles; obtained at the well by E. H. Sellards.

	Depth in Feet From	To
Very black slaty shale of fine texture. In thin section a minute fragment of coaly material, apparently of a leaf was seen. In closed tube bituminous fumes sufficient to sustain a flame and fumes of sulphur and ammonia were noted. No fossils observed.	1100	1110

Bluish gray schistose (?) shale and black shale. The gray shale has slickensided appearance, is very thinly laminated and occasional fragments show veining. The black shale is slightly coarser and more uneven in texture than the gray and does not have the schistose appearance. The gray shale contains small lumps of

Depth in Feet
From To

crystalline pyrite. None was seen in the black shale. No fossils were noted in washed material. In closed tube strong ammonia fumes were given off. 1170

William Bacon 2, Nolan-Bell Oil Company

Location same as No. 1.

Description of samples by H. T. Knikor and E. B. Stiles; submitted by N. A. Schwald and C. E. Mannering.

Depth in Feet

Black, hard slaty shale containing some pyrite. The rock is greatly slickensided. A thin layer of calcite was noted along some of the fractured surfaces. The rock is cut by joints which cause it to split into angular pieces with plain straight surfaces. In thin section the shale has a brown color due to the presence of much bituminous material, and is seen to contain a number of minute clear grains. When heated in closed tube, very strong bituminous fumes that supported a strong flame were liberated. When fragments of the rock are ignited they support a flame. Possibly lower Bond/shale. 1060

(Barnet)

Dark grayish green crystalline rock, hard black and greenish gray shale, and a few fragments of light gray dolomite. In thin section the crystalline rock is seen to be composed, for the greater part, of clear, narrow, rectangular crystals of various sizes. Some bituminous impregnations were noted. In washed material the crystalline rock was seen to contain pyrite and a number of calcite veins. The black shale is highly bituminous, and contains some fine, clear grains. One tapering calcite vein and two veins (?) in the shape of a cross were noted in one fragment. Fragments of this shale, in washed material, show calcite veins. The greenish gray shale, in section, shows an exceedingly fine texture and the presence of some bituminous material. In thin section the dolomite is seen to have a finely crystalline texture. It appears to come from the Ellenburger. 1100

Dark greenish gray crystalline rock. In thin section most fragments show an abundance of very narrow, slender crystals, about one-fourth mm. in length. Larger rectangular crystals are also present, one fragment containing only this kind. Several fragments are seen to have a granular texture in which are embedded many small clear grains and crystals. . . . 1500-1510

Grayish green crystalline rock and black slaty shale. The crystalline rock contains some pyrite. In thin section one fragment of crystalline rock is seen to be coarsely crystalline in texture. Other fragments are granular and finely crystalline. One of these latter contains many clear intersecting veins of various sizes. The shale, in section, is seen to be highly bituminous and to contain fine clear grains. One fragment shows a one-half to one mm. wide calcite vein. Another fragment has sbhistose structure. This shale appears to be the same as found at 1060' and may be caving 1510-1550

Dark green and gray crystalline gneiss, containing considerable chlorite? Small pockets of pyrite were seen in some of the quartz. Considerable brown biotite present 1805

Depth in Feet

Very dark slightly greenish crystalline rock containing considerable biotite (?). The crystalline rock in thin section shows many needle-like crystals some of which have a radial arrangement. Others lie at all angles through the mass. The larger part of the fragments is made up of these crystals with a small amount of granular material filling the intervening spaces. 1810

Like sample from 1810 1815

Like sample from 1810 1820

The Cretaceous at this locality extends to 896 feet. The first sample obtained below the Cretaceous at 1060 feet is described as being possibly Barnet shale. The next sample at 1100 may contain pieces from the Ellenburger limestone. Aside from pieces of shale which are probably cavings, the material at 1500 feet and below is much altered rock and may be pre-Paleozoic.

Noah Bailey 1, Mellon Oil Company

Located on James Evitts survey 10 8/10 miles southeast of Killeen.

Elevation by aneroid 700 feet.

