

UNITED STATES DEPARTMENT OF THE INTERIOR
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Stratigraphic Sections of Jurassic San
Rafael Group and Adjacent Rocks in
Delta, Mesa, and Montrose Counties,
Colorado

By

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This report is preliminary and has not
been edited or reviewed for conformity
with U.S. Geological Survey standards.

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By J. C. Wright and D. D. Dickey

Introduction

These sections were measured prior to 1960, before adoption of the metric system. Publication was delayed by other assignments of the authors and later by the untimely death of J. C. Wright. They are being released at this time because of the increased interest in the uranium potential of Jurassic rocks.

The Sunnerville and Entrada are the only formations of the San Rafael Group that are present in these sections. The medial silty member and upper sandy member of the Entrada Sandstone are generally equivalent to the Dewey Bridge and Slick Rock Members respectively which were named after these sections were measured.

Figure 1 is a map showing the locations of the stratigraphic sections included in this report. The following terms were found convenient in helping to describe stratigraphic sections on the Colorado Plateau:

Entrada berries--Very well rounded, nearly spherical, frosted sand grains larger than grains of the matrix and composing a very small part of the total volume. They are common in the Entrada Sandstone, but are not exclusive to it

Slickrim--A slightly rounded or curved cliff of sandstone as opposed to a vertical cliff

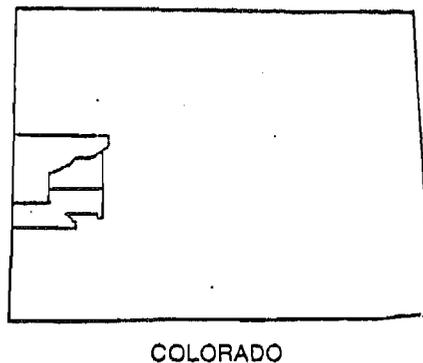
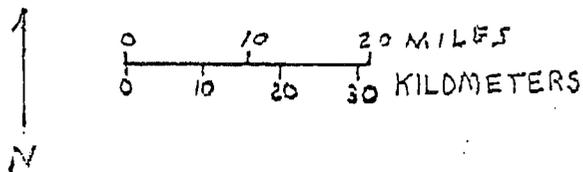
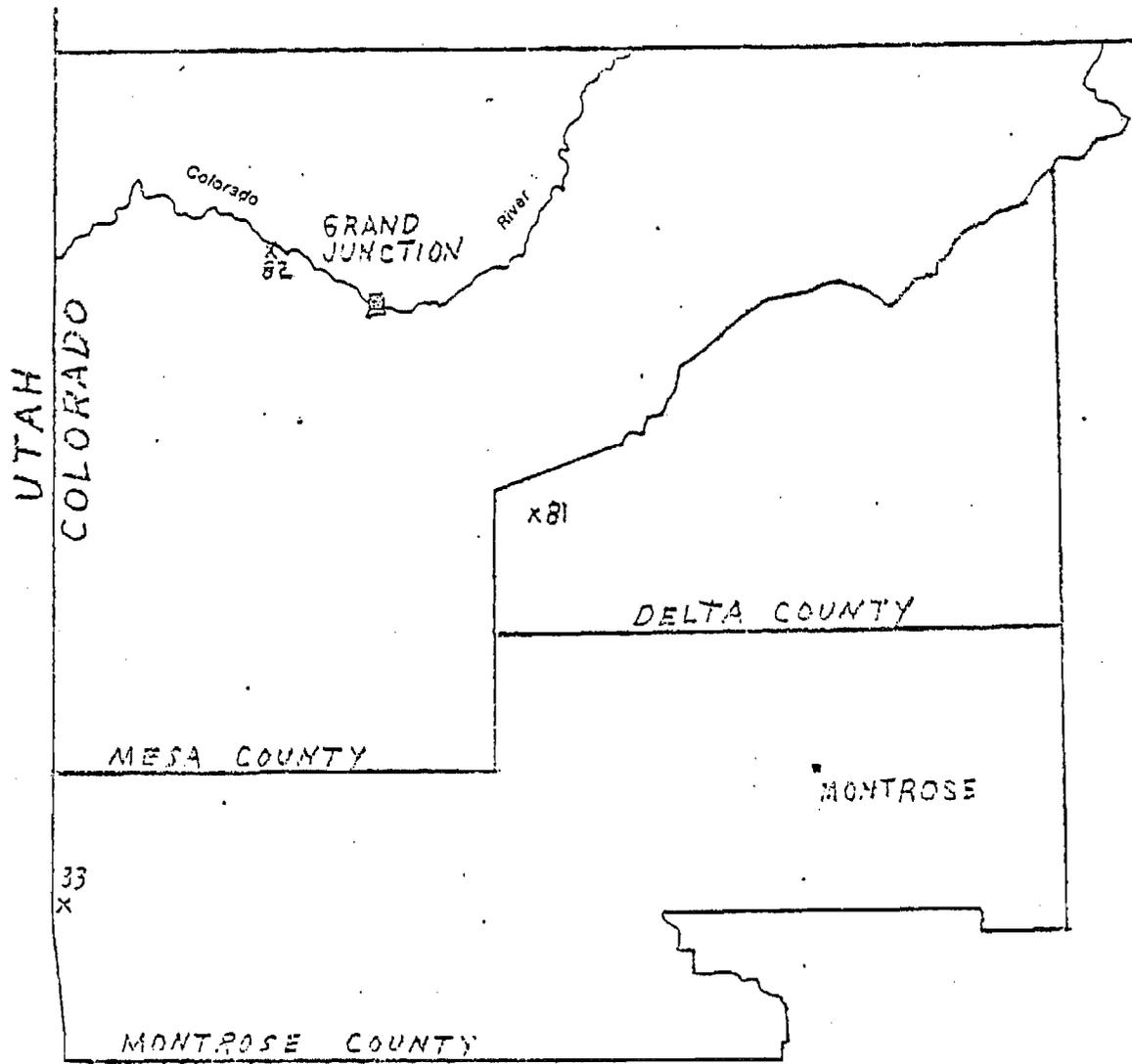


