# GEOLOGY OF THE STONEWALL QUADRANGLE, GILLESPIE AND KENDALL COUNTIES, TEXAS

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Llano region and is in the marginal portion of the Edwards Plateau where 5-20A and 5-20B. much of the plateau surface has been destroyed by erosion. Along the southern edge, lobes of the Edwards Plateau are present which southward coalesce to form a continuous narrow east-west plateau belt part of which is just south of the Stonewall quadrangle. Most of the quadrangle is within the gently undulating, broad Pedernales River

The geology of the Stonewall quadrangle is shown on a planimetric map, the Morgan Creek is surrounded by and the only topographic map available Hensell sand. is the reconnaissance 30-minute Fred-

portion of the Folia I can be done at the middle containing silicified Billingsella.

Fossils noted, but not concered, in the next two outcrops to the west are Lytospira and Ophileta. Pedernales River drainage basin and is Above this is considerable mediummostly drained by Three Mile Creek bedded limestone and dolomite foland South Grape Creek and its tribulowed by stromatolitic bioherms having Dolomitic facies.—Two outcrops of tary Dry Creek. Cave Creek enters the inter-areas of bedded limestone and the dolomitic facies of the Gorman Pedernales River within the quadrangle dolomite. The contact with the over- formation occupy a synclinal area in and other important branches drain a lying Pedernales dolomite is irregular, the northwestern portion of the quadconsiderable area in the vicinity of the caused by lateral gradation from lime- rangle. Cretaceous overlap masks some to be about 270 feet along the Blanco river. A small area in the southeastern stone to dolomite. Shale is actually of the details but the surrounding outcorner of the quadrangle is drained by a minor constituent of the Point Peak crops of the Staendebach in the Stone- tional beds are present in the subbranches of Blanco River. shale within the quadrangle. No fossil wall quadrangle and the Gold quad- surface in the southern part of the The Stonewall quadrangle is high on collections were made from the Point rangle to the north show that the Gor- quadrangle caused by lateral gradation the southern side of the Llano uplift, Peak and much of it appears to be man must be limited in extent and of clastic sediments of the Hensell to and rocks of Cambrian and Ordovician relatively unfossiliferous.

Two samples were described by northeast-southwest direction. The Gorfrom the Llano uplift.

Ouachita orogeny (Barnes, 1948). The the unit along the river at Blumenthal. Gold quadrangle sand is present in the trarily placed at the bottom of the Cretaceous rocks are essentially hori- One sample from a bed 20 inches thick dolomite. No fossils were found. lowest bench-forming bed, be it limezontal, dipping eastward about 10 feet is a rather pleasing combination of

graphic, structural, economic, and geo- purplish tint. Fossil fragments are physical problems of the region cannot abundant and small cavities are numerbe given in the space available. Refer- ous. The rock takes a rather good but ences cited below deal with some of somewhat uneven polish. A thin section —The Cretaceous rocks dip eastof similar publications, an index to amount of angular quartz up to 0.1 mm into account it is estimated that the map to locate other quadrangles men- calcite in particles from extremely between Pedernales River and the base of the contact between observed points tioned in the present text.

## GEOLOGIC FORMATIONS PALEOZOIC ROCKS

Riley Formation The Cap Mountain limestone outcrop in In thin section the rock is seen to be It is likely that other units of the Ordothe northwestern portion of the quad- about one-third calcite and two-thirds vician are overlapped in the subsurface. terials. Along South Grape Creek 77 rangle is in the continuation of a fault dolomite containing a small amount of The Hensell varies widely in color and feet of Glen Rose beds were measured. in which the Cap Mountain limestone mm in size. The calcite is mostly in sorted, and ranges from coarse matecontains much coarse clastic quartz and grains between 1 and 3 mm in size and rial such as conglomerate through the that in the lower part they are somemicrocline and occasional granite the dolomite averages about 1/3 mm in various sand sizes to silt and clay. what more highly fossiliferous. pebbles. Southward the clastic material size.

stratigraphic level. corneous brachiopods.

