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## GEOLOGICAL SURVEY RESEARCH 1962

SHORT PAPERS IN GEOLOGY, HYDROLOGY, AND TOPOGRAPHY,  
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## GEOLOGIC STUDIES

## ECONOMIC GEOLOGY

1. STRATIGRAPHIC AND STRUCTURAL CONTROLS OF MINERALIZATION IN THE TAYLOR MINING DISTRICT  
NEAR ELY, NEVADA

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The Taylor mining district lies on the west flank of the Schell Creek Range 15 miles southeast of Ely and 5 miles northwest of Connors Pass. The district has produced \$1 to \$2 million worth of silver, and a little gold, copper, lead, zinc, and antimony since 1883, of which about half has been produced since 1935.

The ore occurs sporadically in highly silicified rocks. Stratigraphic and structural controls of the silicified bodies determined through the geologic mapping of the Connors Pass 15-minute quadrangle are reported here. Sulfides (stibnite, galena, sphalerite, and possibly chalcocite) are seen in few hand specimens; no silver was recognized in the field. Spectrographic analysis of 40 samples from 7 pits shows that the silver content generally increases eastward, or stratigraphically upward, and that silver is more closely associated with antimony than with other base metals. The distribution of the ore within the silicified bodies was not further investigated.

The sequence of the rocks and their degree of mineralization are tabulated below; the age of the rocks appears on the map explanation. Silification is re-

stricted to limestone, and preferentially to thin-bedded or shaly limestone beneath thick shale formations. The map (fig. 1.1) illustrates the stratigraphic and structural controls of the main silicified bodies.

<i>Formation</i>	<i>Degree of mineralization</i>
Gravel.....	Barren.
Latite and dacite flows and tuffs.	Do.
Granophyric rhyolitic dikes.	Kaolinized but not mineralized.
Ely Limestone.....	Barren.
Chainman Shale.....	Do.
Joana Limestone.....	Many small lenses of silicified rock near the top of the formation, bearing Sb and Ag.
Pilot Shale.....	Barren.
Guilmette Formation:	
Member c.....	Large silicified bodies, especially in the upper half of the unit, bearing Ag, Au, Cu, Pb, and Zn.
Member b.....	Few, scattered, small silicified bodies.
Member a.....	Barren.
Simonson Dolomite.....	Do.
Sevy Dolomite.....	Do.

