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GEOLOGY OF THE WEST CANYON AREA, NORTHWESTERN UTAH COUNTY, UTAH

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To his wife, Margaret, the writer wishes to express his appreciation for her help and encouragement.

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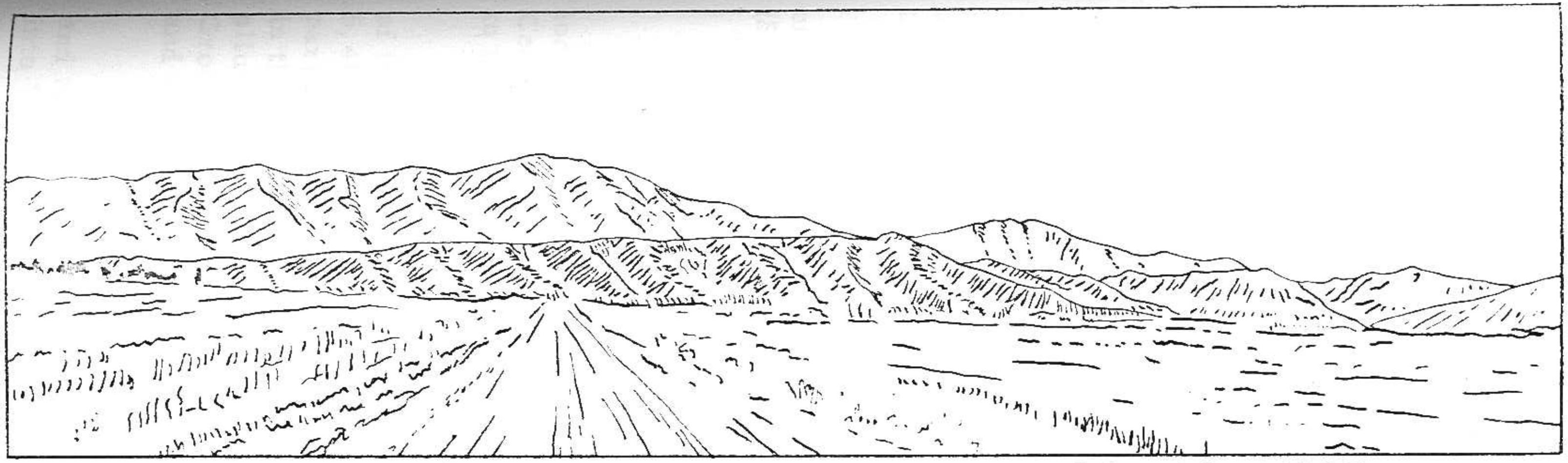
ABSTRACT

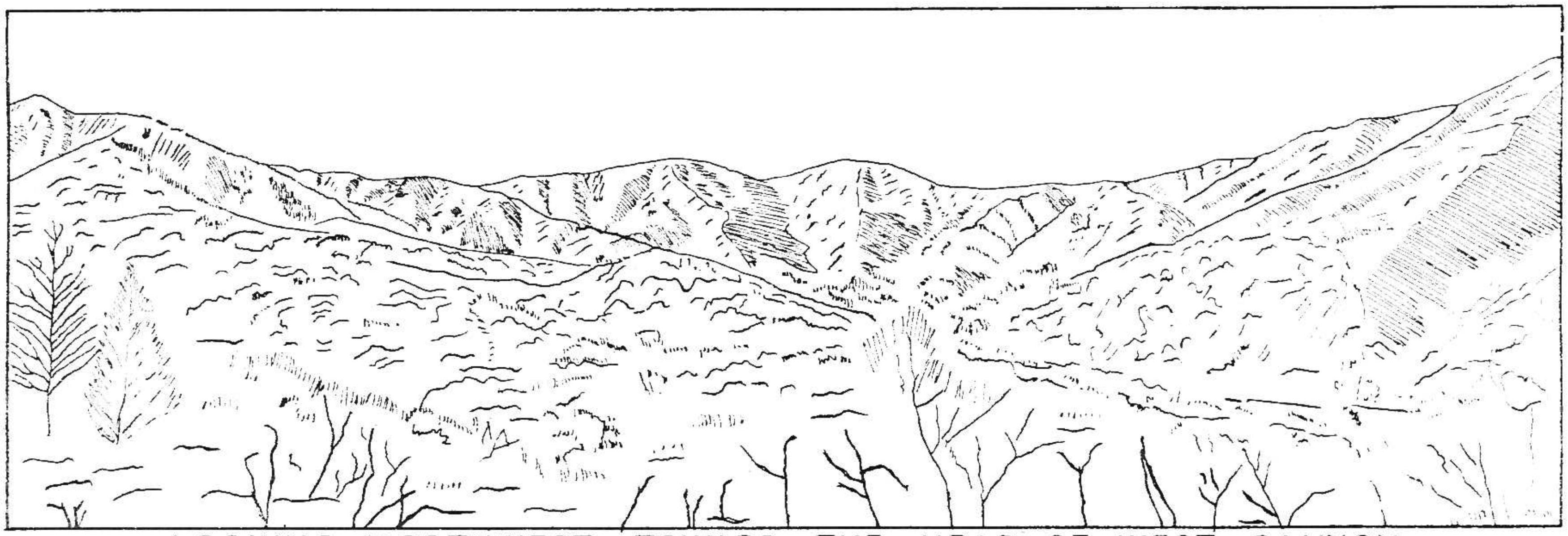
Approximately thirty-five square miles were mapped for this report. The area is located in the south-central part of the Oquirrh Mountains, about twenty-five miles south of Salt Lake City and eleven miles west of Lehi, Utah. It is in the extreme northwestern corner of Utah County and is bounded on the west by the Tooele-Utah County line and on the north by the Utah-Salt Lake County line.

The Mississippian system is represented in the area by the upper part of the Deseret limestone, the Humbug formation, the Great Blue limestone, and the lower half of the Manning Canyon shale. The combined thickness of the Mississippian rocks is 5,467 feet, and this is overlain by the upper Manning Canyon shale (Springeran) and 3,842 feet of Pennsylvanian Oquirrh formation, divided into the Morrow, Atoka, and Des Moines series in this report. Several small moraines and cirques are present in the area.

The major structural feature of the West Canyon area is a large asymmetrical northwest plunging anticline. Folds and possible faults within the area formed during the Cedar Hills orogeny (?) and various phases of the Laramide orogeny. Folding was followed by Tertiary volcanism and erosion.



VEIW OF THE WEST CANYON AREA LOOKING WEST



LOOKING NORTHWEST TOWARD THE HEAD OF WEST CANYON

FIGURE 1

INTRODUCTION

LOCATION AND ACCESSIBILITY

The area considered in this report is situated in the southeastern Oquirrh Mountains about twenty-five miles south of Salt Lake City and eleven miles west of Lehi, Utah. It is bounded on the west by the Tooele-Utah County line and on the north by the Utah-Salt Lake County line and lies within Townships 4 and 5 South, Ranges 2 and 3 West, Salt Lake Base and Meridian (See Plate 2) encompassing approximately thirty-five square miles. The meridian 112° 10' W. Longitude and the parallel 40°25' pass through the area.