Drillers Log

	Depth in Feet below Surface		
	From	To	Thickness
Soil, dark	0	1½	1½
Light yellow clay and yellow lime	1½	8½	6½
Shell, limestone and alternating shale and clay	8½	14	6
Yellow clay and alternating shale and lime	14	20	6
Solid lime 4, yellow lime 4	20	28	8
Blue clay	28	29	1
Blue lime, 26	29	55	26
Gray lime	55	59	4
Blue rock or marl 59-144	59	144	85
White lime	144	152	8
Blue lime, light lime	152	185	33
Blue lime, dark lime	185	195	10
Blue lime, light lime	195	205	10
Blue lime, light lime 205-282	205	282	
Blue lime, light lime 282-202-391	282	391	
Blue lime 391-439	391	439	
Blue shale, cavey	439	451	12
Blue rock	451	458½	3½
Blue shale, cavey	458½	461	6½
Blue rock and shale 22	461	483	22
Blue rock, hard, 483-520	483	520	
Blue sand rock, 520-548	520	548	
White sand rock, 548-560	548	560	
Gray quick sand and white clay and white lime and gravel. Strong fresh water flow	560	562	2

	Depth in Feet below Surface		
	From	To	Thickness
Hard white sandstone. Lime and white clay	562	572	12
White coarse sandstone. Cuts bit.	572	576.8	4' 8"
Cong. dark sandstone, mixed sand, cuts bit fast	576.8	584	4' 8"
Soft almost limestone sand in clay	584	598	17
Blue sandstone	598	600	2
Dark blue sandsonte	600	607	7
Hard blue rocks cut very slow gravel (Five hours cutting 2 ft. cong.)	607	609	2
Dark blue gumbo and shale. Balls on the bit. Tough like black rubber.	609	613½	4½
Light blue shale or soapstone 32 hrs. drilling 3 ft. springy like rubber.	613½	617	3½
Light blue soapstone	617	621	4
Light blue soapstone. Gritty	621	625	4
Blue shale balls on bit. Trace of oil and gas	627	631	4
Blue shale balls	631	637½	6½
Light blue shale	637½	642	4½
Hard blue shale. In places balls on bit 642-662	642	662	20
Sandstone. Brown 1, gray 1	662	667	5
No record	667	670	3
Hard lime. 3 and Blue lignite	670	679	9
Hard blue lime	679	680	1
Blue shale	680	681	1
Hard blue rock	681	682	1
Hard gray lime	682	687	5
Light blue shale, gray sand and light flow of water. Five gal. a min. Very little shale and sulphur. Soda	687	693	6
Coarse white lime	693	697	2
Hard white lime	697	725	28
Blue shale	725	732	7
Black pebble conglomerate artesian water flow	732	740	8
Brown sand rock	740	750	10
Gray sand and lime	750	755	5
Hard gray sandstone and lime	755	758	3
Hard yellow lime	758	758'8"	8"
Oil show at 760. Gray sand and lime. Rainbow, little oil and gas.	758'8"	765	6'4"
Hard gray sand	765	774'6"	9'6"
Hard gray sandstone (streak red clay)	774'6"	798	23'6"
Brownish and blue gumbo 8'	798	810	12
Brownish and blue gumbo and blue rock and hard blue shale at	810	868	58

Remainder of log omitted T.D. -3790 ft.

Description of samples by H. T. Winton; submitted by Hugh Smith and by Wallace E. Pratt.

Grayish green shale of fine texture. Thin films of brown color give the fragment the appearance of being blotched or variegated. The fracture is uneven, almost hackly and apparently follows no cleavage planes. One distinct slickensided surface was seen. No fossils were found in washed material. In closed tube test fumes of sulphur and ammonia and very faint fumes of bitumen were noted. . . 860'.

Dark gray very fine grained quartzite showing a few mica scales. Specimen shows indistinct stratification and is transversed in various directions by obscure irregular joints. One side of the fragment shows finer and somewhat greenish material. Aspect Huronian (J.A.U.) on a polished surface laminations, about one-tenth of an inch apart, were noticed. These are cut and displaced by several irregular faults. Aspect is that of the supposed Huronian seen in the bottom of the Waco Oil and Refining Company's Harrington Well and in the bottom of the city well at Hillsboro (j.A.U.) Ammonia fumes were noted in closed tube. . 1761-1822 ft.

