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

				COMPOSITE STRATIGRAPHIC SECTION
LEA	Volcanic rocks			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.
				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
FERMIAN	Arcturus Format	ion		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.
_	Oketaella sp Schwagerina sp.			
NA	Fault—Canina sp.	000	0	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.
EINING T L'VAINIAIN	Fault — Ely Limestone		222	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.
	? Ameura sp.	0	0	Nodular, light orange-brown chert present throughout. Algal? bodies averaging 6 inches in diameter present near top. 280' Medium- and thick-bedded, medium- to light-gray weathering and fracturing limestone plus shale and/or siltstone that
	Composita sp. Spirifer sp.			weather to brown dirt. Limestone is bioclastic, highly so near base. Chert present is sparse, cream-colored to gray nodules.
MISS	Chainman Shale		* * * * * * *	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. 115' errors allies Nedular beds of light to medium gray. Fresh surfaces same color and predominantly medium
	Pilot Shale	0 0 0	0	crystalline. Nodular beds of light brown and pinkish chert present. 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.
	Calvinaria sp. Fault			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.
?	Kottlowski, 1950 Eleutherokomma sp. uilmette 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.
G A C	mphipora	10/00 V P	509	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.
	ladopora tringocephalus sp			985* Medium-bedded dolomite weathering light grcy, 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.
S	Sevy 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. 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 lmm in diameter total 10 feet in thickness page to of formation.
P H	Halysites sp.	6000	0	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 lmm in diameter total 10 feet in thickness near top of formation. 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.
U	pper Ordovician -	0000	0/0	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.
-	ygospira sp.			Gray to brown weathering chert nodules common, particularly in dark weathering beds. 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.
	Eureka Quartzite Lehman Shale	3 3 3	? ?	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. Light-blue weathering limestone and shale and/or siltstone weathering to brown dirt. Limestone is in thin, nodular beds
Ar - Me	nomalorthis sp. Ka acronotella sp. Bathyurella sp.	nosh Sh	3	and is dark gray and finely crystalline on fresh surfaces. A large ostracode, Eoleperditia bivia (White), is very abundant in lower part of formation. Shale weathering to medium-brown dirt and khaki flakes. Present are sparse bioclastic limestone interbeds containing
	Formation D Benthaspis sp. Ptyocephalus sp.		5	Medium- to thick-bedded limestone in upper half and shale and/or siltstone weathering to brown dirt in lower half. Lime- stone is blocky in outcrop, weathers light blue-gray with yellow mottling, fresh surfaces medium dark gray and dense. Medium light-gray weathering limestone in thin to thick beds and some siltstone or shale weathering to dirt. Limestone locally has highquartz silt content and weathers bright yellow and orange. Fresh limestone is medium gray and finely
1000	Formation C Aulacoparia sp. Strigigenalis sp.			to coarsely crystalline. Chert abundant in irregular, thin to medium beds and nodules. Chert laminated, weathers blue-white, yellow, light brown, and pink. 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
	Formation B		0	dark gray and finely crystalline. Small chert nodules present but rare.
P	Parabellefontia sp.			
	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. Very thin-to thin-bedded, platey limestone. Parting surfaces weather light gray, yellow, and light orange. Limestone
R	Prosaukia sp. Richardsonella sp. Dunderberg S phelaspis sp.	hale		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. Shale weathering to medium-brown dirt and greenish-brown flakes. Medium-gray weathering limestone in this to medium-brown dirt and greenish-brown flakes.