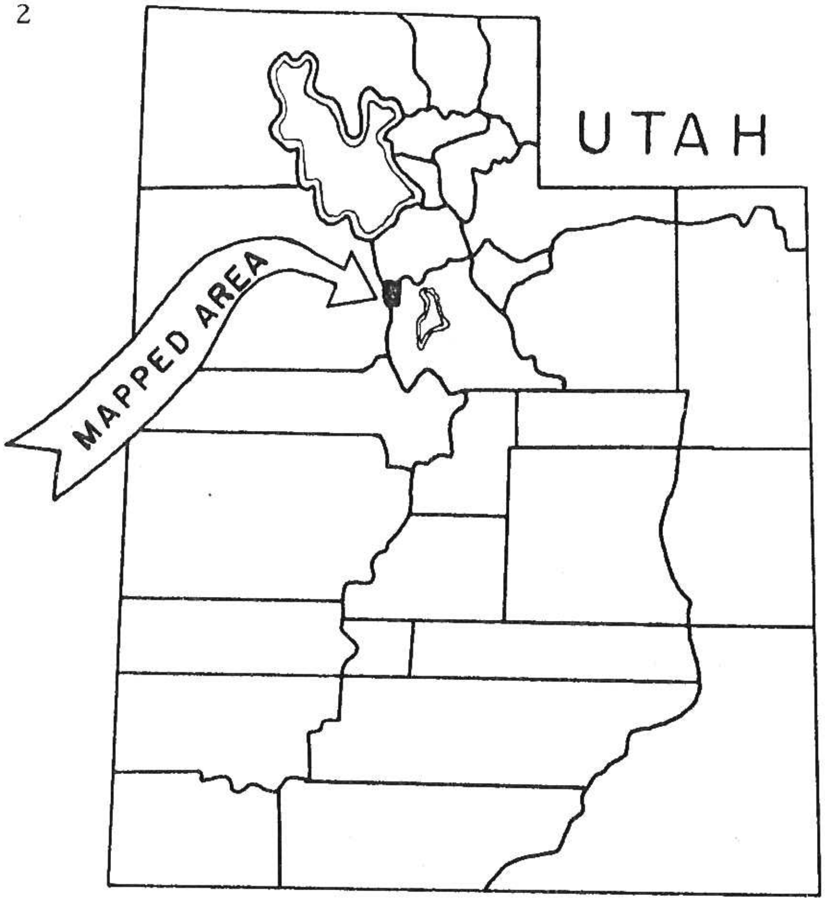
The area is accesible along graded roads that extend the length of West Canyon and Left Fork northward from Utah State Highway 73 (See Plate 2).

PHYSICAL FEATURES

The Oquirrh Mountains trend essentially north-south and are located east of Rush Valley, west of Jordan River Valley, and north of Cedar Valley. The range is approximately thirty miles long and six to twelve miles wide.

Relief in the mapped area is 5,172 feet with a maximum elevation of 10,572 feet above mean sea level and a minimum elevation of 5,400 feet. The area is rugged especially in its west and northwest parts. This ruggedness, however, gives way to subdued topography in the south and southeast part of the area, which grades to large alluvial deposits that slope outward to the valley to the southeast. Ground moraines and cirques are present at elevations of 8,000 feet and above.

The drainage of the area is controlled by many small canyons and two larger ones, West Canyon and Left Fork. Left Fork drains into West Canyon, and from this confluence southward there is a perennial stream which, although small, is an important source of irrigation water for the people of Cedar Fort.



INDEX MAP
PLATE 2

CLIMATE AND VEGETATION

The arid to semi-arid climate is similar to that of nearby areas in this part of the Great Basin. According to Bullock (1951, p. 10), the weather station located at the pumping station on the north end of Utah Lake reports a forty year average of 12.45 inches of annual precipitation for the surrounding area. This average is probably somewhat lower than that of the Oquirrhs. The reported temperature range at the weather station is from -28° to 106° F.

The vegetation of the area varies notably with elevation and with annual mean temperature and rainfall. Dense growths of Douglas fir, with a few Spruce and some Pinon and Yellow pine, are found in the high areas, especially on the north-facing slopes. Aspen is abundant in the higher canyons and gulches, along with scrub oak, box elder, choke cherry, and alder. The lower slopes support a large growth of cedar (Utah juniper), buck brush, bulb cactus, sagebrush, and bunch grass. Dry land wheat farms and open range land occupy the southeast part of the area.

FIELD WORK

The field work started in July, 1954, and was completed November, 1954. The area was mapped in part on aerial photographs having a scale of 1:12,000 and in part on a controlled mosaic with a scale of approximately 1:21,000. Attitudes of strata and other pertinent geologic data were plotted on the mosaic and aerial photographs. Formation limits were plotted by walking the contacts from one area to another. Chracteristic rock and fossil samples were collected for laboratory study. Stratigraphic sections were measured with the aid of a steel tape and Brunton compass.

After completion of the field mapping, the geologic data was transferred from the aerial photographs to the controlled mosaic. The final map compilation was accomplished by transferring this information to a portion of the Fairfield topographic quadrangle, which was enlarged by photostatic methods to a scale of 1:21,320. This has been photographically reproduced to the scale shown on Plate 1.

PREVIOUS WORK

King (1877, pp. 443-454) was probably the first to publish any reference to the geology of this area. Spurr (1895, pp. 395-455) made a study of the economic geology of part of the Oquirrh Mountains, with emphasis being placed on the Mercur Mining District. Gilluly (1932, 171 pp.) included the area of this report in his study of the Stockton-Fairfield Quadrangles.

GEOLOGY

GENERAL STATEMENT

Paleozoic sedimentary rocks and Tertiary igneous rocks crop out in the West Canyon area. Quaternary alluvium occupies the valleys and bordering low area. Paleozoic rocks include formations of Mississippian and Pennsylvanian ages. Of these two, the Mississippian comprises 5,467 feet of limestone, shale, and orthoquartzite; and the Pennsylvanian consists of 4,351 feet of shale, calcisiltite, limestone, and orthoquartzite. The Tertiary rocks consist of quartz monzonite sills.

The stratigraphy of the area, as presented in detail in succeeding pages, is summarized in Table 1.

SEDIMENTARY ROCKS

GENERAL SECTION

The sedimentary rocks in the West Canyon area have a total thickness of 9,815 feet (See Figure 2). They include Mississippian, Pennsylvanian, and Quaternary strata. Nomenclature applicable to the geologic formations follow that of Gilluly (1932).

MISSISSIPPIAN SYSTEM

Deseret limestone

Distribution.--The Deseret limestone is the oldest Paleozoic formation exposed in the West Canyon area. Only the upper 55 feet of the formation is exposed in the mapped area at the southern tip of Long Ridge.