Several large fragments of black indurated shale of very fine texture, and one fragment of quartzite measuring about 2 x 3 x 1 inches. The shale is highly slickensided with an unusually fine polish. Evidence of sharp folding is shown in two fragments, one of which is in a sharply turned "S" shape. The slickensiding is not confined to the exterior of the fragments but is extensively distributed throughout. In thin section it is seen to be of fine and very uniform texture with some minute black and brown specks. No evidence of fossils was seen. The fragment of quartzite is also slickensided on three sides and is somewhat polished. On fresh fractured surface the sand grains are seen to be broken smooth with the matrix. In thin section the rock is seen to be composed of poorly assorted sand grains with a silty matrix filling the interstices between the grains. Faintly defined veins, frequently parallel, are seen to cut the fragment but do not appear to be numerous. Sample gives very strong ammonia fumes in closed tube. Those fragments are said to have come from well after a shot at -1920-1960

Black indurated non-calcareous schistose shale of fine texture. In thin section several fragments show clear generally parallel veins. One fragment shows one clear vein crossing two other veins at almost right angles. No fossils were noted. In closed tube faint ammonia fumes were given off. - 2596-2630

Black indurated shale some of which shows slickensides. - - - - - - 2630-2640

Dark reddish brown schistose shale containing areas of quartz schist (?). The shale is cut by quartz veins in many instances. Some fragments of the shale show traces of organic remains such as sponge spicules and filled casts of some apparently spherical spinous bodies measuring three-tenths mm. in diameter and less. One had some fifty short spines externally. Several had been flattened. Most of the shale is of very even, fine texture. Some fragments however contain some fine quartz silt. The quartz schist, in section , is seen to be cut in all directions by veins of clear quartz some of which contain some green coloring. With the sample is some very dark greenish schist which is cut by many veins. - 2640-2655

Black schistose shale and black and dark dirty green chert. - - - 2655-2675

Black schistose shale some of which show round slightly oval clear bodies similar to those seen in the chert from 2655-2675 - - - - 2675-2680

Black shale like that from 2740 and indurated greenish gray chert and some shale of the same color. - - - - - - - - - - - - - - - - - - 2740

Black shale like that from 2740 and indurated greenish gray schistose shale and chert of the same color. - - - - - - - - - - - - - - - 2755

Dark indurated schistose shale of unusually clear and fine texture, very similar to that from 2755' - - - - - - - - - - - - - - - - - 2785-2790

Description of samples at 2540, 2555, 2580, and 2765 omitted. These samples include hard slate-like noncalcareous shale and gray fine grained quartzite or sandstone.

Reddish brown schistose shale like that described from 2640-55 feet. - 2850

Black and greenish indurated shale containing considerable pyrite. - 2865-2890

Dark highly indurated shale containing some very fine silt. - - - - 2890-2915

Dark gray highly indurated shale or schist containing some silt. - 2915-2935

Dark gray indurated shale like that from 2915-35 feet, and black fine textured and slickensided shale. - - - - - - - - - - - - - - - 2935-2965

Black indurated, slickensided schist or shale and some bright green chert. One fragment of the shale contains large areas of clear vein material. The chert contains granular small lumps slightly brownish in color. One or two of these are roughly diamond shaped. In closed tube very strong bituminous fumes with a heavy deposit in tube were given off. - - - - - - - - - - - - - 2990

Dark bluish gray indurated schistose shale. - - - - - - - - - - - - - - 3015

Dark gray and black indurated slaty shale and green chert. - - - - - 3025

Black slaty shale like that from 3025 feet, and greenish gray chert and schistose shale. - 3040

Dark gray slaty shale and some chert. - - - - - - - - - - - - - - - - - 3050

Black and dark gray indurated slaty shale. - - - - - - - - - - - - - - 3090

Dark bluish gray and some slightly greenish slaty shale, containing some pyrite. - 3110

Dark slaty shale. - 3120

Dark bluish gray slaty shale of very fine clear texture. - - - - - - 3130

Dark gray fine textured hard rock. In thin section fragments are seen to be cut by irregular and roughly bordered veins. One fragment shows healed brecciation. One fragment cut by a sharp clear vein, contains many small and irregular areas having a bluish color. Practically all fragments seen in section show small cracks or fractures and many show clear veins. In closed tube faint fumes of ammonia and very faint bituminous fumes were given off. - 3150

Dark very hard silty rock very similar in appearance to that from 3150 feet, and some dark slaty shale of very fine texture - - - 3170

Dark slaty shale and greenish gray schistose shale. - - - - - - - - - 3175

Black slaty shale and greenish schistose shale and chert. - - - - 3185-3195

Dark, faintly greenish, gray schistose rock. - - - - - - - - - - - 3195-3205

Dark gray schistose rock. - 3205-3215

Dark gray schistose rock and dark slaty shale. - - - - - - - - - - 3215-3222

Dark brownish-red schistose shale, like that from 2850 feet. - - 3222

Gray to almost black flint and some maroon red and dark gray shale. - 3305-3315

Dark purplish brown or maroon red indurated shale. In thin section this shale shows an uneven or dappled texture due to small spots of dense texture lying in a less opaque matrix. In one fragment several crystalline inclusions having a circular form in section were seen. These measure about one-fourth to one-third mm. in diameter. In closed tube very strong ammonia fumes were given off. - 3315-3320