Figure 1. Map showing the locations of stratigraphic sections in this report.

(Section numbers are in system referred to by Wright, J. C., and Dickey, D. D., 1963, Block diagram of the San Rafael Group and underlying strata in Utah and part of Colorado: U.S. Geological Survey Oil and Gas Investigations Chart OC-63.)

COLORADO - MONTROSE COUNTY

LION CANYON section (33)

[NE 1/4 sec. 15, T. 47 N., R. 20 W., at entrance of
Lion Canyon into LaSal Creek; measured by J. C. Wright
and D. D. Dickey, September 5, 1956]

Feet

Upper Jurassic

Morrison Formation (incomplete):

16. Mostly channel-fill sandstone. Approximately-----	75.0
15. Siltstone and mudstone. Approximately-----	35.0
14. Sandstone, white (N 9) fine- to medium-grained, poorly sorted; composed of well-rounded quartz grains. Some pink, yellow, and green chert, subrounded to angular, medium-grained to granules. Very abundant lime cement causes light color. Thin trough sets of small-scale cross-strata. Series of channel-fill sandstone ledges, 3-15 ft thick, with minor interbeds of siltstone-----	<u>60.0</u>
Total of incomplete Morrison Formation-----	<u>170.0</u>

Note: The Summerville-Morrison contact is mostly covered; here it can
be determined only by base of lowest sandstone which fills channels.