arily enlarged, producing crystal faces some outcrops by fossils. which glitter in the sun. Morgan Creek limestone member.— composed of brownish fragments in a The Hensell sand in Gillespie County The Morgan Creek limestone crops out groundmass of fritted material deep is composed predominantly of two

both in the northwest and northeast reddish brown in color was collected color facies, a lower one predominantly portions of the quadrangle. The north- by Barnes, Dawson, and Parkinson red and an upper one predominantly western outcrop is much the larger and (1947, p. 153). The dolomite is porous gray. The dividing line between these rests on the Welge sandstone described and takes a rather poor polish. In facies roughly parallels the base of the above. The exposure includes all of the thin section dolomite grains up to 2 mm Glen Rose limestone and therefore rises beds up to the Eoorthis zone and an are present, and the section contains stratigraphically toward the Llano upunknown thickness of the Billingsella- some angular quartz in grains up to lift, being controlled in part by the 28 feet of Comanche Peak limestone, bearing beds above. The top of the 1/15 mm in size. Fossils are not plentiproximity of the ancient shore. A third and about 15 feet of Walnut clay. The Morgan Creek is covered by Hensell ful in the Pedernales dolomite, and facies is present in the Stonewall quadsand. The lower part of the Morgan the only collections made are trilobites rangle in the basal portion of the Hen-Creek as elsewhere in the Llano uplift and brachiopods from localities 3-8A sell in which the beds are mostly yelis of a reddish color, thickly bedded, and 6-13A. and highly sandy at the base. Upward San Saba limestone member.—In the middle facies wedges out eastward. the rank of members seems logical. the limestone is somewhat thinner southwestern part of the Llano uplift The Hensell is so slightly indurated However, instead of introducing a new are trilobites and Billingsella in many are present in the Stonewall quadrangle. neath the Glen Rose limestone. The rank, especially since the U. S. Geo- the Blanco road a thickness of 43 feet Luckenbach-Blanco road.

Section Along South Grape Creek, 2.25 Miles South-Southwest of Blumenthal Thickness in feet Feet above

Shingle Hills formation: 145 feet measured Glen Rose limestone member: 77 feet 1. Limestone-coarse grained, one bed, grayish orange, resistant, very hard, and composed o ground-up oyster shell. This bed essentiall forms the top of a heavily vegetated hill. 2. Clay-poorly exposed. . Limestone—coarse grained aggregate of fossil fragments, hard, slightly sandy, yellowish gray, and produces a flat which is one of the or benches in the line of section. L. Clay—poorly exposed. Limestone-silty, argillaceous, nodular, forms a small bench, and is burrowed. . Clay—poorly exposed.
7. Limestone—silty, argillaceous, nodular, forms a small bench, and is burrowed. The upper surface contains Lithodomus? borings. 8. Clay—poorly exposed.
9. Limestone—silty, argillaceous, nodular, forms a small bench, and is burrowed with burrows weathering out to produce a honeycombed 10. Clay—poorly exposed, except for a platy lime-

stone weathering out at about 109 feet which is about 2 inches thick. The limestone con-

tains fossils, weathering out on top surface

consisting mostly of gastropods up to 2.5 inches long and only 0.1 inch in diameter at

the base. Casts of pelecypods and gastropod

11. Limestone-silty, argillaceous, nodular, con-

tains some casts of fossils, and forms a bench.

12. Clay—poorly exposed.

be from within interval.

weathered out on flat at foot of interval may

lar to the Cap Mountain limestone. Threadgill member of the Tanyard for- the greatest density of population within However, a collection of fossils from mation. locality 2-20A contains, according to ORDOVICIAN SYSTEM (LOWER Dr. Josiah Bridge, a conaspid zone ORDOVICIAN-ELLENBURGER GROUP) indurated, exposed sections normally fauna, identifying the outcrop as Morgan Creek limestone. Another outcrop

ericksburg quadrangle. Elevations rangof Point Peak shale are numerous ber appears to be present. The dolosils collected from the Hensell and Point Peak shale member .- Outcrops ing between 1,423 and 1,969 feet were ing between 1,423 and 1,969 feet were northeast of Stonewall, north of Blumite coarsens a little toward the Gormite coarsens and the Gormite coarsens a little toward the Gormite coarsens and the Gormite coarse but neither the highest nor the lowest in the vicinity of Blumenthal are locality 6-1B north of the Cemeterio elevation was reached. However, it is mostly of stromatolitic limestone in the de Nuestra Señora de Guadalupe have estimated that the relief within the quadrangle is about 600 feet, ranging between about 1,400 and 2,000 feet in portion of the Point Peak is a shale portion of the Point Peak is a shale portion of the Point Peak is a shale reserved. In the deep identified by Dr. Josiah Bridge as belonging to the Symphysurina zone. Fossils noted, but not collected, in the

greenish gray with stylolite lines of Broader discussions of the strati- dull purple and areas having a faint minute to 3 mm in size.

