Geology of the Emerald Mountain Quadrangle
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(Transposed by Gregg Wilkerson, 2021)

I. Regional Setting

The Emerald Mount in quadrangle, in Kern County, California, is located near the southern end of the Sierra Nevada province, on the west slope and over the southern end of the Sierra range. It portrays an area entirely within the major fault block bounded on the north-west by the Kern Canyon- White Wolf system of faults probably mainly right lateral, and on the southeast by the Garlock fault system, mainly. left lateral. This block was brought to, its present geographical position by the interaction of the two fault systems, possibly fairly late in geological time. It is cut by numerous less extensive faults, but these may be dominantly vertical in movement (Louke, 1964, p. 1).

The northern part of the quadrangle (Piute Mountains) is entirely within the Sierra Nevada, and the aspect or the country is clearly Sierran. The Piute Mountains comprise the local Sierra crest; they are built of granodiorite and metamorphic rocks [that are] similar to those exposed throughout the range. The southern part of the area is host to the shallow intrusive and extrusive rocks of the Tehachapi Volcanic basin, the deepest portion of which is located near Monolith, on the Tehachapi Quadrangle immediately to the south. The north extremity of this basin trends across the quadrangle and the associated shallow emplaced dikes finger out [e.g. become attenuated] northwesterly near Walker Basin (Louke, 1964, p. 1).

II. Structural Setting

Two regional structural trends are displayed on this quadrangle. The older trend, northeast and north, is most strikingly shown by the metamorphic septa which trend in this direction aero the western half of the map. This trend is borne out by the sub-parallel foliation structure of the granodiorite over large areas The younger trend, northwest and west, is Tertiary and Recent in age. It is best displayed by the configuration of the Tehachapi Basin, whose structures and boundaries trend in this direction on the Tehachapi Quadrangle to the south. The various faults further demonstrate the later trend, notably the boundary faults of the Piute Mountains (Louke, 1964, p. 2).

The older structures are of two kinds, those which are remnants of the folds which were formed before granitic intrusion, and those which were themselves influenced by the intrusion. The oldest structures are those which preceded [the intrusions. They are associated with the granodioritic intrusion and are only partially preserved. These [partially preserved structures are] prominent metamorphic pendants and septa, [which] appear to have survived the intrusion with little major rotational. displacement of their structural components. An outstanding example of this type or structure is the central metamorphic septum of the quadrangle, a feature of regional extent which preserves its steep east-dipping character except very locally, even though it is greatly attenuated as it crosses this area. Structures indicated by these fragmental metamorphic remains are [small, poorly exposed or] incomplete (Louke, 1964, p. 2).

Two east-dipping flanks [faults?], which may in fact be part or a single large structure show [are exposed?] on the west half of the quadrangle. These [two faults] are bounded to the southeast by a complicated southwest plunging syncline, whose axis, [is] in the vicinity of the mouth or Tollgate Canyon, [The syncline] has been intruded by granodiorite. The structural nature of another [structural?] reversal, north or Walker Basin is not known (Louke, 1964, p. 3).

[There are unique] structures associated with the leucogranite. The outcroppings of this rock in the southeastern part or the map are the northern units of a northeast trending complex or intrusive bodies; the largest area lies to the south on the Tehachapi Quadrangle appear to be influenced by the process of intrusion. Detailed mapping of the dome in Back Canyon, the northeaster-most intrusive body of the group demonstrated that the contact at the base of the dammed-up [??] metamorphic rocks is intrusive and awfully close to concordant. The other more southerly intrusive bodies are also associated with "anticlinal features". Probably the force or this group of intrusions was instrumental in doming up the surrounding rocks, but the magma may have arisen selectively into pre-existing high structural positions (Louke, 1964, p. 3).

The forces which operated [within] the younger structural trend, northwesterly, produced the narrow, somewhat, linear trough north or Indian Creek into which the rhyolitic extrusives a feed were washed [e.g. eroded]. Gentle down warping during and after the ash-tails accentuated the initial dips, and preserved the eroded debris. The average dip is about 25°, the greatest, about 55 °. The fold, in its linear simplicity, is similar to others in the Tehachapi Basin to the south (Louke, 1964, p. 3-4).

Most of the structural record of the younger structural trend is preserved as a series of faults, trending northwesterly. These are the response to forces which have been active from the Tertiary until recently (Lourke, 1965, p. 4).