Du Ps	eudagnostis mmunis		727	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. 1350° Limestone, medium to light gray in upper half, medium gray in lower half. Beds thick to very thick, fresh limestone are
Но	Kingstonia sp.			coarsely crystalline limestone and reworked, sandsized limestone fragments.
	Modocia sp.			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.
1	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.
Ba	athyuriscus elegans			Siltstone and/or shale weathering to brown dirt and medium-gray weathering limestone. Limestone in plates 3/8 to 2
	Secret Canyon Formation		1776	inches thick, fresh surfaces dark gray and finely crystalline. Subordinate amount of plates have pinkish-gray, buff.
E	athyuriscus sp. lrathina sp. tychagnostus 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			200° Light-gray, sugary dolomite in very thick beds. Fresh surfaces are lighter than weathered and are coarsely crystalline.
	Formation	7 7	13061	shape are abundant. Very light-gray weathering limestone with faint pinkish cast. Small raised dolomite flecks near base, a few dark lime— 260' stone bands averaging 6'' wide are present higher up. Fresh surfaces even lighter than weathered and dense to finely crystalline.
All	Glossopleura sp. — Kistocare sp. bertella sp. liella germana (Ress	er)		860' Siltstone and interbedded medium-to dark-gray limestone. Limestone in thin and medium beds, fresh surfaces are finely
Pto	armiganoides sp. Pioche Shale annia sp. Olenellus s		.000	higher in section. 420' Micaceous siltstone in medium-brown plates and medium-brown dirt. Some thin quartzite interbeds present near the base. Thick-bedded limestone present in the interval 150-160 feet above the base.
	Zacanthopsis sp.			The first transfer of the first transfer of the pase.
				1870* Light-brown to rust weathering quartzite in beds averaging 1 foot in thickness. Quartzite is fairly pure, feldspar less than 5 percent, distributed flakes of mica are rare. Fresh surfaces are very light brown and light pinkish brown. Grains are medium to coarse, granules rare, pebbles very rare. Thin interbeds of micaceous siltstone similar to those in the Picche Shelp company of the later later.
P	rospect Mountain		2	in the Pioche Shale comprise minor amount of total thickness.
	Quartzite	13,17,37	272	
	}			1970' Quartzite similar to that above, but with a faint purple cast and less rusty weathering beds. Beds are slightly thicker, averaging a bit more than 1', but rarely exceeding 4'. Purple and pinkish-purple laminae locally common, 3-to 12-inch purple bands rare. Minor (±4 percent) feldspar present throughout. Sparse interbeds of purple siltstone less than 3 feet thick are distributed throughout.
			1	
	Precambrian H		25	
	Precambrian G	0	000	Light-gray weathering quartzite in beds 6 inches to 6 feet thick. Quartz clasts are of coarse sand and granule size. Clasts rarely exceed 1.5cm, largest noted is 4cm. Small percentage of clasts are light brown, light green, and light purple. Sparse, bright-red, jasperoid clasts also present. Small, dark-gray spots 1-3mm scattered through quartzite.
	Precambrian F			state, particularly flear base. Would clasts poorly sorted, rarely exceed 3mm in diameter.
	Precambrian E	0	33	Light-gray quartzite with faint hues of orange, rust, and green. Quartz in thick beds with conspicuous white quartz venation. Fresh surfaces are white and grains are of coarse sand to granule size and quite angular. Argillaceous material weathering to medium-brown dirt.
	Precambrian D		18	265' to 3-foot beds. Largest clasts are white quartz and milky feldspar of granule size. 145' Indurated siltstone weathering to greenish-gray plates averaging 3/8 inche in thickness. Mainly dark-gray near base and becoming lighter and greener toward top.
	Precambrian C		18	tion extends 1 to 2cm into rock. Fresh quartzite light brown to buff, clasts 1/16 to 5mm. Rectangular concentrations of hematite and rectangular voids scattered through rock.
				380' Altered shale and/or siltstone in irregular plates. Plates are medium brown and exhibit "knots" ½ to 2mm in diameter. 160' Indurated shale and/or siltstone in greenish-gray weathering plates. Lower 35 feet has metallic, "gun metal" gray color.
	Precambrian A			340° Rusty, orange-brown, and yellow-brown weathering quartzite in thick to very thick beds. Weathered quartzite smooth to

