DEPARTMENT OF THE INTERIOR

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STRATIGRAPHIC SECTIONS OF LOWER CAMBRIAN AND UPPER PROTEROZOIC ROCKS IN NYE, LANDER, AND LINCOLN COUNTIES, NEVADA, AND SONORA, MEXICO

By

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INTRODUCTION

The enclosed stratigraphic sections are the detailed data on which several discussions of Lower Cambrian and upper Proterozoic rocks in Nevada and Mexico are based. Correlations in Nye and Lander Counties, Nevada, are described by Stewart and Palmer (1967) and Stewart and McKee (1977, p. 5-10, fig. 5), in Lincoln County, Nevada, by Stewart (1974), and in Mexico by Stewart and others (1984). These publications give graphic columns of the stratigraphic sections and discussions of the regional significance of the stratigraphy.

The stratigraphic sections were measured using a Jacobs staff and Abney hand level. The described colors are those recommended by the National Research Council (Goddard and others, 1948). Description of stratification largely follows that recommended by McKee and Weir (1983)

Note that thickness of units in the sections in Nevada are given in feet whereas thicknesses in the section from Sonora, Mexico, are given in meters.

The Cerro Rajon section in Sonora, Mexico was measured by Stewart and McMenamin of the USGS and J. M. Morales-Ramirez of the Consejo de Recursos Minerales of Mexico as part of the program of cooperative research being conducted by the two governments.

STRATIGRAPHIC SECTIONS

NEVADA - NYE COUNTY

SUMMIT CANYON section, measured starting at Summit Creek on east side of Toiyabe Range and ending 1-1/2 mi to west on conspicuous east-west-trending ridge about half a mile south of Summit Creek. Approximately along common boundary between secs. 21 and 28, and secs. 22 and 27, T. 13 N., R. 42 E. (all sections unsurveyed).

(measured by J. H. Stewart, August, 1968)

Palmetto Formation as mapped by Ferguson and Cathcart (1954). See Stewart and McKee (1977, fig. 5) for correlation:

	Feet
18. Limestone (50 percent) and phyllite (50 percent). Limestone, medium dark gray (N4), very finely crystalline, laminated. Phyllite, medium light gray (N6), very fine textured. Unit weathers to form slopes in places, cliffs in other places. Probably at least 500 ft (estimate) exposed ----------	500+
17. Phyllite, medium dark gray (N4), fine textured. Unit cut by several diorite(?) dikes. Thickness is crude estimate. ----------	150(?)
16. Phyllite (70 percent) and quartzitic siltstone (30 percent). Phyllitic, dark greenish gray (5GY4/1) to olive gray (5Y4/1), fine textured quartzitic siltstone, light brownish gray (5YR6/1), brownish gray (5YR4/1), and yellowish gray (5Y8/1), coarse silt, laminated, occurs in one-half inch to six-inch layers. Unit weathers to form slope. Unit several or many hundred feet thick. Unit generally similar to unit 11, although may have more dark-colored phyllite. Unit about 200 to 300 ft thick; probably too badly faulted for precise measurment ---	200-300
Total of incomplete Palmetto Formations as mapped by Ferguson and Cathcart (1954)----------	850
Gold Hill Formation as mapped by Ferguson and Cathcart (1954) (incomplete):	
Carbonate-bearing unit:	
15. Calcite marble, similar to that in unit 12, top 15 ft is medium light gray (N6) and weathers same color. A few thin layers medium gray (N5) phyllite occur interstratified with marble. Unit forms ridge at top of hill ----------	50
Note: Units 13 and 14 are faulted and folded along outcrop and exact thickness is in doubt. At some places along outcrops only one limestone unit is present instead of two as along the line of section. However, the areas that appear to be unfaulted have two limestones, so the sequence as shown in the section is probably correct, although the thickness of units 13 and 14 may be slightly in error	
14. Marble and quartzitic siltstone, possibly some calc-silicate rock. Marble, similar to that in unit 12, probably siltier. Stratification is more gnarly probably due to structural contortion. Quartzitic siltstone, similar to that in unit 13. Possibly same rock that looks like quartzitic siltstone is	

actually calc-silicate hornfels. Marble occurs mostly in lower half of unit, quartzitic siltstone in upper half. Unit weathers to form slope ---------- 48

13. Phyllite (80 percent) and quartzitic siltstone (20 percent). Phyllite, greenish gray (56Y6/1) to light olive gray (5Y6/1), fine textured, micaceous. Quartzitic siltstone, light gray (N7), probably coarse silt, occurs as thin to very thin layers. Unit weathers to form slope. Unit is faulted. Thickness measured along line of section was 90 ft, but true thickness may be about 150 to 200. This latter estimate made about half way down the south wall of Summit Canyon where an apparently unfaulted section occurs ---------- 150±

12. Calcite marble, very pale orange (10YR8/1), minor light gray (N7), weathering same colors, coarsely crystalline, appears to be evenly laminated, but at least part of lamination could be due to shearing of unit, weathers to form prominent light-colored ledge. Unit from 40 to 55 ft above base is about half marble and half phyllite and quartzitic coarse siltstone. Some of rock in this interval is probably calc-silicate hornfels ---------- 68

Total of carbonate-bearing unit ---------- 316

Upper phyllite and quartzite unit:

11. Phyllite and a lesser amount of quartzite to quartzitic siltstone. Phyllite, light olive gray (5Y5/2) and greenish gray (5GY6/1), fine textured, probably originally fine to coarse silt, micaceous. Quartzite to quartzitic siltstone, yellowish gray (5Y8/1), light brownish gray (5YR6/1) and greenish gray (56Y6/1), very fine grained in places, coarse silt in other places, laminated, occurs in 1/4-inch to 10-inch layers interstratified with phyllite, very scarce very low angle small-scale cross strata, locally some waviness to laminae suggesting ripple laminae. Unit weathers to form steep slope. Amount of quartzite to quartzitic siltstone estimated as follows: 0 to 275 ft, 40 percent; 275 to 370, 10 percent; 370 to 500, 30 percent; 500 to top, outcrops too poor to estimate, probably less than 30 percent, however. Some thin layers contain coarse to very coarse grains and small granules at about 900 ft above base of unit. Marble layers occur in unit at following positions: 128 to 132 ft, 275 to 287 ft, 398 to 400 ft, and 449 to 451 ft above base of unit ---------- 1,735

10. Quartzite, white (N9), weathering same color, grain size difficult to determine due to recrystallization, but probably very fine grained, laminated to very thin bedded, weathers to form white ledge. Unit contains a 1-ft layer of phyllite about 10 ft above base of unit ---------- 35

9. Phyllite (60 percent) and quartzite (40 percent). Phyllite, greenish gray (5GY6/1) to light olive gray (5Y6/1), weathering same colors, micaceous, size of coarse silt, metasiltstone. Quartzite, yellowish gray (5Y8/1), very fine grained, laminated, occurs in 1/4-inch to 10-inch layers interstratified with phyllite. Unit weathers to form slope. Marble occurs in following positions, 25 to 27 ft, 39 to 41 ft, 70 to 72 ft above base of unit ---------- 215

8. Calcite marble, very pale orange (10YR8/2), weathering same color and rarely light gray (N7), coarasely crystalline, laminated to very thin bedded, weathers to form light-colored band. Unit contains a few thin layers of calc-silicate hornfels. Along Summit Canyon this same unit forms prominent ledge containing prospects and mines ---------- 45

7. Phyllite (75 percent?) and quartzite (25 percent). Phyllite, greenish gray (5GY6/1), medium gray (N5) and rare pale yellowish brown (10YR6/2), weathering some colors, probably metasiltstone, abundant mica. Quartzite, light greenish gray (5GY8/1) to yellowish gray (5Y8/1), very fine grained, silty in places, grades into coarse-grained siltstone, laminated, occurs in laminae to very thin sets interstratified with phyllite. Unit weathers to forms saddle along ridge spur ----- 250

Total of upper phyllite and quartzite unit ---------- 2,280

Quartzite unit:

6. Quartzite and rare (<5 percent) phyllite. Quartzite, yellowish gray (5Y8/1), very light gray (N8) to white (N9), weathering pale yellowish brown (10YR6/2), fine- to medium grained, rare very fine grained parts, scarce coarse to very coarse-grained parts containing granules and small pebbles (as large as 1/2 inch) of quartz in lower half to two-thirds of unit, laminated to thin bedded, appears evenly bedded from distance, common tabular planar very thin sets of low-angle cross-strata, some indistinct very low-angle cross-strata. Phyllite similar to that in unit 1, occurs in 1/2 in to 1 ft layers. Unit weathers to form prominent cliffs. Top 400 ft of unit is generally thinner bedded, finer grained, and contains more phyllite than rest of unit ---------- 1,875

5. Quartzite (73 percent), phyllite (20 percent), and marble (7 percent). Quartzite similar to that in unit 4. Rare parts contain granules and pebbles of quartzite. Phyllite similar to that in unit 1. Marble, yellowish gray (5Y8/1) to light gray (N7), locally grades into silty micaceous marble. Marble constitutes about 50 percent of lower 11 ft of unit and occurs from 35 to 37 ft, 113 to 114 ft, and 138 to 140 ft above base of unit. Unit may be offset locally by small faults. Unit weathers to form slope and is less resistant than overlying or underlying units ---------- 140

4. Quartzite, some parts contain graunles and pebbles, yellowish gray (5Y8/1), weathering very light gray (N8), fine- to medium grained, contains granules and small pebbles (as large as 1/2 inch) of quartz in about 10 percent of unit, laminated to very thin bedded, minor amounts of very thin to thin planar sets of small-scale cross-strata, weathers to form cliff ---------- 128

Total of quartzite unit ---------- 2,143

Lower phyllite and quartzite unit (incomplete):

3. Phyllite similar to that in unit 1. Contact with overlying unit covered ---------- 30+

2. Calcite marble, very light gray (N8) and grayish orange (10YR7/4), weathering same colors and light gray (N7), medium to coarsely crystalline, some laminae to thin beds, weathers to form

prominent light-colored slope. Phyllite occurs from 2 to 8 ft above base of unit. Part of upper third of unit is covered --- 60

1. Phyllite to schist, medium light gray (N6) with moderate yellowish brown (10YR5/4) along fractures, weathers dark yellowish brown (10YR4/2), mostly fine textured micaceous phyllite, some coarse textured schist with porphyroblasts of mica and possible andalusite, in places rock is laminated to very thin bedded, stratification commonly obscured by foliation; weathers to form slope. Many high-angle faults appear to cut rocks to east (down canyon) and sequence below this unit not determinable. Most likely unit is stratigraphically the lowest exposed. Some very fine(?) grained quartzite in top 10 ft ---------- 370+

Total of lower phyllite and quartzite unit (incomplete) ----- 460

Total of Gold Hill Formation as mapped by Ferguson and Cathcart (1954) (incomplete) ---------- 5,199

Base of section at lowest outcrops, about 50 ft above Summit Creek

NEVADA-LANDER COUNTY

CLEAR CREEK section, measured about 1,500 ft up canyon from where creek enters narrow canyon at end of road; east side of Toiyabe Range, NE 1/4 sec. 10, T. 15 N., R. 43 E.

(measured by J. H. Stewart, June 1969)

Top of section at low-angle fault. Rock above is highly contorted limestone similar to that in unit 8. This fault is a relatively minor one within the "blue marble" unit of Means (1962). Excluding unit 7, the "blue marble" in the area may be on the order of 200 ft thick, but the unit is highly lenticular due to structural movements and an exact thickness cannot be determined.

	Feet
Clear Creek sequence of Means (1962):	
Blue marble unit of Means (1962)	
8. Limestone, medium-gray (N5), weathering same to light-gray (N7), finely to mediumly crystalline, laminated to thin-bedded, weathers to form cliff. Some small folds within unit	110+
Total of blue marble unit of Means (1962)	110+
Brown schist unit of Means (1962):	
7. Hornfels and limestone. Hornfels, medium dark-gray (N4), very fine textured, indistinct laminae to thin beds, foliation at high angle to bedding. Limestone, medium-gray (N5), finely to very coarsely crystalline, indistinctly laminated to thin bedded. Limestone occurs in following positions in unit: 0.5 ft, 11 to 16 ft, 45 to 81 ft (sparse hornfels in this interval), 119 to 120 ft and 124 to 127 ft. Unit as a whole weathers to form dark ledgy slope indistinguishable from underlying unit from a distance. Unit looks structurally intact, but much folding in this part of section locally	128+
6. Phyllite, light-olive-gray (5Y6/1), fine textured, foliation at high angle to indistinct bedding, weathers to form steep ledgy slope. Top 30 ft of unit and a few layers elsewhere in unit are closer to a hornfels than a phyllite and weathers as blocky outcrops. These originally may have been limy parts of the unit that now are calc-silicate hornfels.	220+
5. Marble, very pale orange (10YR8/2), mediumly to coarsely crystalline, indistinct and wavy laminae to very thin beds, weathers to form inconspicuous light-colored ledge. Marble is iron-stain in many places. A few layers are silty and contain mica. Basal 3 ft of unit is yellowish-gray (5Y8/1) and grades into unit 4	40
Total of brown schist unit of Means (1962)	388+
Buff quartzite unit of Means (1962):	
4. Quartzite and <10 percent limy sandstone and phyllite. Quartzite, white (N9) to very light gray (N8), weathering very pale orange (10YR8/2), very fine grained (a few thin layers are fine-grained with scattered medium grains), laminated to very thin bedded, weathers to form conspicuous cliffs. Limy sandstone, similar to quartzite except friable and contains calcite cement, occurs	

as thin layers throughout unit and constitutes about 50 percent of top 5 ft of unit. Phyllite, similar to that in unit 1, occurs as 1 to 3-in layers. In places unit contains a few very thin layers of calc-silicate hornfels. Unit as a whole weathers to form conspicuous light-colored cliff ---------- 110+

Note: Folding and structural movement commonly occurs in areas near contact of units 3 and 4. Thickness of units 3 and 4, therefore, could be in error.

3. Phyllite (80 percent), quartzite (10 percent), and marble (10 percent). Phyllite and quartzite similar to that in unit 1, marble to that in unit 2. Quartzite and marble occur in 1 in to 1-ft layers interstratified with the phyllite. Unit weathers to form dark-colored slope below conspicuous white cliff of unit 4 ---------- 53+

2. Marble and quartzite. Marble, yellowish-gray (5Y8/1) to very pale orange (10YR8/2), stained and discolored locally, coarsely crystalline, occurs in 1 in to 10-ft layers interstratified with quartzite. Quartzite, yellowish-gray (5Y8/1), sparse light-greenish-gray (5GY8/1), very fine grained, indistinctly laminated to very thin bedded, occurs in 1 in to 12-ft layers interstratified with marble. About equal amounts of marble and quartzite in lower 30 ft and top 13 ft of unit; entirely quartzite from 30 to 42 ft. Unit as a whole weathers to form ledgy slope. Unit forms light-colored band on outcrops ---------- 55+

Total of buff quartzite unit of Means (1962) ---------- 218+

Quartzite-schist unit of Means (1962):

1. Phyllite and sparse quartzite. Phyllite, medium-dark-gray (N4), sparse olive-gray (5Y4/1), mediumly crystalline, abundant muscovite, well developed foliation at high-angle to bedding. Quartzite, yellow-gray (5Y8/1), weathering mostly medium-gray (N5), very fine grained, indistinctly laminated to very thin bedded; occurs as 1/2 in to 6-in layers except in upper 30 ft where it forms layers 10 ft thick. Quartzite constitutes about 5 percent of lower 130 ft of unit and about 80 percent of top 30 ft. Unit weathers to form steep slope. Many minor folds within unit. ---------- 160±

Total of incomplete quartzite-schist unit of Means (1962) --- 160±

Total of incomplete Clear Creek sequence of Means (1962) ---------- 876

Base of section; base of outcrop. Base of section about 20 ft above creek level at lowest outcrop of phyllite.

NEVADA - LANDER COUNTY

CROOKED CANYON section, measured in upper part of Crooked Canyon; section ends at crest of Toiyabe Range; SW 1/4 sec. 30, T. 17 N., R. 44 E., and SE 1/4 sec. 25, T. 17 N., R. 43 E.