The two prominent faults in the southwestern part of the map are the northernmost of a swarm of faults most of which are located on the Tehachapi Quadrangle to the south. The Tollgate Fault, a major feature, some seven miles long, is probably not active, but the fact that slickensided dacite can be picked up along its trace at Stevenson Canyon indicates the movement after rhyodacite emplacement. The portion of the fault west of Hog Canyon is marked by local mineralization of clay alteration solutions, silicification and metallic sulfide mineralization but not in economic concentration. From Tollgate Canyon to the southeast, the fault trace is marked by a line of small rhyodacite intrusions some of which are dike-like and parallel to the fault. Evidence points toward this fault, a pre- rhyodacite feature, as a conduit for rhyodacite intrusion and related mineralization, and a focus for post- rhyodacite movement (Louke, 1965, p. 4).

The Firehouse Fault probably is similar in genesis to the Tollgate Fault but is shorter and much less conspicuous in the landscape. The trace of this fault northwest of Caliente Canyon is marked only by a conspicuous rhyodacite dike. To the southeast, several large prospect tunnels intersecting the fault, and the remains of an arrastre mill attest to sulfide mineralization which was profitable to exploit during the Depression. The fault trace is not clearly exposed as it runs southeastward along the rhyodacite and over-steepened east side of the Indian Creek Canyon and disappears under alluvium and Terraces (Louke, 1965, p. 4-5).

The swarm at northwest trending rhyolitic dikes in the Sand Canyon area was emplaced in joints which are also a manifestation of the forces creating the northwest trend. The walls at these joints seem to have little or no relative movement and a search disclosed no slickensiding. Just what response to force the joints represent is unknown (Louke, 1964, p. 5).

The boundary faults of the Piute Mountains, a large horst., also trend northwest. The southwest foot or this range is bounded by a complex of scarps, in rough[ly] en-echelon arrangement along a linear zone. Each of these scarps has a pronounced linear topographical effect, in every case with a sense of displacement that is] up on the east. Upon close examination, the scarps are seen to be the locus of very closely spaced fracturing in the granodiorite and a [are expressed by a] few seeps and springs. No outcrops of pulverized granite or gauge could be found. Experience has shown the writer that direct evidence of the nature of faulting in granitic rocks is generally obscured or seldom exposed naturally. In any case, movement along this system of scarps appears not to have continued into the recent. As will be shown below, total vertical displacement here may be about 3,500 feet (Louke, 1964, p. 5)

The system of boundary faults at the northeastern face of the Piute Mountains is also arranged in an en-echelon pattern. These faults separate the mountains from Kelso Valley to the east. Only the extreme western edge or Kelso Valley enters this [Emerald Mountain] quadrangle. The rest of this large arid mountain valley is located on the Cross Mountain Quadrangle to the east or this northwest trending group, only one fault enters this quadrangle; it crosses the Harris grade east of Landers Meadow. The trace is amply marked by springs, fractures, and topographical effects. Activity into the recent is demonstrated by disturbed alluvium in Kelso Valley. Total displacement along this Eastern Piute scarp is of the nature of 2000'- 3000'; the amount depends on the depth of the alluvial fill in Kelso Valley (Louke, 1964, p. 5-6).

III. Physiography

One of the aspects of this area not easily depicted on a single geological map is the record of an ancient landscape preserved on the mountain tops. Field examination revealed that the concordant mountaintops of Eagle Peak-Antimony Ridge-Harper Peak are indeed the uplifted remnants of a former, gently-rolling landscape. Widely scattered very small remnants of old alluvial terraces and single well-rounded cobbles were found on these summits, and these indicate that erosion has not progressed far enough to obliterate all traces of the partly depositional character of a [former] gentle landscape. Topographical analysis, unsatisfactory because so little area of the old landscape is preserved, produced a hint that an older range of hills, antedating the deep Caliente Canyon, may have trended near[ly] North-South (Louke, 1964 p. 6).

The ancient and upraised landscape which slopes gently northeastward (with interruptions) from the high summit of the Piute Mountains may be a dislocated part at the topography discussed above. Should this be so, a displacement of some 3,500 feet is indicated for the western boundary faults of the Piute Mountains (Louke, 1964 p. 6).