TABLE 1

A SUMMARY OF THE STRATIGRAPHY OF THE WEST CANYON AREA

Age	Formation	Thickness	Lithology and Remarks
Quaternary	Alluvium	?	Unconsolidated silts, coarse gravels. Some glacial fill of probable Wisconsin age at altitudes of 8, 000 feet and above.
Pennsylvanian	Oquirrh formation Desmoines series	1, 196 feet	Predominantly quartzites with interbedded limestone. Top not exposed in area.
	Oquirrh formation Atoka series	1, 578 feet	Interbedded quartzite and limestone, more quartzitic toward top.
	Oquirrh formation Morrow series	1, 068 feet	Massive blue-gray fossiliferous limestone with subordinate beds of sandy limestone toward top.
	Manning Canyon Shale	2, 495 feet	Black carbonaceous shale and calcisiltites with subordinate interbedded limestone and quartzites.
Mississippian	Great Blue limestone	2, 486 feet	Light-blue limestone somewhat silty toward top. Massive and more fossiliferous at the base with an 88 foot bed of black carbonaceous shale, the Long Trail shale member, 478 feet above the base.
	Humbug formation	940 feet	Limestone with lenticular sandstone and quartzite interbedded.
	Deseret limestone	55 feet	Blue-gray cherty limestone. Upper fifty-five feet exposed only.

STRATIGRAPHIC COLUMN OF THE WEST CANYON AREA

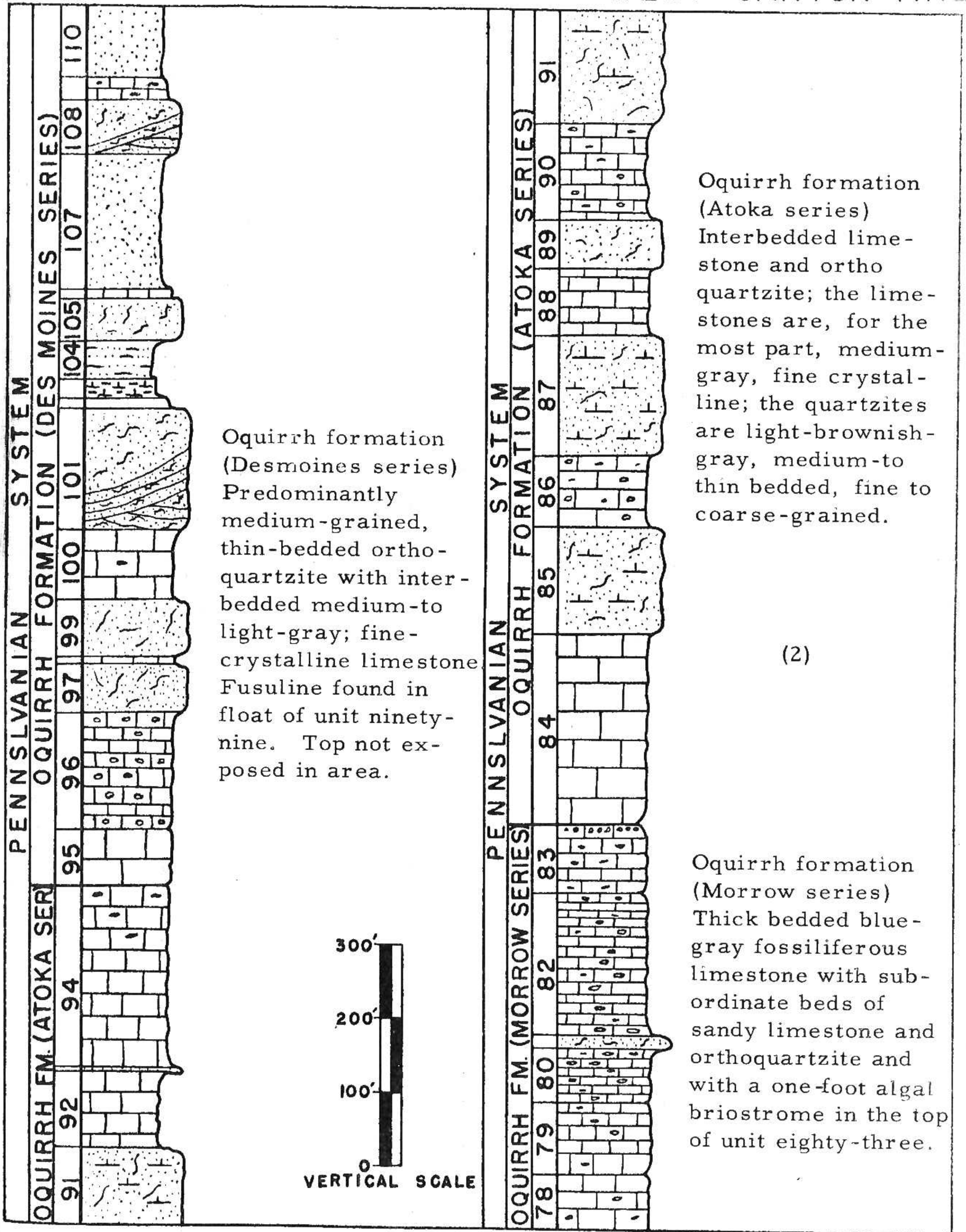


FIGURE 2

FIGURE 2 (CONTINUED)