(measured by J. H. Stewart, July 1969)

Top of section; top of good exposure. To west (up section) is mostly dark-gray (N4) limestone with some medium-gray (N5) phyllitic siltstone. This sequence above unit 13 is poorly exposed and could be in fault contact with unit 13. Nonetheless, sequence appears to belong to the Broad Canyon Formation of Mean (1962). The Gold Hill-Broad Canyon contact is sharp and well exposed about 500 ft to north and appears from a distance to be marked by change from limestone below to poorly exposed siltstone and limestone above.

Gold Hill Formation (incomplete) as mapped by Washburn (1970):

	Feet
Unit 6 of Stewart and McKee (1977):	
15. Limestone, medium-dark-gray (N4), weathering same and medium-light-gray (N6) and in a few layers moderate yellowish-brown (10YR5/4), very finely crystalline, sparse laminated parts, mostly thin to thick even beds; weathers to form light-colored ledgy slope at top of ridge. Unit is faulted and contorted and exact thickness uncertain; thickness given probably within 50 to 75 ft of being correct. Unit contains some float of limy siltstone and phyllitic siltstone, but these rock types probably constitutes only a few percent of unit	275(?)
14. Siltstone, dark-gray (N3), some parts weather dark-yellowish-brown (10YR4/2), fine silt, indistinctly laminated, well-developed cleavage at angle to bedding, weathers to form slope. Unit highly contorted and appears to be cut out structurally along strike	25(?)
13. Limestone, medium-dark-gray (N4), weathering same color and medium-light-gray (N6), very finely crystalline, evenly laminated to thin bedded, weathers to form minor ledgy slope	90±
Total of unit 6 of Stewart and McKee (1977)	390+
Unit 5 of Stewart and McKee (1977)	
12. Siltstone, medium-light-gray (N6) to light-olive-gray (5Y6/1), mostly dark-gray in top 50 ft, some parts weather with greenish cast, coarse silt, sparse mica, much of unit appears structureless, locally laminae to very thin beds are noticeable, lower 20 ft of unit contains some very low-angle cross strata. Weathers to form steep slope. Unit from 20-22 ft above base is mostly limy siltstone to silty limestone that weather moderate yellowish-brown (10YR5/4). Top 100 ft contains some light-gray (N7) to medium-dark-gray (N4) and light-olive-gray (5Y6/1) very finely crystalline limestone. Only a few thin layers of limestone occur in the lower part of this 100 ft, but the amount of limestone increases upwards to about 30	

percent in the top 30 ft of the unit. Unit gradational into overlying unit. Parts of unit are contorted and measured thickness could be in error; thickness is probably too thick, if anything, by several tens of feet. Contortion is most intense in top 100 ft of unit. A few hexactinellid sponge spicules in float from upper half of unit in area 500 ft to north of line of section ---------- 298(?)

11. Siltstone (70 percent) and limy siltstone (30 percent). Siltstone, medium-light-gray (N6) to light-olive-gray (5Y6/1), coarse silt, rare mica, laminated to very thin bedded. Limy siltstone, same colors as siltstone, weathering light-olive-gray (5Y6/1) to moderate yellowish-brown (10YR5/4), coarse silt, occurs in 1/2 in to 2-in layers interstratified with siltstone. Stratification is irregular and rock weathers to form "crape" structure. Unit weathers to form ledgy slope. Unit transitional into underlying unit ---------- 45

Total of unit 5 of Stewart and McKee (1977) ---------- 343(?)

Unit 4 of Stewart and McKee (1977):

10. Limestone and silty limestone, medium-light-gray (N6), silty parts are grayish-orange-pink (5YR7/2) and weather moderate yellowish-brown (10YR5/4), very finely crystalline, indistinctly very thin-bedded, weathers to form ledge. Basal 10 ft of unit is all medium-light-gray limestone, above that is increasing amount of silty limestone (and probably also some limy siltstone); top part of unit is mostly silty limestone. Basalt 6 ft of unit contain indistinct elliptical masses up to 2 in in maximum diameter; from 6 to 8 ft above base unit contains abundant Girvanella. Top 13 ft has "crape" structure with alternations of limestone and silty limestone. Transitional into overlying unit. Top of unit placed at top of highest limestone layers ---------- 23

9. Covered, weathers to form slope ---------- 36

8. Siltstone to quartzitic siltstone, grayish-orange-pink (5YR7/2), minor amount greenish-gray (5GY6/1) and very pale orange (10YR8/2), coarse silt, sparse mica locally, wavy laminae to very thin beds; weathers to form small ledge. Upper 10 ft contain a few thin layers of limy siltstone to silty limestone ---------- 35

7. Sandstone and limy sandstone, yellowish-gray (5Y8/1), pinkish-gray (5YR8/1) and light-brownish-gray (5YR6/1), limy layers weather pale-yellowish-brown (10YR6/2), mostly very fine grained (sandstone in parts of basal 10 ft contain scattered medium to coarse quartz grains and a 1-ft layer of fine- to medium-grained sandstone); locally in upper part of unit rock may be coarse siltstone rather than very fine grained sandstone. Limy sandstone constitutes about 30 to 40 percent of unit and occurs in 1 in to 2-ft layer interstratified with sandstone in similarly thick layers. Unit is evenly and distinctly laminated to very thin bedded. Unit weathers to form light-colored cliff ---------- 56

6. Siltstone (90 percent) and quartzitic siltstone to quartzite (10 percent). Siltstone, greenish-gray (5GY6/1), light-olive-gray (5Y6/1), to medium-light-gray (N6), very fine

textured, some slaty cleavage. Quartzitic siltstone to quartzite, pale-yellowish-brown (10YR6/2) to very pale-orange (10YR8/2), some yellow-gray (5Y8/1), coarse silt to very fine-grained sand, grain size of much of rock near boundary of coarse silt and sand; laminated, occurs in 1/2 in to 1-ft layers interstratified with the siltstone. Unit as a whole weathers to form slope. Limestone (or marble), similar to that in unit 3, occurs from 23 to 24 ft and 25 to 26 ft above base of unit. Upper of these two limestones contain archaeocyathids, some as large as 1/2 inch in diameter. Some structural contortion in unit and thickness approximate, although probably not in error by more than 30 ft ---------- 166+

5. Marble, grayish-orange (10YR7/4) to very pale orange (10YR8/2), and medium-light-gray (N6), weathering mostly grayish-orange (10YR7/4), very finely to finely crystalline, indistinctly thin- to thick-bedded, weathers to form conspicuous yellow gray band on slope. Small (1/8 to 1/4 in in diameter) archaeocyathids noted in top foot of unit. Basal few feet and top few feet of unit contain highly recrystallized, small platy structures that could be pelmatozoan debris. Unit locally structurally contorted; exact thickness of unit uncertain, but must be between 20 to 30 ft thick ---------- 22±

Total of unit 4 of Stewart and McKee (1977) ---------- 338

Note: Unit offset on top of unit 4, so that overlying units measured starting 200 ft to south.

Unit 3 of Stewart and McKee (1977):

4. Quartzitic siltstone to quartzite and minor amount of meta-siltstone. Quartzitic siltstone to quartzite, yellow gray (5Y8/1), light gray (N7), some medium light gray (N6) to medium gray (N5), mostly yellow gray from 750 to 1,380 ft, coarse silt to very fine grained sand, much of rock is near boundary of silt and sand, mostly laminated to very thin bedded, some massive layers within which bedding difficult to see, sparse very low angle cross strata. Meta-siltstone, greenish gray (5GY6/1) to dark greenish gray (5GY4/1), some light greenish gray (5GY8/1) and medium gray (N5) to light gray (N7), fine textured, abundant limonite spots, some mica; occurs in 1-in to 6-ft layers interstratified with quartzitic siltstone to quartzite. Amount of siltstone approximately as follows: 0 to 300 ft, 30 percent; 300 to 900 ft, 5 to 10 percent; 900 to 1,335 ft, 15 to 25 percent; 1,335 to 1,380 ft, 5 percent; and 1,380 to 1,540 ft, 30 percent. A 1-ft layer of yellow-brown marble occurs from 1,402 to 1,403 ft, and a few 1-in layers of yellow-brown marble occur from 1,452 to 1,453 ft. Unit as whole weathers to form steep rubble-covered slope. Unit measured in headwaters of Crooked Canyon; line of section always with 150 ft of creek or gully bottom. Somewhat variable strike and dip along line of section; thickness could be slightly in error due to this variability. Meta-siltstone is mostly hornfels, although locally slaty cleavage is present and is a phyllite. ---------- 1,540+

3. Meta-siltstone (70 percent) and quartzite (30 percent). Meta-siltstone, light brownish gray (5YR6/1), light gray (N7), sparse dusky yellow (5YR6/1), micaceous, fine textured, mostly

hornfels but some schistose rock. Quartzite, yellowish gray (5Y8/1) to very pale orange (10YR8/2), sparse medium gray (N5), mostly fine grained, some fine to medium grained parts, some silty quartzite grading to micaceous, sandy siltstone; laminated to very thin bedded, a few small to medium scale cross strata. Unit weathers to form slope. Some structural contortion in lower part of unit, so that thickness probably slightly in error. Quartzite occurs in layers from 1-in to 4-ft thick ---------- 90±

Total of unit 3 of Stewart and McKee (1977) ---------- 1,630+

Note: Section transferred so that unit 3 measured starting 1,500 feet south of unit 2.

Unit 2 of Stewart and McKee (1977):

2. Quartzite, yellowish gray (5Y8/1) to white (N9) with some pale yellowish brown (10YR6/2) to very pale orange (10YR8/2), weathers mostly very pale orange (10YR8/2), fine- to medium-grained with scattered coarse grains (above 95 ft contains some very fine to fine grained quartzite), stratification mostly concealed, some very thin beds. From distance, unit appears evenly layered with alternating thick layers of ledge-forming quartzite and of nonresistant quartzite (perhaps fine grained). Weathers to form conspicuous cliff. A phyllitic siltstone layer about a foot thick noted about 30 ft above base of unit ---------- 155±

Total of unit 2 of Stewart and McKee (1977) ---------- 155+

Unit 1 of Stewart and McKee (1977):

1. Metasiltstone (phyllite and hornfels) and quartzite. Metasiltstone, greenish gray (5GY6/1), pale yellowish brown (10YR6/2), and light olive gray (5Y6/1), fairly micaceous, abundant limonite spots, fairly fine textures, indistinctly laminated to very thin bedded. Quartzite, light brownish gray (5YR6/1) to yellowish gray (5Y8/1), very fine grained, laminated, a few low angle cross strata, occurs in 1/2-in to 10-ft layers interstratified with metasiltstone. Amount of quartzite in unit as follows: 0 to 73 ft, 30 percent; 73 to 300 ft, 5 percent; 300 to 415 ft, poorly exposed, probably <5 percent; 415 to 550 ft, 30 to 40 percent, increasing upwards to about 80 percent at 500 ft above base of unit; 550 to 565, 50 percent; and 565 to 635 ft, 20 percent. Unit as whole weathers to form ledgy slope. A few fine- to medium-graiend quartzite layers (with sparse scattered coarse grains) occur in unit. These quartzite layers are very pale orange (10YR8/2) to yellowish gray (5Y8/1), locally contain cross strata, and weather to form minor ledges. These layers occur in following positions above base of unit: 73 to 78 ft, 545 to 550 ft, and 563 to 577 ft ---------- 635±

Total of unit 1 of Stewart and McKee (1977) ---------- 635±

Total of Gold Hill Formation (incomplete) as mapped by Washburn (1970) ---------- 3,501

Base of section; base of unfaulted section. About 50 to 75 ft downslope below base of section is medium gray (N5) very fine textured contorted phyllite that resembles rocks in the Broad Canyon Formation. Rocks below base of section to south appear to be highly faulted and contorted and not to be in place. Limestone farther downhill and structurally below

the phyllite is fairly thick (over 100 ft). It resembles upper member of Gold Hill Formation and may be east of major fault that drops Middle Cambrian rocks down to the east. I am not sure where the 120-ft limestone is that Washburn (1970) reports, but it could be part of the upper member of Gold Hill Formation in a fault sliver along the major fault zone.

NEVADA - LANDER COUNTY

MOUNT CALLAGHAN section, measured starting on the North Fork of Silver Creek in the northeastern most part of sec. 14, T. 21 N., R. 44 E., extending for 1-1/2 mi to the north-northeast and ending on hill 9270, south-central part of sec. 1, T. 21 N., R. 44 E., 1-1/2 mi west of Mount Callaghan.

(Measured by J. H. Stewart, August 1966)

	Feet
Unit B1 (incomplete) of Stewart and Palmer (1967):	
15. Siltstone float in lower 70 ft and outcrop in upper 100 ft. Siltstone float similar to that in unit 14. Siltstone in upper 100 ft is medium dark gray (N4) to dark greenish gray (5GY4/1), weathering mostly dark greenish gray (5GY4/1), fine(?) silt, silt size mica abundant, phyllitic, platy cleavage weathers to form knob at top of hill. A thin layer of knoby limestone with irregular interlayers of siltstone occurs at 85 ft above base of unit. ----------	170
14. Almost all float, a few outcrops of siltstone and limestone. Siltstone, light olive gray (5Y6/1) to olive gray (5Y4/1), greenish gray (5GY6/1), and rare dark yellowish brown (10YR4/2), weathering same colors, medium(?) silt, micaceous, platty splitting. Limestone, similar to that in underlying unit, crops out in a few places in lower third of unit. Limestone is conspicuous in lower half of unit. Limestone appears to decrease in amount upwards in unit. Unit probably transitional sequence from limestone below to siltstone above. Unit weathers to form gentle slope ----------	80
Total of unit B1 (incomplete) of Stewart and Palmer (1967) ----	250
Unit A5 of Stewart and Palmer (1967):	
13. Limestone, medium dark gray (N4), some medium light gray (N6) in upper 85 ft, weathering medium light gray (N6) with some light gray (N7) in upper 85 ft, very finely crystalline, 2 to 3 in thick beds in lower 72 ft of unit, indistinct 1/2 to 1 ft beds in upper 85 ft; weathers to form prominent ledge. Upper 85 ft of unit is massive smooth weathering ledge that outcrop widely in area. Common to abundant Girvanella in top 110 ft of unit. The trilobites Paedeumias and Olenellus (?) sp. (14656-62JA; 6003-CO) occur in float at 5 ft above base of unit, probably within 5 ft of being in place. Top of unit at bench at top of prominent ledge ----------	157
Total of unit A5 of Stewart and Palmer (1967) ----------	157
Unit A4 of Stewart and Palmer (1967):	
12. Covered. Some medium light gray (N6), yellowish gray (5Y7/2) weatherring silty limestone and limestone like that in unit 11, probably occurs in lower 25 ft of unit, based on float. Unit weathers to form slope ----------	95
Total of unit A4 of Stewart and Palmer (1967) ----------	95
Unit A3 of Stewart and Palmer (1967):	
11. Limestone, medium dark gray (N4), weathering same color with uncommon 1/8 to 1/2 in grayish orange (10YR7/4) bands,	

very finely to finely crystalline, in beds 1/2 to 3 in thick, weathers to form ledge. Grayish orange weathering layers may be silty. Common Girvanella and Bristolia from 50 to 60 ft above base of unit ---------- 65

Total of unit A3 of Stewart and Palmer (1967) ---------- 65

Unit A2 of Stewart and Palmer (1967):

10. Covered. Some float of greenish gray (56Y6/1) and pale red (5R6/2) micaceous coarse siltstone occurs about a third of way up in unit, suggesting same siltstone. Some grayish orange (10YR7/4) limy micaceous coarse siltstone occurs with siltstone float. Weathers to form slope. Collection (14656-62J; 5974-CO) containing Bristolia sp. from float near top of unit. This float probably was derived from upper part of unit 11 ---------- 75

9. Poorly exposed limestone, light gray (N7), weathering same color with some grayish orange (10YR7/4) on bedding surfaces, very finely crystalline, laminated, weathers to form slight ledge ---------- 5+

