GEOLOGIC MAP AND SECTIONS OF THE SOUTHERN CHERRY CREEK AND NORTHERN EGAN RANGES
WHITE PINE COUNTY, NEVADA

By William H. Fritz

COMPOSITE STRATIGRAPHIC SECTION

System	Formation / fossils	Thickness	Description
TERT.	Volcanic rocks	700'	Welded tuffs and at least one extrusive andesite porphyry. Tuffs weather cream and brick-red and are remains of once widespread ignimbrites. Porphyry is lavender in color.
PERMIAN	Arcturus Formation; *Oketaella* sp., *Schwagerina* sp.	1975'	Predominantly siltstone and/or shale weathering to medium brown dirt. Some beds weather to cream-colored, buff, and light-brown cobbles. Cobbles are flattish and many have secondary, white, limy coating. Also present are beds weathering to orange and red pebbles and cobbles of siltstone and sandstone. These brightly colored fragments are deeply weathered and highly porous. At rare intervals in formation are limestone interbeds weathering light gray and containing orangish-brown chert. Limestone is thin to thick bedded and is finely crystalline.
PENNSYLVANIAN	Fault; *Canina* sp.	2135'	295' Thick- to thin-bedded, light-gray weathering limestone plus siltstone and/or shale that weathers to light brown dirt. Limestone is dense to finely crystalline, partings near faulted top of formation are covered with yellow and light-brown weathering silt. White to light-brown nodular chert locally abundant. Spheroidal to elongate algal? bodies up to 6 feet in length are present.
	Fault; Ely Limestone		515' Limestone and siltstone as above, but limestone thicker bedded and weathers and fractures medium gray. Gray and orange-brown chert nodules present throughout. Algal? bodies averaging 6 inches in diameter present in lower half.
			1045' Limestone and siltstone as above. Limestone thin to thick bedded, light to medium gray, slightly darker on fresh surfaces. Nodular, light orange-brown chert present throughout. Algal? bodies averaging 6 inches in diameter present near top.
	? *Ameura* sp., *Composita* sp., *Spirifer* sp.		280' Medium- and thick-bedded, medium- to light-gray weathering and fracturing limestone plus shale and/or siltstone that weather to brown dirt. Limestone is bioclastic, highly so near base. Chert present is sparse, cream-colored to gray nodules.
MISS.	Chainman Shale	1015'	Shale weathering to dark- and medium-brown dirt that has faint greenish hue. When wet, dirt is nearly black. Light-brown to rusty weathering quartzite interbeds totaling 35 feet present near middle. Fresh quartzite is light brown to white and fine to medium grained.
	Joana Limestone		115' Limestone in medium- to very-thick beds, light to medium gray. Fresh surfaces same color and predominantly medium crystalline. Nodular beds of light brown and pinkish chert present.
?	Pilot Shale; *Calvinaria* sp.	615'	Siltstone weathering to yellow and orange-brown plates. Marker beds of light-gray weathering limestone present 100 feet above faulted base. Limestone is in medium beds totalling 16 feet in thickness.
DEVONIAN	Fault; *Atrypa multicostella* Kottlowski, 1950; ? *Eleutherokomma* sp.	1400'	425' Limestone in thin to medium beds, minor medium-bedded dolomite, and some siltstone and/or shale weathering to brown dirt. Limestone weathers medium- to medium light-gray and is dark gray and finely crystalline on fresh surfaces. Lower 130 feet consists of uniformly thin-bedded, nodular limestone.
	Guilmette Formation		505' Shale and/or siltstone weathering to brown dirt plus limestone and dolomite in equal amounts. Medium to thick beds of medium-gray weathering limestone and medium-brown weathering dolomite in upper 175 feet. Sparse limestone and dolomite in thin, platy interbeds in lower 330 feet.
			470' Light-gray limestone in thick to very thick beds. Limestone is dense and medium gray on fresh surfaces. Lower 190 feet contains some medium and thin beds and is slightly darker.