Middle Jurassic

Summerville Formation:

13. Covered, probably siltstone like unit 11-----	12.0
---	------

LION CANYON section--Continued

Feet

Summerville Formation--Continued

12. Sandstone, moderate orange-pink (5YR 8/4) weathers same, very fine grained, well-sorted, well-rounded; well cemented, limy; has clusters of grains with films of black, manganese(?) stain; thin even beds. Forms a series of very steep ledges----- 15.0
11. Covered. Exposures on east side of the canyon suggests that this is siltstone (10R 5/6) weathering reddish-orange. Forms slope----- 34.0
10. Sandstone, white (N 9), stained moderate orange-pink (10R 7/4) by wash from above, very fine grained, well-sorted; abundant lime cement causes whitish color; composed of glassy quartz grains; thin to very thin beds with some small-scale cross-stratification in a bed about 1 ft thick. Forms ledge----- 4.0
9. Siltstone, pale reddish-brown (10R 5/4), weathers same, poorly sorted; sandy and clayey; thin, even, indistinct bedding. Forms recess----- 6.0
- Total of Summerville Formation----- 71.0

Note: The Summerville-Entrada contact is conformable over several miles.

LION CANYON section--Continued

Feet

Entrada Sandstone:

Moab Member:

8. Sandstone, color and lithology like unit 7, very thin even bedding, a few thin sets of small-scale cross-strata. Forms upper part of vertical cliff above slickrim----- 57.0
- Total of Moab Member----- 57.0

Upper sandy member:

7. Sandstone, moderate orange-pink (5YR 8/4) weathers very dark pinkish-gray (5YR 7/1) very fine grained, well-sorted, well-rounded; contains "Entrada berries," thick sets of large-scale cross-strata including some very low-angle cross-strata near top. Forms lower part of a nearly vertical cliff at the top of the slickrim. May be a part of Moab Member----- 27.0
6. Sandstone, orange-pink (5 YR 7/4) weathers grayish orange-pink (5YR 7/2), very fine grained with very abundant medium-grained well-rounded gray-frosted and glassy "Entrada berries"; probably well sorted, bimodal. Thick sets (10-20 ft thick) of large-scale cross-strata. Forms steep slickrim----- 40.0

LION CANYON section--Continued

Feet

Entrada Sandstone--Continued

Upper sandy member--Continued

5. Sandstone, same in color and lithology as unit 4, but about 80 percent of the bedding is thin sets of medium-scale cross-laminae. This cross-stratification occurs in horizontal units 2-10 ft thick, separated by irregularly laminated, reworked units, 1-3 ft thick. The reworked units tend to be very fine grained and slightly darker color----- 47.0
 4. Sandstone, moderate reddish-orange (10R 6/6) weathering to orange-pink (10R 6/4), very fine to fine-grained, moderately well to poorly sorted, abundant fine- to medium-grained, well-rounded gray-frosted "Entrada berries"; well cemented; some small irregular streaks of fine-grained yellowish-sandstone. Irregular, indistinct, probably somewhat disturbed lamination which locally passes into a distinctly cross-stratified phase. Weathers into two rounded, slickrim ledges----- 41.0
 3. Sandstone, grayish orange-pink (5YR 8/2) weathering orange-pink (5YR 7/4), very fine to fine-grained, moderately well to well-sorted; well cemented; single massive bed. Forms slickrim----- 10.0
- Total of upper sandy member----- 165.0

LION CANYON section--Continued

Feet

Entrada Sandstone--Continued

Medial silty member:

2. Siltstone, moderate orange-pink (10R 7/4) to pale reddish-brown (10R 5/4); poorly sorted. The unit is composed of about seven thick even beds with undulatory bases; these form a riblike cliff; at the base of each bed is 0.5-2.0 ft of sandy, coarse, massive siltstone, which forms a ledge and has a nearly flat top, but seems to grade into an overlying darker, finer siltstone, 1-3 ft thick; internally the siltstone shows many disturbed laminae. About 3 mi east of here the fine siltstone recesses become so insignificant that the coalescing sandy ledges form a unit hardly distinguishable from the upper sandy member; however, the thick even massive bedding persists suggesting that this is a facies change rather than a pinching out of the medial silty member. It is probably not possible to distinguish the two members for mapping purposes much farther to the east. The lower part of the upper sandy member differs from the medial silty member only in having slightly coarser grains and much thicker disturbed beds that weather to the rounded slickrim-----

30.0

Total of medial silty member-----

30.0

LION CANYON section--Continued

Feet

Entrada Sandstone--Continued

Medial silty member--Continued

Total of Entrada Sandstone (exclusive of

Moab Member)----- 195.0

Total of Entrada Sandstone (inclusive of

Moab Member)----- 252.0

Total of San Rafael Group----- 323.0

Note: The Entrada-Navajo contact appears even over several miles. The Entrada sharply truncates the Navajo crossbeds. Reworked Navajo was not found in this area.