8. Almost all of unit is float. Float is coarse siltstone to silty sandstone, pale yellowish brown (10YR6/2) to dark yellowish brown (10YR4/2), dark greenish gray (5GY4/1), dark gray (N3), and light brown (5YR6/4), weathering same colors, some pieces weather grayish red (10R4/2), grades from coarse silt to very fine grained sand, abundant mica, platy splitting, common "worm trails". Unit from 125 to 172 ft contains common float of light gray (N7) oolitic limestone. Amount of this float increases in amount upward suggesting bed (perhaps 5-10 ft) near top of interval. Limestone float also occurs in top 80 ft of unit. Some of this may be from limestone units above. Some is light brown (5YR6/4) silty limestone and probably comes from this interval. Unit everywhere poorly exposed ---------- 325+

7. Phyllitic siltstone, greenish gray (5GY6/1) to dark greenish gray (5GY4/1), weathering same colors, medium(?) silt, micaceous, evenly laminated, platy to slabby splitting, weathers to form highest prominent ledge in lower half of stratigraphic section. A few "worm trails" and trilobite(?) scratches ---------- 33

6. Covered. Weathers to form slope between ledge forming interval of units 2 to 5 and ledge of unit 7 ---------- 100

Total of unit A2 of Stewart and Palmer (1967) ---------- 538

Unit A1 of Stewart and Palmer (1967):

5. Quartzite, similar to that unit of unit 4. Units 2 to 5 form cliffy well-exposed interval along most of outcrop. From distance base of this interval marks prominent change from dominantly quartzite below to dominantly phyllitic siltstone above ---------- 2+

4. Covered ---------- 23

3. Phyllitic siltstone (80 percent) and quartzite (20 percent). Phyllitic siltstone, pale olive (10Y6/2) to greenish gray (5GY6/1), weathering some colors, medium silt, grades in places to very fine grained silty sandstone, micaceous, platy splitting in places. Quartzite, dark yellowish brown (10YR4/2) to pale yellowish brown (10YR6/2), weathering dark

yellowish brown (10YR4/2), medium to coarse grained, occurs in 1 to 18 in beds interstratified with phyllitic siltstone. Some quartzite beds are laminated, most are structureless. Weathers to form minor ledge. Common "worn trails" similar to those in unit 1 ---------- 42

2. Covered. Before offset lower 10 ft of unit exposed and consisted of 50 percent quartzite and 50 percent siltstone, similar to that and transitional to that in unit 1 ---------- 20

Offset in section so that overlying units measured 100 ft east of unit 1

1. Quartzite (90 percent) and phyllitic siltstone to phyllitic silty sandstone. Quartzite, white (N9), yellowish gray (5Y8/1), pale yellowish brown (10YR8/2), and rare dark yellowish brown (10YR4/2), weathering mostly very pale orange (10YR8/2) to pale yellowish brown (10YR4/2), mostly medium grained, some medium to coarse grained parts, fair-sorting, horizontally thinly bedded, some medium scale cross-strata, but difficult to see due to recrystallization. Phyllitic siltstone to phyllitic silty sandstone, pale olive (10Y6/2) and greenish gray (5GY6/1), weathering same colors, medium(?) silt, micaceous, grades to silty very fine grained sandstone which in places contains fine to medium grains, occurs in beds from 1/4 in to 4 ft thick interstratified with quartzite. Siltstone constitutes about 50 percent of the lower 50 ft of unit. Common "worm trails" parallel to bedding throughout unit. These trails are commonly 1/8 to 3/8 in across and 1 to 4 in long. Unit weathers to form cliffs. Unit cut by many small faults, and thickness is approximate. Fragmentary and unidentifiable trilobites occur near top of unit ---------- 505

Total of incomplete unit A1 of Stewart and Palmer (1967) ---- 592

Base of section in canyon at first group of aspen trees going up canyon. Base of exposure.

NEVADA - LANDER COUNTY

RAVENSWOOD section A, measured on east side of Shoshone Range, sec. 15, T. 22 N., R. 42 E.

(Measured by J. H. Stewart, August 1968)

Top of section at fault. Overlying rock is rubble of limestone locally containing fragments of Bristolia.

	Feet
Lower Cambrian strata (incomplete):	
Quartzite and siltstone unit (incomplete):	
4. Siltstone and quartzite. Siltstone, pale olive (10Y6/2) to grayish olive (10Y4/2), medium to coarse silt, platy. Quartzite, yellowish gray (5Y8/1) with dark yellowish brown (10YR4/2) patches, weathers grayish red (5R4/2) on same fracture surfaces and has reddish tint when viewed from distance, texture varies, some parts are medium grained and fairly well sorted, other parts are poorly sorted and range in grain size from medium to very coarse; mostly indistinctly very thin bedded, rare low angle cross-strata in tabular planar sets. Quartzite occurs in layers from 1/2 in to 2 ft thick interstratified with siltstone. In a few layers, the quartzite is fine grained and in a other layers it is composed of fine to coarse grains set in silty matrix. Unit contains abundant worm borings parallel to bedding planes and a few perpendicular to bedding (Scolithus). These borings range in diameters from 1/8 in to about 5/8 in. Some occur entirely within the siltstone, others on the bottom surfaces of quartzite units. Unit weathers to form slope with a few ledges. A few small folds occur in unit, but probably affect total thickness only slightly. Amount of siltstone and quartzite is as follows: 0 to 183 ft, 65 percent siltstone, 35 percent quartzite; 183 to 222 ft, 90 percent siltstone, 10 percent quartzite; 222 to 236 ft, 20 percent siltstone, 80 percent quartzite; 236 to 250 ft, 90 percent siltstone, 10 percent quartzite; 250 to 350 ft, mostly covered, a few outcrops of siltstone and very rarely of quartzite; 350 to 390 ft, poor outcrops, probably about 80 percent siltstone, 20 percent quartzite; 390 to 460 ft, 20 percent siltstone, 80 percent quartzite, includes 6 ft unit of quartzite from 418 to 424 ft ----------	460
3. Covered. Probably siltstone like unit 2 ----------	30
2. Siltstone, dusky yellow (5Y6/4), pale olive (10Y6/2), and grayish olive (10Y4/2), mostly fine to medium silt, some parts composed of coarse silt, platy; weathers to form slope. Common small animal markings on bedding planes. Unit contains a few silty, very fine grained laminated sandstone layers from	

	1/2 to 2 in thick. Trilobites (Paedeumias sp.) were collected (13130-13J) from float in this unit, and must be weathering out of unit. Unit weathers to form slope ----------	55
1.	Quartzite to quartzite sandstone (70 percent) and siltstone (30 percent). Quartzite to quartzitic sandstone, light olive gray (5Y5/2), yellowish gray (5Y7/2), light gray (N7), dusky yellow (5Y6/4) weathering same colors, very fine to fine grained, micaceous, indistinctly horizontally laminated to very thin bedded. Siltstone, pale olive (10Y6/2), dusky yellow (5Y6/4), and light olive gray (5Y5/2), weathering same colors, coarse silt, micaceous platy, occurs in 1 in to 1 ft layers, interstratified with quartzite and quartzite sandtone. Unit weathers to form ledgy interval above wash ----------	33
	Total of incomplete quartzite and siltstone unit ----------	578
	Total of incomplete Lower Cambrian strata ----------	578
	Base of section at wash, base of exposure	

NEVADA - LANDER COUNTY

RAVENSWOOD section B, measured on east side of Shoshone Range, sec. 15, T. 22 N., R. 42 E.

(Measured by J. H. Stewart, August 1968)

Top of section at top of hill, top of continuous exposure.

		Feet
	Lower Cambrian strata:	
	Limestone unit:	
10.	Limestone, light gray (N7) to medium gray (N5), rarely altered(?) to grayish orange (10YR7/4), very finely to finely crystalline, indistinct and slightly wavy layers from 1 in to 1 ft thick; weathers to form conspicuous, commonly smooth weathering, cliff. No definite Girvanella noted, although darker rounded area in rock in a few places suggest algal structures. Most likely these rounded area are original clastic structures in the rock or due to later tectonic distortion ----------	150
9.	Covered, weathers to form slope. Could be fault in this interval but no good evidence of that. Altitudes above and below are similar and rock types are not duplicated between units 8 and 10 ----------	65+
8.	Limestone and silty limestone, medium gray (N5), silty parts weather moderate brown (5YR4/4), remainder weathers light gray (N7), very finely crystallinely, evenly laminated, rarely very thin bedded, commonly platy, weathers to form slope, poorly exposed in part particularly in upper quarter. Lower 25 ft contain minor amounts of dolomite similar to that in unit 7 and also rare light gray (N7) (commonly weathering moderate brown (5YR4/4)), platy very fine grained sandstone, limy sandstone, and quartzite. Olenellus sp. (JS-68-10; 6367-CO) collected from float in middle of unit; probably close to being in place. Bristolia (JS-68-11; 6368-CO) collected in float in top 10 ft of unit; probably derived from somewhere in covered interval of unit 9 ----------	100
7.	Dolomite, medium light gray (N6), weathering moderate brown (5YR4/4), medium to coarsely crystalline, indistinctly laminated, weathers to form fairly conspicuous brown ledgy interval ----------	30
6.	Covered, weathers to form slope ----------	10
5.	Silty limestone and limestone, medium dark gray, silty parts weather moderate yellowish brown (10YR4/2), the remainder light gray (N7), very finely crystalline, indistinct and wavy very thin beds, silty and non-silty parts do not form distinct layers, weathers to form ledgy interval. Basal 3 ft of unit contain silty limestone and limy very fine grained sandstone ----------	17
4.	Covered. Weathers to form slope ----------	13
3.	Girvanella-bearing limestone, medium gray (N5), very finely crystalline, a few indistinct bedding planes, weathers to form inconspicuous ledge on top of dark sandstone and	

quartzite of unit 2. Girvanella are elliptical and as large as 1.5 in in maximum dimension ---------- 2
Total of limestone unit ---------- 387

Quartzite and siltstone unit (incomplete):

2. Limonitic and hematitic sandstone, limy sandstone and quartzite, dark yellowish brown (10YR4/2), moderate brown (5YR4/4), medium gray (N5), and grayish orange (10YR7/4), weathering mostly dark yellowish brown (10YR4/2), very fine to fine grained in parts, medium grained in other parts, commonly limy, some parts silty, indistinctly laminated to very thin bedded; weathers to form slope. Lower half poorly exposed ---------- 12

1. Quartzite (50 percent) and siltstone (40 percent). Same rock types as in Ravenswood section A, unit 4 ---------- 55+
Total of incomplete quartzite and siltstone unit ---------- 67
Total of incomplete Lower Cambrian strata ---------- 454

Base of section; starts about 750 ft up wash from base of Ravenswood section A. Starts about 50 ft up hill from wash

NEVADA-LINCOLN COUNTY

CALIENTE section, measured 2 mi northwest of Caliente along north side of conspicuous west northwest-trending canyon containing rock quarry, southern part sec. 31, T. 4 S., R. 67 E.

(measured by J. H. Stewart, May 1969)

Top of section, top of decipherable exposure. The Pioche Shale and rocks probably as high as the Highland Peak Limestone are exposed within one mile to east, but those rocks appear too faulted and contorted to measure a stratigraphic section

Zabriskie Quartzite:

	Feet
16. Quartzite, white (N9), basal 18 ft of unit and rarely elsewhere contain reddish-brown iron stain along fractures, fine- to medium-grained, scattered coarse grains in some places; very thin to thin bedded, indistinct generally low angle small to medium scale cross strata; weathers to form prominent white cliff. Thickness uncertain due to abundant faulting in area. Thickness given is estimate, but true thickness probably somewhere between 100 and 300 ft	150(?)
Note: Units 14 and 15 faulted and contorted. Thicknesses are uncertain.	
15. Quartzite (40 percent) and siltstone (60 percent). Same type of quartzite and siltstone as in unit 14 except that quartzite in basal 9 ft and many of the others quartzite layers in unit are fine- to medium-grained (sparse scattered coarse grains). Quartzite from 7 to 9 ft above base of unit contains abundant Scolithus tubes. Top 5 ft of unit is grayish red (10R4/2) and contains both quartzite and siltstone	70(?)
Zabriskie Quartzite	220(?)

Wood Canyon Formation:

Upper member:

14. Quartzite (60 percent) and siltstone (40 percent). Quartzite, pinkish gray (5YR8/1) to yellowish gray (5Y8/1), sparse pale yellowish brown (10YR6/2), very fine- to fine grained, laminated to very thin bedded, a few low-angle cross strata. Siltstone, dusky yellow (5Y6/4) and grayish yellow (5Y8/4), fine to coarse silt, grades to silty very fine grained sandstone, micaceous, platy, occurs as 1 in to 10 ft layers interstratified with quartzite. Unit as a whole weathers to form slope. Part of unit poorly exposed. Layers of quartzite are from 1/2 ft to 10 ft thick, siltstone layers are of comparable thickness	135(?)
13. Basalt, medium-dark-gray (N4), weathering light-olive-gray (5Y5/2), a few laths of plagioclase (as large as 1 mm) set in aphanitic matrix, some small (less than 5 mm) vesicules in top half of unit, weathers to form slope. Appears to be part of stratigraphic section, and not intrusive	

rock, but outcrop is so small that exact relationship to sedimentary units difficult to determine ---------- 5

12. Siltstone (50 percent) and silty quartzite (50 percent). Siltstone, dark-greenish-gray (5GY4/1) to light-olive-gray (5Y5/2), fine to coarse silt, micaceous, platy. Silty quartzite, medium-gray (N5), light-gray (N7), dark-gray (N3), and brownish-black (5YR2/1), (colors commonly are mottled and interlayered), very fine to fine grained, some fine- to medium-grained parts, silty, laminated to very thin bedded, occurs as 1/2 in to 2 ft layers interstratified with siltstone that occurs in sets of comparable thickness. Basal 8 ft of unit contain abundant grayish-orange (10YR7/4) siltstone and a few medium- to coarse-grained quartzite layers. Top 5 ft of unit contains abundant moderate yellowish-brown (10YR7/4) siltstone. Unit as a whole weathers to form blackish cliff. Abundant animal tracks, trails, borings, and castings ---------- 133

Total of upper member ---------- 273

Middle member (lower 65 ft may be equivalent to lower member):

11. Quartzite to sandstone (90 percent) and siltstone (10 percent). Quartzite to sandstone, pale red (5R6/2) to grayish red (5R4/2), minor amount grayish orange pink (10R8/2), medium- to coarse-grained, commonly silty, poorly to fairly well sorted, laminated to thin bedded, abundant cross strata in basal 100 ft and rarely in rest of unit. Cross strata are in thin to very thin tabular planar and trough sets and are small-scale, or rarely medium-scale. Siltstone, grayish red (10R4/2), medium to coarse silt, micaceous, platy, occurs as 1/16 in to 1 ft layers interstratified with the quartzite to sandstone. Unit weathers to form cliffs. Well-exposed minor sedimentary structures. The siltstone commonly is broken up and forms flakes in the sandstone and quartzite. The sandstone and quartzite commonly fills "cracks" on top surfaces of the siltstone. These cracks may be mud cracks, or possibly cracks form in the breaking up of siltstone laminae ---------- 631

Note: Offset in section so that unit 11 measured 1,000 ft southeast of where unit 10 measured, starting in major canyon. Offset necessary to cross fault dropping east block down about 150 to 200 ft

10. Conglomerate and quartzite, pale red (5R6/2) to pinkish gray (5YR8/1), grades from coarse to very coarse quartzite to conglomerate with granules and pebbles of quartz and rarely of quartzite and jasper (pebbles are commonly 1/2 in in diameter, the largest is 1 in), indistinctly and irregularly thin bedded, rare low-angle cross strata, weathers to form fairly conspicuous ledge ---------- 7

9. Quartzite (90 percent) and silty sandstone (10 percent). Quartzite, pinkish gray (5YR8/1), sparse yellowish-gray (5Y8/1) and light-greenish-gray (5GY8/1), some fine- to medium-grained parts, remainder is medium to coarse-grained, some scattered very coarse grains mostly; cross stratified

on small scale (probably both tabular planar and trough sets). Silty sandstone, greenish-gray (5GY6/1) to medium-light-gray (N6), silty, fine-grained, scattered medium to coarse grains, laminated to thin bedded; occurs as 1/2 ft to 3-ft layers interstratified with quartzite, most abundant in top 12 ft of unit. Some scattered granules and small pebbles in quartzite 4 ft and 12.5 ft below top of unit top ---------- 82

8. Siltstone, silty sandstone, to quartzite, intergradational rock types, greenish-gray (5GY6/1) to dark-greenish-gray (5GY4/1), light-gray (N7) to medium-gray (N5), grades from coarse micaceous siltstone, to silty very fine- to fine-grained sandstone, to (silty?) fine- to medium-grained quartzite, in places medium- to coarse-grains are scattered within thin beds; laminated to very thin beds, several ripple-marked surfaces exposed (the ripples have generally parallel crests). Unit weathers to form reentrant and marks distinct break in lithology in section ---------- 65

Total of middle member (lower 65 may be equivalent to lower member) ---------- 785

Total of Wood Canyon Formation ---------- 1,058

Stirling Quartzite (incomplete):

7. Quartzite, similar to that in unit 5. No conglomerate noted. Weathes to form cliff ---------- 103

6. Quartzite and sandstone, yellowish-gray (5Y8/1) to greenish-gray (5GY6/1), mostly very fine to fine-grained, some mica, laminated to very thin bedded; weathers to form slope, poorly exposed. Contains a few thin layers of cross stratified quartzite like that in unit 5 ---------- 48

5. Quartzite, pale red (5R6/2) to pinkish-gray (5YR8/1), medium- to coarse-grained, very thin to thin bedded, some thin tabular planar and trough sets of small- to medium-scale cross strata, weathers to form steep ledgy slope. Unit contains some conglomerate with granules and pebbles of quartz. Conglomerate occurs in following positions: 0 to 40 ft sparse granule and small pebble conglomerate; 75 ft, 0.5 ft conglomerate; 132 to 136 ft, conspicuous layer mostly of conglomerate with granules and pebbles as large as 1 in ---------- 158

Note: Section transferred downhill about 100 ft to where unit 5 rests directly (unfaulted) against the basalt (unit 4). The contact is sharp; no basalt debris noted in overlying quartzite. Basalt does not crosscut conglomerate, however, and appears to be everywhere at base of same sedimentary layer.