	Amphipora, *Cladopora*, *Stringocephalus* sp.	1310'	985' Medium-bedded dolomite weathering light grey, light brown, and medium brown. Dolomite is medium to dark gray on fresh surfaces and finely crystalline. Most beds are blocky in outcrop and finely laminated, some exhibit mottling rather than laminae. Several beds contain interformational dolomite breccia, and 10 to 15 feet interbedded limestone is present near the top.
	Simonson Dolomite		325' Uniformly light brownish-gray, sugary dolomite in beds averaging 1½' in thickness. Fresh surfaces are slightly lighter than weathered and are medium to coarsely crystalline.
	Sevy Dolomite	425'	425' White to very light-gray weathering dolomite. Dolomite is medium brownish gray and dense on fresh surfaces. Beds containing "floating" quartz grains up to 1mm in diameter total 10 feet in thickness near top of formation.
? SILURIAN	*Halysites* sp., *Favosites* sp.	1680'	785' Light-gray to light brownish-gray dolomite. This unit closely resembles the lowest unit in the Simonson Dolomite, but differs in having light-gray to cream-colore chert nodules at various horizons.
	Upper Ordovician-Silurian formation		660' Thick-bedded, light gray and medium-brown to chocolate-brown weathering dolomite in five thick, alternating layers starting with brown base. All dolomite is medium to dark gray on fresh surfaces and finely to medium crystalline. Gray to brown weathering chert nodules common, particularly in dark weathering beds.
?	*Zygospira* sp.		235' Medium- to thick-bedded dolomite. Light-gray and chocolate-brown weathering layers alternate throughout. Fresh surfaces are medium to dark gray and finely crystalline. Chert present in minor amounts.
ORDOVICIAN	Eureka Quartzite		175' White to yellowish-white weathering quartzite. Surface spotted by rust-colored pits half an inch in diameter. Induration varies from friable sandstone to vitreous quartz. Quartz grains average 0.3 mm in diameter.
	Lehman Shale; *Eoleperditia* sp.	475'	Light-blue weathering limestone and shale and/or siltstone weathering to brown dirt. Limestone is in thin, nodular beds and is dark gray and finely crystalline on fresh surfaces. A large ostracode, *Eoleperditia bivia* (White), is very abundant in lower part of formation.
	Kanosh Sh; *Anomalorthis* sp., *Macronotella* sp.	300'	Shale weathering to medium-brown dirt and khaki flakes. Present are sparse bioclastic limestone interbeds containing abundant ostracode and orthid brachiopod valves.
	Formation D; *Bathyurella* sp.	485'	Medium- to thick-bedded limestone in upper half and shale and/or siltstone weathering to brown dirt in lower half. Limestone is blocky in outcrop, weathers light blue-gray with yellow mottling, fresh surfaces medium dark gray and dense.
	Formation C; *Benthaspis* sp., *Ptyocephalus* sp.	620'	Medium light-gray weathering limestone in thin to thick beds and some siltstone or shale weathering to dirt. Limestone locally has high quartz silt content and weathers bright yellow and orange. Fresh limestone is medium gray and finely to coarsely crystalline. Chert abundant in irregular, thin to medium beds and nodules. Chert laminated, weathers blue-white, yellow, light brown, and pink.
	Formation B; *Aulacoparia* sp., *Strigigenalis* sp.	670'	Shale and/or siltstone weathering to light- and medium-brown dirt and medium-gray weathering limestone. Limestone in medium to thick interbeds, many of which display flat-pebble limestone conglomerates. Fresh limestone medium to dark gray and finely crystalline. Small chert nodules present but rare.