LION CANYON section--Continued

Feet

Jurassic and Triassic(?)

Navajo Sandstone (incomplete):

1. Sandstone, moderate orange-pink (5YR 8/4) weathering orange-white (10YR 9/4), very fine grained with some coarse silt, well-sorted, well-cemented; thick sets of large-scale cross-beds. No persistent horizontal truncation planes seen in the upper 100 ft. "Entrada berries" are present in upper 2 ft.

Forms rounded slickrim cliff----- >100.0

Total of incomplete Navajo Sandstone----- >100.0

COLORADO-DELTA COUNTY

BROUGHTON FRUIT FARM section (81)

[Units 1-8 and 14 measured in N 1/2 sec.27, T. 14 S., R. 98 W., on west side of river opposite farmhouse. Units 9-13 measured NW 1/4 sec. 26, T. 14 S., R.98 W., on east side of river about 300 yds southeast of farmhouse; measured by J. C. Wright and D. D. Dickey, October 22, 1957]

Feet

Upper Jurassic

Morrison Formation (incomplete):

14. Limestone, medium dark-gray (N 4), weathering same, microcrystalline; the lower half is in massive even beds 1-2 ft thick, which when favorably etched by weathering reveal a clastic texture of limestone pebbles about 1-3 cm long, and also contain a few ropy charophyte charophystems; these massive beds are separated by thin interbeds 1-3 in. thick composed dominantly of charophyte stem fragments. The upper half of the unit is composed of structureless beds a few inches thick containing a few ropy charophyte stem fragments. Claystone splits occur between limestone beds. Forms

ledge on a steep slope----- 18.0

Total of incomplete Morrison Formation----- 18.0

BROUGHTON FRUIT FARM section--Continued

Middle Jurassic

Summerville Formation:

13. Claystone (85 percent) with interbedded limestone (10 percent) and sandstone (5 percent). Claystone, greenish-gray (5G 6/1), weathering same; weathers shaly, forms clayey slope. Limestone, medium-dark-gray (N 4) to greenish-gray (5GY 7/1), some beds sandy and silty; beds in upper part of unit are slightly darker; even bedded; forms ledges. Sandstone, light-greenish-gray, very fine grained, moderately well sorted, contains red accessory grains; firmly cemented with thin beds----- 43.0
12. Sandstone, white (N 9) to yellowish-white (5Y9/1), stains yellowish-brown (10YR 5/2), fine to very fine grained, moderately well to well-sorted; composed of rounded clear quartz, considerable yellowish feldspar or chert with accessory red and black minerals and rare glauconite; firmly cemented with considerable calcite cement; irregular undulating even laminae and thin trough sets of small-scale cross-laminae. Forms ledge----- 6.0
11. Covered, similar to unit 9----- 8.5

BROUGHTON FRUIT FARM section--Continued

Feet

Summerville Formation--Continued

10. Sandstone, very limy, very light-gray (N 8), weathering light brownish-gray (5YR 6/1), very fine to fine-grained, moderately well-sorted composed of well-rounded clear quartz grains with accessory glauconite and red and black minerals; very well cemented with calcite. Massive, irregular in thickness. Forms ledge----- 1.0
9. Claystone, silty, and siltstone, clayey, interbedded in irregular thin even beds; grayish green (10GY 5/2), forms soil covered slope of about the same color----- 12.5
8. Sandstone, yellowish-white (5Y 9/1), weathering dark-yellowish-gray (5Y 6/2), very fine grained, well-sorted; composed of rounded clear quartz grains with red and black accessory grains; one thin bed near the middle contains abundant well-rounded frosted medium-to very coarse grains of gray and milky quartz and rarely of pale colored quartz or chert; firmly cemented thin even beds with minor small-scale cross-laminae; symmetrical ripple marks on some bedding planes. Forms very even prominent ledge with blocky joint surfaces----- 10.0