Like sample from 3305-3315 feet. - - - - - - - - - - - - - - - - 3320-3330

Like sample from 3320-3330 feet. - - - - - - - - - - - - - - - - 3340-3350

Like sample from 3305-3315 feet. - - - - - - - - - - - - - - - - 3350-3360

Dark maroon red shale like that from 3315-3320 feet - - - - - - - 3370-3380

Dark maroon-red shale like that from 3315-3320 feet - - - - - - - 3380-3385

Maroon-red shale like that from 3315-3320 feet, but more highly indurated. - 3390-3400

A brownish gray shale which in thin section is seen to be composed of much fine argillaceous material and a few very small worn sand grains. A small quantity of calcareous material is also noted. One fragment of the shale is seen to be finely laminated, the laminations being slightly wavy. Two small fragments are crossed by narrow, dark-colored, broken and branching veins. When heated in a closed tube ammonia fumes were given off. - - - - - - - - - - - - - - 3470-3475

Like sample described from 3470-3475 - - - - - - - - - - - - - - 3475-3480

A mixture of brownish gray shale and a maroon-red, indurated sandy shale. - 3480-3485

A purplish brown or maroon-red sandy shale, which in thin section is seen to be slightly laminated. - - - - - - - - - - - - - - - - - - 3485-3500

A mixture of dark grayish or black shaly slate and green and black chert. In thin section it is noted that the slate is finely granular in texture. In thin section, the chert is seen to be fine in texture. It contains a considerable quantity of bituminous material in the form of minute spots and shreds, which are brown in color. There are also noted, several systems of branching straight veins filled with crystalline material. It is further noted, that in the chert there are many round and oval clear bodies, which appear to be the remains of Radiolaria. These are extremely abundant, one fragment being composed almost entirely of these bodies. When heated in a closed tube, ammonia and bitumen fumes were given off - 3500-3505

A mixture of dark gray or black slaty shale, pale green chert and greenish shale. - 3505-3510

A mixture of hard black slate and greenish gray chert. - - - - - - - 3515-3540

The sample is a mixture of dark gray or black shaly slate, and a grayish green chert. -3540-3545

A dark grayish or black slate containing some calcareous material. - 3540-3550

Like sample from 3540-3550 feet, except that the veins are not so abundant. - 3550-3560

A hard indurated grayish black slate, which in thin section is seen to be faintly laminated. - 3560-3570(a)

A dark gray, almost black slate, which in thin section is seen to be composed of very fine-grained silt, with a few angular sand grains, 1/40 mm. or less in size. - - - - - - - - - - - - 3560-3570 (b)

A mixture of dark gray or black bituminous slaty shale and light greenish gray chert. - 3570-3580

A mixture of dark gray or black slaty shale, and greenish gray chert. - 3575-3580

A mixture of maroon schistose shale and dark greenish gray hard shale. - 3590-3605 (a)

A mixture of maroon red shale and dark greenish gray hard shale. - 3590-3595 (b)

A mixture of dark gray shale and maroon-red shale, in about equal quantities. - 3605-3615

A mixture of red shale and dark gray shale, like previous sample, except that in the thin sections, it is noted that two fragments of gray rock are crossed by dark veins, much branched and broken, and variable in width. - 3615-3625

A dark gray or black slate with a few fragments of red shale. In thin section it is noted that the gray shale is composed of very fine, compact argillaceous material, containing a small quantity of fine, rather worn sand grains. Several veins about 1/10 mm. in width are noted. These veins contain a bright green substance, probably quartz. Several fragments show rather imperfect laminations. No fossils were noted. When heated in a closed tube, very strong ammonia fumes with a nitrogen odor, and slight bitumen fumes were given off. - - - - - - - - - - - - - - - - 3625-3640

A mixture of dark gray or black slaty-shale and greenish gray chert. In thin section the slaty-shale is seen to have a granular matrix of dark brown, argillaceous material, containing fine sand grains and pyrite crystals. - 3640-3645

A dark gray or black slaty-shale, which in thin sections is seen to have a granular matrix of brownish argillaceous material, containing a few worn sand grains, and much pyrite. - - - - - - - - - 3640-3650