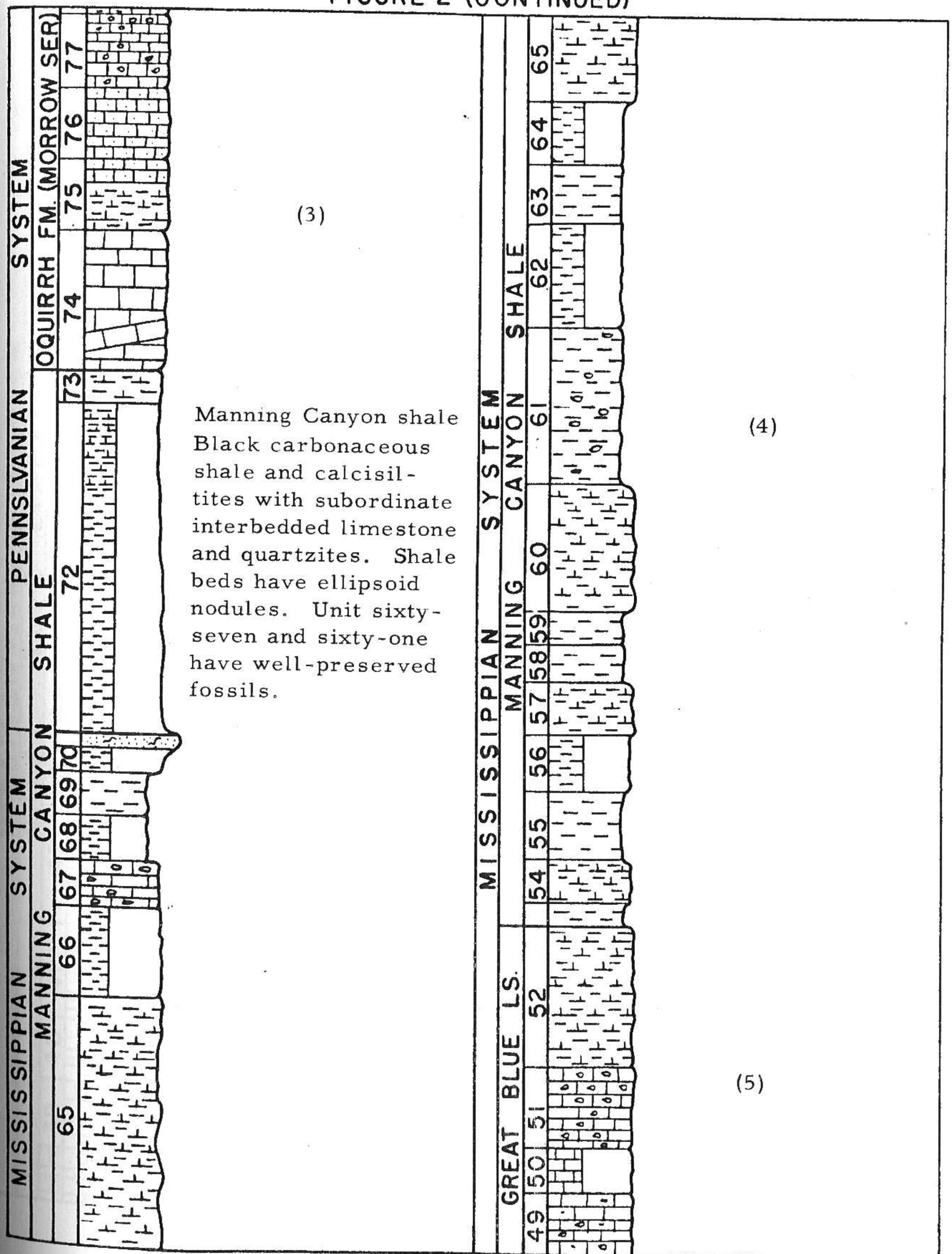
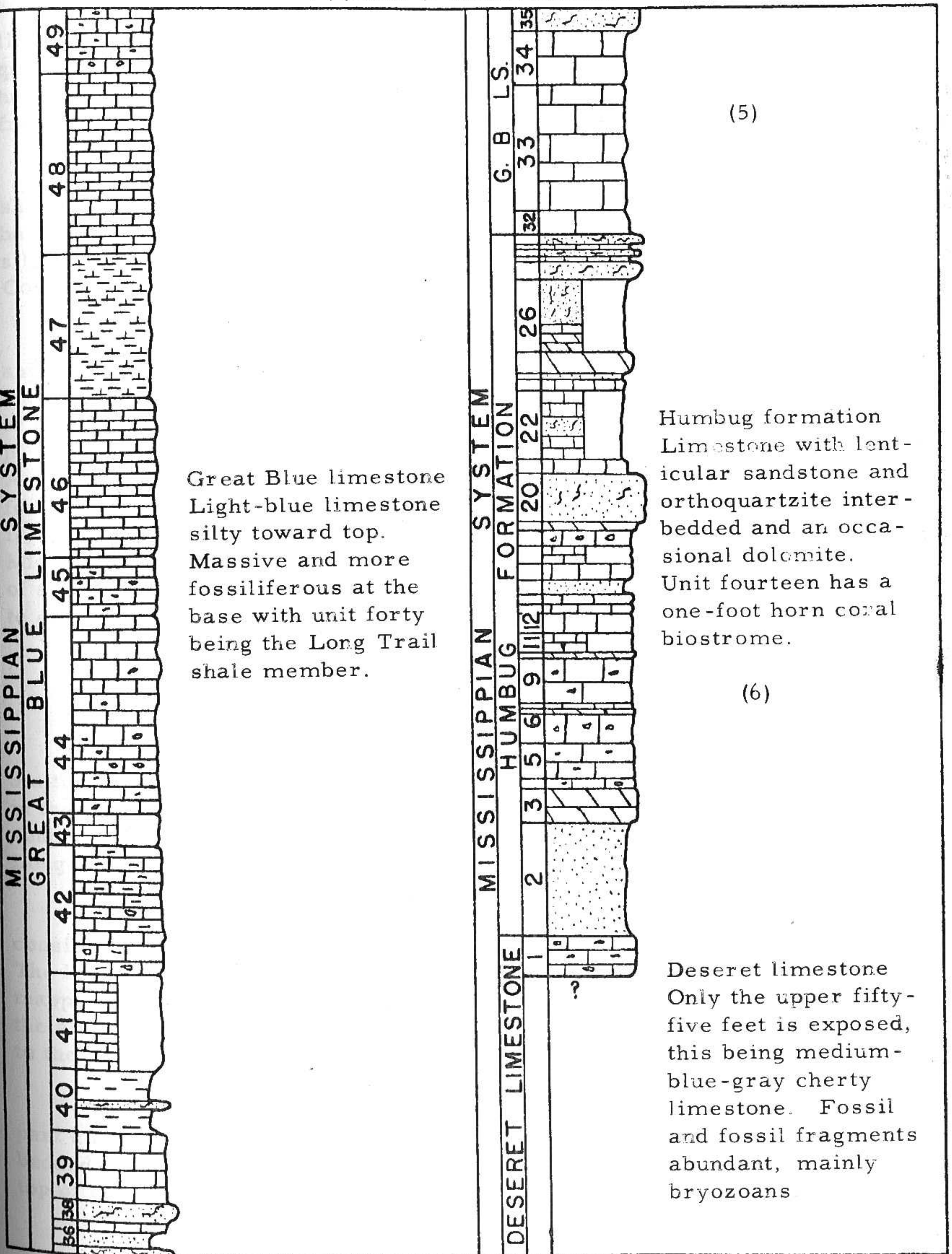


FIGURE 2 (CONTINUED)



Lithology and depositional environment. --The outcropping Deseret limestones are composed of blue-gray fine-grained limestone with large quantities of black chert. The chert nodules and lenses range from one half of an inch to three inches in diameter. Abundant fossils and fossil fragments, mainly coral and bryozoans, occur in this bed.

The deposition of the Deseret limestone was likely in quiet offshore waters and under conditions in which considerable silica was being carried in solution and colloidal suspension. The source of the silica may have been extensive volcanism nearby likely west of the Cordilleran geosyncline.

Correlation and thickness. --The present writer did not identify any diagnostic fossils in the formation during field work. Fenestella sp. and fragments of Spirifer sp. were collected. The stratigraphic position of this formation indicates it to be Upper Mississippian. Gilluly (1932, p. 26) assigned an Upper Mississippian age to the Deseret limestone. A correlation of the local Deseret with the upper portion of the Pine Canyon formation of the Tintic district is suggested. The Pine Canyon formation is, according to Lindgren and Loughlin (1919, pp. 40-41), Upper Mississippian. The fact that both formations are overlaid by a sequence of alternating limestones and quartzites of the Humbug formation tends to confirm this.

Humbug formation

Distribution. --The Humbug formation was named by Tower and Smith (1899, p. 626) from exposures in the Old Humbug mine located in the Tintic mining district. The Humbug formation crops out over the south-central part of Long Ridge, forming all of the southern part of Long Ridge except for the southernmost hill of Deseret limestone (See Plate 1).

Lithology and depositional environment. -- The Humbug formation consists of alternating limestone, dolomite, sandstone, and quartzite. The lower contact of the formation is placed at the base of the lowest mappable sandstone bed. The upper contact is a transitional zone where the alternating limestones, orthoquartzites, and sandstones give way to the medium-to thick bedded limestones above.

In general, the formation is thin-to-thick bedded. The lower part consists predominantly of limestone and dolomite with one interbedded thick sandstone. Sandstone and quartzite dominate toward the top of the formation.

The limestone and dolomite are very light to dark-gray with the dolomites being characteristically lighter. The limestones are coarse-grained to finely crystalline, with the exception of two thin cryptocrystalline beds. The dolomites are fine-grained to cryptocrystalline. The sandstones and quartzites are coarse-to-fine grained and vary from light-gray to medium-brown. There is a persistent one-foot coral briostrome about 500 feet from the base of the formation.