BROUGHTON FRUIT FARM section--Continued

Feet

Summerville Formation--Continued

7. Covered, mostly reddish, probably siltstone and
claystone----- 39.0
6. Chert, pale-blue (5PB 7/2), weathering light-gray (N 7)
to white (N 9) with some bright orange-red particularly
on upper surface; composed of fragments about 1/4-1 cm
in size, irregular angular to subrounded in shape.
Chert grains are banded like agate, some of them nearly
entire with their colloidal centers near the present
centers, other centers are offset. Probably
correlative with the top of the Bilk Creek
Sandstone Member of Wanakah Formation----- 0.5
5. Sandstone, dark-yellowish-gray (5Y 6/2), very fine grained,
moderately well sorted, very clayey near base
and very limy near top; composed of clear rounded
quartz grains, forms recess----- 1.75
4. Claystone, dark-grayish-red (5R 3/2)----- 0.25

BROUGHTON FRUIT FARM section--Continued

Feet

Summerville Formation--Continued

3. Interbedded sandstone (50 percent) and silty sandstone (50 percent). Sandstone moderate orange-pink (10R 7/4), weathering light-orange-pink (10R 8/4), fine- to very fine grained, moderately well sorted; composed of subrounded to rounded clear quartz grains, with a few black and reddish-orange accessory grains and in some beds medium-grained "Entrada berries"; firmly cemented; irregular even beds about 0.5-2.0 ft thick with undulatory upper and lower contacts. Forms ledges. Silty sandstone, dark-pink (5R 6/4) with mottled spots of yellowish-gray (5Y 8/1), weathering same, lithology same as other sandstone of this unit but slightly finer grained, bedding same as other sandstone in this unit. Forms recesses alternating with ledges of other sandstone of this unit, one purple claystone about in middle of unit. Whole unit forms even ribbed cliff----- 38.0

Total of Summerville Formation----- 160.5

Note: The Summerville-Entrada contact appears conformable.

BROUGHTON FRUIT FARM--Continued

Feet

Entrada Sandstone:

2. Sandstone, moderate reddish-orange (1OR 6/6), weathering same, very fine grained, well-sorted; composed of subrounded to rounded clear quartz grains with abundant well-rounded frosted medium- and coarse-grains of clear and dark-gray quartz particularly abundant in the lower third of the unit; red, orange, and cream-colored coarse chert grains, also common in lower third; firmly cemented; irregular even laminae with lateral changes to minor small-scale cross-stratification, laminae form indistinct tabular sets of 0.5-2.0 ft thick. Forms slickrim or vertical cliff-----

51.0

Total of Entrada Sandstone----- 51.0

Note: The Entrada-Wingate contact appears generally smooth and even; exposed locally.

BROUGHTON FRUIT FARM section--Continued

Feet

Upper Triassic

Wingate Sandstone:

1. Sandstone, reddish-orange (10R 5/6), weathering same, very fine-grained, moderately well to well-sorted; composed of subrounded to subangular clear quartz grains with a few black accessory grains; firmly cemented; thin wedging planar sets of medium-scale cross-laminae.

Bottom not exposed----- >10.0

Total of incomplete Wingate Sandstone----- >10.0

COLORADO-MESA COUNTY

FRUITA section (82)

[SW 1/4 sec.29, T. 1 N., R. 2 W.; measured by J. C. Wright
and D. D. Dickey, April 22, 1958]

Note: Top of exposure. Dip slope strewn with very large blocks of tightly cemented sandstone, white (N 9) weathers dark brownish-gray (5YR 3/1), fine-grained, well-sorted, composed of well-rounded, transparent quartz grains with pore space entirely filled by calcite cement. Lateral to section about 50-75 ft of greenish-yellow (10Y 7/2) claystone overlies the measured brown and purple claystones. This claystone may be the Lower Cretaceous Burro Canyon Formation and the loose blocks of sandstone on the hilltop may be debris derived from a lenticular sandstone within the Burro canyon. A more ledgy dusky yellow sandstone forms an inconspicuous cuesta about 100 ft above the measured section of Morrison. This may be the Dakota Sandstone.