2 feet thick and is several feet above The Hensell sand in the vicinity of terrace of any one bed gradually the first sample described. It is pre- Pedernales River rests on all units of merges with the general slope as it dominantly brownish red with ran- the Cambrian except the Hickory sand- dies out it is easy to raise or lower domly distributed minute white areas stone and on units of the Ordovician inand ivory-colored areas, none of which cluding the Staendebach member of The Glen Rose limestone consists of are more than a quarter of an inch in the Tanyard formation and the dolo-Cap Mountain limestone member.— size. The rock takes a brilliant polish. mitic facies of the Gorman formation. sand or, more correctly stated, beds composition, is in general very poorly

Outcrops of conglomerate, Kshh(c), lessens, indicating either an increasing Pedernales dolomite member.—Out- are well indurated basal conglomerate limestone and identified by Dr. Ralph distance from the source or a higher crops of Pedernales dolomite are widely outcropping mostly in proximity to Imlay are as follows: scattered along the northern edge of Paleozoic rock outcrops. The outcrops Lion Mountain sandstone member .- the quadrangle. They are most plenti- of the conglomerate within Stonewall One Lion Mountain sandstone outcrop ful east of Stonewall where coarse- quadrangle are small and mostly sit-1,200 feet long is mapped in the north- grained and fine-grained facies have uated in the vicinity of Stonewall and western part of the quadrangle. The been mapped separately. Fine-grained Blumenthal with one isolated outcrop member is poorly exposed and is identi- dolomite is in contact with the under- on South Grape Creek. Conglomerate fied by an occasional iron nodule from lying Point Peak shale except in the present elsewhere in the Hensell is not the weathering of glauconite and some vicinity of Blumenthal where coarse- indurated and is not mapped separately. lenses of cross-bedded trilobite coquina grained dolomite is resting directly on One of these conglomerates in a highscattered through the soil on a sandy stromatolites of the Point Peak shale. way cut about one-quarter mile east of flat. A few limestone beds in situ in the About 1.5 miles east of Stonewall along South Grape Creek is composed mostly lower part of the unit mostly contain a north branch of Pedernales River a of Cambrian limestone, Ordovician (?) small area of the upper fine-grained chert, and granite and underlies a dolomite of the Pedernales appears to coarse-grained gray sandstone. be collapsed, being partly in contact Angular quartz granules and solu-Welge sandstone member. — The with coarse-grained dolomite and partly tion-sculptured microcline are common Welge sandstone rests upon the Lion in contact with San Saba limestone. in the lower part of the Hensell espe-Mountain sandstone and does not crop Many of the Pedernales dolomite out- cially in the vicinity of Pedernales out elsewhere in the quadrangle. The crops are isolated and have been identi- River. The upper portion of the Hensandstone is brown, nonglauconitic, and fied by lithology, relative position with sell sand is finer grained and contains many of the quartz grains are second- reference to identified outcrops, and in abundant silt and clay, and in the vicinity of the base of the Glen Rose

A sample of a brecciated dolomite some of the beds are calcareous.

beds throughout the sequence. A few The San Saba limestone grades laterally more siliceous and coarser grained of the Billingsella in the upper part of into coarse-grained Pedernales dolomite lower portions support a growth of the sequence are silicified. Fossils col- and is therefore a calcitic facies of the broad-leaf oak which on aerial photolected are brachiopods from localities dolomite. The San Saba limestone outgraphs shows as a featureless expanse of The Morgan Creek limestone outcrop part of the quadrangle. They are un-

Staendebach member .- Most of the man contact. Fossils collected from follows:

Gorman Formation

Shingle Hills Formation

probably forms a basin elongated in a carbonate beds of the Glen Rose away by Dr. Ralph Imlay are as follows: photographs. Additional points of coninliers surrounded by Cretaceous rocks. Barnes, Dawson, and Parkinson (1947, man is composed of microgranular The contact between the Glen Rose The faulting present accompanied the pp. 134-135) from the top portion of dolomite, and to the northwest on the limestone and the Hensell sand is arbi-

Hensell sand member (Barnes, 1948). In mapping, however, it is almost im-

these problems. This publication on the shows the rock to be about equally ward in the Stonewall quadrangle bench-forming bed ceases to exist, so Stonewall quadrangle is one of a series dolomite and calcite with a small about 10 feet per mile. Taking the dip the basal boundary of the Glen Rose which is shown on the opposite page. in size. The dolomite is mostly in Hensell sand outcrop ranges between is gradually rounded off from the base The reader is referred to this index rhombs about 1/3 mm in size and the about 100 and 130 feet in thickness of one to the base of the next. Most of the Glen Rose limestone. Additional was traced on aerial photographs with The other sample is from a bed about beds are present in the subsurface. the aid of a stereoscope, and since the