A mixture of black slaty-shale, a medium gray sandstone (?) containing calcareous material, and a greenish gray sandy shale. - - - 3645-3650

A dark gray or black slaty shale, which in thin section is seen to be very fine grained and compact in texture. - - - - - - - - - 3650-3655(a)

A dark gray slate, which in thin section is seen to be fine in texture, and to contain many small spots of yellowish impurities, and fine sand grains Pyrite is present. - - - - - - - - - - - - - - - 3650-3655(b)

A dark gray or black slaty shale mixed with a small quantity of light greenish gray chert. - 3655-3660

A brownish black flinty chert, which in thin section is seen to be dense in texture, with many narrow broken veins filled with clear quartz. - 3660-3670

A mixture of grayish, almost black, cherty slate, and a little greenish gray chert. - 3660-3672

Like sample from 3660-3672 feet, except that there is a smaller quantity of the grayish green chert present. - - - - - - - - - - - - - 3672-3678

A brownish black chert containing clear quartz grains, small in size (less than 1/8 mm.). Pyrite is present. - - - - - - - - - - 3680

A mixture of black cherty-shale like that described in sample from 3645-3650 feet, showing laminations slightly folded, and grayish green chert (?) which in thin section is seen to be fine in texture, to contain some fine sand grains and some spots of yellowish impurities. - 3690-3695

A hard black sandy and cherty slate which in thin section is seen to be fine in texture, to contain minute sand grains, and many shred-like brown particles. One very narrow jagged vein was noted in one fragment. When heated in a closed tube, very faint ammonia and bitumen fumes were given off . - - - - - - - - - - - - - - 3695-3700

A hard brownish black flint containing clear quartz grains and some pyrite, like sample from 3695-3700 feet - - - - - - - - - 3700-3705

Like sample from 3695-3700 feet, - - - - - - - - - - - - - - - 3710-3720

A hard black flint-like rock with considerable calcareous material present. - 3720-3725

A hard black flinty slate, slightly calcareous, which in thin section is seen to be composed of much granular argillaceous material, brown in color, with several small veins, filled with clear crystalline material, and a dark brown or black deposit. - - 3710-3720

Like sample from 3728-3732 feet. - - - - - - - - - - - - - - - 3735-3740

Like sample from 3728-3732 feet, except that the presence of calcareous material is noted in very fine veins in the flint. - - 3745-3750

Like sample from 3750-3755 feet, except that calcareous material is much less abundant. - - - - - - - - - - - - - - - - - - - 3755-3760

Calcareous black flint, like sample from 3750-3755 feet. - - 3760-3770

A brownish black shaly and flint-like rock, which in thin section is seen to be crossed by several systems of small veins variable in size and filled with clear quartz and a dark deposit. 3765-3770

A hard black flint-like rock, which in thin section is seen to contain much crystalline material irregularly distributed and cemented by a brown granular matrix. - 3770-3773(a)

A hard black slate (?) containing a considerable quantity of calcareous material and some pyrite. - - - - - - - - - - - - - - - 3770-3773 (b)

Like sample from 3770-3773 feet. - - - - - - - - - - - - - - - - 3780-3783

Hard black flint-like rock, like the sample from 3780-3783' - - 3785-3790

The Cretaceous at this locality extends to 798 feet. The first sample obtained at 860 feet is apparently from below the Cretaceous.

The next sample obtained is at 1761-1822 feet at which depth the well is in much folded and altered rocks possibly pre-Paleozoic. The drilling penetrated the altered rocks not less than 2000 feet. Of this interval the greater part is largely dark more or less schistose shale or slate. Below 3520 to 3790 there is considerable maroon and red shales with the black shales.

Eppersen 1.

Located 3 or 4 miles northwest of Belton.

Description of samples by O. M. Richey and E. H. Sellards; submitted by A. L. Creenman, 1926.

Pieces of greenish gray calcareous shale. Calcite and a little pyrite, crinoid stems, and smooth ostracods were observed in the washed material. Pennsylvanian - 722

J. R. Holcomb 1, Bell County Oil Company.

Located on the Louis Walker survey on the south side of Nolan Creek 3 miles west of Belton. Elevation by aneroid 760 feet.

Description of samples by J. A. Udden and E. B. Stiles; submitted by W. C. Bean.

Fine-grained in part dark green, in part dark purplish probably quartzite affected by many small irregular shearing planes. - - - - - 1150

This well was underreamed from 900 to 1265 feet. Samples obtained by E. H. Sellards from this underreaming coming probably from below 1105 feet were of the general character of the sample obtained at 1150 feet.