4. Basalt, dark-greenish-gray (5GY4/1), laths (1 to 2 mm) of plagioclase set in aphanitic matrix, vesicular (rarely amygdaloidal) in top 30 ft. Top of basalt where measured is fault. Pinch out of basalt to south across canyon may be due to faulting rather than original lenticularity. -------- 120+

3. Quartzite, yellow-gray (5Y8/1) to pinkish-gray (5YR8/1), mostly pale red (5R4/2) in bottom 10 ft, fine- to medium-grained, thin-bedded, sparse cross strata,

weathers to form ledge. Basal 10 ft are transitional into quartzite of underlying unit ---------- 48

Note: Section crosses fault with 20 ft displacement near where units 2, 3, and 4 were measured. Adjustments in thickness were made to compensate for this faulting.

2. Siltstone (30 percent) and silty sandstone to quartzite (70 percent). Siltstone, grayish-red (5R4/2), coarse silt, micaceous, platy, occurs as 1 in to 3-ft layers interstratified with silty sandstone to quartzite, most abundant near base of unit. Silty sandstone to quartzite, pale red (5R6/2) to grayish-red (5R4/2), grades from silty very fine grained sandstone to fairly clean very fine to fine grained quartzite; micaceous, laminated to thin-bedded. Weathers to form small reentrant. Most of upper 10 ft of unit is quartzite, although a 6-in siltstone occurs at top ---------- 50

1. Quartzite and sparse conglomerate. Quartzite, yellow-gray (5Y8/1) to pinkish-gray (5YR8/1), mostly medium- to coarse-grained, some fine medium-grained parts, very thin to thick bedded, abundant tabular planar and trough sets of small- to medium-scale cross strata. Conglomerate, same colors as quartzite, consists of granules and small pebbles (rarely as large as 1.5 in) of quartz and quartzite set in medium- to very coarse grained matrix, mostly in layers from 1/2 to 2 ft thick. Conglomerate occurs in 4-ft interval about 200 ft above base of unit, constitutes about 25 percent of unit from 245 to 310 ft above base of unit, and is abundant from 375 to 381 ft above base of unit; conglomerate probably occurs elsewhere in unit where exposures are poor. Unit weathers to form cliffs. Quartzite is highly fractured, but does not seem to be cut by any faults of large displacement. Top 4 ft of unit is conspicuous yellowish gray band ---------- 390

Total of incomplete Stirling Quartzite ---------- 917

Base of section at wash. Small outcrops to west of wash can not be tied to section east of wash.

DELAMAR section A, measured 1.9 mi south-southwest of Delamar. Section starts 0.7 mi south of Cedar Wash, 0.8 mi north of Big Lime Wash, and about 0.7 mi east of bedrock-alluvium contact, continues uphill and ends 0.2 mi southeast of base of section. NE 1/4 sec. 14, T. 6 S., R. 64 E.

(measured by J. H. Stewart, May 1969)

Top of section; top of exposure. To east is talus slope of quartzite and east of that is Tertiary volcanic rock

	Feet
Stirling Quartzite (incomplete):	
7. Quartzite, yellow gray (5Y8/1), sparse pinkish gray (5YR8/1), weathering same colors and pale yellowish brown (10YR6/2), fine to medium grained some medium to coarse-grained parts, fair to poorly sorted; very thin to thin bedded, sparse tabular planar sets of small-scale cross strata; forms top of hill. A thin layer of grayish-red micaceous siltstone occurs at 77 ft above base of unit ----------	130
6. Basalt, dark greenish gray (5GY4/1) to olive gray (5Y4/1), plagioclase laths as large as 1 mm set in aphanitic matrix; top 30 ft of unit contains some vesicular parts. In places vesicules are partly or wholly filled with green aphanitic material and in other places with white quartz. Unit weathers to form greenish black outcrop ----------	86
5. Quartzite, light brownish gray (5YR6/1), pale red (10R6/2), and pale yellowish brown (10YR4/2), mostly fine or medium grained, some medium to coarse grained parts; very thin to thin bedded, sparse small-scale cross strata. Quartzite mostly fine or medium grained in lower half, containing more medium to coarse parts in upper half. About 50 percent of unit from 0 to 17 ft is grayish red (5R4/2) micaceous coarse siltstone to silty very fine grained sandstone. Abundant iron staining along fractures in top 4 ft of unit. Unit weathers to form gentle slope. Quartzite in places contain angular flakes of siltstone that weather out to form holes ----------	108
4. Quartzite, yellowish gray (5Y8/1), weathering same color, fine to coarse grained, very thin to thin bedded, sparse small-scale cross strata. Top 4 ft of unit is mostly granule to small pebble conglomerate. Unit weathers to form small ledge ----------	30
3. Quartzite (90 percent) and argillite (10 percent). Quartzite, light brownish gray (5YR6/1), pale yellowish brown (10YR6/2), and yellowish gray (5Y8/1), mostly fine grained, (some fine to medium grained layers); evenly very thin to thin bedded. Argillite, grayish red (5R4/2), micaceous, coarse(?) silt, platy splitting, occurs as 1 to 3 ft layers in at least three places in unit. Unit weathers to form gentle slope. Quartzite	

in places contains angular flakes of siltstone (as large as 1.5 in across) that commonly weather out as holes ---------- 35

2. Quartzite and minor amounts of conglomerate to conglomeratic quartzite. Quartzite, very light gray (N8) to yellowish gray (5Y8/1) in lower 290 ft, light brownish gray (5YR6/1) to pale red (10R6/2) with sparse very light gray (N8) in rest of unit, mostly medium to coarse grained, some fine to medium grained parts, some coarse to very coarse grained parts; fair to poorly sorted; very thin to thin bedded, minor amounts of thin to thick tabular planar (probably some trough) sets of small to medium-scale cross strata. Conglomerate to conglomeratic quartzite, same colors as quartzite, granules to pebbles of white, pink, or clear quartz and sparse jasper (red chert) set in medium to very coarse grained matrix (pebbles as large as 2 in, mostly less than 1/2 in); very thin to thin bedded, occurs as 2 to 24 in layers interstratified with quartzite. Conglomerate to conglomeratic quartzite occurs only in following parts of unit: some from 500 to 550 ft, and as about 10 percent of interval from 820 ft to top of unit. Granules occur in quartzite from 260 to 280 ft above base of unit. Micaceous silty(?) very fine to fine grained sandstone occurs commonly in interval from 305 to 325 ft above base of unit. Basal 130 ft of unit poorly exposed. Basal 375 ft of unit forms ledgy slope, rest of unit forms fairly prominent cliffs. A very few pieces of float contain holes that suggest that in places the quartzite originally contained angular flakes of siltstone ---------- 948

1. Conglomeratic quartzite, pale red (10R6/2), scarce grayish red (10R4/2), weathering same colors, medium to very coarse grained with granules and small pebbles (mostly less than 1/2 in in diameter); indistinct thin beds, scarce small-scale cross strata, forms ledgy brownish-red sequence at base of hill. Some (10 percent) medium to very coarse grains are white and chalky; could be altered feldspar or clay fragments ---------- 70

Total of incomplete Stirling Quartzite ---------- 1,407

Base of section, base of sequence that seem continuous and relatively unfaulted. Could be more continuous strata to west of wash, but this is a risky assumption in this highly faulted area

DELAMAR section B, measured 3.3 mi south southwest of Delamar and about 1/2 mi south of Big Lime Wash (see Callaghan, 1937, fig. 2 for place names). Section starts 1 mi west northwest of Big Lime Mountain and ends 1/2 mi west northwest of that mountain. East-central part of sec. 22, west-central part sec. 23, T. 6 S., R. 64 E. (measured by J. H. Stewart, May 1969)

Top of section, not top of exposure

	Feet
Pioche Shale (incomplete):	
12. Siltstone, similar to that in unit 10. Next limestone about 150 ft higher	Unmeasured
11. Limy siltstone grading up into limestone. Limy siltstone, yellowish gray (5Y7/2), coarse silt, thin bedded. Limestone, medium gray (N5), finely to mediumly crystalline, indistinctly very thin bedded, contains abundant Girvanella as large as 1 in across. Sequence in unit as follows: 0 to 23 ft, limy siltstone; 23 to 28 ft, interstratified limestone and limy siltstone; 28 to 36 ft limestone. Unit weathers to form ledge. Top 8 ft of unit form conspicuous gray band on outcrop	36
10. Siltstone, pale olive (10Y6/2) to light olive gray (5Y5/2), fine to coarse silt, micaceous, platy. Weathers to form slope. A few 1/2 to 2 in layers of silty very fine grained sandstone occur throughout unit; some of these are calcareous. A few 1/2 to 1 in silty limestone layers occurs in unit from 90 to 110 ft above base. Abundant tracks and trails in siltstone	205
9. Siltstone to silty siltstone to silty sandstone, dusky yellow (5Y6/4), grades from coarse siltstone to silty very fine to fine grained sandstone, micaceous, indistinct and wavy (?) very thin beds, platy in places. Abundant tracks and trails along bedding planes. Silty sandstone weathers out as minor ledges. Unit forms slope; top of unit at lowest part of saddle. A few thin fine grained quartzite layers occur in lower third of unit, but do not weather as conspicuous ledges like those in unit 8	125
Total of incomplete Pioche Shale	366
Zabriskie Quartzite:	
8. Quartzite and siltstone. Quartzite is similar to that in unit 7 except it is commonly pale yellowish brown (10YR6/2) and dark yellowish brown (10YR4/2) and is mostly medium to coarse grained in lower half of unit and fine to medium grained in upper half. A few layers in basal half contain granules and small pebbles (as large as 0.2 in) of quartz. Siltstone, dusky yellow (5Y6/4), coarse silt, commonly grades to silty very fine grained sandstone, micaceous, platy. Unit forms back side of hogback. Siltstone occurs in basal 3 ft and in part of top 10 ft of unit; it probably occurs elsewhere, but is not visible due to abundant quartzite debris. Top of unit placed at top of highest quartzite layer.	63

7. Quartzite, white (N9) to pinkish gray (5YR8/1), fine to medium grained, scattered to abundant, coarse to very coarse grains, indistinctly very thin to thin bedded, scarce low angle trough(?) cross strata and high-angle small scale tabular planar cross strata; weathers to form prominent cliff. Some possible Scolithus tubes in lower few ft of unit. Top of hogback at about 140 ft above base of unit. Some layers contain scattered granules of quartz in top 20 ft of unit ---- 157

6. Siltstone and quartzite. Siltstone, grayish red (5R4/2) and sparse dusky yellow (5Y6/4), fine to coarse silt, micaceous platy. Quartzite, grayish red (5R4/2) and yellowish gray (5Y8/1), fine grained with some fine to medium grained parts in lower half, mostly fine to medium grained in upper half, laminated to thin bedded, sparse small to medium scale cross strata. Amount of quartzite increases upwards. Unit grades into overlying unit. Base of unit placed at lowest occurrence of fine to medium grained quartzite. Abundant animal tracks and trails in siltstone. Abundant indistinct Scolithus in quartzite in upper part of unit.
Unit weathers to form slope ---------- 40
Total of Zabriskie Quartzite ---------- 260

Wood Canyon Formation:
Upper Member:

5. Poorly exposed quartzite to sandstone, and siltstone. Quartzite to sandstone, light olkive gray (5YR6/1) to olive gray (5Y4/1) in lower half, pale yellowish brown (10YR6/2) in upper half, very fine to fine grained and silty in lower half of unit, laminated to thin bedded. Siltstone, dusky yellow (5Y6/4) and greenish gray (5GY6/1), fine to coarse silt, micaceous, platy, commonly contains animal tracks and trails, and worm borings and castings on bedding planes. Unit weathers to form slope ---------- 300
Total of upper member ---------- 300

Middle member (lower 30 ft may be lower member):

4. Quartzite (85 percent) and siltstone (15 percent). Quartzite, yellowish gray (5Y8/1), minor amount of very pale orange (10YR8/2), light olive gray (5Y6/1), and greenish gray (5GY6/1), weathers mostly pale yellowish brown (10YR6/2) with reddish tint, fine to medium grained, rarely medium to coarse grained, very thin to thin bedded, some laminated parts, abundant thin tabular planar and trough sets of small to medium scale cross strata. Quartzite commonly contains flakes of siltstone. Siltstone, grayish red (5R4/2), rarely greenish gray (5GY6/1), fine to coarse silt, micaceous, platy, occurs as 1/2 in to 1 ft layers interstratified with quartzite. Mud cracks noted in siltstone at several places. Abundant Scolithus tubes in quartzite in top foot of unit. Line of section about 100 ft east of quarter section marker ---------- 895

3. Conglomerate, yellowish gray (5Y8/1), granules and pebbles (as large as 0.7 in) of quartz, quartzite, and rarely of jasper set in medium to very coarse grained matrix, indistinctly very thin to thick bedded; weathers to form light-colored ledge -- 6

2. Quartzite to sandstone (90 percent) and siltstone (10 percent). Quartzite to sandstone, greenish gray (5GY6/1) to dark greenish gray (5GY4/1), minor amount of pale yellowish brown (10YR6/2),

mostly very fine to fine grained in lower half, grading up into fine to medium or medium to coarse in upper half, (probably most of quartzite and sandstone is silty), evenly laminated to very thin bedded. Siltstone, greenish gray (5GY6/1) to light olive gray (5Y6/1), mostly coarse silt grading to silty very fine grained sandstone, micaceous, laminated, platy splitting. Unit weathers to form dark colored slope; siltstone commonly contains worm boring and castings along bedding planes. Siltstones is most abundant (perhaps 50 percent) in lower 30 ft of unit and this part of unit could be called the lower member of the Wood Canyon Formation. On the other hand, the unit is transitional from dominantly siltstone in lower part, through fine grained quartzite and sandstone with some siltstone in middle part, to dominantly medium to coarse siltstone in upper part -------- 101

Total of middle member (lower 30 ft may be lower member) - 1,002

Total of Wood Canyon Formation ---------- 1,302

Note: Top of unit 1 is sharp break in section from light colored quartzite below to dark-colored quartzite above. Top of unit 1 forms a thin, but conspicuous, light-colored ledge.