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 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 creas). 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 of thesis problems and for generally contributing his time.

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 Formation, those equivalent in age to the Eldorado Dolomite are represented by limestone, and those of the thin-bedded limestones of the Secret Canyon are replaced by siltstone or shale. text opposite the beds to which they refer. sented by limestone, and those of the thin-bedded limestones of the Secret Canyon are replaced by siltstone or shale.

The locations of the various measured segments shown in the composite section are shown on the geologic map. The locations of the segments in their respective thrust sheets (see sheets on index map) are: Precambrian A through F, thrust sheet I; Precambrian G through Prospec: Mountain Quartzite, thrust sheet IVa; Pioche Shale through Hamburg Formation, thrust sheet II; Dunderberg Shale through Simonson Dolomite, thrust sheet IVb; Guilmette Formation, thrust sheet V; Pilot Shale through Chainman Shale thrust sheet IVb(?); and Ely Limestone through Arcturus Formation, thrust sheet IVa (?).

Additional faunal data on the Pioche Shale in thrust sheet II is given by Fritz (1968). In that publication the Cambrian section in sheet II is referred to as the Campbell Ranch Section. In previous reports (Fritz, 1960; Woodward, 1962, 1964) the same section has been called the Bakers Ranch section.

area as a thesis problem, and for generously contributing his time and guidance.

PRE-TERTIARY STRUCTURE

During Late Precambrian through Early Permian time only mild uplifts, widely spaced in time, interrupted normal deposition of the strata now exposed in the map area. Three unconformities resulting from these uplifts are strongly inferred to be present. These unconformities, as reported in regional studies, are (1) at the base of the Early Cambrian Prospect Mountain Quartzite, where some latest Precambrian strata may be missing (Misch and Hazzard, 1962, p. 303; Woodward, 1963, p. 821); (2) at the base of or within the Eureka Quartzite, where Middle Ordovician strata are thin or missing (Kirk, 1933, p. 42; Webb, 1958, p. 2352); and (3) either immediately or a short distance below the base of the Arcturus Formation, where some Middle and Upper Pennsylvanian strata are missing (Steele, 1960, p. 93).

Deposition interrupted by similar broaduplifts must have continued from Permian into Early Jurassic time, because outcrops of widespread formations deposited during this interval are exposed in the northern portion of the Cherry Creek Range (Smith, 1932, p. 9) and near the town of Currie, Nev. (Wheeler and others, 1949). These two localities are less than 30 miles north of the map area.

A major orogeny took place in east-central Nevada in the interval following deposition of the Early Jurassic beds near Currie, and before deposition of Cretaceous beds exposed near Illipah, Nev., (Easton, 1954) and Eureka, Nev. (Nolan and others, 1956, p. 68). The writer believes that most of the faults now exposed in the map area resulted from this orogeny, which Misch (1960, p. 33) hastermed the Mid-Mesozoic orogeny and which will here be called the Mesozoic orogeny. The most obvious of the resulting Mesozoic structures are thrust faults of the younger-over-older type, tearfaults, and west dipping (imbricate) faults. The present westward dip of nearly all of the pre-Mesozoic strata exposed in the area is also attributed to the Mesozoic orogeny. The degree of dip, however, has been modified by Tertiary deformat PRE-TERTIARY STRUCTURE In order to relate the complex pattern of Mesozoic faults shown on the map, it is necessary to define the earliest and largest of the Mesozoic structural units. These are large thrust sheets that have been moderately to highly deformed and, therefore, cannot be quickly recognized on the map, nor are all of them confined to the map area. These thrust sheets will be emphasized in the following text and they are shown on the indexmap. Each thrust sheet has been assigned a Roman numeral to indicate the relative east-west depositional (pre-orogenic) position of the strata belonging to any given sheet as compared to the strata in other sheets. Thus, thrust sheet I is believed to have originated east of thrust sheet II, thrust sheet II east of thrust sheet III, etc.