Feet

Upper Jurassic

Morrison Formation (incomplete):

Brushy Basin Member (incomplete):

33. Claystone like unit 31. Some interbedded greenish lenticular sandstone about 1-10 ft thick----- 103.0
32. Siltstone, very pale red (5R 7/2) weathers same, very firmly cemented with abundant calcite; lenticular. Thickness ranges from 3 ft to a feather edge. Upper foot has small-scale cross-laminae. Forms small ledge. Measured 13° dip----- 2.0

FRUITA section--Continued

Feet

Morrison Formation (incomplete)--Continued

Brushy Basin Member (incomplete)--Continued

31. Claystone, pale-reddish-brown (10R 5/4), with some beds of grayish-purple (5P 4/2); even bedded. Weathers to frothy "popcorn"-like surface----- 54.0
30. Sandstone, greenish-white (5G 9/1), weathers pale-greenish-yellow (10Y 8/2), fine- to medium-grained, well-sorted, composed of clear quartz with common light-brown, red, amber, and green accessory grains; firmly cemented with abundant calcite; low-angle, thin cross-beds. Forms inconspicuous ledge near base of steep earthy slope----- 25.0
29. Covered; probably includes much grayish-red claystone and very little, if any, sandstone----- 60.0
- Total of incomplete Brushy Basin Member----- 244.0

Salt Wash Member:

28. Sandstone (50 percent) interbedded with claystone (50 percent). Sandstone, yellowish-white (5Y 9/1), weathers light-gray (N 7), fine- to medium-grained; composed of clear subrounded quartz grains with sparse pink and amber accessory grains; lenticular ledges about 5-15 ft thick with cross-strata. Claystone, dark-greenish-gray (5G 4/1) and reddish-brown (10R 4/4). Forms prominent dip slopes----- 78.0

FRUITA section--Continued

Feet

Morrison Formation (incomplete)--Continued

Salt Wash Member--Continued

27. Claystone (65 percent) with interbedded sandstone
30 percent) and limestone (5 percent). Claystone
dominantly dark greenish gray (5G 4/1) with some
pale reddish brown (10R 5/4). Sandstone in
lenticular beds about 1-4 ft thick. Limestone,
medium-gray (N 5) in beds 6-18 in. thick.
Unit forms talus-strewn slope. Graduated dip from
from 9° at base to 6° at top----- 93.0
26. Limestone, medium light-gray (N 6) weathers same, micro-
crystalline, not megascopically fragmental. Protects
prominent dip slope. Offset on this unit for several
hundred yards down the dip slope----- 1.0
25. Interbedded claystone (60 percent), sandstone (30 percent)
and limestone (10 percent). Claystone concealed,
probably similar to unit 23. Sandstone like unit 22
but very fine grained and silty; forms several
lenticular ledges. Limestone like unit 24 in several
beds each about 6 in. thick. Unit forms slope.
Used 20° dip----- 19.0
24. Limestone medium-dark-gray (N 4) weathers same, micro-
crystalline, but looks like an annealed breccia;
almost concealed on slope----- 1.0