The Cretaceous at this locality extends to 1105 feet. Altered rocks probably pre-Paleozoic are found at 1150 feet and may be present immediately under the Cretaceous.

Drillers log of this well indicates sand with show of oil at 610 to 614 feet; quartz conglomerate (basal Cretaceous) at 1065 to 1105 feet; yellow gumbo at 1105 to 1107 feet; limestone at 1107 feet; total depth, 1550 feet.

John Kolls 1, Down, Ferry and Hughes.

Located 3 miles north of Belton. Drilled 1915-16.

This well is said to be cased to 1135 feet. The well flows water, the flow coming from below 1135 feet.

On the Kolls farm near this well exposed in the railroad cut is a fault with almost vertical dip. This fault trends northeast-southwest.

Description of samples by J. A. Udden; submitted by A. E. Hughes.

Bluish gray limestone containing considerable fine sand and some argillaceous material. Texture compact and even. Resembles Pennsylvanian sandstone. - 1269-1324

Gray, very compact sandstone, of fine texture. Some black shale present. In this an obscurely outlined fragment of a sponge spicule was noted. Pennsylvanian in aspect. - - - - - - - - - - - - - - - - - 1400

Gray sandstone and dark gray shale. The sandstone is fine in texture. Material only slightly calcareous. Resembles Pennsylvanian sediments. Mica noted. - 1400 plus?

In 1920 an additional sample was obtained by E. H. Sellards from Mr. Kolls said to come from depth 1446 feet. This sample consists of black shale and dark gray fine sandstone without fossils.

Drillers log indicates Cretaceous as probably extending 1182 feet. A flow of water being obtained at that depth.

John Kolls 1, Petoskey Oil Company.

Located 3 miles northwest of Belton.

Description of samples by E. H. Sellards and O. M. Richey.

Cuttings of dark gray non-calcareous shale. A little clear quartz noted in the washed material. - - - - - - - - - - - - - - - - - - - 1170

Cuttings of dark gray non-calcareous shale and quartz. - - - - - - 1180

Fine cuttings of dark gray non-calcareous shale and clear quartz. - 1187

Cuttings of dark gray non-calcareous shale and clear quartz. A very little calcite was noted in the washed material. - 1190

Same as sample from 1190 feet. - - - - - - - - - - - - - - - - - - - 1193

Fine cuttings of clear quartz and a small amount of dark gray sandstone. - 1197

Fine cuttings of clear quartz and some dark gray non-calcareous shale. No fossils were observed. - - - - - - - - - - - - - - - - - 1198

The Cretaceous in this locality probably extends in the well drilled by Down, Ferry, and Hughes to 1182 feet. Underneath the Cretaceous is apparently Pennsylvanian. There is no evidence that the pre-Paleozoic rocks are reached in this well.

Slayden 1, Eclipse Oil Company.

Elevation given as 900 feet.

Description of samples by J. A. Udden and H. T. Kniker; submitted by Roy Hudson and Dave Donoghue, 1920.

A cherty dark rock of fine texture and in part a rock that may be designated as black limestone of fine texture. The sample consists of a dozen fragments ranging from one-half to one and one-half inches in diameter. Evidently the siliceous phase is an alteration of the calcareous phase represented in the sample. All fragments are cut by veins and fissures. The widest vein measures about one mm. in thickness and consists of white quartz. Some of the fissures are exceedingly thin and they show no filling. Most of the fragments are bounded by fissured surfaces several of which show slickensides and minute striation due to motion. The fissures and veins are in many varied directions indicating that the rock has been very much fractured on a minute scale. Two of the fragments show lamination evidently due to the original stratified condition of the rock. The cherty black rock still contains some dolomite or calcite as indicated by the effervescence on the application of acid. In thin section of this rock it is seen to have a structure which shows minute distant crystals of calcite or dolomite embedded in the chert in which also appear a number of particles of black material varying in size and shape. One thin section of chert shows distinct quartz veins. The limestone shows a fine texture in part crystalline. It contains embedded fragments of organic matter such as sponge spicules, fragments of crinoid stems, fragments of Bryozoa, shells of ostracods. It also contains

some quite original crystals of calcite or dolomite and several grains of glauconite are noted in one section. The limestone and the black chert both give off bitumen sufficient to form drops of oil in a closed tube. They also give fumes of ammonia and of sulphur.