At each of its various exposures, thrust sheet I is structurally the lowest sheet, it contains the oldest strata, and drag structures indicate the relative movement of the overlying sheet was eastward. The largest and best exposure of thrust sheet I is in the northeast part of the map area and extends northward beyond the border. At the northern half of this exposure most of the stratigraphic formations known to belong to sheet I are visible. These formations are Precambrian A-H, Prospect Mountain Quartzite, and probably part of the Pioche Shale. At the north end of this exposure sheet I is overlain by Cambrian strata of sheet V. At the south end of the exposure nearly all of the known formations in thrust sheet I have been tectonically removed. Here Ordovician and Silurian strata of thrust sheet IV rest in fault contact on sheet I. Between the north and south ends of the exposure are small klippen of Cambrian and Ordovician (?) strata which are thought to belong to thrust sheet V. In the south-central portion of the map area, thrust sheet I is exposed at six localities in fault contact directly below thrust sheet IV. Thrust sheet I is probably exposed 9 miles south of the map area, where it is overlain by thrust sheet III (Woodward, 1964, fig. 2). There the Precambrian and Lower Cambrian stratigraphic sequence is even more complete than at the north end of the first location described.

At all exposures except one, strata in thrust sheet I are underlain by income and which work the second s by igneous rocks which mask the relationship between Sheet I and the substrata below. Because the igneous intrusions postdate the Mesozoic orogeny, their implacement may have been quided by one or more Mesozoic thrust planes. It is equally possible that the igneous intrusions plane above this strata would then constitute a décollement

Thrust sheet I

Thrust sheet II Thrust sheet II is located in the southern portion of the map area of the Cambrian and part of the early Ordovician (Formation A) can definitely be assigned to sheet II. Near the main exposure are other outcrops of Ordovician through Silurian strata that may also belong to sheet II. The Cambrian in sheet II has been contrasted with the Cambrian in sheet IVa by Fritz (1960, p. 17) and to the Cambrian in sheets III and IVa by Woodward (1964, p. 35). Fritz (1968) has described the late Lower and early Middle Cambrian tipsheet III are several to the contrast of the contrast ate Lower and early Middle Cambrian trilobites in sheet II. In essence, late Lower and early Middle Cambrian trilobites in sheet II. In essence, these works suggest that sheet II belongs to a more easterly facies than the Cambrian in Sheets III and IV. The Cambrian in sheets III and IV. The Cambrian in sheets III and IV. The Cambrian in sheets III more closely resembles the Cambrian to the southwest in the Southern Snake Range near the Nevada-Utah border (Drewes and Palmer, 1957). Faunally, the early Middle Cambrian trilobites in sheet II are closely related to those described (Resser, 1939) from northern Utah and southeastern Idaho.

Partial structural agreement as to the east-west assignment of sheets II and IV can be seen on the geologic map starting near the north end of the main exposure of sheet II. Here equivalent formations in sheets II and IV are nearly aligned in a north-south direction, with strata in sheet IV lying only slightly ahead (east) of strata in sheet II. To the north and within the length of sheet IV, these same strata have been offset until they lie far ahead (east) of that in sheet II. Within sheet IV the amount of eastward offset is between 3 and 5 miles.

Thrust sheet III The structural pattern north and south of sheet II suggests that The structural pattern north and south of sheet II suggests that sheets III and IV may have originated from a single sheet that wrapped around sheet II from the west. However, Woodward (1964, p. 36) has pointed out certain differences between the Cambrian through Devonian strata in sheets III and strata in sheet IV that make this suggestion difficult to accept. Most obvious of these differences is that the thickness of the Sevy and Simonson Dolomite in sheet III, 900 and 650 feet respectively is incompatible with the thickness of the respectively is incompatible with the thickness of the same formation in sheet IV, 425 and 1,310 feet respectively, only 10 miles to the north.