The depositional environment of the Humbug formation was likely that of a fluctuating sea upon an unstable to slightly stable shelf. The clastic limestones and cross-bedded sandstones and quartzites suggest deposition in shallow seas subjected to strong littoral currents. The presence of the cryptocrystalline limestones and dolomites indicates changing environment with periods of relatively quiet water.

Correlation and thickness.--The Humbug formation of the West Canyon area is 940 feet thick. It is correlated with the type locality in the Tintic district on the basis of lithologic similarity and stratigraphic position.

Foraminifera of the genus Endothyra were collected. Spirifer sp. and horn corals are also present. The writer compared the specimans of Endothyra from the Humbug of the West Canyon area with those collected by Calderwood (1951, pp. 48-49) in the Humbug of the Cedar Hills area and found them to be the same form. Endothyra collected by Calderwood was identified by Thompson and Zeller as a lower Meramecian form.

Great Blue Limestone

Distribution.--The Great Blue limestone was named by Spurr (1895, pp. 374-376) from outcrops in the Mercur mining district. The name "Great Blue," a miners' term not given from any specific locality, has become accepted through usage. The Great Blue limestone is exposed in the central part of the West Canyon area from Bald Knoll to Iron Canyon, where it forms a subdued topography over most of its outcrop area, ledges being rare.

Lithology and depositional environment.--The Great Blue limestone rests conformably on the Humbug formation with the boundary being placed at the top of the highest persistant quartzite bed of the Humbug.

The Great Blue limestone in the West Canyon area consists of a lower and an upper limestone member, separated by shale beds named the Long Trail shale member by Gilluly (1932, p. 29). The lower limestone member is thick-bedded, finely crystalline limestone with an occasional interbedded quartzite bed. The Long Trail shale member consists of black carbonaceous shale with a red quartzite bed near the center of the member. The upper limestone member consists predominantly of calcisiltite with subordinate interbedded, finely crystalline limestone.

The lower limestone member suggests depositon in quiet water offshore whereas the upper two members are suggestive of a stable shelf environment.

Correlation and thickness. - Gilluly (1932, p. 29) measured a total thickness of 3,600 feet of Great Blue on Bald Knoll and gave thicknesses of 2,750 feet for the upper limestone member, 85 feet for the Long Trail shale member, and 500 feet for the lower limestone member. These three figures total 3,335 feet. The writer measured 2,486 feet of Great Blue limestone in the same location. Although exposures were not continuous they were frequent enough to maintain a close check on attitudes. The writer measured 478 feet for the lower limestone member, 88 feet for the Long Trail shale member, and 1,920 feet for the upper member.

Fossils found by the writer in the Great Blue limestone include the following:

Orthotetes sp.
Chonetes chesterensis
Rhombopora sp.
Composita trinuclea

This assemblage of fossils suggests that the strata in the Great Blue limestone, in which they occur, may be Chesterian. The formation is correlated with the Great Blue limestone of surrounding areas because of its age, lithology, and stratigraphic position.

MISSISSIPPIAN AND PENNSYLVANIAN SYSTEMS

Manning Canyon shale

Distribution. -The Manning Canyon shale was named by Gilluly (1932, p. 31) from outcrops in Manning Canyon in the southwestern Oquirrh Mountains. This shale is exposed in the West Canyon area as a continuous band from the mouth of Threemile Canyon to the head of West Canyon, where it swings sharply east and then southeast along West Canyon to the mouth of City Canyon. (See Plate 1.) The Manning Canyon shale is easily eroded to form subsequent valleys such as the main valley of West Canyon.

Lithology and depositional environment. - The Manning Canyon shale rests conformably upon the Great Blue limestone. The contact is gradational and is placed where the shales predominate over the silty limestone.

The Manning Canyon is interbedded shales and calcisiltites with a medial limestone member and occasional beds of quartzite. The shales are carbonaceous and are abundantly fossiliferous, especially in the upper half. They also contain numerous ellipsoidal geodes lined with crystals of pyrite. The medial limestone member is a finely crystalline limestone that contains numerous fossils and forms a ledge where it is exposed. The quartzite beds are fine to medium-grained, brown weathering, and have a scintillating appearance. These quartzite and limestone beds are good marker beds within the formation.

Accumulation of the Manning Canyon shale was once undoubtedly in shallow water with a soil source from a rising landmass. The inter-bedded crystalline limestones indicate occasional deepening of the water and lack of clastic material. The quartzite beds indicate stronger than usual shallow water currents. Hintze (1913. pp. 115-120) thought the area was emergent for a time during Manning Canyon time. This might be true, but the present writer could not find evidence to substantiate an uncomformity.

Correlation and thickness.--Fossils of both Chester and Springer ages were collected from the formation. This fact plus lithologic similarity and stratigraphic position indicates a correlation with Gilluly's (1932, p. 32) Manning Canyon formation. According to Girty (Gilluly, p. 33), the Mississippian and Pennsylvanian systemic boundary lies within the Manning Canyon shale. The portion above the highest quartzite is Pennsylvanian; the portion below it is Mississippian. The present writer found this division to be true but was unable to determine the exact position of the boundary.

The following fossils were collected from the Manning Canyon shale by the writer:

Schizophoria sp.
Cliothyridina sublamella
Composita wasatchensis
Spiriferina
Avonia
Hustedia miseri
Dictyoclostus portlockianus
Spirifer opimus

The writer measured 2,495 feet of Manning Canyon shale near Iron Canyon (See Plate 1), which is much thicker than the 1,140 feet of section that Gilluly (1932, p. 32) measured near the mouth of Soldier Creek on the west side of the Oquirrh Mountains. This difference possibly can be accounted for, in part, by thinning of the section due to flowage during folding. Similar thinning is apparent in West Canyon within the mapped area. Some of the difference in thicknesses is also accounted for by the writer placing the upper boundary of the formation 200 to 300 feet higher than did Gilluly.

PENNSYLVANIAN SYSTEM

Oquirrh formation

Distribution.--The Oquirrh formation was named by Gilluly (1932, p. 34) from outcrops in the Oquirrh Mountains. It crops out in the mapped area as two broad bands flanking both sides of a prominant anticline (See Plate 1). The strata dips to the southwest throughout the southwest part of the area and to the northeast in the northeast part. The Oquirrh formation has been subdivided in this report into three series because of its great thickness: rocks of Morrowan age comprise the lower unit; rocks of the Atokan age form the middle unit; while Des Moines strata make up the upper unit (See Plate 1). The Oquirrh formation is characterized by ledge and slope topography.

Lithology and depositional environment.--The contact between the Oquirrh formation and Manning Canyon shale is transitional and was mapped where limestone predominates over calcisiltite and shale. The lower or Morrowan series is composed predominantly of limestone with occasional interbedded calcisiltite toward the bottom of the unit and one quartzite bed near the top. The limestones are thin-to-thick bedded, mainly fine-to-medium crystalline; some crinoidal limestones are present. Chert nodules and stringers are present throughout most of this unit. Fossils are abundant in the lower part of the Morrowan rocks.