Fossils collected from the Glen Rose

Locality 6-15A, about 1.7 miles airline southeast of Luckenbachnomya jurafacies Cragin Panope? knowltoni (Hill erpula paluxiensis Hill nallaster cf. texanus (Roen Porocystis globularis (Giebel ryphaea mucronata Gabb uspidaria sp. Anomia sp. Aporrhais? sp. Arctica medialis (Conrad) rigonia sp.

rotocardia sp. ecten (Chlamys) stantoni Hill Cardium? sp. ryphaea wardi Hill and Vaugha natia? praegrandis (Roemer seudonerinea? sp. 'ylostoma cf. regina (Cragin)

apezium? sp. Locality 6-17A, about 3 miles air bach and from near the top of the Glen Rose limestone—

Stonewall quadrangle consists of about lowish gray to greenish gray. The red tion that these units should have about

the quadrangle. Since the Hensell sand is so slightly quadrangle and a few are in the north-

> Locality 3-15A, about 1 mile southsoutheast of Stonewall-Ostrea sp.

Creek about 1.8 miles southwest Panope? cf. knowltoni (Hill) Pecten (Chlamys) stantoni Hill

Glen Rose limestone member.-The

stone, dolomite, or calcareous sandstone. In following the contact, as bench-forming beds come or go, the contact is lowered or raised to the base of the next bench-forming bed.

Aporrhais? sp.

STRATIGRAPHIC SECTION

Thickness in feet Feet above

13. Limestone—argillaceous, silty, nodular, fos-siliferous and forms a bench. Fossils are

pelecypod and gastropod casts and Porocystis

aroughout most of interval with an inch

thick platy limestone bed at base covered by

several genera of small pelecypods which

Limestone-argillaceous, nodular, fossil casts

Clay-highly calcareous, silty, and contains

bundant pelecypod and gastropod casts, a

Limestone-sandy in lower portion, silty,

argillaceous, and nodular. In lower part

nighly burrowed with the burrows being

orange. In upper part a few recessive zones

are somewhat more argillaceous than the in-

bundant, gastropod casts are common, and

in the upper part of interval Porocystis up to

inch in diameter are present. The lime-

which can be traced for a long distance.

Hensell sand member: 68 feet measured

few thin pebbly bands. The bottom foot is

cemented by calcium carbonate. A bed from

51.5 to 62 feet is somewhat cross-bedded, in-

ypods and gastropods, and shows some evi-

s in smaller pieces and is less abundant that

lower in section. The sand grains are angular

o subrounded and a few are well rounded

19. Clay-highly sandy and weathered yellowish

lence of burrows. Microcline is present but

tone in this interval forms a distinct bench

18. Sand—coarse to fine grained and contains a 14

ew oysters, worm tubes, and Porocystis.

weather in relief on the surface.

common, and forms a bench.

Clay-poorly exposed.

logical Survey excludes the Kiamichi was determined for the combined Wal-

clay from the Fredericksburg group nut and Comanche Peak. Since the (Wilmarth, 1938, p. 776). thickness of the Walnut near by within Walnut clay.—A thickness of 15 feet the quadrangle is 15 feet, the thickness of Walnut clay was measured along the Luckenbach-Blanco road, and this is about 28 feet. Near Cain City in the Luckenbach-Blanco road, and this adjacent guadrangle to the west its crops are situated in the northeastern woodland. Much of the woodland has of Walnut clay was measured along of the Comanche Peak limestone here about 1 mile downstream from Stone wall is massive and lithologically simiwall is massive and lithologically simiabout 1 mile downstream from Stone
is perhaps a little thicker than its adjacent quadrangle to the west its probably covered much of the outcrop thickness is 29 feet. The thickness of the Hensell sand. The high average within the Stonewall quad-rangle. Along the Luckenbach-Blanco the Comanche Peak within the quadrangie. Along the Luckenbach-Blanco road the Walnut clay rests on a poorly rangle is probably, therefore, near 28 robbles and floor materials in highway construction since they exposed limestone having a rusty upper feet. surface, and similar limestone is present The Comanche Peak limestone grades are not more than a few feet thick. In in the quadrangles to the west and downward into the Walnut clay and in the Edwards, limestone from the Comanche stone and from some levels in the Edwards, limestone from the Comanche stone and from some of the units in the Stonewall quadrangle, however, one the Stonewall quadrangle, however, one the Stonewall quadrangle, however, one north. A piece of limestone seen in upward into the Edwards limestone.