Thrust sheet IV Thrust sheet IV contains Precambrian through Permian strata, and Thrust sheet IV contains Precambrian through Permian strata, and the entire sheet has undergone considerable right-lateral displacement, as has been mentioned above. If the various subsiderary fault blocks and slices are restored, it becomes obvious that the now deformed and partially covered tear fault shown between sheet IVa and IVb (see index map) is an early and important structure. North of this fault are tear faults of considerable magnitude; south of it at the northwest corner of IVb, strata have yielded northeastward along various faults, probably to immediately occupy space vacated by east-moving blocks of IVa. For the most part, strata south of the early tear fault and deep within sheet IVb are judged to be but slightly offset. The complex surface pattern exhibited here is in part due to the unassigned klippen resting on sheet IVb, and in part due to small thrust faults near the upper surface of IVb. The latter faults are believed to have resulted from forward (eastward) drag from the overlying, unassigned plates.

Thrust sheet V Thrust sheet V contains Cambrian through Pennsylvanian strata and possibly some Permian strata at its westernmost exposures. Faults within this sheet are of small displacement, therefore the sheet is not within this sheet are of small displacement, therefore the sheet is not as highly deformed as those previously described. Thought to be an early structure in this sheet is a southwesterly trending fault, located at the point where the road enters the Cherry Creek Range from Egan Basin. To the southwest and trending normal to this fault are numerous, nearly identical tear faults. Northwest of this fault are a number of small imbricate faults and slices, some of which extend south to overlap the early, southwesterly trending fault.

At the northwest exposure of sheet V is an overthrust, moderate in size, but nevertheless larger than any overthrust in the Northern in size, but nevertheless larger than any overthrust in the Northern Egan or Cherry Creek Ranges. The upper plate of Upper Ordovician through Middle Devonian strata exhibits the same weak deformation as in sheet V and, therefore, this plate is tentatively assigned to sheet V rather than to the adjacent, highly deformed sheet VI.

Thrust sheet VI Thrust sheet VI is a narrow thrust sheet, and one cannot help but speculate that its position between larger sheets V and VII bears some relationship to its intense deformation. The western half is cut by numerous thrust faults, many of which have rotated by sliding to the southeast as well as east. The manner of displacement of the plates at southeast as well as east. The manner of displacment of the plates at the west and of this sheet resembles that at the north end of sheet IV. The Late Precambrian through Pennsylvanian strata in thrust sheet VI differ somewhat from strata to the south. The Middle Cambrian exhibits "zebra stripes" or alternate light and dark weathering beds, contains chert at a number of horizons, and includes a thin-bedded limestone member that may correlate with the Clarks Springs Member at Eureka, Nev. These features are also present in sheet VII, but not in sheets II-IV. Missing in this sheet is the lower, thick-bedded limestone member of the Guilmette Formation seen in sheets III and VI but not in nember of the Guilmette Formation seen in sheets III and VI but not VII. The Ely Limestone in sheet VI contains a much higher ratio of clastic material than do the sheets to the north or south. Thrust sheet VII

Sheet VII Sheet VII Sheet VII constitutes most of the Cherry Creek Range and extends to 35 miles north of the present map area. It contains Cambrian through Triassic strata having a volume that probably approaches or exceeds the combined volumes in sheets II=IV. In sheet VII the Diamond Peak Formation is well developed in contrast to related thin to very thin quartzite units in sheets to the south. The main internal structures in sheet VII consist of small east-west trending right-lateral faults at its south end, and numerous small thrust farther north. Although it is the least deformed at the sheets described, sheet VII is considered to have least deformed of the sheets described, sheet VII is considered to have moved the greatest relative distance eastward. This is indicated by the consistent eastward displacement seen within each sheet as structures are observed from sheet II northward to and into thrust sheet VII. Because of its size and greatest relative eastward displacement, the relative movement of sheet VII probably played a profound role in producing Mesozoic structures as far south as the present southern boundary of the map area.