	Formation A; *Parabellefontia* sp.	1360'	1090' Medium, light-gray weathering limestone and some light- to medium-brown dolomite in thick to very thick beds. Fresh surfaces are medium gray and finely crystalline. Sparse nodules of gray, white, and brown chert present in both limestone and dolomite.
	Briscoia sp.		270' Light-gray weathering limestone in thin to medium, "crinkly" beds and shale and/or siltstone weathering to brown dirt. Fresh limestone surfaces are dark gray and dense to finely crystalline.
CAMBRIAN	Windfall Formation; *Prosaukia* sp., *Richardsonella* sp.	575'	Very thin- to thin-bedded, platey limestone. Parting surfaces weather light gray, yellow, and light orange. Limestone laminated, fresh surfaces dark gray to black and dense to finely crystalline. Black laminated chert abundant near base. Basal 25 feet is marker unit consisting of light-gray weathering limestone in 1-foot beds.
	Dunderberg Shale; *Aphelaspis* sp., *Dunderbergia* sp., *Pseudagnostis communis*	495'	Shale weathering to medium-brown dirt and greenish-brown flakes. Medium-gray weathering limestone in thin to medium beds comprises less than ten percent of formation. Limestone surface locally coated with light-brown argillaceous material, fresh surfaces are medium to dark gray and medium to finely crystalline.
	Hamburg Formation; *Kingstonia* sp.	2350'	1350' Limestone, medium to light gray in upper half, medium gray in lower half. Beds thick to very thick; fresh limestone predominantly finely crystalline, approximately same color as weathered. Some medium gray beds contain lighter, coarsely crystalline limestone and reworked, sandsized limestone fragments.
	Modocia sp.		360' Siltstone and/or shale weathering to brown dirt and light blue-gray weathering limestone in nodular beds. Parting surfaces of limestone partially coated with yellow to light-orange weathering silt. Fresh limestone surfaces medium to dark gray and finely crystalline.
	Marjumia sp.		640' Medium-gray limestone in medium- to very-thick beds. Weathered surfaces medium gray, faintly mottled. Fresh surfaces medium to light gray, finely to coarsely crystalline. Reworked sand to pebble-sized limestone fragments present at various horizons.
	Secret Canyon Formation; *Bathyuriscus elegans*	1775'	Siltstone and/or shale weathering to brown dirt and medium-gray weathering limestone. Limestone in plates 3/8 to 2 inches thick, fresh surfaces dark gray and finely crystalline. Subordinate amount of plates have pinkish-gray, buff, and light-orange weathering surfaces.
	Bathyuriscus sp., *Elrathina* sp., *Ptychagnostus* sp.		765' Medium- and light-gray weathering limestone in thick to very thick beds. Limestone in upper half is darkest, finely to coarsely crystalline, and many beds contain oolites. Limestone in lower half is finely crystalline. All limestone is slightly darker on fresh surfaces than on weathered.
	Eldorado Formation	1385'	200' Light-gray, sugary dolomite in very thick beds. Fresh surfaces are lighter than weathered and are coarsely crystalline.
			160' Dark-gray weathering and fracturing limestone and some siltstone and/or shale. Limestone is finely crystalline, upper beds are thin to medium, lower beds are thick. Elongate, light-colored structure similar to Amphipora in size and shape are abundant.
			260' Very light-gray weathering limestone with faint pinkish cast. Small raised dolomite flecks near base, a few dark limestone bands averaging 6" wide are present higher up. Fresh surfaces even lighter than weathered and dense to finely crystalline.
	Glossopleura sp., *Kistocare* sp., *Albertella* sp., *Poliella germana* (Resser), *Ptarmiganoides* sp.		860' Siltstone and interbedded medium- to dark-gray limestone. Limestone in thin and medium beds, fresh surfaces are finely crystalline and nearly black. Girvanella sp. present in 2-foot limestone bed at base and second interval 80 feet higher in section.