Peak, reworked siliceous materials from the Paleozoic. Much of the outcropthe Stonewall quadrangle, however, one north. A piece of finitesione section on Three Mile Creek, about 40 the vicinity is full of Lithodomus? The upper boundary is arbitrarily the Hensell sand, and an occasional the Paleozoic. Much of the outcropping Paleozoic rock is hard enough for about 1 mile northeast of Stonewall believed to be the uppermost beds of the Morgan Creek is surrounded by

Staendevoch member. Nost of the outcrops of the Staendebach member are in the northwestern portion of the bearing limestone. The Comanche Peak of the same bed. Farther east in bearing limestone. The Comanche Peak of the same bed. Farther east in bearing limestone. The Comanche Peak of the same bed. Farther east in bearing limestone. The Comanche Peak of the same bed. Farther east in bearing limestone. The Comanche Peak of the same bed. Farther east in bearing limestone. The Comanche Peak of the same bed. Farther east in bearing limestone. The Comanche Peak of the same bed. Farther east in bearing limestone. The high gravel.—Sand and gravel.—Sand gr Blanco County the top limestone of limestone contains considerable argilsupports a clumpy vegetation, live oak

Sand and gravel.—Sand and gravel central portion. Only the mostly cherty, the Hensell sand are not common but the Glen Rose is commonly bored. laceous material especially in its basal mottes being common.

contact is placed at the point that the rowed and the lower part is nodular. contact is placed at the point that the calcareous content becomes sufficiently high to cause the rock to have some resistance to weathering. Within the rowed and the lower part is nodular. The top portion is well bedded but being soft is infrequently exposed.

The top portion is well bedded but being soft is infrequently exposed.

The Comanche Peak limestone is drainages in the area but are insignificant deposits. Local beds within the drainages in the area but are insignificant deposits. Local beds within the drainages in the area but are insignificant deposits. resistance to weathering. Within the The Comanche Peak limestone is drainages in the area but are insignifi-Stonewall quadrangle the Walnut bench softer than the overlying Edwards limebecomes wide enough to map, and the stone and has eroded into a steep alluvium is composed of sand and silt of the sand beds contain argillaceous Walnut is shown on the map by a slope which is characteristic of its outsold color line only in the western third of the quadrangle. The Walnut clay of the quadrangle. The Walnut clay are a bank which is trained by the common of the quadrangle on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the quadrangle. On aerial photographs the Comanche Peak limestone on north clones is characteristic of its outsold color line only in the western third of the property of the prope forms a bench which is typically bar-ren of trees but which is still not wide terized by a distinctive black band, enough to influence noticeably the cul- caused by a thick growth of vegetation dominated by a narrow-leaf oak, Most of the fossil collections made "Quercus texana Sargent (Texas oak)," Cambrian and Ordovician rocks are able for the production of crushed from the Walnut clay also contain fos- listed by Cuyler (1931) as being the exposed along Pedernales River in the rock. sils from the basal portion of the over- dominant tree on the Walnut and northern part of the quadrangle, and

lying Comanche Peak limestone, since Comanche Peak. Locality 3-12A, about 6.4 miles airline south-southeast of Stone-Lunatia? praegrandis (Roemer)

> were traced under the stereoscope, and complicated. vegetational banding. The Comanche Peak limestone is rocks could, however, account for at is the Hensell sand. fossiliferous especially in its basal por- least a portion of the anomalous mass. In much of the area in the vicinity tion, and indications of fossils are

socardia sp. Metengonoceras cf. ambiguum Exogyra texana var. weath ensis Cragin ryphaea mucronata Gabb clay collections. Holectypus planatus Roemer Locality 3-17A, about 4.3 miles air- limestone is about 160 feet thick along line south by a little east of the Luckenbach-Blanco road, and per-

Pholadomya sancti-sabae Brachydontes pedernalis Holectypus cf. planatus Roemer

ylostoma cf. regina (Cragin)

Turritella sp. Lunatia? pedernalis (Roemer)

rapezium texana (Roemer)

Tapes cf. aldamense (Böse)

Tapes cf. guadalupe Böse

Pholadomya sancti-sabae

Cyprimeria texana (Roemer

Arctica sp.
Pecten (Neithea) occidentalis

Protocardia sp.

Trigonia sp.

Cucullaea sp.