Stirling Quartzite (incomplete):

1. Quartzite (80 percent) and siltstone (20 percent). Quartzite, yellowish gray (5Y8/1), pinkish gray (5YR8/1), pale yellowish-brown (10YR6/2), and sparse greenish-gray (5GY6/1), some fine-grained parts, some medium-grained parts and some medium to coarse-grained parts, finer grained parts are generally laminated, coarser grained parts generally very thin to thin bedded or cross stratified in very thin to thin tabular planar and trough sets. Siltstone, grayish-red (5R4/2) and greenish gray (5GY6/1) to dark greenish-gray (5GY4/1), micaceous, fine to coarse silt, grades to very fine grained silty sandstone; platy splitting. Siltstone commonly contains bedding plane markings which are probably worm borings and castings. Unit weathers to form slope. Unit from 0 to 37 ft is about 50 percent siltstone; siltstone may constitute about 10 percent of rest of unit. Poorly exposed light brownish-gray (5YR6/1) weathering dark yellowish-brown (10YR4/2) laminated, silty dolomite occurs from 60 to 63 ft above base of section. This could be one continuous layer of dolomite or two one-ft layers. Unit from 55 to 56 ft is a conglomerate containing granules and small pebbles of quartz. ---------- 177

Total of incomplete Stirling Quartzite ---------- 177

Base of section at base of continuous outcrop. Section starts in small wash about 300 ft north of small outcrop of basalt on small hill. No definite way of fitting basalt into section because of poor outcrops and minor faulting, but section missing between basalt and base of unit 1 is probably only a few ten's of feet at most. Less likely, basalt could be absent along line of section and section includes rock equivalent to strata both above and below basalt.

NEVADA - LINCOLN COUNTY

PATTERSON MOUNTAIN section A, measured on west side of the Schell Creek Range about 3 1/2 mi north of Patterson Pass. Section starts near Whiterock Spring and continues eastward to near top of range. Northernmost part sec. 13, T. 9 N., R. 64 E., and northwesternmost part of sec. 18, T. 9 N., R. 65 E.

(measured by J. H. Stewart, May and June, 1969)

	Feet
Pioche Schale (incomplete):	
18. Poor outcrops, a few exposures of light-olive-gray (5Y5/2) micaceous siltstone in lower 10 ft of unit. Next 100 ft probably mostly siltstone. Some float of Girvanella-bearing limestone. About 200 ft of strata exposed from top of unit 17 to crest along Shell Creek Range. Most of this 200 ft is probably siltstone. Some very fine grained silty(?) micaceous sandstone exposed along and near crest ----------	(unmeasured)
17. Limy sandstone to sandy limestone, very light gray (N8), weathering white (N9) to grayish orange (10YR8/2) in less limy places to medium light gray (N6) in more limy places, composed of fine to medium (some scattered coarse) subround grains set in calcite matrix, laminated to very thin bedded, irregular bedding planes with some local scours (up to 1/2 in) and small-scale cross strata; weathers to form small ledge on top of conspicuous white cliff of underlying unit. Grades from limy sandstone in lower part of unit to limy sandstone and sandy limestone in upper part. A few 1/2 to 10-in layers of noncalcareous quartzite (similar to that in unit 16) occurs in bottom 8 ft of unit ----------	36
Total of incomplete Pioche Shale ----------	36
Prospection Mountain Quartzite (incomplete):	
16. Quartzite, white (N9), mostly fine- to medium-grained, a few fine-grained parts, indistinctly bedded in layers from 1/2 to 2 ft thick, sparse very thin trough(?) sets of low angle small-scale cross strata. Unit weathers to form conspicuous white cliff at top of quartzite sequence. Some yellowish-gray (5Y8/1) fine-grained laminated to very thin bedded quartzite is poorly exposed at base of unit ----------	125
15. Covered. Float of white quartzite and light-olive-gray siltstone. On minor ridge about 300 ft south, the basal 25 ft of this covered interval (as determined by matching a minor bench on top of the main cliff forming part of unit 14) is quartzite similar to unit 14 ----------	319
Equivalent of Zabriskie Quartzite (covered in part):	
14. Quartzite, pinkish-gray (5YR8/1), sparse white (N9), fine- to medium-grained, sparse medium- to coarse-grained parts, mostly fine-grained in basal 50 ft, laminated to thin bedded, sparse low angle cross strata, weathers to form conspicuous light-colored cliff ----------	120
Total of equivalent of Zabriskie Quartzite (covered in part) ----------	120

Equivalent of Wood Canyon Formation

Equivalent of upper member of Wood Canyon Formation:

13. Quartzite (70 percent) and siltstone (30 percent). Quartzite, pale red (5R6/2) to grayish-red (5R4/2), very fine grained, some fine-grained parts, sparse mica, laminated, sparse small-scale cross strata, occurs in 1/2 in to 4-ft layers interstratified with siltstone. Siltstone, pale red (5R6/2), light-brownish-gray (5YR6/1), and light-greenish-gray (5GY8/1), micaceous, fine to coarse silt, platy, occurs as 1/4 in to 1-ft layers. Unit weathers to form steep ledgy slope. A few worm borings parallel to bedding but not nearly as abundant as in unit 11 -------- 80

12. Covered with a few poor outcrops from 80 to 90 ft above base of unit. Outcrops are of light-greenish-gray (5Y5/2) very fine grained laminated quartzite to sandstone with a few 1/2 in layers of micaceous dark-greenish-gray (5GY4/1) siltstone. Unit weathers to form slope. Consistently poor outcrops of this unit along mountain; probably mostly nonresistant siltstone. ---------- 215

11. Siltstone and quartzite to sandstone. Siltstone, light-olive-gray (5Y5/2), coarse silt, micaceous, platy in part. Quartzite to sandstone, yellowish-gray (5Y8/1) to pale yellowish-brown (10YR6/2), weathers mostly the latter color, very fine grained, micaceous in places, grades to siltstone places, laminated, occurs in 1/2 in to 4-ft layers interstratified with siltstone. Quartzite to sandstone constitutes about 20 percent of lower 60 ft of unit and 60 percent of top 22 ft. Abundant worm borings and castings and other animal markings along bedding planes in siltstone. In places, siltstone is very knobby due to abundance of these borings. No definite trilobite markings noted, but some markings could be from trilobites ---------- 82

10. Covered. Weathers to form slope ---------- 11

Total of equivalent of upper member of Wood Canyon Formation---------- 388

Equivalent of middle member of Wood Canyon Formation:

9. Quartzite and sparse siltstone. Quartzite, pinkish-gray (5YR8/1), minor amount yellowish-gray (5YR8/1), some grayish-red (5R4/2) in top 400 ft, medium- to coarse-grained, some fine- to medium-grained parts (minor amount fine grained quartzite in top 300 ft of unit), thin to thick-bedded, some laminated parts, abundant thin to thick trough and tabular planar sets of low and high angle small- to medium-scale cross strata. Siltstone, similar to that in unit 8. Unit weathers to form cliff. A few layers of granule conglomerate noted in basal 250 ft of unit. Amount of siltstone in unit is as follows:

0 to 250 ft, only a few layers, 250 to 335 ft, 2 percent; 335 to 596 ft, 5 percent; 596 to 601, all siltstone; 601 to 960 ft, 3 percent, 960 to 995 ft, 10 percent; 995 to 1,230, 5 percent.

A few worm(?) trails or burrows along bedding planes and a few possible mud cracks noted in top 250 ft of unit. Abundant *Scolithus* tubes in quartzite from 10 to 15 ft below top of unit ---------- 1,230

8.	Quartzite and sparse siltstone. Quartzite, pale red (5R6/2), sparse grayish-red (5R4/2) and yellowish-gray (5Y8/1), medium- to coarse-grained, some fine- to medium-grained parts (no conglomeratic parts noted in place, although some float of conglomerate occurs), thin- to thick-bedded, abundant very thin to thick trough and tabular planar sets of high-angle small- to medium-scale cross strata (some low-angle cross strata also occurs). Siltstone, grayish-red (5R4/2), fine to coarse silt, micaceous, occurs in 1 in to 1-ft layers interstratified with the quartzite. Siltstone constitutes about 10 percent of lower 100 ft of unit, apparently does not occur from 100 to 335 ft, and forms 5 percent of unit from 335 ft to top of unit. Unit weathers to form slope in lower 100 ft, a cliff from 100 to 455 ft, and slope from 455 to 485 ft. Top of unit a slight bench that marks topographic and color break from pinkish-red cliff below to light-gray less cliffy outcrops above. Basal 40+ ft of unit 9 forms conspicuous light-colored ledge along some parts of outcrop. Quartzite in a few places contains flakes of siltstone ----------	485
7.	Covered. Weathers to form slope. Forms nonresistant interval with units 4 to 6 ----------	54
6.	Siltstone, grayish red (5R4/2), fine to coarse silt, micaceous, laminated, platy, weathers to form minor ledge ----------	6
5.	Covered. Weathers to form slope ----------	6
4.	Quartzite, moderate pink (5R7/4), fine-grained, laminated to very thin bedded, weathers to form minor ledge ----------	4
	Total of equivalent of middle member (lower 70 ft may be lower member) of Wood Canyon Formation ----------	1,785
	Total of equivalent of Wood Canyon Formation ----------	2,173
	Equivalent of stirling Quartzite (incomplete):	
3.	Quartzite (90 percent) and siltstone (10 percent). Quartzite, yellowish-gray (5Y8/1) to pinkish-gray (5YR8/1), and abundant grayish-red (5R4/2), fine- to medium-grained, some medium- to coarse-grained parts, contains a few conglomeratic quartzite layers with granules of quartz. Thin to thick-bedded, abundant tabular planar sets of small- to medium-scale cross strata. Siltstone, grayish-red (5R4/2), sparse light-olive-gray (5Y6/1), fine to coarse silt, micaceous, occurs as 1- to 10-in layers interstratified with quartzite. Unit as a whole weathers to form prominent cliff. Top 2 ft of unit is conglomerate (the most conspicuous conglomeratic layer in unit) and contains granules and small pebbles (as large as 1/2 in) of quartz ----------	261
2.	Covered. Abundant float of basalt, and some possible outcrop of basalt in lower 30 ft. Basalt, dark-greenish-gray (5GY4/1) to medium-dark-gray (N4), laths of plagioclase as long as 5 mm set in aphanitic matrix, sparse float of vesicular basalt with vesicules as large as 1 cm. Unit weathers to form conspicuous slope covered with trees and brush within cliffy quartzite sequence ----------	90
1.	Quartzite, pinkish-gray (5YR8/1) to yellowish-gray (5Y8/1), mostly medium- to coarse-grained, some fine- to medium-grained parts, about 10 percent conglomerate to conglomeratic	

quartzite with granules and small pebbles (rarely 1 in across) of quartz and rarely of jasper and quartzite; very thin to thick bedded, abundant thin tabular planar sets of small to medium scale cross strata; weathers to form conspicuous cliff. Unit contains a few thin layers of light-greenish-gray (5GY8/1) micaceous fine- to medium-grained quartzite. Conglomerate is in 1-in to 12-in layers scattered irregularly in unit. Thickness of unit is actual measurement, not estimate ---------- 500

Total of incomplete equivalent of Stirling Quartzite ---- 851

Total of incomplete Prospect Mountain Quartzite --------- 3,588

Base of section, base of unfaulted section. To west units 1, 2, and 3 are repeted downhill.

NEVADA-LINCOLN COUNTY

PATTERSON MOUNTAIN section B, measured on west side of Schell Creek Range, 2 mi north of Patterson Pass, west-central part of sec. 24, T. 9 N., R. 64 E.

(measured by J. H. Stewart, June 1969)

Top of section, not top of exposure

Pioche Shale (unmeasured):

		Feet
14.	Siltstone, light-olive-gray (5Y5/2) to pale olive (10Y6/2), fine to coarse silt, micaceous platy in part. Probably about 300 ft of strata between top of unit 13 and base of a sequence consisting of thin to thick layers of medium-gray (N5) limestone interstratified with siltstone. Upper part of this estimated 300-ft interval contains a minor amount of pale yellowish-brown (10YR6/2) very fine grained sandstone. Lower 5 ft of unit contains a few poorly exposed layers of yellowish-gray (5Y8/1) to dark-yellowish-brown (10YR6/6) and pale red (5R6/2) fine- to coarse-grained quartzite. This quartzite is probably interstratified with siltstone and is a transition sequence between units 13 and 14. Abundant animal tracks and trails in unit 14 ----------	unmeasured
	Prospect Mountain Quartzite (incomplete):	
13.	Quartzite, white (N9), sparse very pale orange (10YR8/2), fine to medium-grained, evenly laminated to thin-bedded, weathers to form conspicuous white cliff at top of quartzite-bearing sequence ----------	95
12.	Siltstone and silty sandstone in about equal proportions and similar to that in unit 9. Bottom 5 ft and top 6 ft of unit are covered. Unit weathers to form slope ----------	21
11.	Quartzite, yellowish-gray (5Y8/1), fine- to medium grained, evenly laminated to thin-bedded, weathers to form ledge ----------	33
10.	Covered, weathers to form slope. Probably mostly nonresistant rock like that in unit 9 ----------	12
9.	Siltstone to silty sandstone, greenish-gray (5GY6/10) to dark-greenish-gray (5GY4/1), medium-dark-gray (N4) and light-olive-gray (5Y5/2), grades from fine siltstone to silty very fine to fine grained sandstone, micaceous, platy to flaggy splitting. All gradation of rock types from siltstone to silty sandstone, but siltstone and silty sandstone generally interstratified in sets from 1/4 in to 12 in thick. Probably 70 percent of unit is siltstone and 30 percent silty sandstone. Unit as a whole weathers to form slope. Abundant animal tracks, trails, burrows and castings. Quartzite similar to that in unit 8 occurs from 12 to 13 ft and 65 to 67 ft above base of unit ----------	190

Equivalent of Zabriskie Quartzite:

8. Quartzite (70 percent) and siltstone (30 percent). Quartzite, very pale orange (10YR8/2) to moderate yellowish-brown (10YR5/4), medium- to coarse-grained, laminated to thin-bedded, minor amount of thin tabular planar sets of high-angle small-scale cross strata. Siltstone, light-olive-gray (5Y6/1) to olive-gray (5Y4/1) and medium-dark-gray (N4), coarse silt, micaceous, platy, abundant animal tracks, trails, burrows, and casts, occurs in 1/2 in to 6-ft layers interstratified with quartzite which occurs in layers of comparable thickness. Amount of siltstone increases upwards from perhaps about 10 percent near base to about 40 percent near top. A few sets of cross strata are as thick as 4 ft ---------- 105

7. Quartzite, white (N9), sparse yellowish-gray (5Y8/1) and pinkish-gray (5YR8/1), fine-grained, some fine- to medium-grained parts, indistinct stratification, some very thin to thin beds, minor thin tabular planar sets of small- to medium-scale, high-angle cross strata, weathers to form conspicuous cliff. Top 20 ft of unit weathers back to form bench on top of cliff, is poorly exposed, and could contain some concealed very thin layers of siltstone like that in unit 8. A few layers from 165 to 175 ft above base of unit contain granules of quartz. A 1-in layer of red micaceous siltstone occurs at 146 ft above base of unit ---------- 220

6. Quartzite (90 percent) and siltstone (10 percent). Quartzite, pale red (5R6/2), sparse pale yellowish-brown (10YR6/2), fine-grained, sparse fine- to medium-grained parts, laminated to thin-bedded, sparse low- to high-angle cross strata, probably mostly tabular planar type. Siltstone, grayish-red (5R4/2), fine to coarse silt, micaceous, platy, occurs as 1/2 in to 8-in layers interstratified with quartzite, exact amount of siltstone difficult to estimate because of poor exposures. Top 8 in of unit is grayish-red siltstone with abundant sand-filled tubes of Scolithus ---------- 44

Total of equivalent of Zabriskie Quartzite ---------- 369

Equivalent of Wood Canyon Formation (incomplete):

Equivalent of upper member of Wood Canyon Formation:

5. Siltstone (80 percent) and quartzite (20 percent). Siltstone, grayish-orange (10YR7/4) in lower 61 ft of unit, medium-dark-gray (N4) with a purplish cast from 61 to 111 ft, mostly fine silt, micaceous, platy. Quartzite, yellowish-gray (5Y8/1), light-olive-gray (5Y5/2), some pale red (5R6/2) from 61 to 111 ft, very fine to fine grained, laminated to very thin bedded, sparse low angle cross strata. Unit as a whole weathers to form slope. Sparse worm(?) burrows parallel to bedding siltstone ---------- 111