PREVIOUS WORKS AND ACKNOWLEDGEMENTS

Few published works give more than brief statements on the geology of the present area. Early workers in the northern portion and adjoining Cherry Creek district have been cited in Adair's Master's thesis (1961, p. 4). In 1916 Hill (p. 161-180) described a number of small mines in the area, and some of the larger mines in the Cherry Creek district. Misch and Easton (1954) noted a major shearing-off plane in the northeast part of the area. The author's Master's thesis (Fritz 1957) covers an area south of this fault, and his Doctoral thesis (1960) expanded the area to its present limits. These two theses, plus his unpublished mapping in the summers of 1960 and 1963, furnished most of the data used in the present sheet.

In 1960 Young (p. 159-161) published a description of a local Cambrian section, and shortly thereafter theses by Adair (1961) and Reed (1962) were completed on parts of the area (see index map for theses areas). A thesis (1962) and subsequent publication (1964) by Woodward cover the area immediately south of the present map.

The writer is indebted to Prof. Peter Misch for suggesting the area as a thesis problem, and for generously contributing his time and guidance.

STRATIGRAPHY

The following comments relate to the stratigraphic section shown to the left. In that section, detailed stratigraphic notes are given in the text opposite the beds to which they refer.

In general the lithology shown in the section carries throughout the area, but sharp contrasts were noted when certain strata in one thrust sheet were compared with strata of equivalent age in another. Therefore, it should be emphasized that this is a composite stratigraphic section and that data pertaining to any given segment of the section has been taken exclusively from one thrust sheet. As an example of the stratigraphic differences in thrust sheets, some contrasts between the Middle Cambrian of thrust sheet II (shown in the stratigraphic section) and sheet IV might be cited. Sheet II contains an upper member of the Pioche Shale, a dolomite unit in the Eldorado Formation, and considerable thin-bedded limestone in the Secret Canyon Shale. In sheet IV the rocks equivalent in age to the upper Pioche member are probably the thick-bedded, barren limestones included in the Eldorado

PRE-TERTIARY STRUCTURE

Thrust sheet I

Thrust sheet II

Thrust sheet III

Thrust sheet IV

Thrust sheet V

Thrust sheet VI

Thrust sheet VII

Summary of pre-Tertiary structure

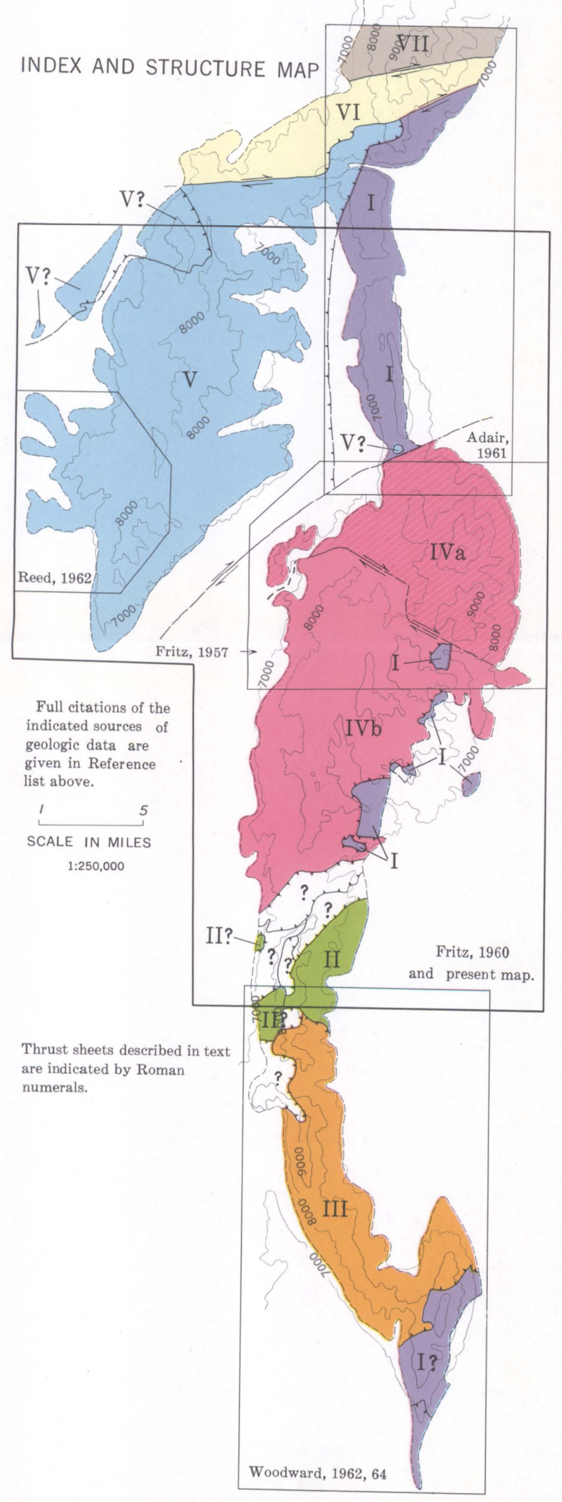
TERTIARY DEFORMATION

REFERENCES

EXPLANATION

QUATERNARY: Qal Alluvium
TERTIARY: Tv Volcanic rocks
PERMIAN: Pa Arcturus Formation
PENNSYLVANIAN: Pe Ely Limestone
MISSISSIPPIAN: Mc Chainman Shale; Mj Joana Limestone
DEVONIAN: MDp Pilot Shale; Dg Guilmette Formation; Dsi Simonson Dolomite; Dse Sevy Dolomite
ORDOVICIAN SILURIAN: OS Upper Ordovician-Silurian formation
ORDOVICIAN: Oe Eureka Quartzite; Ol Lehman Shale; Ok Kanosh Shale; Od Ordovician formation D; Oc Ordovician formation C; Ob Ordovician formation B; Oa Ordovician formation A
CAMBRIAN: Cw Windfall Formation; Cd Dunderberg Shale; Ch Hamburg Formation; Cs Secret Canyon Formation; Ce Eldorado Formation; Cpi Pioche Shale; Cpm Prospect Mountain Quartzite
PRECAMBRIAN: Precambrian formation H; PCg Precambrian formation G; PCf Precambrian formation F; Precambrian formation E; Precambrian formation D; Precambrian formation C; PCb Precambrian formation B; PCa Precambrian formation A
TERTIARY: Intrusive rocks — Quartz monzonite and fine-grained porphyritic equivalent