Tapes cf. whitei Böse

Linearia? irradians (Roemer)

Nerinea cf. incisa Giebel

Trigonia sp. Exogyra texana Roemer yphaea mucronata Gabl Enallaster texanus (Roemer) Locality 6-5A, about 4.3 miles airline southeast of Luckenbach ryphaea mucronata Gabb strea (Lopha) sp. Iolectypus planatus Roemer ocality 6-5B, about 4.5 miles airaprinula crassifibra (Roemer) Tylostoma cf. regina (Cragin) porrhais? subfusiformis Nerinea cf. incisa Giebe rotocardia multistriata S

Tapes cf. whitei Böse lapes cf. guadalupe Böse Tapes cf. aldamense Böse holadomya sancti-sabae Cyprimeria texana (Roemer) Trigonia sp. Isocardia sp. Modiola concentrice-costellata

Brachydontes pedernali Exogyra texana Roemer ryphaea mucronata Gab nallaster texanus (Roemer rochotiara texana (Roemer Holectypus planatus Roemer Holectypus engerrandi Lambert Locality 6–10A, about 3.5 miles southeast of Luckenbach-

gray. 20. Sandstone—medium grained, argillaceous, re-

21. Clay-silty, weathered to yellowish orange,

and with oysters in clumps at the base of

grained lenses, highly argillaceous, cross-

pedded, and contains pebbles up to an inch

in diameter of locally derived, slightly finer

are angular and are mostly quartz and some

to medium grained lenses, highly argillaceous,

highly cross-bedded, very poorly sorted, and

contains a few pebbles in some beds up to

ter inch in size are common. Some lenses

are near clay in composition and are of a

grayish green color-a few balls of this ma

terial are contorted and are present in the very coarse grained sand. Masses of the

ner grained contemporaneous sediments are

White specks of kaolin? present are prob ably weathered plagioclase feldspar. The

24. Sand-mostly fine to medium grained, highly argillaceous, and pale olive with some of the

are angular and are mostly quartz, some

nicrocline, and a very small amount of mica.

regular masses on the surface of the outcrop

sand grains are mostly angular.

throughout the interval.

grained, argillaceous sediments. The grains

23. Sand—mostly very coarse grained, some fine

22. Sand—medium grained, some coarse and fine 16

are cemented by calcium carbonate.

sistant, and the poorly sorted angular grains

deposits within the quadrangle are probably stream deposited, but much of

The Walnut clay grades upward into portion. Some of the Comanche Peak

Alluvium.—Deposits of alluvium are

these rocks continue southward bethe fossils from both units weather In mapping the Comanche Peak lime- neath the Cretaceous. No well data free and intermingle. Fossils collected stone, points at which its boundaries were obtained within the quadrangle, A ground-water survey of Gillespie from the Walnut clay and identified cross roads were placed on aerial but it is unlikely that rocks younger County was made by Shield (1937). Of tact were mapped at many places be- brian are present beneath the Creta- wall quadrangle, 8 are probably in the tween roads and on all outliers. On ceous. The outcropping Paleozoic rocks Hensell sand outcrop area, and the portions of the photographs having are faulted, and their pattern beneath other 2 are probably in the Glen Rose

> stereoscopic coverage the boundaries the Cretaceous probably is equally outcrop area; however, these wells probwhere stereoscopic coverage was lacking 
> The information about the pre- Some of the wells penetrate the Henthe boundaries could still be very Cambrian rocks upon which the Paleo- sell and enter rocks of Paleozoic age. closely approximated by following the zoic rocks lie is limited to some gravity One such in the vicinity of Blumendata. An east-west-trending gravity thal reported to be obtaining water No section of the Comanche Peak ridge, reaching a maximum on the Cain from limestone may be obtaining water limestone within the quadrangle is City quadrangle to the west, dominates from near the horizon of the Welge described; however, sections which are the gravity picture within the quad- and Lion Mountain sandstones. probably similar have been measured in rangle. The values of gravity within the The wells range from 38 to 325 feet he Cain City quadrangle to the west quadrangle are considerably higher than in depth, and in 1936 the water level and the Albert quadrangle to the east. in quadrangles to the north. Large grav- ranged from 25 to 178 feet below the In the eastern part of the quadrangle ity maxima in the area of outcropping surface. The total solids range between and first noted along the Luckenbach- pre-Cambrian rocks of the Llano uplift 366 and 2,343 parts per million with Blanco road is a layer of caprinulids are associated with Packsaddle schist half of the wells above a thousand which in the section measured in the (Romberg and Barnes, 1944, and subse- parts per million. The main easily avail-Albert quadrangle is 5 feet thick. quent unpublished data). Basic intrusive able source of ground water in the area

> abundant throughout much of the rest MINERAL RESOURCES the sandstones of the Cambrian should of it. Collections were not made from the Comanche Peak limestone, but, as The mineral resources of the quad-dolomite is exposed, for example, the explained above, some fossils from it rangle are limited to nonmetallic sub- depth to the Welge and Lion Mountain probably are included with the Walnut stances and water. Outside of the soils sandstones should range from about 300 Edwards limestone. — The Edwards sources are construction materials. the Point Peak shale and Morgan Creek

haps as much as 20 feet additional Edwards is present along the ridge to the north. The base of the Edwards is zoic age outcropping within the quadplaced at the base of the lowest lime-stone which contains chert. The Ed-Holectypus cf. planatus Roemer