It is believed that these specimens some from the Bend formation and if such is the case it is evident that this formation where entered in this well is fractured and folded by some tectonic movement of considerable extent and violence such as accompanies mountain folding. It would seem that the Bend in this place has been lifted up into some mountain structure and agin cut down by erosion and is now separated by an angular unconformity from whatever rocks underlie. . 1000

Black flint. A large fragment shows irregular small quartz veins extending in different directions, the veins varying in size, the largest ones measuring about one-sixth of a millimeter in thickness. - - - - - - - - - - - - - - - 1216

Slayden 2, Eclipse Oil Company

Located 7 miles south of Killeen.

Description of samples by H. T. Winton; submitted by E. H. Sellards, 1921.

Gray, indurated silt. With this is some limonitic material. Some calcareous material present, is probably from above. In thin section the material is finely granular and contains some fine angular sand grains. The silt makes about 90% of the sample. It varies in color from greenish gray to purplish gray. Fossils noted: A few fragments of highly calcareous material, parts of pelecypod shells, which probably were washed in. In a closed tube, faint ammonia fumes were given off. - 695

A light, faintly greenish gray shale containing veins of calcite; and a small quantity (5% or less) of iron stained rock. - - - - - - - - - 710

Light to greenish and brownish gray shale, (60%) and iron-stained shale (40%), the latter giving a slightly pink color to the sample. - - - - - - - 720

Light gray shale, containing a slight quantity of calcareous material, and a small quantity of iron-stained rock. - - - - - - - - - - - 760

Medium gray marly shale, containing small veins of calcareous material. - 811

Hard, slate-gray shale, fine angular sand (less than 1/8 mm. in diameter), about 30%; and a very slight quantity of calcareous material. - 830

A mixture of hard, fine-grained, red, indurated, muddy-silt, or slate, veined with calcareous material, and hard greenish slate, which in several fragments is seen to be slickensided. - - - - - - - - - - - 850

A hard greenish gray slate, which contains a slight quantity of calcareous material. - 935

A hard, indurated, dense, maroon-red slate. - - - - - - - - - - - - - - 940

A roddish mixture of dark gray chert and a brownish red slate. - - - 945

A hard, greenish gray rock, which in the washed sample is seen to be composed of--(1) an iron-stained, slightly indurated, greenish chert, which in thin section is seen to be finely granular, and to contain many pyrite crystals variable in size. (2) clear, crystalline flint, or quartz containing some brownish, carbonaceous material. (3) a hard, greenish quartzite which in thin section is seen to be composed of many clear angular and a few rounded quartz grains, 0.2 mm. in size, and some pyrite cemented in a nondescript matrix stained with brownish bituminous material. - - - - - - - - 950

Black, highly bituminous chert. - 1000

Black flint, cut with many fairly straight veins filled with calcite. - 1050

The samples obtained from this well indicate that at this locality Bond is probably present underneath the Cretaceous but is very much altered and broken by mountain making movements.

Swope 1, Killeen-Bell Oil Company.

Located on Williams Frees survey 5 3/4 miles south and 3/4 mile west of Killeen. Elevation by aneroid 888 feet.

Description of samples by J. A. Udden and E. H. Stiles; submitted by E. H. Sellards.

Micaceous gray sandstone containing some pyrite and showing some peculiar bedding marks which on one side of the rock suggest irregular ripple marks. This piece of rock resembles sandstone from the Strawn. - From the dump.

The Cretaceous at this locality does not exceed the thickness of 850 feet and may be less, for while no log has been obtained the drillers reported that black hard rock was entered at about 850 feet. The sample described is from the dump and may come from above 850 feet and below the Cretaceous.

Warrick 1, Bell Williams Oil Company.

Located on E. Ingram survey 6.7 miles northwest of Jarrell. Elevation by aneroid 864 feet.

Description of samples by J. A. Udden; submitted by E. H. Sellards.