The Atokan series is composed of interbedded limestone and quartzite. The division between the Atokan and Morrowan series is placed where the quartzites become regularly interbedded with the limestones. At this place in the section there is a one-foot algal biostrome which, on a weathered surface, has the appearance of caraway seeds. The limestones of this unit are finely crystalline, thin-to-thick bedded with less chert than the lower unit. The quartzites are fine-to-coarse-grained, thin-to-medium bedded, and cross-bedded. The quartzite beds are resistant and form near-vertical cockscomb ridges in the eastern part of the area.

The Des Moines series is predominantly orthoquartzite and sandstone interbedded with occasional limestone and calcarenite. The division between the Desmoinesian and Atokan strata is placed where the orthoquartzite greatly predominates up-section over the limestone. The orthoquartzites are medium-to-coarse-grained, are thin-to-thick bedded as well as being resistant to weathering, and form cockscomb ridges in parts of the area. The sandstones are coarse-grained and are thin-bedded to laminated.

The interbedding of limestones and quartzites indicates deposition under unstable conditions with strong currents prevailing at times.

Correlation and thickness.--The Oquirrh formation aggregates 3,840 feet in thickness in the West Canyon area. Of this, 1,068 feet is Morrowan, 1,576 feet is Atokan, and 1,196 feet represents an incomplete section of Desmoinesian.

The following fossils were collected from the Oquirrh formation:

Morrowan	Atokan	Desmoinesian
Spirifer rockymontanus	Chaetetes sp.	Chaetetes sp.
Composita trilobata	Dictyoclostus sp.	Fusulina s. s.
Cleiothyridina orbicularis	Ameura sp.	Mesolobus mesolobus
Hustedia miseri	Syringopora sp.	Pinniretopora sp.
Composita wasatchensis	Neospirifer sp.	
Dictyoclostus portlockianus		
Buxtonia sp.		
Fistuliapora sp.		
Dictyoclostus morrowensis		
Ameura		

This assemblage of fossils indicates that the writer's section of the Oquirrh formation can be zoned into the Morrowan, Atokan, and Desmoinesian. The formation is correlated with the Oquirrh formation of surrounding areas because of its age, lithology, and stratigraphic position.

QUATERNARY SYSTEM

Alluvium and fanglomerate

Much of the southeast part of the West Canyon area contains large fans (See Plate 1) characterized by coarse, poorly sorted material with little or no cementing material. Float from most of the bedrock formations exposed in the area can be recognized within the fanglomerate. In addition to the fanglomerate, normal stream sediments occur in the bottoms of most of the canyons.

Glacial moraines

Small cirques and moraines below the Jumpoff, near the heads of Mill Canyon, Jackson Hollow, and the first canyon south of Mill Canyon are evidence of past glaciers. According to Gilluly (1932, p. 40) the glaciation was probably Wisconsin age.

IGNEOUS ROCKS

TERTIARY SYSTEM

Very few igneous rocks are exposed within the West Canyon area; however, a large body of exposed latite flow rock is immediately northeast of the area. Latite float can be found in all parts of the West Canyon area, which fact indicates to the writer that this area was also covered with the flow rock at one time. Five small quartz monzonite sills were mapped in the West Canyon area, four of which are located on the first small ridge southeast of Maple Canyon and one on the ridge just northwest of Jackson Hollow. (See Plate 1). With the information available in the West Canyon area it is impossible to date this volcanic activity other than post-Desmoinesian. Gilluly (1932, p. 69), however, states that the volcanic activity was probably late Eocene or Oligocene.

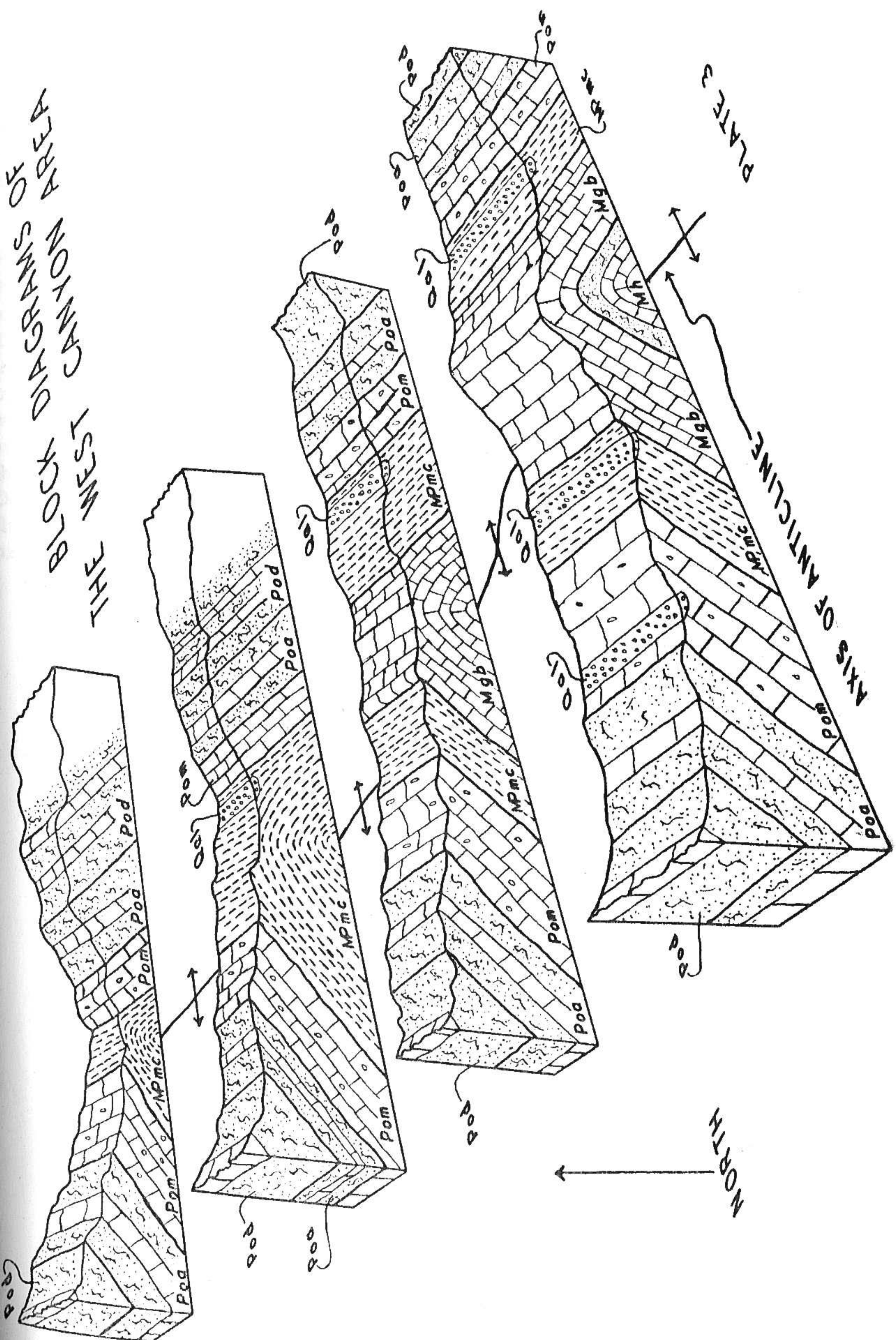
STRUCTURE

According to Gilluly (1932, p. 69) the Oquirrh Mountains consist for the most part of two large simple subparallel anticlines and two similar synclines. These folds have northwest trends and plunge both northwest and southeast from a transverse uplift that crosses the range in the vicinity of Ophir.