Locality 6-4A, about 5 miles airline

wards limestone in the Stonewall quadthe river the outcrops are in flat areas high as the Cap Mountain limestone in south by a little west of Stonesouth by a little west of Stonetypes including limestone, dolomite, and chert. The limestone and dolomite vary

ries. Barnes, Dawson, and Parkinson (1947, pp. 134–135 and 153–154) have in some areas. The Hickory sandstone widely in composition, texture, thickdescribed some of the rocks in the is an aquifer at many places in central ness of beds and hardness, and the vicinity of Blumenthal. Two samples Texas and from its character in an expression of the variation is very were collected, one from a massive outcrop in the Gold quadrangle to the well shown on aerial photographs by stromatolitic limestone and another north should be water bearing in this vegetational banding. The outcrop of from a somewhat dolomitic inter-bed. part of the Llano uplift. the Edwards has an average density of The rock takes a fair to brilliant vegetation greater than that of the polish depending on the amount of SELECTED REFERENCES Glen Rose limestone, and in addition dolomite present, but the deposit is the vegetation shows better segregation subject to overflow, making it unsuited BARNES, V. E. (1948) Ouachita facies in Enallaster cf. obliquatus Clark the vegetation shows better segregation line southeast of Luckenbach— the Comanche Peak limestone, the Ed- lected from a coarse-grained dolomite wards limestone flattens out into gently overlying the stromatolitic limestone. KINSON, G. A. (1947) Building stone sloping surfaces. The hard limestone The rock is not especially pleasing in of central Texas: Univ. Texas Pub. beds weather slowly and have only a color and is mostly suited for producting crushed stone. This deposit also CLOUD, P. E., JR. (1947) Stratigraphy thin soil covering or are bare and nearly void of vegetation. The softer is along Pedernales River and subject of the Upper Cambrian, Llano uplift, Texas: Bull. Geol. Soc. Amer., vol beds develop a more adequate soil and to overflow.

are thickly vegetated mostly by a scrub Deposits of San Saba limestone with CLOUD, P. E., JR., and BARNES, V. E. oak locally known as "shinnery." Cuy- massive appearance are situated in the (1948) The Ellenburger group of cenler (1931) identifies it as "Quercus northeastern portion of the quadrangle. tral Texas: Univ. Texas Pub. 4621, fusiformis Sargent (mountain scrub The stone is light colored and attracoak)." In areas that are highly cherty tive, but coring would be necessary to indicator of geologic formations: Bull. the broad-leaf oak is common. determine if the stone is massive Amer. Assoc. Petr. Geol., vol. 15, pp. 67-78. The Edwards surface is mostly rocky enough for the production of saw-blocks. and above some beds is chert-strewn. Limestone beds within the Edwards Some of the chert in the Edwards limestone, at the top of the Comanche limestone is of a quality suitable for Peak limestone, and perhaps within Smoothingiron granite mass, Lla the manufacture of artifacts, and be- the Glen Rose limestone are of about cause it was used extensively by the the proper thickness for ledge-stone for Shield, Elgean (1937) Records of wells, aborigines is mostly referred to as building. Some of the limestone beds

flint. Only the harder beds in the in the Edwards are of a pleasing light Edwards are exposed, and this in con- color, but most of the limestone in junction with the gentle slopes makes the Comanche Peak is yellowish gray Comanche Peak limestone. - The the measuring of sections difficult. and somewhat drab. thickness of the Comanche Peak lime- No fossil collections were made from Road material.—Some of the secondstone was not measured within the the Edwards within the Stonewall quad- ary roads within the quadrangle have vol. 19, pp. 1508-1537.