FRUITA section--Continued

Feet

Morrison Formation (incomplete)--Continued

Salt Wash Member--Continued

- | | | |
|-----|---|-----|
| 23. | Claystone, dark-brownish-gray (5YR 3/1) and dusky red-purple (5RP 3/2) poorly exposed. Used 25° dip----- | 4.5 |
| 22. | Sandstone, yellowish-white (5Y 9/1) weathers dark-grayish-orange (10YR 6/4), fine-grained, moderately well to poorly sorted; composed of clear quartz grains with black iron oxide accessory grains and green claystone chips; lenticular with an irregular base and a flat top. Forms ledge----- | 1.5 |
| 21. | Claystone, greenish-gray (5GY 7/1). Weathers to frothy, appearing earthy slope----- | 4.0 |
| 20. | Limestone, medium-light-gray (N 6) weathers light-gray (N 7), microcrystalline; fragmental, one fragment resembles charophyte stem, one charophyte oogonia seen. Forms ledge----- | 3.0 |
| 19. | Poorly exposed. Claystone dusky red-purple (5RP 3/2) to moderate reddish-brown (10R 4/6)----- | 8.5 |
| 18. | Sandstone, white (N 9), fine-grained, moderately well sorted contains black and red accessory grains; firmly cemented with calcite; flat irregular beds with ripple marks. Forms small ledge----- | 1.0 |
| 17. | Poorly exposed. Probably claystone, limy, medium dark-gray (N 4), laminated, fissile----- | 5.0 |

FRUITA section--Continued

Feet

Morrison Formation (incomplete)--Continued

Salt Wash Member--Continued

16. Limestone, medium-light-gray (N 6) to dark-gray (N 3) weathers same, microcrystalline, fragmental, contains abundant shells and fragments of gastropods in the darker layers and a few pelecypod(?) fragments. No charophyte stems or oogonia seen. Forms series of minor ledges. A 6-in. parting of green claystone near middle. Measured 30° dip-----	8.5
Total of Salt Wash Member-----	228.0
Total of incomplete Morrison Formation-----	472.0

Note: The Morrison-Summerville contact is poorly exposed on slope.

Middle Jurassic

Summerville Formation:

15. Mostly covered. Appears to be sandstone like unit 14 in thin ledges-----	4.0
14. Sandstone, white (N 9), weathers same to pale-yellowish- brown (10YR 6/2), fine-grained, well-sorted, contains a few medium grains; composed of clear quartz with black, red, green, and orange accessory grains; even bedded with ripple marks. Forms blocky jointed ledge. Measured 30° dip-----	2.0

FRUITA section--Continued

Feet

Summerville Formation--Continued

- | | |
|---|------|
| 13. Interlaminated sandstone like unit 10 (60 percent),
claystone like unit 12 (30 percent), limestone
like unit 11 (10 percent)----- | 5.5 |
| 12. Claystone, dark greenish-gray (<u>5GY</u> 4/1), weathers
greenish-gray (<u>5GY</u> 6/1), thinly laminated, fissile.
Poorly exposed on slope----- | 3.0 |
| 11. Limestone, greenish-gray (<u>5GY</u> 6/1) microcrystalline.
Forms minor ledge or slope----- | 0.5 |
| 10. Sandstone (50 percent) with interbedded claystone
(50 percent). Sandstone, white (<u>N</u> 9), weathers
grayish-orange (<u>10YR</u> 7/4) to dark-yellowish-orange
(<u>10YR</u> 6/6) , very fine grained, well-sorted; composed
of clear rounded quartz grains with accessory opaque
iron oxide mineral grains; firmly cemented with
calcite; thin even beds with ripple-marks. Forms
ledges at base, middle, and top of unit. Claystone
between lower and middle sandstone ledges like unit 9;
claystone between middle and upper ledge like unit 8.
Measured dip 30°----- | 14.0 |

FRUITA section--Continued

Feet

Summerville Formation--Continued

- | | |
|---|-------------|
| 9. Claystone, dark-greenish-gray (5GY 4/1), weathers greenish-gray (5GY 6/1), contains some reddish-brown claystone in interbeds near base; thinly laminated, fissile; poorly exposed. Several feet near top completely covered. Forms slope. Used 33° dip----- | 12.0 |
| 8. Claystone, dark-reddish-brown (10R 3/6) to dark-grayish-red (5R 3/2), limy, slightly silty; contains small nodules of reddish-brown (10R 4/4) silty limestone; thinly laminated. Concealed on slope. Used 33° dip----- | 9.0 |
| 7. Covered, probably like unit 8----- | <u>4.0</u> |
| Total of Summerville Formation----- | <u>54.0</u> |

Note: The Summerville-Entrada contact is covered.