VI Stratigraphic Explanation

Alluvium (Qal)

The alluvium consists or sand and gravel and a minor amount of residual soil. Unconsolidated, in general, it is very locally cemented with limey material in the vicinity of tufa-bearing springs. This group includes raised terraces on the southern edge at Walker Basin and in various locations in the upper Caliente Basin. Alluvial fans have developed on the margins of Welker Basin and Kelso Valley (the western extremity of the Kelso Valley alluvium is located at the eastern edge of the quadrangle; the main part the valley is on the adjacent Cross Mountain Quadrangle. The alluvial material appears not to be folded, although it is probably broken by faulting in Kelso Valley. Initial dips are up to about 5°. The maximum alluvial thickness at the western end of Walker Basin (on the Breckenridge Mountain

Quadrangle) is estimated at over 1,000 feet, with probably a greater thickness in Kelso Valley (Louke, 1964, p. 7).

Placer Deposits

Placer gravels containing gold dust and small nuggets in the Claraville and Lorraine areas were worked at times for many years by small scale methods. The total production is unknown (Louke, 1964, p. 7).

Volcanic Rocks (Rex, rf, v. rd)

The rhyolitic extrusives on the southeastern part of the quadrangle are a succession of flows, breccias ., and tufts which are partly water-reworked. This material emerged from isolated vents, some of which are elongate, dike-like, in the area of Stevenson Peak and to the south and east. The sedimentary volcanics vary greatly in composition locally, ranging from chaotically piled volcanic debris near the vent areas, through poorly sorted breccias, volcanic gravels, sands (some which are cross-bedded by stream deposition), to lake beds or sandy tuff. This material. is interbedded with flows and cut by dikes and other intrusions (Louke, 1964, p. 7-8).

Rhyolite Dikes (rd)

The rhyolitic dikes form a very prominent north-west trending swarm in the Piute Range- Sand Canyon-Rancheria Creek sector, and to the southeast. They appear to have risen through parallel joints of the prevailing structural system. Some of the rhyolitic extrusive rock of the southeastern part of the area, therefore, may have been extruded from dikes (Louke, 1964, p. 8).

The dikes range up to 250 feet wide and nearly 2 miles long. They intrude both granitic and metamorphic rock, but the best developed dikes are in the granodiorite. Several prominent dikes, intrusive into the granodiorite near Twin Oaks, extend into the metamorphic rocks of the central septum and finger out within a foot or so. Scale of the map prevented portrayal of the dikes of the swarm, but the largest and most representative are shown (Louke, 1964, p. 8).

The dikes are flow-banded, locally glassy at the outer edges and tapering ends, and tend to weather in columnar joints. The dike rock is aphanitic to glassy (devitrified) and locally porphyritic, with widely scattered small phenocrysts. Some dikes contain an abundance or scattered small lithophysae. In color, the rock is white, weathering to brown and gray (Louke, 1964, p. 8).

> Note: lithophysae are hollow, bubble-like, or rose-like spherulites, usually with a radial and concentric structure, that occur in certain rhyolites, obsidians and related rocks.

Mineralization associated with the dikes is insignificant in the north-western part or the dike swarm. Products of alteration., however, are more noticeable toward the southeast. The large dikes east of Stevenson Peak are all somewhat altered and, locally, the rhyolite and the surrounding country rock are almost completely altered to clay minerals (Louke, 1964, p. 9).

Vent volcanics (v)

Various areas which appear to be the remains of vents are identified by their stratigraphic relation to the extrusives ., and by the nature of the rock. Those form distinctive high outcrops centered about Stevenson Peak and Nellie' s Nipple. The rock in these areas has close-spaced jointing and is bleached, silicified, and strongly altered to clay minerals• It probably had been glassy, and carries numerous to extremely abundant xenoliths of assorted volcanic rocks and plutonics (Louke, 1964, p. 9).

Rhyolite Flows (rf)

The red flows and shallow intrusives, which occur in several locations on and to the north or Stevenson Peak, range in composition from andesite to andesite-basalt. The weathered surface of the rock is characterized by a dark brown-red color; the fresh surface is light brown. Columnar jointing is characteristic, and is a permanent flow-banding due to tabular concentrations or phenocrysts. The red flow area east or Stevenson Peak is probably one massive flow (Louke, 1964, p. 9).

The rock is porphyritic, with a groundmass composed largely of devitrified glass. Phenocrysts, abundant, and crowded locally, are biotite, andesine plagioclase, hornblende, quartz and a trace of magnetite (which apparently contributes the red weathering oxidization (Louke, 1964, p. 9).