Thickness in feet Feet above

shale from the Point Peak shale. The material produced from one pit marginal to an outcrop of the Staendebach member of the Tanyard formation con-

cobbles, and finer materials including cause freeze damage. Better materials caliche. Much of the material is limedeposits within the quadrangle are situated along Pedernales River be-

too much caliche to be used without first being screened and washed. Some SUBSURFACE GEOLOGY of the Paleozoic rocks and some zones within the Edwards limestone are suit-

ably penetrate to the Hensell sand.

of the Pedernales River the depth to not be excessive. Where Pedernales the most important nonmetallic re- to 550 feet. Depths to these sands in limestone outcrops will be less. The quality of these sands as an aquifer is unknown, but the Welge at least should contain some water. The Hickory sand-

ROMBERG, FREDERICK, and BARNES, V. E. (1944) Correlation of gravity observations with the geology of the County, Texas: Geophysics, vol. 9 drillers' logs, and water analyses i

THOMPSON, S. A. (1935) Fredericks

burg group of Lower Cretaceous with

bedded, medium to light gray, and outcrops of the San Saba limestone are that it readily breaks down and forms name, Fredericksburg could easily be Stonewall quadrangle. A short distance rangle; however, some fossiliferous been surfaced by calcareous materials WILMARTH, M. G. (1938) Lexicon of where glauconitic, greenish gray. Fossils are trilohites and Billingsella in many are trilohites and Billingsella in many are present in the Stonewall quadrangle and Billingsella in many are present in the Stonewall quadrangle and Billingsella in many are present in the Stonewall quadrangle and Billingsella in many are present in the Stonewall quadrangle and the United States, and Billingsella in many are present in the Stonewall quadrangle and the United States, and Billingsella in many are present in the Stonewall quadrangle and the United States, and Billingsella in many are present in the Stonewall quadrangle and the United States, from colluvial deposits, and calcareous 1244 pp.

Thickness in feet Feet above 25. Sand-very coarse grained, in part con-12 142 3 - 15 glomeratic, highly argillaceous, cross-bedded, and poorly sorted. The sand grains are of quartz, considerable microcline, and sma lin? specks that probably originally wer inches in diameter, and those consisting quartz and quartzite are well rounded, as other irregular pebbles are composed of cal pearance of caliche. Microcline fragments u 26. Clay—highly sandy, gravish green, and with 3 145 0 - 3

with caliche capping the interval as the clay were serving as a base for the deposition of calcium carbonate. The amount of insoluble residue, after hydrochloric acid treatment, for a portion

o 34 inch in length are common.

caliche stalactites forming on face of outcrop

Feet above base

Base from U. S. Department of Agriculture, Agricultural Adjustment Administration, Geology by Virgil E. Barnes 1939-1947 aerial photographs flown by Kargl Aerial Surveys, Ltd., 1938. Assisted by Louis Dixon Cartography by Ann Connor and J. W. Macon 5000 2500 0 Datum is mean sea level GILLESPIE COUNTY SPRING LIVE OAK

TEXAS STONEWALL QUADRANGLE

**EXPLANATION** 

SEDIMENTARY ROCK

Qol

Alluvium

Qhg

High gravel

(gravel and sand in terraces along streams and as col-

UNCONFORMITY

Ked

Edwards limestone

Comanche Peak limestone

(marl and marly limestone ranging from nodular at bas

\_\_\_Kwo-\_\_

Walnut clay

(calcareous clay grading upward into the marl of the

overlying member; contains a profusion of Exogyra

Kshgr

(alternating beds of limestone, marl, and clay, some of which are highly arenaceous)

Hensell sand member

(sand, silt, and clay, predominantly red and gray, with conglomerate, Kshh(c), at base)

UNCONFORMITY

Qg(mg)

(dolomitic facies, thickly to thinly bedded, predominant) icrogranular to fine grained

Ots(mg)

Staendebach member

DISCONFORMITY

**EWP(C)** 

Pedernales dolomite member

inantly noncherty, massive, coarse grained facies,

€ws

San Saba limestone member

(sublithographic, thickly bedded, light gray)

Point Peak shale member

Morgan Creek limestone member

Welge sandstone member

DISCONFORMITY

€rl

Lion Mountain sandstone membe

ÆK6

Cap Mountain limestone member

(granular, glauconitic, gray to brown; grades to cal-

careous sandstone at base

(U, upthrown side; D, downthrown side,

Observed and inferred contact

£ 1 2

Laterally gradational contact

Strike and dip of beds

Prevailing dip of beds

+ 5-208

Locality of fossil collection

Fossils noted but not collected

(earth-dammed pond for water storage)

× 1499

Alidade elevation of gravity station

Line of described section

(highly glauconitic sandstone with limestone beds and lenses more abundant toward base, bench forming)

Caranular, glauconitic, thinly to thickly bedded, gray in

(thickly bedded to fissile, argillaceous, in part magn

(showing sparingly to abundantly cherty, thinly thickly bedded, fine grained facies, Ewp(f), and predor

itic facies, thickly to thinly bedded, cherty, fine

(gravel, sand, and silt along stream bottoms

GEOLOGIC MAP OF THE STONEWALL QUADRANGLE, GILLESPIE AND KENDALL COUNTIES, TEXAS

INDEX MAP