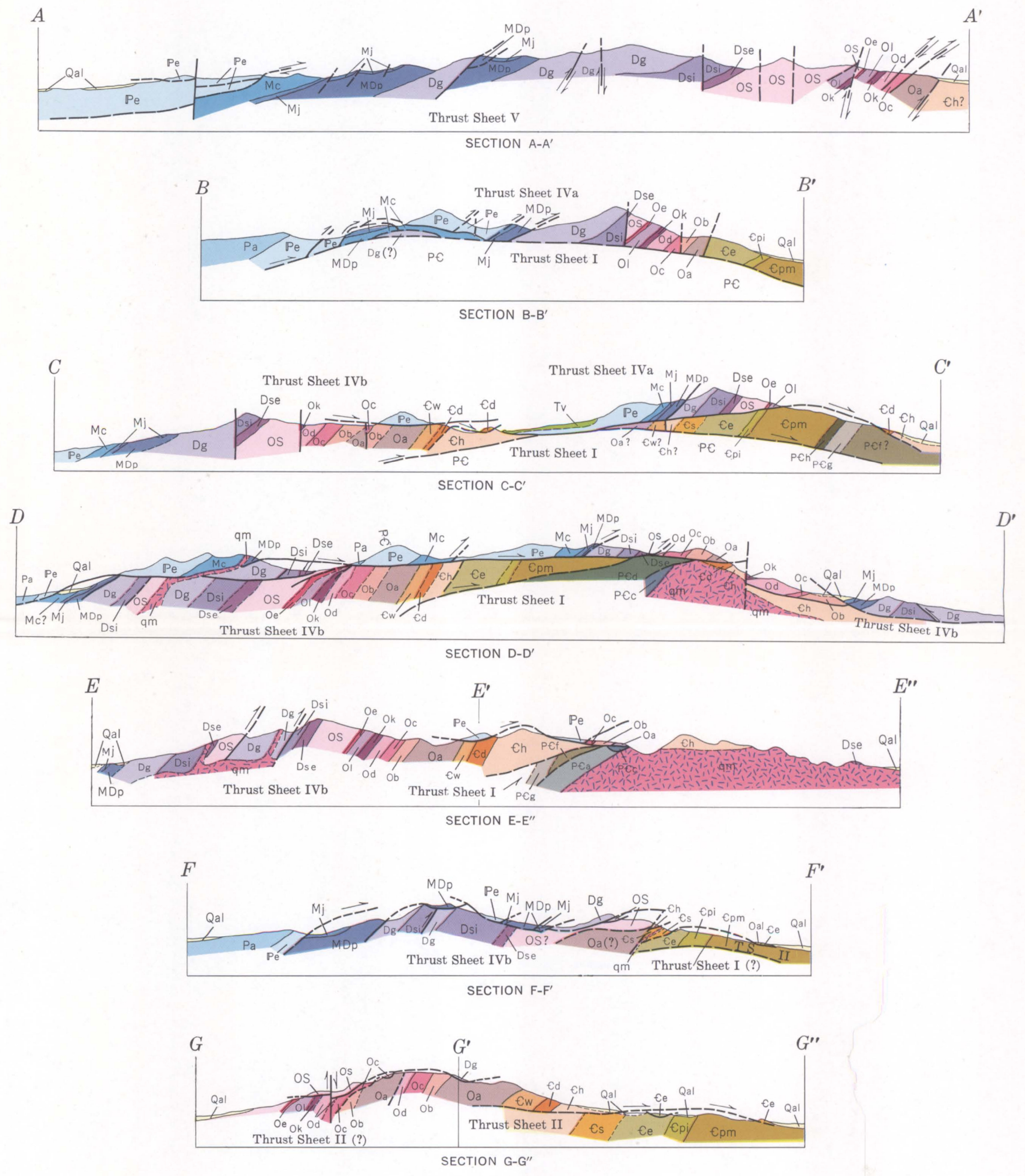
Alluvium and bedrock contact
Formational contact, dashed where inferred
Fault, dashed where inferred
Thrust fault, dashed where inferred
Strike-slip or tear fault
Strike and dip of beds
Horizontal beds
Strike and dip of foliation
Measured section