The area of this report is situated on the Long Ridge anticline, which is one of the four major folds of the Oquirrh Mountains. The Long Ridge anticline was named by Gilluly (1932, p. 70), the axis of which almost coincides with the axis of Long Ridge. The Long Ridge anticline is asymmetrical and plunges to the northwest (See Plates 1 and 3). The northeast limb of the anticline is steep to nearly vertical in places and may overturn at depth. The southwest limb, on the other hand, has a much more gentle dip.

Two small parallel folds, superimposed on the Long Ridge anticline, were mapped from the mouth of Iron Canyon to the head of West Canyon. These folds are here named the Iron Canyon syncline and the West Canyon anticline. The syncline was named because of its apparent beginning at the mouth of Iron Canyon and the anticline being named because the axis of the fold coincides with the trace of West Canyon. From the evidence available the smaller folds were formed contemporaneously with the Long Ridge anticline.

The writer believes that a reverse fault is present at the contact of the Great Blue limestone and Manning Canyon shale from the mouth of Iron Canyon to the mouth of Left Fork (See Plate 1). The absence of much of the Manning Canyon section and the apparent deflection of the axis of the Long Ridge anticline to the northeast at this point (See Plate 1) would


BLOCK DIAGRAMS OF
THE WEST CANYON AREA
PLATE 3
AXIS OF ANTICLINE
NORTH
Pod
Poa
Pom
MPmc
Mgb
Mh
Qal

tend to confirm a northeast movement of the Great Blue limestone over the Manning Canyon shale. Alluvium covers much of the area and the writer was unable to obtain additional information to confirm the faulting. It is probable that this faulting occurred at the time of the Willard thrust, in late Montana or early Paleocene.

The present writer would point out that the possibility is equally strong that the compressional phase which threw the paleozoic strata of the Oquirrh Mountains into a series of broad-open to moderately closed folds occurred as early as mid-Cretaceous time (Cedar Hills Orogeny?). The axes of these folds trend northwest-southeast but are cut by numerous tear faults which strike northeast-southwest and along which strike slip movement amounted to as much as five miles. These tears likely merge with the south-central Wasatch Mountains allochthon of Bissell (1952, p. 622) and could conceivably be associated with the orogeny to which the Willard thrust is assigned. Gilluly (1932, p. 69) states that the west side of the Oquirrh Mountains are bounded by a series of faults in steplike arrangement that are between Oligocene and Pliocene in age. Faulting has been subordinate to folding in the Oquirrh range (according to Gilluly).

ECONOMIC POSSIBILITIES

The Old Mayflower Mine, which is abandoned and sealed, and several prospect pits are located in the West Canyon area. Although considerable money and labor were spent in developing the Old Mayflower Mine, it has reportedly never produced any commercial ore. This mine is located in the Manning Canyon shale very near the axis of the Long Ridge anticline (See Plate 1) which is probably responsible for the small amount of mineralization present. All of the prospect pits are located in areas of limonite staining. Most of the prospecting has been done in the hope of extending the boundaries of the Ophir and Bingham mining districts to the northeast and southwest respectively.

Structurally the West Canyon area is favorable for oil production. However, any favorable source and reservoir-rock combination has been destroyed by erosion.

Water has the most economic importance of any substance in the West Canyon area. Numerous springs are located within the area, most of them near the contact of the Manning Canyon shale and the overlying Oquirrh formation (See Plate 1).

The people of Cedar Fort own the water rights of the area and depend upon it for their main source of irrigation water. According to [1]E. J. Peterson, President of the Cedar Fort Water Board, about fifteen second feet of water normally reaches Cedar Fort, approximately five and a half miles south of the area, in the early Spring but the quantity diminishes to almost nothing by Fall. Water measurements have been made by [2]S. R. Boswell, Utah County Agent, in both Cedar Fort and at the fork of West Canyon and Left Fork and the loss in the five and a half miles of canal leading to Cedar Fort is found to be as high as 40%. This figure varies with the quantity of water in the ditch and decreases from the standpoint of percentage loss as the volume in the ditch increases. Seepage is responsible, in the writer's opinion, for the greatest loss. Most of the five and a half miles of ditch from the mouth of West Canyon to Cedar Fort is built on a large alluvial fan which has a high porosity and a tremendous volume. The writer believes the volume of water available in Cedar Fort can be increased by following these suggestions: first, by fully developing all available springs and seeps, paying particular attention to the zone near the contact of the Manning Canyon shale and the Oquirrh formation (See Plate 1). Second, by building and lining with cement or other impervious material a small, deep reservoir immediately south of the fork of West Canyon and Left Fork. This reservoir could be used to store up water during the dry season and to catch the excessive run-off,

[1]Personal communication, November, 1954.
[2]Personal communication, January, 1955

which is ordinarily lost during heavy rains. Third, by lining the ditch with cement or bentonite from the reservoir to Cedar Fort. High cost, however, might make this impossible in as much as $2.75 per foot of ditch is the lowest available estimate for coating the ditch. The building of the reservoir would somewhat reduce the need of lining the ditch as water could be run through the ditch in larger quantities. This would greatly reduce the loss of water to evaporation and possible seepage. The presence of the alluvial fan makes the lining of the reservoir and ditch an important consideration.

SUMMARY OF GEOLOGIC HISTORY

The earliest geologic event recorded in the West Canyon area was the deposition of upper Mississippian sediments. These sediments, represented by the Deseret limestone, indicate that the area was subsiding beneath a shallow sea in the Cordillerian miogeosyncline, under conditions favorable for invertebrate life and devoid of terrigenous clastic material. During a short interval, represented by the Humbug formation, shallow water or currents which were stronger than usual prevailed, permitting the accumulation of sandy clastic material. Except for a period of lime deposits in quiet offshore waters during Great Blue time, the remainder of the Mississippian period and early Pennsylvanian time was marked by shallow water conditions with only occasional deepening. The sediments were chiefly clay with some sand and an occasional lime deposit. The remainder of the Pennsylvanian time, recorded in the West Canyon area, was marked by first, a period of lime accumulation in an area that must have been just below wave base but with occasional currents that were strong enough to cause cross-bedding. This was followed by a period of rapid accumulation of sand that must have been laid down in shallow water but with interbedded marine lime sediments, which indicate that the area was constantly submerged.

A sedimentary record of the interval between upper Pennsylvanian and Quaternary is not found in the West Canyon area.

The area was folded most likely during mid-Cretaceous time and possibly faulted during late Montana or early Paleocene time. After a period of erosion, late Eocene or Oligocene volcanics invaded the area in the form of quartz monzonite sills with large latite flows just north and east of the mapped area.

During the Pleistocene time there was periodic glacial activity in the highlands, followed by stages of Lake Bonneville in Cedar Valley. In the period since Pleistocene time the geologic history of the area has been marked by continued erosion in the mountains and deposition in the valleys.