Rhyodacite Shallow Intrusive (rda)

The rhyodacite is nearly uniform in appearance overver large areas; It appears to be of shallow intrusive origin, but probably includes extrusive rocks locally. The rock outcrops over a great area in the southern third of the quadrangle and the northern Tehachapi Quadrangle. The rhyodacite generally lacks regional directional structures, but is locally flow- banded and affected by jointing patterns. In places, it preserves the structure of the rocks invaded as on Antimony Ridge, where it replaced a series of north-east striking metamorphic rocks apparently bed by bed, and the relief bedded structure crops out prominently, preserved in dacite (Louke, 1964, p. 10).

The rhyodacite, light tan on freshly broken surfaces, weathers to various shades of tan, yellowish, brown, and white, but most characteristically light brown with a vague pinkish cast. The texture is porphyritic, with groundmass aphanitic to glassy (devitrified). The phenocrysts are variably abundant, ranging from about one fourth of the volume to greater than 75 percent of the volume. Phenocrysts are as follows, in order of decreasing abundance (Louke, 1964, p. 10):

Plagioclase, notably albite up to 0.1”, porcelaneous, white, euhedral to subhedral (Louke, 1964, p. 10)….

With

Orthoclase. Porcelaneous euhedral potassium feldspar up to 0.15”, generally with a light pink cast (Louke, 1964, p. 10)….

And

Biotite, up to 0.1” black, euhedral, tabular sections of crystals (Louke, 1964, p. 10)….

And

Quartz up to 0.2”, subhedral and anhedral in outline, clear and glassy (Louke, 1964, p. 10)….

The rhyodacite invaded the plutonic rocks with no apparent influence on regional structure; the contact is in many places diffuse and in others zigzag or anfractuous everyplace mappable -with difficulty. The large masses of dacite in the southwestern part of the quadrangle apparently intruded a northeast trending metamorphic body of that area and the general outlines of the invading body follow the same trend (Louke, 1964, p. 10-11).

Mineralization and alteration associated with the rhyodacite is widespread, both within it and in adjacent plutonic rocks. Locally the rhyodacite is intensely bleached, softened, altered and mineralized by both kaolinization and silicification. The plutonic-rhyodacite contacts in the southwest part of the quadrangle are the loci of strong silicification and minor mineralization In places these contacts are characterized by a boldly-outcropping silca-rock, the silica rock possibly being derived from and preserving the texture of granodiorite (Louke, 1965, p. 11).

Metallic (sulfide) mineralization in the Lorraine and Studhorse Canyon mining districts is associated with silicification and concentrated near dacite-plutonic contacts. This silver-gold-antimony mining area has produced over a million dollars worth of metals and is presently active on a small scale (Louke, 1965, p. 11).

Olivine Basalt (bas)
A few small exposures or olivine basalt are present in the Indian Creek drainage. These appear to have been engulfed by the dacite. The porphyritic, dark colored rock has a devitrified glassy groundmass And phenocrysts of labradorite, olivine, chlorite, and a trace of magnetite (Louke, 1964, p. 11).

Non-Marine Sedimentary Rocks (MK?)
A small area or non-marine sedimentary rocks is exposed in Sections 25 and 36, T.30S., R.34E, MDM, resting on granitic rock end dipping southward unconformably under the rhyolite extrusives (Louke, 1964, p. 11).

These beds are probably or volcanic-lacustrine origin. The bottom 200 feet comprise green-grey clayey silt, consolidated but porous which was derived from the underlying granodiorite, and contains little or no volcanic ash. Higher beds are of water worked ashy materials. Bedded rhyolitic tuff, greenish colored, partly cemented with silica but with some porosity, contains thin interbeds of white cherty tuff. Interbedded with this material, especially toward the top of the interval, is consolidated tuffaceous sandstone, red-brown, thinly bedded, with some fine-grained thin layers with preserved mud-cracks. At least one bed of cherty tuff contains fossil plants which resemble reeds About 1,350 feet of [stratigraphic] thickness is exposed (Louke, 1964, p. 12).

Undifferentiated Granitic Rocks (gr, Jurassic or Cretaceous)
Undifferentiated granitic rock which is considered to be virtually All of the composition of biotite-hornblende granodiorite in composition constitutes A major pluton which makes up the main mass at the Piute Mountains and Red Mountain, and extends tens of miles north and south. The central metamorphic septum at the quadrangle roughly divides two outcropping areas of plutonic rock, but samples from both areas are nearly the same composition. The granodiorite-metamorphic contacts are sharp and fairly straight, indicating a certain amount of force during emplacement of the granodiorite (Louke, 1964, p. 12).