4. Quartzite and sparse siltstone. Quartzite very pale orange (10YR8/2) to very light gray (N8), very fine to fine grained, evenly laminated to very thin bedded, a few thin tabular planar and trough sets of high-angle cross strata. Siltstone, light-olive-gray (5Y5/2), fine to coarse silt, micaceous, platy splitting. Siltstone occurs in following positions in unit:

32 to 36 ft, 56 to 57 ft, and 79 to 80 ft. Much of middle part of unit is poorly exposed and other siltstone layers might be concealed; total amount of siltstone in unit could be 10 percent. Unit as a whole weathers to form ledgy slope. Contact with overlying unit poorly exposed but probably gradational ----------	139
3. Siltstone and quartzite to sandstone. Siltstone, light-olive-gray (5Y5/2), fine to coarse silt, micaceous, platy, abundant animal tracks, trails, burrows, and castings along bedding planes. Some probable trilobite markings and scratches. Quartzite to sandstone, light-olive-gray (5Y5/2) to grayish-olive (5Y4/2), very fine to fine grained, laminated, occurs as 1/2 in to 12-in layers interstratified with siltstone. Amount of quartzite to sandstone in unit 11 as follows: 0 to 70 ft, 50 percent; 70 to 106 ft, 10 percent, 106 to 112 ft, 80 percent. Unit as a whole weathers to ledgy slope. Unit forms prominent brown unit above cliffs of unit 1 ----------	112
2. Quartzite, very light gray (N8) to light-olive-gray (5Y6/1), very fine to fine grained, sparse fine- to medium-grained parts, laminated to very thin bedded; weathers to form ledge in lower 4 ft and slope in upper 9 ft. Lower 4 ft of unit weathers to form a part of the ledge sequence of unit 1 and could be placed in that unit except for the coarser grain-size of unit 1. Top 9 ft of unit are poorly exposed and could contain some siltstone similar to that in unit 3 ----------	13
Total of equivalent of upper member of Wood Canyon Formation ----------	375
Equivalent of middle member of Wood Canyon Formation (unmeasured):	
1. Quartzite (95 percent) and siltstone (10 percent). Quartzite, pale red (5R6/2) to grayish-red (5R4/2), and minor amount of pinkish-gray (5YR8/1) and yellow-gray (5Y8/1), medium- to coarse-grained, laminated to thin-bedded, sparse low-angle cross strata. Siltstone, grayish-red (5R4/2) coarse silt, micaceous, platy, occurs as 1/2 in to 10-in layers interstratified with quartzite. Unit as a whole weathers to form slope or, in places, cliffs. A few indistinct worm(?) trails and burrows and a few mud cracks(?). Abundant Scolithus tubes in quartzite from 7 to 9 ft below top of unit. Only about 150 ft of unit examined. Same as unit 7 in Cave Valley section A ----------	Unmeasured
Total of incomplete equivalent of Wood Canyon Formation ----------	375
Total of incomplete Prospect Mountain Quartzite --------	1,095

MEXICO - SONORA

CERRO RAJON section, measured in several segments (see Stewart and others, 1984, fig. 3, for specific locations) in Cerro Rajon area, Long. 111°56.3' to 111°58.0' W., Lat. 30°23.6' to 30°25.4'N.

(measured by J. H. Stewart, M. A. S. McMenamin and J. M. Morales-Ramirez, March, 1982)

Jurassic rocks (unmeasured):

	Meters
87. Boulder conglomerate, pale red (10R6/2) composed of pebble to boulder as large as 1 m of quartzite; matrix was not seen; stratification not determinable; weathers to form gentle slopes. Only 5+ m examined. Poor outcrops but definitely in place above unit 86. Clasts probably mostly from upper Proterozoic and Lower Cambrian quartzites. Some granule conglomerate as clasts not readily identificable as to source. ----------	unmeasured
Arrojos Formation (incomplete):	
86. Limestone, medium gray (N5) to light gray (N7), and pale olive gray (5Y6/1), very finely crystalline, thin bedded; weathers to form ledge in valley. ----------	15
85. Siltstone (95 percent), and limestone (5 percent). Siltstone, (5GY6/1), sparse pale red (10R6/2), fine to medium silt, platy splitting, sparse tracks and trails. Limestone, pale yellowish brown (10YR6/2) to very pale orange (10YR8/2), medium crystalline; occurs as thin to bery thin beds interstratified with siltstone; common fossil trash. Unit weathers to form gentle slope to northwest of hogback. A few thin beds of light brown (5YR6/4) weathering silty limestone in lower half of unit. ----------	78
Total of incomplete Arrojos Formations ----------	93
Cerro Prieto Formation:	
84. Limestone, light gray (N7) to medium gray (N5), weathering same with conspicuous very pale orange (10YR8/2) color bands 1 to 10 m thick, medium to coarsely crystalline, thin bedded; sparse oncoliths ("Girvanella"). Difficult to measure accurately on long dip slope. Light color bands may be altered limestone. ----------	37+
83. Limestone, medium gray (N5), weathering same color, very finely crystalline; indistinct thin beds; abundant oncoliths ("Girvanella") from 1 to 2 cm in diameter; weathers to form conspicuous ledge. Difficult to measure accurately on long dip slope. ----------	45+
Total of Cerro Prieto Formation ----------	82
Buelna Formation:	
82. Sandy limestone (80 percent) and quartzite (20 percent). Sandy limestone, light olive gray (5Y6/1), weathering same and light brown (5YR6/4), fine to medium rounded quartz grains; trough and tabular planar sets of cross-	

strata. Quartzite, yellowish gray (5Y8/1) fine to medium grained, trough and tabular planar sets of small scale cross-strata occurs as 5 to 20 cm thick cosets interstratified with sandy limestone. Unit weathers to form small ledge. ---------- 3

81. Siltstone (80 percent) and quartzite (20 percent). Siltstone, greenish gray (5GY6/1), coarse silt, micaceous platty splitting; abundant tracks, trails, and burrows. Quartzite, pale yellowish brown (10YR6/2) to yellowish gray (5Y8/1), very fine to fine grained; laminated; occurs in 1 to 5 cm sets interstratified with siltstone. Unit weathers to form slope. ---------- 8.5

80. Sandy limestone and minor intraclast conglomerate, pale red (10R6/2) weathering light olive gray (5Y6/1) with light brown (5YR6/4) patches, medium crystalline with fine to medium rounded grains of quartz; indistinct thin beds, lower 2.5 m contains common tabular planar sets of cross-strata. Intraclast conglomerate occurs from 2.5 to 4 m above base of unit, and contains tabular clasts as large as 10 cm in sandy lime matrix. Unit weathers to form conspicuous ledge in middle of Buelna Formation. ---------- 10.5

79. Limestone, siltstone, and minor quartzite. Limestone, medium gray (N5) with pale brown (5YR5/4) mottling, very finely crystalline; indistinct thin bels; abundant burrows; Salterella in limestone. Quartzite, pale yellowish brown (10YR6/2), very fine to fine grained, laminated to very thin bedded. Siltstone, greenish gray (5GY6/1), micaceous, platty splitting. Siltstone and minor quartzite occurs from 7.5 to 10.5 and 16.0 to 21.0 on above base of unit. Rest of unit is limestone. ---------- 21

78. Siltstone, limestone, and quartzite. Siltstone, yellowish gray (5Y7/2) coarse silt, micaceous, platty splitting. Limestone to sandy limestone, similar to that in unit 77, occurs in thin beds. Quartzite, yellow gray (5Y8/1), very fine to fine grained; laminated, some small scale cross-strata. Quartzite occurs near top of unit. Unit poorly exposed, probably mostly (60 percent?) siltstone. ---------- 12

77. Sandy limestone and quartzite, poorly exposed. Sandy limestone, pale red (10R6/2) and medium gray (N5), weathering light brown (5YR6/4) to dark yellowish brown (10YR4/2) and medium gray (N5), fine to medium sand; irregular faminae to thin beds. Quartzite, pale red (10R6/2), fine to medium grained with scattered very coarse grains to granules of quartz. Poorly exposed. Unit weathers to form small ledge. ---------- 4

76. Limestone, medium light gray (N6), weathering same color with light olive gray mottling, medium crystalline; thin bedded; common burrows, weathers to form minor ledge. ---------- 6.5

75. Dolomite to sandy dolomite (50 percent) and quartzite (50 percent). Dolomite to sandy dolomite, medium light gray (N6), weathering light brown (5YR6/4)) to moderate

brown (5YR4/4), medium crystalline, sandy parts contain fine to medium rounded quartz grains; iregularly laminated to thin bedded; abundant tabular planar sets of small to medium scale cross-strata. Quartzite, pale yellowish brown (10YR6/2) to moderate yellowish brown (10YR5/4), weathering same color and yellow gray (5Y8/1), fine to medium grained; laminated to thin bedded; some tabular planar sets of small scale cross-strata; occurs as 1 to 30 cm cosets interstratified with dolomite to sandy dolomite. Stratification as whole has crinkly aspect due to some wavy bedding. Unit as whole weathers to form ledge. ---------- 12

Total of Buelna Formation ---------- 77.5

Proveedora Quartzite:

74. Quartzite, pinkish gray (5YR8/1), sparse medium gray (N5) and pale red (10R6/2), fine to medium grained, scattered coarse grains, well-rounded; laminated to very thin bedded; common very thin (10 cm) tabular planar sets of low angle cross-strata; a few medium scale cross-strata, lower hill less well bedded, many parts in lower half appears almost structureless; weathers to form cliff and hogback. Abundant Scolithus in basal 90+ m; few, if any above 90 m. Greenish gray (5GY6/1) and pale red (10R6/2) micaceous coarse siltstone occurs in following positions in unit; 20 percent of basal 4.5 m of unit and in following lower positions above base 4.5 to 8.5 m, 20 to 22 m, 79 to 83 m. No siltstone above 83 m. Basal 83 m of unit forms cliff and slope topography whereas unit above 83 m forms cliffs. Some siltstone interclasts in quartzite in lower 50 ± m of unit. ---------- 201

Total of Proveedora Quartzite ---------- 201

Puerto Blanco Formation:

Unit 4 of Stewart and others (1984):

73. Siltstone (80 percent) and quartzite (20 percent). Siltstone, greenish gray (5GY6/1) to light olive gray (5Y6/1), one medium gray (N5) layer with purplish cast in lower part of unit, fine to medium silt, locally micaceous; platty splitting; abundant tracks, trails, and burrows. Quartzite, yellowish gray (5Y8/1) to light brownish gray (5YR6/1), very fine to fine grained; laminated to very thin bedded; occurs in 1 cm to 1 m layers interstratified with siltstone. A 2 m thick limy quartzite (light brownish gray weathering) occurs in middle of unit. Unit weathers to form steep slope. Much talus and poor outcrops in upper half. ---------- 44

72. Limestone to silty limestone (50 percent), siltstone (25 percent), quartzite (20 percent), and dolomite (5 percent). Limestone to silty limestone, medium gray (N5), weathering same and pale olive gray (5Y6/1) with light brown (10YR6/4) mottling locally, very finely crystalline, common very fine grained (quartz) sandy parts; laminated to thin bedded, common tabular planar

sets of small scale cross strata; occurs in 0.1 to 4 m cosets interstratified with other lithologies. Siltstone, grayish orange (10YR7/4) and greenish gray (5GY8/1), coarse silt, micaceous, irregularly splitting; poorly exposed. Quartzite, very pale orange (10YR8/2) to pale yellowish brown (10YR6/2), very fine to five grained; laminated to thin bedded; common Scolithus burrows; occurs in 10 cm to 1.5 m cosets. Dolomite, medium gray (N5) to pale yellowish brown (10YR6/2), weathering light brown (5YR6/4), very finely crystalline; laminated to thin bedded. Dolomite occurs in 1 to 4 m layers in upper third of unit. Shell trash beds of limestone occur locally in unit. Archeocyathids occur in basal fourth of unit; not in living position; could be reworked. Unit weathers to form steep slope with common ledges ---------- 97

Total of unit 4 of Stewart and others (1984) ---------- 141

Unit 3 of Stewart and others (1984):

71. Limestone, medium gray (N5), weathering medium light-gray (N6), very finely crystalline, oolitic in part; thin beds, sparse low angle cross-stratification; weathers to form upper part of cliff with unit 70. Unit 70 and 71 form and "orange-gray" banded cliff that is conspicous along outcrop. Some limestone contain peculiar irregular "fillings" that may be burrows. Basal 4 m of unit contain abundant light brown (5YR6/4) very thin to thin sets of laminated sandy, very fine grained quartz limestone. ---------- 13

70. Archeocyathid-limestone, light gray (N7) to yellowish gray (5Y8/1), weathering very pale orange (10YR8/2) and light gray (N7), very finely crystalline, indistinct thin beds; weathers to form "orange" cliff. Archeocyathids range in diameter from 0.5 to 4 cm. ---------- 18

Offset so that unit 70 measured 1 km S. 50 W. of where unit 69 measured

69. Quartzite (90 percent) and siltstone (10 percent). Quartzite, yellowish gray (5Y8/1) to light olive gray (5Y6/1), very fine to fine grained; indistinct thin to thick beds. Siltstone, greenish gray (5GY6/1), coarse silt, micaceous, occurs as very thin to thin beds in middle of unit; platty splitting. Unit weathers to form part of ridge top along line of section. ---------- 6.5

68. Sandy limestone, limestone, and siltstone, in about equal proportions. Sandy limestone, grayish orange (10YR7/4), very fine grained quartz sand in very finely crystalline matrix, evenly laminated; sparse low angle cross-strata. Limestone, similar to sandy limestone except for sand context. Siltstone, greenish gray (5GY6/1), platty splitting. Unit weathers to form small resistent ledge. ---------- 5

67. Siltstone (80 percent) and quartzite (20 percent). Siltstone, yellowish gray (5Y8/1) to dusky yellow (5Y6/4), medium to coarse silt, somewhat micaceous, platty spilling. Quartzite, yellowish-gray (5Y8/1), weathering very pale orange (10YR8/2), very fine grained, evenly

laminated; occurs in 1 to 20 cm sets interstratified with siltstone. A few tracks, trails, and burrows in siltstone. ---------- 36

66. Archeocyathid-limestone, yellowish gray (5Y8/1) to pinkish gray (5YR8/1), weathering very pale orange (10YR8/2), very finely crystalline, indistinct thick beds, no stratification can be seen in much of unit; unit weathers to form prominant cliffs. Abundant archeocyathid throughout unit. Diameter of archeocyathids ranges from 0.5 to 5 cm. A few thin sets of grayish orange siltstone is lower third of unit. Unit appears to be somewhat sheared tectonically. ---------- 39

Total of unit 3 of Stewart and others (1984) ---------- 117.5

Unit 2 of Stewart and others (1984):

65. Siltstone (80 percent) and quartzite (20 percent). Siltstone, yellow gray (5Y7/2) to dusky yellow (5Y6/4), medium silt, micaceous; platty splitting; abundant borings, and track and trails. Quartzite, yellow gray (5Y8/1), very fine grained; evenly laminated, occurs in 1 to 10 cm sets interstratified with siltstone. A few limy siltstone beds. Unit weathers to form steep light colored slope. ---------- 150

64. Siltstone to silty limestone, grayish red (5R4/2), greenish gray (5GY6/1) and yellow gray (5Y8/1), coarse silt, locally micaceous, laminated, weathers to form small ledge and hogback. Contains trace fossils (Cruziana). ---------- 5

63. Quartzite to siltstone, grayish red (5R4/2) and greenish gray (5GY6/1), very fine grained sand to coarse silt, somewhat micaceous, no stratification visible in much of unit, probably mostly thick bedded, some laminae. Basal 5 m contains 20 percent 1 to 5 cm thick beds of silty dolomite which weather grayish orange (10YR7/4). Unit weathers to form steep slope. Common borings in quartzite in upper part of unit. ---------- 18

Total of unit 2 of Stewart and others (1984) ---------- 173

Unit 1 of Stewart and others (1984):

62. Intraclast conglomerate, pale yellowish brown (10YR6/2), composed of light brown and medium gray tabular clasts, as large as 15 cm, of dolomite and sandy dolomite in medium to coarse quartz sand matrix; indistinct thin beds; weathers to form small ledge. ---------- 4.5