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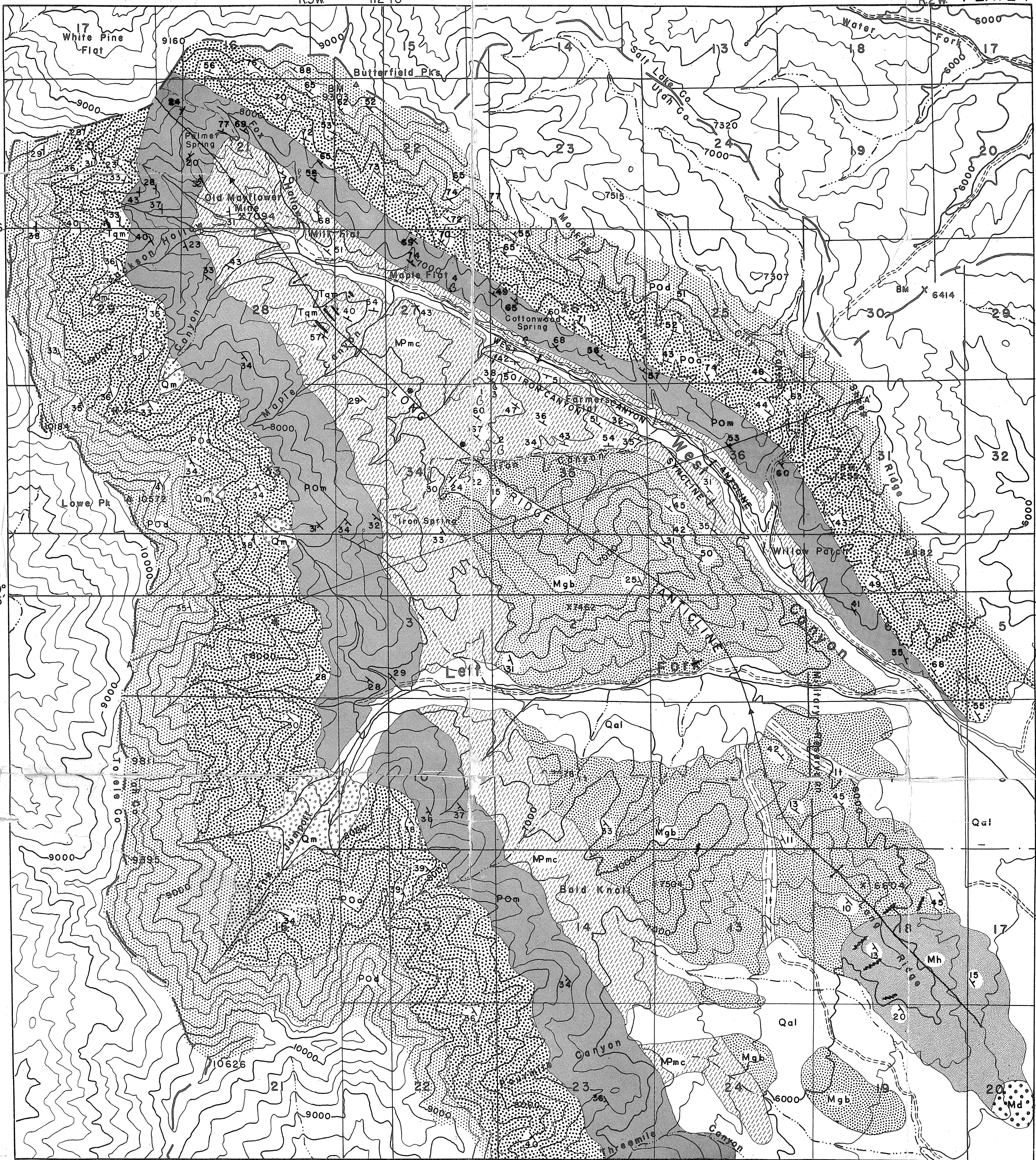
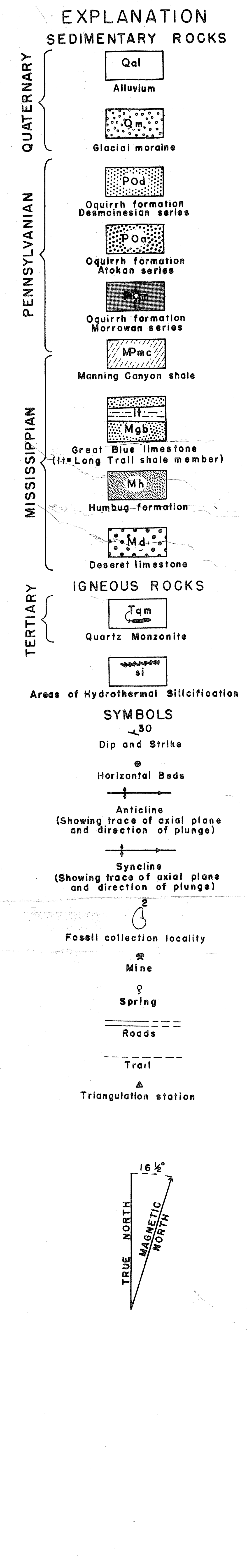
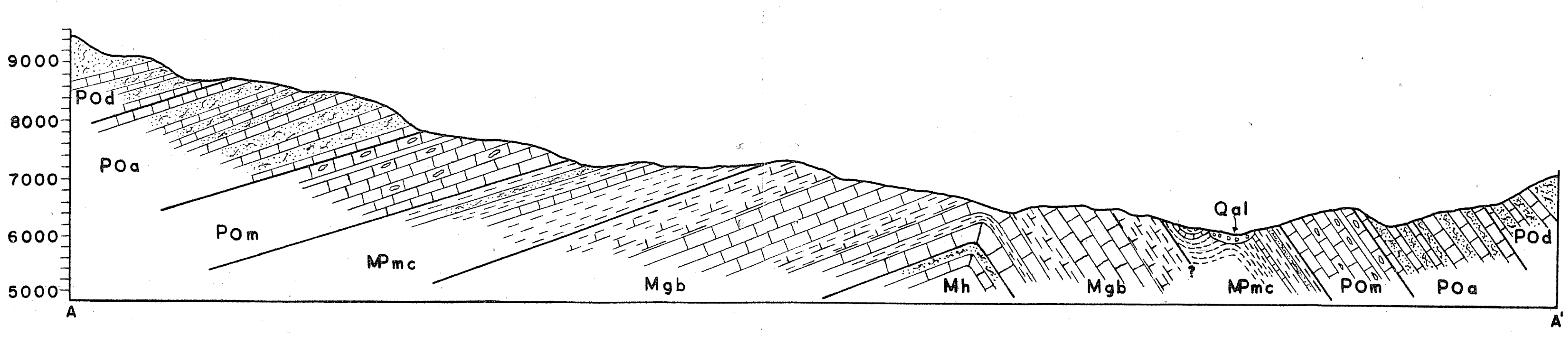


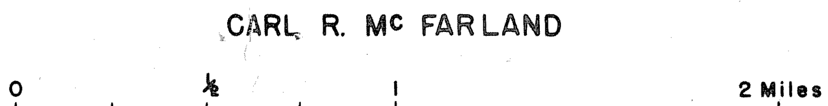




GEOLOGIC MAP AND CROSS SECTION OF THE WEST CANYON AREA NORTH WEST UTAH COUNTY, UTAH

by

CARL R. Mc FARLAND



Contour interval 250 feet

1955