Notably in the upper Sand Canyon-Rancheria Creek area, the granodiorite is gneissoid, due to parallel aligned biotite flakes. This gneissoid texture typically occurs in the vicinity of metamorphic rocks and the foliation roughly parallels the bedding in the metamorphics. In some areas, such as the slopes south of Piute Peak, abundant xeno1iths of what appears to be metamorphic rock are present, in directionally arranged groups (Louke, 1964, p. 13).

The rock is the usual pepper and salt grey of the Sierran granodiorites and characterized by large plates and sheets of biotite up to ??? mm in diameter. Average grain size is about 0.05'' but between ??? mm and ??? mm the variation is great. The rock is composed or quartz (25·30%), potassium feldspar (8-10%), plagioclase (50-65%), and ferromagnesian minerals (10-15%) Granodiorite in some local areas on Rodeo Ridge (east of Goldpan Canyon and west of Sycamore Canyon) is light colored and characterized by low ferromagnesian content (Louke, 1964, p. 13).

Metallic mineralization contributed by this intrusion appears to be responsible for the gold, quartz veins, of the Claraville District, and of the Joe Walker Mine in Sec. 12, T.29S-R.32E MDM (Louke, 1964, p. 13).

Leucogranite of Back Canyon and Indian Creek (lgr).

The leucogranite of Back Canyon and Indian Creek is the northern extremity of a pluton, which exposed discontinuously, extends southwest- -ward to the Tehachapi Valley. It has a total length of some 12 miles and a maximum exposed width of about three miles. Age relationships of this pluton are indeterminate, due to the lack or exposures showing direct contact relations between leucogranite end other granitic rock (Louke, 1964, p. 13).

The Back Canyon stock is domal in form; the surrounding metamorphic rocks are folded up parallel with the intrusive contact. The leucogranite in the core is vaguely color-banded parallel with the dip and strike of the surrounding metamorphics. From a distance, and on the aerial photographs the rock appears to be bedded. This may be the weathered expression of the platy flow structure resulting from the emplacement of the stock, as described in Balk., page 19 (Louke, 1964, p. 14).

The leucogranite is glaring white on a fresh surface and weathers to a dull light orange-tan color. It is equigranular, with average grain size of .08 inches, but finer grained toward the margins. The rock is composed or quartz (35-40%), potassium feldspar (35-40%), plagioclase (20-30%), and biotite (10-30%). Rare local concentrations of biotite take the form of “clots” scattered in the granite and pegmatite veins with abundant quartz and potassium feldspar are widespread. The leucogranite is notable for the lack of any metallic mineralization, either within or at the contact of surrounding rock (Lourke, 1965, p. 14)

The isolated area of leucogranite at Yates Hot Springs, north of Walker Basin far from the above pluton, may be related to other light-colored plutonic rocks outcropping to the north. This leucogranite contains a swarm of parallel low-dipping pegmatite veins each of which is sharply zoned (Louke, 1964, p. 14).

Metavolcanic Rocks (mv, Jurassic?)

Rocks with the appearance of metavolcanics are exposed near the Piute Look in a diamond-shaped area of some three square miles. The nearest exposure of similar rocks, southeast or Bodfish on the Kernville

Quadrangle, was described by Miller and Webb (1940) as "mostly altered lavas of basaltic or andesitic types" (Louke, 1964, p. 14).

The section at Piute Lookout comprises rocks ranging from solid greenstone to the metamorphosed remnants of' vesicular lavas, tuff's, and breccias. Interbedded with these are metamorphosed sandstones and chert. The outcrop of these rocks is distinguished by the unusual orange-brown weathering color of the rock and the infertility of the derived soil (Louke, 1964, p. 15).

The Jurassic age is conjectural and the rock is so noted only because of the convention o' Jurassic age for southern Sierran metavolcanic rocks. Miller and Webb (1940) considered the meta-volcanic of the Kernville Quadrangle to be interbedded with the Kernville Series (Louke, 1964, p. 15).

Metasedimentary Rocks of the Kernville Series (IPk, ls, Jurassic?)
The Kernville series of metamorphosed sedimentary rocks is exposed discontinuously over a very large area of the southern Sierra Nevada.
Metamorphic pendants and septa on this quadrangle are continuous with these on adjoining maps. The Kernville Series was originally described by Miller, 1931, and the description was enlarged by Miller and Webb (1940) There is not a great thickness of schist identifiable on this quadrangle, but near Tehachapi a continuous thickness of about 4,000 feet is exposed. This must be considered a minimum thickness for the formation to the south; Miller and Webb (1940) report a minimum thickness of more than 15,000 feet in the Bodfish area to the north (Louke, 1964, p. 15).