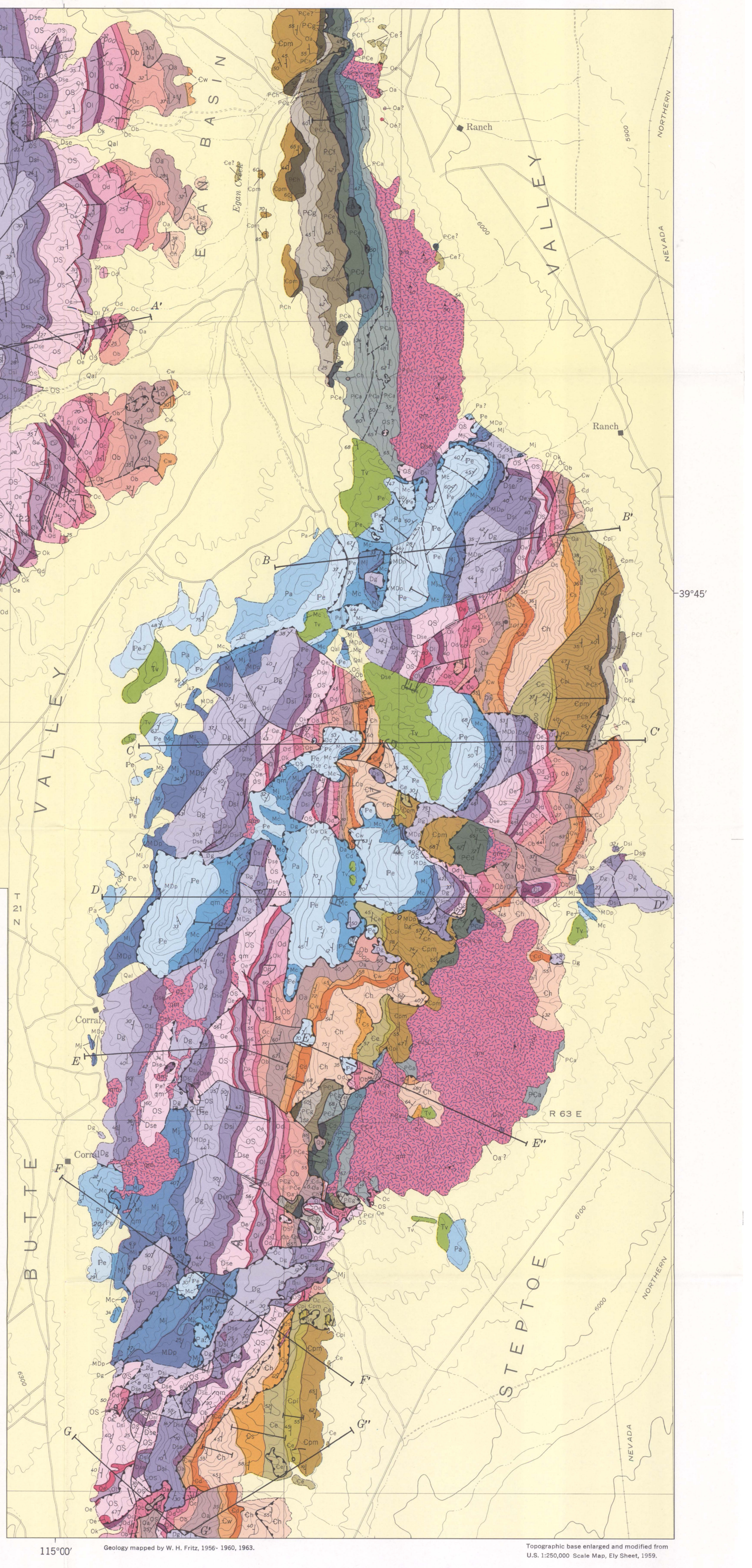


Full citations of the indicated sources of geologic data are given in Reference list above.

SCALE IN MILES 1:250,000

Thrust sheets described in text are indicated by Roman numerals.





Geology mapped by W. H. Fritz, 1956-1960, 1963.

Topographic base enlarged and modified from U.S. 1:250,000 Scale Map, Ely Sheet, 1959.

SCALE 1:62500

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

1968