Several fragments half an inch in diameter of a greenish sandstone, two pieces of schist-like shale and one of limestone. The green sandstone contains some mica. In one fragment are irregular areas of a brown color, apparently stained. The schist-like shale in one fragment shows numerous minute and occasional larger veins of black material (quartz ?) which is somewhat harder than the body of the shale. These veins are crossed at all angles and some are branching. Slickensides also noted. The limestone has several small cavities some of which are partially filled by crystalline material (?). In thin section the rock is seen to be granular in texture with many small irregular shaped areas of crystalline material which gives the section a mottled appearence. In this rock are many indistinct organic fragments. The slickensided shale described above resembles material seen in lowest formation in wells at Hillsboro, Waco, Killeen, and Leander. - 1190-1255

Clear quartz sandstone which contains some pyrite and some shaly material. - 1190-1255

Very dark (schistose ?) shale containing mica, with some dark sandstone with a slightly calcareous matrix. - - - - - - - - - - - - - - 1255-1292

Black micaceous (schistose ?) shale and stone. - - - - - - - - - - 1292-1304

Dark indurated shale with some areas of calcareous material. - - 1304-1307

Dark shale and sandstone with some calcareous particles. - - - - 1307-1326

Dark gray sandstone with some black minutely micaceous shale and large angular fragments of yellow quartz. - - - - - - - - - - - - - 1326-1338

Gray indurated sandstone and black shale like preceeding sample from 1326-1338 feet. In thin section the shale is seen to contain some angular sand grains of varying sizes. - - - - - - - - - - - - - - - - - - 1336-1373

Gray indurated sandstone and black shale like that from 1326-1338 feet. - 1338-1373

Worrick 1, J. B. Hartman.

Located on the Abner Webb survey 6.8 miles northwest of Jarrell within about one-half mile of Williamson County line. Elevation by aneroid 944 feet. This well is a little north of and on higher hand than Warrick 1 of Bell Williams Oil Company.

This well was underreamed from 1122 feet to below 1600 feet. Salt stratum was reported at about 1600 feet. Enough salt came from this depth so that cattle licked salt from the dump. The well was cased at 1122 feet and was reported by Hartman to have been dry from 1122 to 2210 feet.

Description of samples by F. T. Kniker and E. B. Stiles; submitted by J. B. Hartman.

Slightly grayish, black shale highly slickensided and laminated. This shale is very fine textured and has a slick feel, similar to graphite. Some quartz grains and a few fragments of calcareous material present. Strong ammonia fumes noted in closed tube. - - - - - - - 1116

Dark gray very indurated shale or schist containing some angular sand grains. - 1535

Like sample from 1535 feet. - 1660

Dark gray very indurated shale and quartzitic and schistose rock. - - 1765

Like sample from 1765 feet. - 2200

Dark gray quartzitic sandstone composed of poorly assorted grains. - - 2203

Ground up quartzitic sandstone and black hard shale. - - - - - - - - 2206

Black non-calcareous indurated shale. - - - - - - - - - - - - - - -2226-2248

Mainly very hard non-calcareous fine grained sandstone ground up very fine by the drill. - 2248-2249

Light colored indurated fine grained sandstone made up largely of clear quartz sand grains. - 2258

Like sample from 2258 feet. - 2265

Like sample from 2258 feet. - 2276

Mainly light colored indurated fine-grained sandstone containing thin veins of quartz. - 2293

Mainly black indurated shale, containing thin regular veins of quartz. - 2320

Dark to black schistose shale and some hard fine grained quartzitic gray sandstone which contains many quartz veins. - - - - - - - 2410

Dark indurated schist-like rock and black indurated shale. - - - - 2440

Cuttings of dark-gray, slaty shale mixed with much rounded, medium-grained quartz sand. - 2515

Cuttings of brown, sandy and shaly material. - - - - - - - - - - - 2648

Well cemented sandstone with a little muscovite. The rock is slightly ferruginous. - 2767

Cuttings like those from 2767 feet. - - - - - - - - - - - - - - - - 2770

Cuttings like those from 2770 feet. - - - - - - - - - - - - - - - - 2772

These well records show that in western Bell County underneath the Cretaceous which is from 800 to 1100 feet thick, varied conditions are met with. In some of the wells Paleozoic, probably Pennsylvanian, is reached (see Epperson, Kolls, and Slayden wells, pp. 13-14, and Swope, p. 16). Elsewhere the drill passes at once from the Cretaceous into rocks of unknown age, possibly pre-Cambrian. The lack of uniformity from well to well indicates a folded and eroded pre-Cretaceous surface, and the degree of alteration of the rocks suggest that the folding was intense and mountain making in character.

In eastern Bell County no wells have been drilled through the Cretaceous. For correlation within the Cretaceous the most useful well in this part of the county is the R. R. Penn Hardy 1, located on the Sanchez Survey three miles east of Rogers. Samples were received from this well from the surface to 2988 feet. The Buda is recognized at 1348; the Del Rio at 1396; the Georgetown at 1453 and the Edwards at 1609 feet. The well terminates in the Glen Rose.