The metasediments of this area characteristically outcrop in elongate bodies the long axes of which are parallel. to the bedding planes of the rocks. This anisotropic resistance to plutonic engulfment is conjectured to be due to the linear (bedded) distribution of rocks of varying permeability. The massive quartzite which occurs in thick beds, edges and tips some of the pendants, is conjectured to be the rock most resistant to granitic invasion, and, in many places, to protect the schist of the interior (Louke, 1964, p. 14-15).

Some 75% of the thickness of the metasedimentary rocks is dark gray a schist with very subordinate thinly interbedded dull white quartzite. The schist is highly foliated, with the direction of foliation in most places close to parallel with the bedding. The rock is composed of quartz, plagioclase, hornblende, and biotite in variable proportions. Small areas of light-colored quartz-muscovite schist are present in the southern portion of the central septum. The interbedded fine-grained quartzite is composed or finely granular quartz, plagioclase, and scattered fine flakes of biotite (Louke, 1964, p. 16).

This monotonous pile of dark schist preserves to some degree an indication of the original sedimentary texture. The unmetamorphosed rock was obviously a thick pile of silty, perhaps sparsely sandy, shale with subordinate sandstones [and] fairly thinly interbedded. No fossils or other small., fragile structures could be found preserved (Louke, 1964, p. 16).

No rock -which can be identified as meta-conglomerate was found (Louke, 1964, p. 16).

Lenses of massive homogenous quartzite comprise an estimated 5% of the Kernville Series thickness. These are up to 500 feet thick and a mile long, extremely hard and massive, and notably slope-producing. Found associated with metamorphosed limestone [marble] in many places, the quartzite tends to be on strike where the marble pinches out. The rock is completely recrystallized; quartz grains are wholly cemented by quartz cement so that it breaks across the grains. It is a distinctive brownish pink. color, and no signs of bedding are preserved (Louke, 1964, p. 16-17A).

Kernville Series Limestone (ls, Jurassic?)
Within the Kernville Series, intervals containing metamorphosed limestone are stratigraphically important, notably in the southern part or the quadrangle. The limestone masses are profoundly lenticular; individual lenses range from very small and thin to hundreds of feet in thickness and miles in extent. Very thick lenses may pass to massive quartzite or schist along the strike in a few hundred feet. The ls symbol indicates large areas where the rocks are mainly limestone or small areas where the rocks are only 20 to 50% limestone (Lourke, 1964, p. 17A).

The rock ranges from fine-grained dense marble, dark gray in color, to coarsely crystalline material, gray to brilliant white. Much of it is more or less color-banded parallel to the bedding, probably due to differing graphite content. The graphite is abundant locally; it occurs as flakes and clumps. At same location, the limestone is fetid on freshly broken surfaces (Louke, 1964, p. 17A).

Note: fetid means smelly, foul-smelling, evil-smelling, malodorous

Despite a thorough and widespread search, only one limestone fossil locality could be found. This, in the northwest quarter of Section 24, T.306S, R.33E MDM yielded recrystallized structures described as, algal limestones of the type generally known as stromatolites. They represent deposits formed by blue-green algae in shallow water (less than 25 feet normally, commonly less than 10 feet). The water could have been fresh or slightly saline. These fossils are of no stratigraphic (age) value (Dr. J. Harlan Johnson, personal communication). Miller and Webb (1940) report two poor fossil occurrences, one of which, incrustations of calcareous material in circular form which suggests algal forms that may be similar to the above material (Louke, 1964, p. 17A-17B)

The very scanty fossil evidence thus points toward non-marine or possibly littorial deposition of at least two widely separated localities in the Kernville Series. Should more evidence be found to bolser this meager suggestion of edge-basin conditions, this area may eventually be shone to lie at the western edge of the Nevada-Eastern California Paleozoic Basin (Lourke, 1964, p. 17B)

Great thicknesses of nearly pure coarsely recrystallized limestone are present at a number of locations on this sheet [the Emerald Mountain Quadrangle]; these will be available for quarrying when economic conditions permit the development of this relatively remote area. Impressive quantities of marble of fine grade are exposed on the ridge at the head of Back Canyon. Other localities in which great tonnages of marble are indicated are in the Sand Canyon-Eagles Nest sector of the central septum, south of Suburu (now Ritter) Ranch, and northwest of Nellies Nipple (Louke, 1964, p. 17B).

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