Summary of pre-Tertiary structure A number of points which help to summerize the history of the Mesozoic orogeny as interpreted from the present map area have already been made by Misch (1960) in his description of the same orogeny in central-northeast Nevada. He states that during the orogeny: (1) Paleozoic strata became detached from the Late Precambrian substrata thrust sheet !? along one or more thrust (decollement) planes, (2) most of the Paleozoic strata yielded eastward relative to the substrata, (3) considerable horizontal displacement tookplace, and (4) deformation within the superstrata ranged from mild in some areas to complex in others. To the points made by Misch might be added that (5) the amount of relative movement eastward differed for different thrust sheets, and (6) that considerable internal deformation resulted from differential movement of one sheet against another. Also, it is suggested that both the competence of strata in a sheet and the size of the sheet are strong factors governing the amount of deformation it sustained. Finally, there seems to be little apparent relationship between the distance a sheet has traveled relative to the substrata and the amount of deforma-

tion it has undergone.

TERTIARY DEFORMATION There is evidence within the mapped area that at least three im-portant events took place after the Mesozoic orogeny. The order or possible interrelation of these events has not been established. possible interrelation of these events has not been established.

One event was Tertiary volcanism, now known from scattered outcrops of volcanic rocks in the mapped area. As similar rocks are widespread in the eastern Great Basin, and as small outcrops are still preserved along the flanks and even high in the Northern Egan Range, it is probable that the entire map area was once blanketed with volcanic material. Remnants of the volcanic cover are now mainly confined to areas underlain by the easily eroded Arcturus Formation. This association suggests some relief may have existed before volcanism, and that the areas selectively eroded from the Arcturus may have received the areas ungests some relief may have existed before volcanism, and that the areas selectively eroded from the Arcturus may have received the thickest volcanic fill.

A second event was the intrusion of quartz monzonite into Late Precambrian and Paleozoic strata that had been previously deformed by the Mesozoic orogeny. On the west side of the Northern Egan Range the intrusive bodies have clearly followed Mesozoic thrust faults. On the east side are the two largest plutons. These may have contributed to the present relief. However, the writer believes it is more probable that they predate the present erosional cycle.

A third and the most obvious Tertiary event was the uplift of the present ranges relative to the large alluvium-filled valleys. Within part of the Northern Egan Range Tertiary uplift must have been surprisingly uniform, because there has been very little displacement along the highest (latest?) Mesozoic thrust plane (see structural cross section B-B' and C-C'). In other areas some Tertiary faults are locally present near the flanks of the range (sections D-D' and G-G'), but these do not extend for appreciable distances. The possibility that recent rangefront faulting has taken place is precluded by the sinous contact between bedrock and alluvium at the margins of the ranges. It seems probable that the major faults or folds that have blocked out the ranges and valleys now lie below valley fill, and if so, subsurface data would be needed to establish their positions.

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INDEX AND STRUCTURE MAP

Full citations of the

indicated sources of

geologic data are

given in Reference

SCALE IN MILES 1:250,000

Thrust sheets described in text

are indicated by Roman

numerals.

Fritz, 1960 and present map.

Woodward, 1962, 64

list above. 1 5

EXPLANATION Alluvium Windfall Formation Volcanic rocks Dunderberg Shale Arcturus Formation Hamburg Formation Secret Canyon Formation Chainman Shale Eldorado Formation Joana Limestone Pioche Shale MDp Pilot Shale Prospect Mountain Quartzite Guilmette Formation Precambrian formation H Dsi Simonson Dolomite Precambrian formation G. Dse Sevy Dolomite Precambrian formation F Upper Ordovician-Precambrian formation E Silurian formation Precambrian formation D Eureka Quartzite Precambrian formation (Lehman Shale Precambrian formation B Precambrian formation A Ordovician formation I Ordovician formation (Intrusive rocks Quartz monzonite and fine -grained porphyritic Ordovician formation B equivalentOrdovician formation A Fault, dashed where inferred Alluvium and bedrock contact Strike and dip of beds Formational contact, dashed where inferred Horizontal beds ----Strike and dip of foliation Thrust fault, dashed where inferred ____ **——** Strike-slip or tear fault Measured section SECTION A-A'

SECTION B-B'

SECTION C-C'