61. Greenstone, greenish gray (5GY6/1) with grayish red (5R4/2) mottling, weathering dark greenish gray (5GY4/1), tabular (2 to 4 mm) mafic minerals altered to actinolite(?) set in aphanitic matrix; weathers to form dark ledgy unit. A flow or possibly a tuff. ---------- 40

60. Volcanic sandstone to conglomerate, greenish gray (5GY6/1), minor grayish red (5R4/2), variable texture from fine-grained sandstone to very coarse-grained sandstone, also granule conglomerate and sparse pebble conglomerate; a few clasts as large as 20 cm; sand through pebbles generally greenstone and siltstone(?); silty matrix; evenly laminated to thin bedded; bedding poorly defined; weathers to form slope. Top 10 m could be greenstone rather than volcanic sandstone (difficult to say). ---------- 48

59 Greenstone, medium gray (N5), weathering light olive gray (5Y6/1), very finely crystalline; quartz filling of well formed vesicules from 2 to 4 mm in diameter ---------- 7.5

58. Sandstone to conglomerate, grayish red (5R4/2) and greenish gray (5GY6/1), fine to medium grained, silty, sandstone cemented by poikolitic crystals of calcite; grains mostly(?) of siltstone and greenstone(?); grades to granule conglomerate; greenstone pebble conglomerate in top 0.5 m; laminated to thin bedded; sparse tabular planar sets of small scale cross-strata; weathers to form small ledge. ---------- 12

57. Siltstone, greenish gray (5GY6/1) and grayish red (5R4/2), fine silt; platty to slabby spilling; weathers to form slope.---------- 13.5

56. Siltstone (70 percent) and silty dolomite (30 percent). Siltstone, light olive gray (5Y6/1) to olive gray (5Y4/1), coarse silt, somewhat micaceous; platty splitting. Silty dolomite, medium light gray (5Y6/1), weathering light olive gray (5Y6/1) and light brown (5YR6/4), very finely crystalline; occurs in 2 to 10 cm laminated sets interstratified with siltstone. Weather to form lower part of hogback developed part on unit 55. ---------- 12

55. Quartzite (90 percent) to coarse siltstone (10 percent), finer rocks are light olive gray (5Y8/1), coarser rocks are pale red (10R6/2), grades from coarse micaceous siltstone to fine grained quartzite, a few layers of medium grained quartzite; evenly laminated; one example of small scale soft sediment deformation; no cross-strata noted; siltstone is platty splitting; quartzite is slabby splitting; unit weathers to form slope with hogback in upper part. Poorly defined interstratification of 10 to 30 cm thick sets of alternating siltstone (greenish) and cleaner quartzite. Finer grained than typical middle memeber of Wood Canyon Formation and does not contain cross-strata as the Wood Canyon does. ---------- 79.5

54. Conglomerate and minor sandstone. Conglomerate, light brownish gray (5YR6/1) to brownish gray (5YR4/1), composed of granule to boulders of greenstone, dolomite, sandy dolomite, and siltstone set in silty fine to very coarse grained sand matrix; matrix contains angular to rounded clasts of quartz and siltstone (and perhaps other rock types). Clasts are generally rounded; some tabular clasts of sandy dolomite. Crude very thin to thick beds; sparse low angle cross-strata and shallow channels. Sandstone, medium gray (N5) with purple east, weathering brownish gray (5YR4/1), fine to medium grained; locally includes siltstone layers; laminated to thin bedded. Sandstone occurs mostly from 31.5 to 39 m above base of unit; sparse elsewhere in units. Coarsest conglomerate in basal 4 m of unit with clasts of sandy dolomite as large as 1 m. Average clasts are from 5 to 10 cm in most of unit. Clast size tends to decrease upward but 10 cm clasts still are present near top, although they are rare. Unit weathers to form dark ledge

slope. Greenstone clasts are relatively more abundant upward in section. ---------- 61

53. Siltstone (70 percent) and quartzite (30 percent). Siltstone, greenish gray (5GY6/1), greenish gray (5GY6/1), (a 0.5 m set in middle of unit is dark gray (N3), fine to coarse silt, commonly micaceous. Quartzite, pinkish gray (5YR8/1), fine to medium grained, poorly exposed. Unit weathers to form slope. ---------- 7.5

Total of unit 1 of Stewart and others (1984) ---------- 285.5

Total of Puerto Blanco Formation ---------- 717

La Cienaga Formation:

Unit 4 of Stewart and others (1984):

52. Dolomite, medium light gray (N6), sparse pale red (10R6/2) blotches, weathers pale yellowish brown (10YR6/2), very finely crystalline; indistinct laminae to very thin beds, some intraclast (tabular 1 to 2 cm dolomite clasts) in dolomite matrix; weathers to form higher of two conspicuous cliffs in the La Cienega Formation. Basal 1 m of unit contain common sandy (fine to coarse quartz grains) dolomite. ---------- 27

Total of unit 4 of Stewart and others (1984) ---------- 27

Unit 3 of Stewart and others (1984):

51. Siltstone (60 percent), quartzite (30 percent) and dolomite to sandy dolomite (10 percent), similar to unit 50. One piece of siltstone with Runzel marks ---------- 14.5

50. Greenstone, light olive gray (5Y5/2), finely crystalline, altered, scattered vesicules(?) filled with dolomite; overlying siltstone and quartzite appears deposition on top of greenstone. Probably a flow. Weathers to form small ledge. ---------- 1.5

49. Siltstone (60 percent), quartzite (30 percent), and dolomite to sandy dolomite (10 percent). Siltstone, pale olive (10Y6/2) to greenish gray (5GY6/1), weathering same and pale yellowish brown (10YR6/2), fine to coarse silt, micaceous; laminated; platty splitting; common irregular markings on surfaces, most are probably not trace fossils, although one consists of scratches and appears to be a trace fossil (possible Rusophycus). Quartzite, yellowish gray (5Y8/1) to light olive gray (5Y6/1), very fine, fine, and medium grained beds; laminated to thin bedded, common very thin tabular planar sets of low angle cross-strata; occurs as 1 to 30 cm cosets interstratified with siltstone. Dolomite to sandy dolomite, similar to that in unit 48. Unit weathers to form slope. ---------- 9.5

48. Dolomite to sandy dolomite, medium light gray (N6) to brownish gray (5YR4/1), weathering light olive gray (5Y6/1) and light brown (5YR6/4), very finely crystalline, common fine to very fine quartz sand; evenly laminated to thin bedded; weathers to form slope. ---------- 12

Total of unit 3 of Stewart and others (1984) ---------- 37.5

Unit 2 of Stewart and others (1984):

Offset in section so that overlying unit measured 100 m N. 60 W. of underlying units. Offset at horizon 7.5 m below top of unit 47

47. Dolomite, medium gray (N5), weathering light olive gray (5Y6/1), very finely crystalline, indistinct laminae to thin beds; weathers to lowest major light gray cliff in La Cienega Formation. Top 7.5 m of unit contains common sandy dolomite. Sandy dolomite, light gray (N7), weathering pale yellowish brown (10YR6/2), consists of fine grained quartz sand in dolomite matrix; laminated to thin bedded, common thin tabular planar sets of low angle cross-strata; occurs in 10 to 70 cm cosets. Top 7.5 m of unit is less resistant and weathers to form slope. ---------- 37.5

Total of unit 2 of Stewart and others (1984) ---------- 37.5

Unit 1 of Stewart and others (1984):

46. Siltstone (70 percent) and quartzite (30 percent). Siltstone, yellowish gray (5Y7/2) to pale yellowish brown (10YR6/2), weathering the latter color, coarse silt, micaceous; platty splitting. Quartzite, yellowish gray (5Y8/1) to pinkish gray (5YR8/1), fine to medium grained, laminated to thin bedded; common tabular planar sets of small scale cross-strata; occurs as 10 to 50 cm sets interstratified with siltstone. Unit weathers to form slope. ---------- 15

45. Mixed lithology, siltstone, quartzite, silty dolomite, and sandy dolomite. Siltstone, grayish orange (10YR7/4), coarse silt, some mica, platty splitting; occurs in basal meter of unit. Quartzite, yellow gray (5Y8/1), very fine to fine-grained; laminated, rare small scale cross strata; occurs in middle of unit. Silty dolomite, light olive gray (5Y6/1), weathering grayish orange (10YR7/4) coarse silt, very thin to thin beds; occurs in middle and upper part of unit. Sandy dolomite, similar to that in unit 46; forms uppermost 2 m of unit. Unit weathers to form slope. ---------- 4.5

44. Sandy dolomite to dolomite, medium light gray (N6), weathering light olive gray (5Y6/1) to grayish orange pink (5YR7/2), very fine to medium rounded quartz grains in very finely crystalline matrix; laminated to thin bedded common tabular planar sets of small scale cross-strata; weathers to form slope. Common 1-3 mm shelly fossils. ---------- 12

43. Greenstone, greenish gray (5GY6/1), weathering dark greenish gray (5GY4/1), finely crystalline; abundant chlorite; other minerals not identifiable; weathers to form slope. Top of underlying unit is oxidized suggesting possibility that greenstone is a flow. Some of greenstone weathers with "holes" suggesting vesicules, but "holes" are not present in fresh rock. ---------- 6

42. Sandy dolomite (80 percent) and quartzite (20 percent). Sandy dolomite, pale red (10R6/2), weathering light brown (10YR6/4), fine to medium well rounded quartz grains in very finely crystalline matrix; evenly laminated to thin bedded and abundant tabular planar sets of small scale cross-strata. Quartzite, pinkish gray (5YR8/1), fine to medium grained; thin bedded some cross-strata; occurs in 10 cm to 1 m cosets interstratified with sandy dolomite.

	Unit contains at least one thick bed of light-olive-gray-weathering dolomite and one thin bed (in middle of unit) of greenish gray silty fine grained quartzite. Unit weathers to form slope. ----------	25
41.	Dolomite, and minor sandy dolomite, light brownish gray (5YR6/1) to pale yellowish brown (10YR6/2), weathering light brown (5YR6/4), very finely crystalline, sandy parts contain well rounded fine to medium quartz grains; indistinct laminae to thin beds; weathers to form ledge, fairly conspicuous light brown ledge above quartzitic sequence. ----------	13.5
	Total of unit 1 of Stewart and others (1984) ----------	76.0
	Total of La Cienga Formation ----------	178
Tecolote Quartzite:		
40.	Quartzite (40 percent) and sandy dolomite to dolomite (60 percent), similar to unit 36. Unit weathers to form brownish less resistant unit transitional from largely quartzite of unit 39 to largely sandy dolomite of unit 41. ----------	22.5
39.	Quartzite (90 percent) and sandy dolomite to dolomite (10 percent), similar to unit 36. Sandy dolomite to dolomite occurs in 0.5 to 1.5 m thick cosets interstratified with quartzite. Unit weathers to form cliffy light colored unit. Most conspicuous unit or ridge. Quartzite contains common tabular planar and trough cross-strata. ----------	72
38.	Quartzite (50 percent) and sandy dolomite to dolomite (50 percent), similar to unit 36. Unit weathers to form slope, less resistant than overlying or underlying units. ----------	22.5
37.	Dolomite, medium gray (N5) to pale red (10R6/2), weathering light olive gray (5Y6/1), very finely crystalline; indistinct laminae to thin beds; weathers to form ledge Along much of outcrop to east and west unit is difficult to distinguish. ----------	11
36.	Quartzite (50 percent) and sandy dolomite to dolomite (50 percent). Quartzite, pinkish gray (5YR8/1) to yellow gray 5Y8/1), moderate red (5R5/4) mottling, medium to coarse grained; evenly laminated to thin bedded; sparse cross-strata. Quartzite occurs in 0.5 to 1.5 m cosets interstatified with cosets of sandy dolomite to dolomite of comparable thickness. Sandy dolomite to dolomite, medium dark gray (N4); sandy parts weather light olive gray (5Y6/1) to light brown (5YR6/4), dolomite parts weather light olive gray (5Y6/1). Sandy dolomite composed of fine to coarse well rounded quartz grains in very finey crystalline matrix; dolomite is very finely crystalline; sandy dolomite is mostly in thin trough and tabular planar sets of small scale cross-strata; minor laminated to thin bedded parts. Dolomite is laminated to thin bedded. Unit weathers to form light colored cliffy interval. Basal 3.5 m of unit is all sandy dolomite to dolomite transitional with underlying unit. ----------	40.5
	Total of Tecolate Quartzite ----------	168.5

Papalote Formation:

Unit 6 of Stewart and others (1984):

35. Dolomite, similar to unit 33, sparse indistinct trough(?) sets of small scale cross-strata. Stratification is indistinct with laminae to thin beds common. Sparse intraclasts of dolomite as much as 2 cm across. A few 3 to 4 cm layers of "microconglomerate" with 1 to 3 mm plates of dolomite in dolomite matrix (similar to rock in unit 13). Unit weathers to form slope in lower part and somewhat resistant ledge interval in upper part. Line of section probably crosses some small faults in this unit. ---------- 135

34. Siltstone (30 percent) and dolomite (70 percent). Siltstone, moderate red (5R5/4) with greenish gray (5GY6/1) mottling, fine silt, evenly laminated; platty splitting. Dolomite, similar to that in unit 33, except some parts are grayish red (5R4/2) in fresh color and weather pale brown (5YR5/2). Siltstone occurs in 0.5 to 1 m sets interstratified with dolomite. Unit weathers to form slope between somewhat more resistant overlying or underlying units. ---------- 10

33. Dolomite, medium light gray (N6), weathering light olive gray (5Y6/1), very finely crystalline, indistinct laminae to thin bedded; weathers to form small ledge. --------- 12

Total of unit 6 of Stewart and others (1984) ---------- 157

Unit 5 of Stewart and others (1984):

32. Quartzite (40 percent) and sandy dolomite to dolomite (60 percent). Quartzite, pinkish gray (5YR8/1), fine-grained, some fine to medium-grained parts, laminated, sparse tabular planar sets of small scale cross-strata; occurs in 0.5 to 1 m cosets interstratified with sandy dolomite to dolomite. Sandy dolomite to dolomite, grayish red (5R4/2), weathering light brown (5YR6/4), composed fine to coarse rounded quartz grains in dolomite matrix, some parts contain few, if any, quartz grains; laminated, sparse cross-strata; occurs in 0.5 to 3 m cosets interstratified with quartzite. Unit as whole weathers to form slope. ---------- 31.5

Total of unit 5 of Stewart and others (1984) ---------- 31.5

Offset in section so that unit 32 measured 1± km east of where unit 31 measured.

Unit 4 of Stewart and others (1984):

31. Dolomite, medium light gray (N6) and sparse light brownish gray (5YR6/1), weathering light gray (N7), very finely crystalline, indistinctly evenly laminated to thin bedded, weathers to form light gray resistant unit within carbonate sequence. A bed containing domal stromatolites occurs from 15 to 15.5 m above base of unit. Unit from 42 to 45 m above base contains 20 percent sandy dolomite. Sandy dolomite is medium gray (N5), weathers light brown (5YR6/4) to moderate brown (5YR4/4) and contains fine to very coarse well rounded quartz grains. Top of unit is a wash along line of section; projection of contact to

line of section from outcrops 50 m south indicates thickness of unit is complete. ---------- 157
Total of unit 4 of Stewart and others (1984) ---------- 157

Unit 3 of Stewart and others (1984):

30. Silty dolomite to dolomitic siltstone, pale red (10R6/2) to pale reddish brown (10R5/4), weathering moderate orange pink (10R7/4), fine silt in very finely crystalline dolomite matrix; evenly laminated; weathers to form slope. Light olive gray dolomite bed about 1 m thick occurs about 1/3 of way up in unit. ---------- 7.5
Total of unit 3 of Stewart and others (1984) ---------- 7.5

Unit 2 of Stewart and others (1984):

29. Dolomite, medium light gray (N6), weathering light gray (N7), very finely crystalline, laminated, some wavy laminae; weathers to form ledge. ---------- 20
Total of unit 2 of Stewart and others (1984) ---------- 20

Unit 1 of Stewart and others (1984):

28. Poorly exposed. Siltstone, dolomite, and quartzite. Siltstone, pale red (10R6/2), moderate red (5R5/4), coarse to fine silt, micaceous; platty splitting. Dolomite, medium gray (N5) and brownish gray (5YR3/2), weathering same color and pale yellowish brown (10YR6/2), evenly laminated; occurs as two 0.5 to 1 m beds in basal 4 m of unit. Quartzite, pale red (10R6/2), fine grained, laminated; occurs from 16.5 to 17.8 m above base of units. Unit is whole weathers to form slope with minor lodges or dolomite in basal parts. ---------- 31.5
Total of unit 1 of Stewart and others (1984) ---------- 31.5
Total of Papalote Formation ---------- 404.5

Note: Sequence below unit 28, in area where unit 28 was measured, is folded and highest stromatolites are perhaps 15 m below base of unit 28. Folding may indicate fault near top of unit 27, or some kind of folding prior to deposition of unit 28. Basal dolomite of unit 28 is relatively unfolded. Folding and possible faulting indicates uncertainty in measured thickness of unit 27 and the possibility that strata are cut out between units 27 and 28.
Section offset so that unit 28 measured 300 m west of where unit 27 measured.