FRUITA section--Continued

Feet

Entrada Sandstone:

Moab Member:

6. Sandstone, very pale-orange (10YR 8/2) weathers same with many medium dark gray (N 4) spots, very fine-grained, well- to moderately well-sorted; composed of clear rounded quartz grains, and little or no silt; firmly cemented with abundant calcite; thin to thick even beds. Generally forms a single, massive rounded ledge, but locally forms a series of separate ledges. Measured dip 31°----- 37.0
- Total of Moab Member----- 37.0

Upper sandy member:

5. Sandstone, moderate orange-pink (10R 7/4) to grayish-orange-pink (10R 8/2), weathers same; very fine to fine-grained, moderately well to poorly sorted, with sparse "Entrada berries"; contains abundant silt-sized opaque accessory grains; moderately well cemented with abundant calcite; dominantly thin flat beds with planar sets about 2 ft thick of medium-scale cross-laminae in the lower part. Generally forms rounded flat ledges, but locally merges into smooth slickrim cliff. Measured dip 25°----- 22.0

FRUITA section--Continued

Feet

Entrada Sandstone--Continued

Upper sandy member--Continued

4. Sandstone like unit 2 except that "Entrada berries" are less abundant. Measured dip 22°----- 13.0
3. Sandstone, silty, moderate orange-pink (10R 7/4), weathers pale reddish-orange (10R 7/6), very fine grained, with many silt grains, fair- to poorly sorted; many laminae contain "Entrada berries" like those in unit 2; moderately well cemented with calcite; even, slightly irregular, thin beds and laminae. Forms continuous part of a slickrim cliff. Measured dip 22°----- 24.0

FRUITA section--Continued

Feet

Entrada Sandstone--Continued

Upper sandy member--Continued

2. Sandstone, pale reddish-orange (10R 7/6) streaked with grayish-orange (10YR 7/4), weathers light brown (5YR 6/4) with streaks of grayish-orange, very fine grained, moderately well sorted; bimodal, with abundant medium-grained, well-rounded spherical "Entrada berries"; very fine grains are mostly quartz, the "Entrada berries" include abundant gray-frosted quartz grains and amber stained quartz grains and a few conspicuous white chert grains; moderately well cemented abundant calcite; one tabular coset of thick planar sets of large-scale cross-laminae. Forms lowest part of slickrim cliff. Measured dip 21°-----

10.0

Total of upper sandy member----- 69.0

Total of Entrada Sandstone----- 106.0

Note: The Entrada-Kayenta contact; beds above and below appear conformable and the surface even except for irregularities of less than 3 in.

FRUITA section--Continued

Feet

Upper Triassic(?)

Kayenta Formation (incomplete):

1. Claystone (55 percent) interbedded with sandstone (40 percent) and a few lime pebble conglomerates (5 percent). Sandstone, pale-red (10R 6/2) weathers same, fine-grained, moderately well-sorted composed of subrounded clear quartz with abundant accessory grains of amber-stained and opaque silt; firmly cemented with calcite; thick trough-sets of medium-scale cross-laminae. Forms irregular ledges. Claystone, dark reddish-brown (10R 3/4) weathers grayish-red (10R 4/2) slightly silty and micaceous, fissile, weathers to earthy slope. Lime-pebble conglomerate, very sandy light grayish-red (10R 5/2), weathers same to medium-gray (N 5); composed of small rounded and subrounded pebbles of medium-dark-gray (N 4) silty limestone set in a matrix of poorly sorted medium- to coarse-grained sand; firmly cemented by abundant calcite; flat beds 1-2 ft thick; forms small ledges----- 30.0

Total of incomplete Kayenta Formation----- 30.0