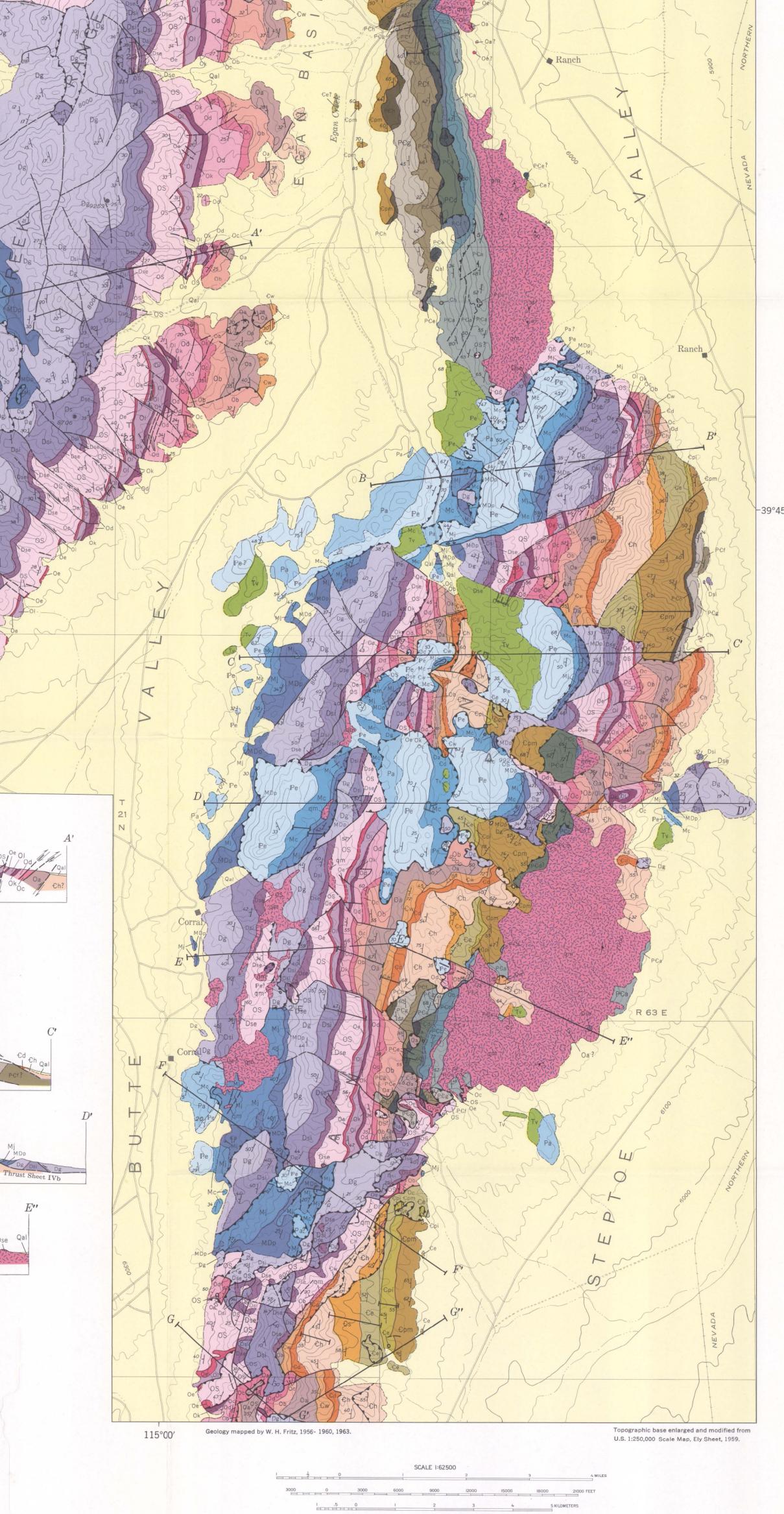
SECTION D-D'

SECTION E-E"

SECTION F-F'

SECTION G-G"

Thrust Sheet IVb



CONTOUR INTERVAL 200 FEET

DATUM IS MEAN SEA LEVEL