Gamuza Formation:

Upper unit:

27. Stromatolic dolomite, medium gray (N5), weathering same color with mottling of grayish orange (10YR7/4), composed of vertical columns (mostly 5-20 cm in diameter) of stromotalites of Conophyton type; very poorly defined thick beds; bedding not noticeable in most rock; weathers to form long dip slope. Thickness approximate due to uncertanties of measurement on dip slope. Common vuggy coarsely crystalline dolomite fillings between stromatolite columns. ---------- 60 +
Total of upper unit ---------- 60 +

Middle Unit:

26. Dolomite (60 percent), siltstone (30 percent), chert (10 percent). Dolomite, grayish red (10R4/2), weathering

moderate orange pink, very finely crystalline; laminated to thin bedded, some waviness to laminae. Siltstone, grayish red (5R4/2), commonly siliceous, evenly laminated. Chert, grayish red (10R4/2), dense, very thin bedded to laminated. Unit poorly exposed, but forms distinct unit between laminated dolomite below and stromotolitic dolomite above. Highly contorted slump(?) fold close to line of section. ---------- 4.5

Total of middle unit ---------- 4.5

Lower unit:

Offset in section so that unit 26 measured 1± km west of where unit 25 was measured.

25. Dolomte, medium gray (N7), weathering light gray (N7) and light olive gray (5Y6/1), very finely crystalline, laminated to thin bedded, wavy laminae common (could be algal mats, possible low angle cross-laminae); weathers to form major cliff and ridge top. Long dip slope on east. Exact thickness uncertain due to long dip slope on north and minor high angle faulting. ---------- 57±

24. Dolomite (60 percent) and dolomitic siltstone (40 percent). Dolomite, medium gray (N5) to medium dark gray (N4), medium to very finely crystalline, laminated to thin bedded, common wavy laminae suggesstive of algal mats. Dolomitic siltstone, pale red (10R6/2) to grayish red (10R4/2), medium-grained silt, laminated to thin bedded. Granule conglomerate (quartz granules in fine to coarse sand matrix) occurs from 5 to 6 m above base of units. Unit weathers to form slope between cliffs of units 23 and 25. ---------- 13.5

Total of lower unit ---------- 70.5

Total of Gamuza Formation ---------- 135

Pitiquito Formation:

23. Quartzite, pale red (10R6/2), minor yellowish gray (5Y8/1), weathering same color and pinkish gray (5YR8/1), fine to medium grained, some medium to coarse grained, composed of rounded quartz grains; laminated to thin bed, common thin trough and tabular planar sets of small to medium scale cross-strata; unit weathers to form ledges and slopes in lower part (outcrops are ledges, covered intervals are slopes), and cliff in upper 32 m. Some dolomitic fine to medium grained sandstone that weathers tight brown (5YR6/4). Some siltstone clasts (2-4 mm) in quartzite in lower part of units. Lower part of unit has covered intervals in following positions 1 to 16 m, 16.5 to 17.5 m, 19.0 to 37.5 m, and 41 to 45.5 m above base of unit. Some herringbone cross-strata. ---------- 77

Total of Pitiquito Formation ---------- 77

Clemente Formation:

Unit 6 of Stewart and others (1984):

22. Siltstone to very fine grained sandstone, pale red (10R6/2) minor greenish gray (5GY6/1), coarse silt to very fine grained sand, micaceous, laminated to thin bedded, some even stratification, common wavy stratification (ripples?) is lower third, common drag marks, flute casts and irregular

markings in lower third. Unit contains intraclat conglomerate from 14 to 15 m and 27 to 30 m above base. Intraclast conglomerate, grayish red (5R4/2), tabular intraclasts of siltstone as large as 15 cm (mostly 1-3 cm) set in fine to medium sand and silt matrix. Some possible penecontemporaneous slumping associated with intraclast conglomerate. Light brown dolomite intraclast conglomerate and dolomite sandstone occurs from 49.5 to 49.8 m above base of unit. Unit weathers to form slope. Minor ledges develop on intraclast conglomerate. ---------- 81
Total of unit 6 of Stewart and others (1984) ---------- 81
Offset on top of unit 21 south of unit 22 measured 250 m east northest of unit 21.

Unit 5 of Stewart and others (1984):

21. Oolitic dolomite and aphanitic dolomite, very pale orange (10YR8/2), some pale red (5R6/2) in upper 1.4 m. Basal 1.2 m contains oolitic dolomite and layers of intraclast conglomerate composed of rounded intraclasts of oolitic dolomite as large as 15 cm is oolitic matrix. Top 1.4 m of unit is aphanitic dolomite with wavy laminae. Unit as whole weathers to form ledge. Unit is identical of Johnnie oolite of Johnnie Formation. ---------- 2.6
Total of unit 5 of Stewart and others (1984) ---------- 2.6

Unit 4 of Stewart and others (1984):

20. Siltstone, brownish gray (5YR4/1), coarse silt, some very fine sand, micaceous(?), laminated to thin bedded; small dark ledge below light colored ledge of unit 21. -------- 0.7

19. Siltstone, greenish gray (5GY6/1), some pale red (10R6/2) in upper part, fine silt, 1 to 2 mm brown (limonite?) stained spots that weather as holes on surface; platty splitting, weathers to form slope. Correlative with green siltstone unit at base of Rainstorm Member of Johnnie Formation. ---------- 12
Total of unit 4 of Stewart and others (1984) ---------- 12

Unit 3 of Stewart and others (1984):

18. Siltstone to very fine grained quartzite, pale red (5R6/2) to light brownish gray (5YR5/1), coarse silt to very fine grained sand, micaceous, laminated, some parts platty spilling; weathers to form slope. Contains a few thin beds of light brown weathering dolomite. One thin bed of medium gray fine to medium grained quartzite occurs in middle of unit. ---------- 10.5

17. Sandy limestone to dolomite, medium gray (N5) to light brownish gray (5YR6/1), weathering medium gray (N5) with light brown (5YR6/4) and light gray (N7) color bands, line mudstone to dolomite with variable amount of very fine grained quartz sand, even to wavy laminae and thin beds; weathers to form "orange" ledge on outcrop. ---------- 7.5

16. Siltstone to very fine grained quartzite, similar to unit 14. A few thin beds of light brown weathering dolomite. Some greenish gray siltstone. Unit weathers to form slope. ---------- 15
Total of unit 3 of Stewart and others (1984) ---------- 33.5

Unit 2 of Stewart and others (1984):

15. Quartzite to granule conglomerate, pale red (10R6/2) and grayish orange pink (5YR7/2), fine to medium sand to granule conglomerate, mostly quartz granules, some reddish granules that may be jaspar; laminated to thin bedded, common tabular planar set of small to medium scale cross-strata, weather to form small ledge. Conglomeratic parts of unit probably constitute less than 30 percent of unit and occur in 5 to 15 m layers or lenses in the quartzite. ---------- 18

Total of unit 2 of Stewart and others (1984) ---------- 18

Unit 1 of Stewart and others (1984):

14. Siltstone to very fine grained quartzite, pale red (10R6/2) to grayish red (5R4/2), coarse silt to very fine grained sand, micaceous, laminated to very thin bedded, mostly even stratification, some slight wavy stratification, platty splitting, weathers to form slope. Basal 5 m contain two thin beds of light brown (5YR6/4) weathering very finely crystalline dolomite. Greenstone, similar to that in unit 7, occurs from 10 to 11 m above base of unit. About 100 m to east, similar greenstone cross cuts strata and is clearly a dike. Greenstone along line of section may also be a dike or sill. ---------- 63

Total of unit 1 of Stewart and others (1984) ---------- 63

Total of Clemente Formations ---------- 210.3

Caborca Formation:

Upper unit:

13. Dolomitic lime mudstone, somewhat recrystallized, medium dark gray (N4) to medium light gray (N6) weathering same colors, recrystallized lime mud, a few dolomite layers as much as 1 m thick; even to wavy laminae, common low angle cross-strata in irregular shallow troughs; local intraclast conglomerate; weathers to form conspicuous ledge with dip slope on north side. "Microconglomerate" with 2 to 6 mm wide plates of dolomite in lime mud occur locally throughout unit, but most abundantly in lower 10 m. Exact thickness of unit uncertain due to dip slope at top and as well as to minor faulting. Top 2 m of unit commonly is light brownish gray (5YR6/1). ---------- 45 ±

Total of upper unit ---------- 45 ±

Offset in section northward from near top of ridge to north side of canyon. Some strata could be gained or lost in this transfer. Transfer probably accurate within 8± m.

Lower unit:

12. Dolomite and siltstone to sandstone. Poorly exposed, rock types may be in about equal amounts. Dolomite, medium gray (N5), weathering light brown (5YR6/4) to light olive gray (5Y6/1), very finely crystalline, some quartz(?) silt, laminated. Siltstone to sandstone, pale red (10R6/2) coarse silt to very fine grained sand, laminated to very thin bedded. Unit as whole forms rubble-covered light reddish brown slope with a few scattered outcrops. Most of rubble is of rock types described in this unit. ---------- 37.5

11. Sandy limy dolomite, medium light gray (N6), and light brownish gray (5YR6/1), silt to very fine quartz sand in limy dolomite matrix, laminated to very thin bedded; forms minor, but persistent, ledge along outcrop. ---------- 2.1

10. Dolomite to dolomitic limestone (70 percent), silty to sandy dolomite (20 percent), and siltstone and minor very fine grained sandstone (10 percent). Dolomite to dolomitic limestone, medium gray (N5), minor pale reddish brown (10R5/4), weathering medium light gray (N6) with layers of light brown (5YR6/4) and pale yellowish brown (10YR6/2), very finely crystalline, laminated to very thin bedded. Silty to sandy dolomite, medium gray (N5), weathering light brown (5YR6/4), silt to very fine quartz(?) sand in dolomitic matrix; laminated; occurs as 1 to 10 cm sets interstratified with dolomite to dolomitic limestone. Siltstone, and minor very fine grained sandstone, pale red (10R6/2), weathering pale reddish brown (10R5/4) coarse silt to very fine grained sand, locally micaceous, platty splitting; occurs as 1 to 10 cm layers interstratified with rest of units. Amount of siltstone increases upward in unit. Unit as whole weathers to form reddish slope. A few small scale cross-strata in dolomite float ---------- 42

Total of lower unit ---------- 81.6

Total of Caborca Formation ---------- 126.6

El Arpa Formation:

Unit 3 of Stewart and others (1984):

9. Dolomite and minor dolomitic limestone medium light gray (N6), minor light brownish gray (5YR6/1), weathering same colors and light gray (N7), very finely crystalline, laminated to thin bedded, weathers to form ledgy interval. A few thin beds and lenses of intraclast conglomerate. One 5 cm bed contain 2 to 4 mm wide plates of dolomite in muddy matrix. Some parts of unit contain very fine sand to coarse silt grains of quartz(?) ---------- 37.5

Total of unit 3 of Stewart and others (1984) ---------- 37.5

Note: Section transferred so that unit 9 measured about 1 km N. 22 E. of where unit 8 was measured. Transfer may involve addition or loss of 8 $\pm$ m of strata due to poor outcrops at top of unit 8 and base of unit 9 at localities where units 8 and 9 were measured.

Unit 2 of Stewart and others (1984):

8. Siltstone to silty very fine grained sandstone (80 percent) and dolomite (20 percent). Siltstone to sandstone, light brown (5YR6/4) to grayish orange (10YR7/4), weathering same colors, coarse silt to very fine grained sand, micaceous, laminated to thin bedded; platty splitting. Dolomite, grayish orange (10YR7/4), very finely crystalline, laminated to thin bedded, amount of dolomite increase in amount upwards and unit is gradational into overlying unit. Unit as whole weathers to form slope. Top 4.5 m of unit is poorly exposed. A thin sandstone unit about 3/4 of way up in unit is similar to sandstone in unit 2. A 0.5 m layer of sandy (medium to coarse grained) dolomite occurs in top 1/4 of unit. ---------- 13.5

7. Greenstone, brownish gray (5YR4/1) to dark greenish gray (5GY4/1), weathering olive gray (5Y4/1), fine to medium crystalline; surface weathers with 2 to 4 mm wide "holes" that suggests vesicules although fresh rock does not contain cavities. Unit weather to form dark ledge. ----------	1.7
6. Dolomite, medium gray (N5), minor light brown (5YR6/4), weathering same colors and light gray (N7), colors occur in 5 to 20 cm bands, finely crystalline; evenly laminated, could be algal mats; unit weathers to form small ledge. Unit is dark color with distinct moderate to pink (5R7/4) 10 cm band at top which is apparently caused by baking from overlying greenstone flow. ----------	4.5
5. Quartzite to sandstone, light brownish gray (5YR6/1) to grayish pink (5Y8/2), weathering same color to pale red (10R6/2), very fine to fine grained, laminated to very thin bedded, weathers to form nonresistant unit. Sparse laminae of micaceous silty very fine to fine grained sandstone. ----------	4.5
4. Dolomite to sandy dolomite (80 percent) and quartzite (20 percent). Dolomitic to sandy dolomite, medium gray (N5), weathering light olive gray (5Y6/1), sandy parts weather light brown (5YR6/4), very finely crystalline dolomite, some layers contain very fine to fine sand (sandy parts probably less than 10 percent of dolomitic part of unit); laminated to very thin bedded, some probable algal structure (algal mats). Quartzite, light gray (N7) to yellowish gray (5Y8/1), weathering very pale orange (10YR8/2), fine grained; occurs in 5 to 15 cm thick sets interstratified with dolomite to sandy dolomite. Set of quartzite are laminated. Unit as whole weathers to form ledgy interval. ----------	10.5
3. Covered except for outcrop of pale yellowish brown (10YR6/2) fine grained laminated quartzite from 3.0 to 3.3 m above base of unit. ----------	8.5
Total of unit 2 of Stewart and others (1984) ----------	43.2
Unit 1 of Stewart and others (1984):	
2. Arkosic sandstone, yellowish gray (5Y8/1), weathering grayish orange pink (5YR7/2), medium to coarse grained, moderate to poorly sorted, subrounded grains, composed of quartz and feldspar; laminated to thin bedded, common thin tabular planar and trough sets of low angle cross-strata; weathers to form inconspicuous ledge. A few layers of granule and small pebble conglomerate occur locally. Basal 10 cm composed of conglomerate with 2 cm long clasts of orthoclase and coarse grains to granules of quartz in dolomitic matrix. Conglomeratic parts are more common in basal part of unit -----	9.0
Total of unit 1 of Stewart and others (1984) ----------	9.0
Total of El Arpa Formation ----------	89.7

Basement complex:

1. Porphyritic granite and greenstone. Porphyritic granite, greenish gray (5GY6/1) with pinkish gray (5YR3/1) orthoclase phenocrysts as much as 4 cm long, matrix of very coarse quartz and medium crystalline chloritized mafic minerals (in part biotite). 1,400 $\pm$ 20 m.y. old (L. T. Silver,

oral commun., 1982). Greenstone, dark greenish gray (5GY4/1), very finely crystalline occurs in irregular masses, probably intruded by prophyritic granite. Unit as whole weathers to form rolling hills to south of measured section. ---------- unmeasured

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