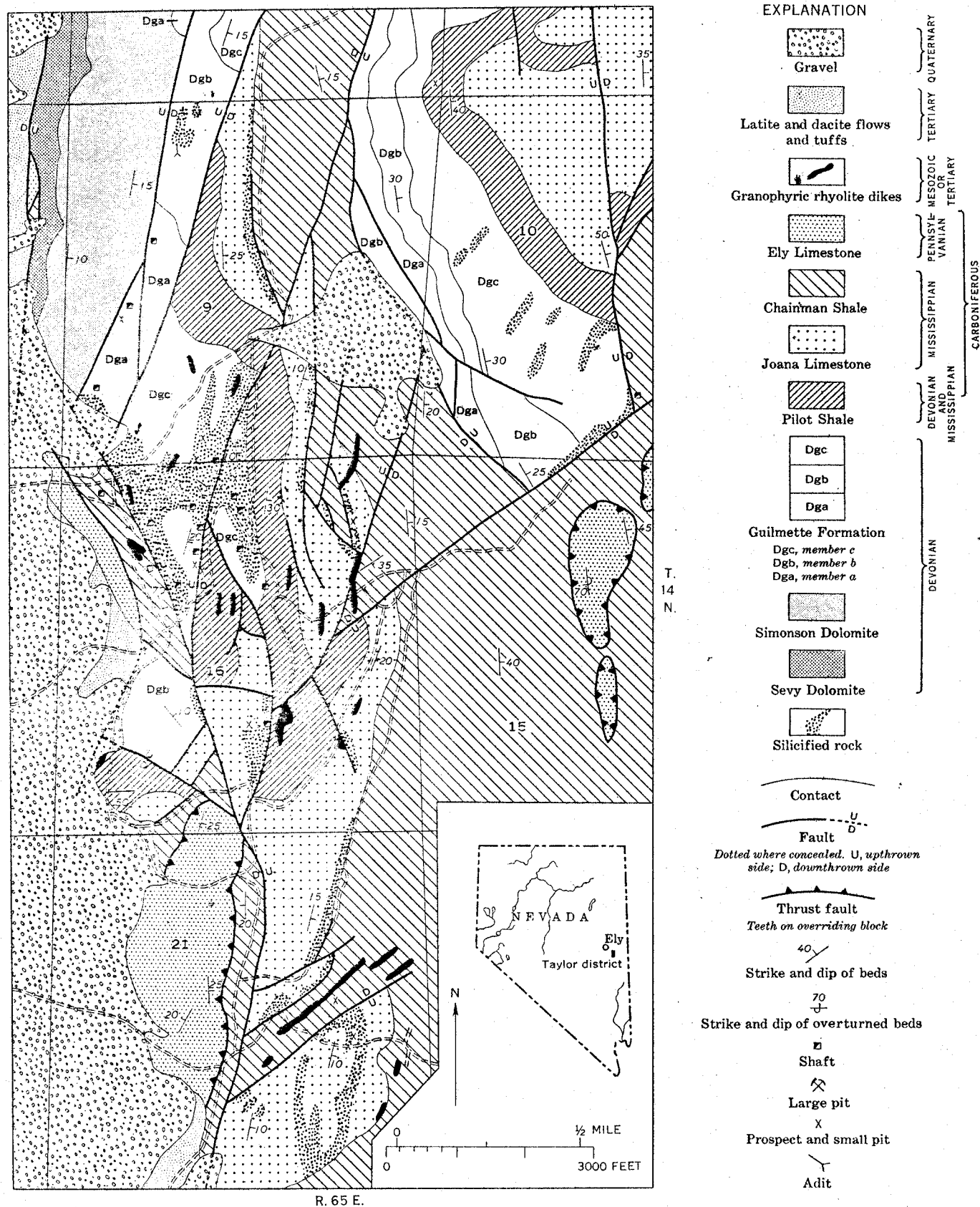


FIGURE 1.1.—Geologic map of the Taylor mining district near Ely, Nev. Silver ore occurs in some silicified bodies.

The silicified limestone is in part localized along normal faults that trend north to northeast and have displacements of a few tens of feet to several hundreds of feet. Silicified rock along these faults is locally sheared. Much smaller silicified bodies are found elsewhere in the quadrangle where normal faults of similar trend cut only the middle or middle and lower plates of the three major thrust plates, and the bodies are probably contemporaneous with the thrusting. A post-mineralization normal fault with many hundreds to possibly several thousands of feet of displacement trends northwest close to the foot of the range and brings young unmineralized rocks down against older mineralized rocks. At least some of the movement on this fault postdates the latite and dacite flows and related sediments, probably of middle Tertiary age, found along the edge of the valley.

Many thick, short rhyolitic dikes with northerly and northeasterly strikes are concentrated in the Taylor district, suggesting that they are related to the mineralization. The feldspars of all the dikes are strongly kaolinized, but none of the dikes are strongly silicified

or mineralized. The concentration of dikes near the mineralized bodies and the parallelism between many dikes, older faults, and silicified bodies suggests that the stresses in the rocks were similar during formation of the dikes and mineralized bodies, and that the silicification and the emplacement of the dikes took place at about the same time. The dikes are porphyritic, with phenocrysts of quartz, unlike that of the nearby rhyolitic volcanic rocks. The dikes may be related to other porphyry intrusive bodies accompanied by mineralization in eastern Nevada.

In conclusion, the ore-bearing silicified bodies are localized near the tops of the Guilmette Formation and the Joana Limestone and along normal faults. The same horizons in adjacent downfaulted blocks, and shaly limestone in the middle member and at the base of the lower member of the Guilmette Formation in the mineralized area, should be explored. The rhyolitic dikes are concentrated near the mineralized bodies and are probably related to them temporally, and possibly genetically.



## 2. SUGGESTIONS FOR PROSPECTING IN THE HUMBOLDT RANGE AND ADJACENT AREAS, NEVADA

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*Work done in cooperation with the Nevada Bureau of Mines*

During recent geologic investigations in the Humboldt Range, northwestern Nevada, we found that for many of the mineral deposits, a distinctive geologic setting can be defined that should serve as a guide in the search for additional deposits both in the Humboldt Range and in nearby localities of similar geologic setting. In the following suggestions for prospecting, broad geologic areas are primarily defined, and within these areas local structures must be considered.

The geologic structures and lithologic units of the range that are referred to in this article are shown on preliminary geologic maps of the Buffalo Mountain quadrangle (Wallace and others, 1959) and of the Unionville quadrangle (Wallace and others, 1962; Wallace and others, 1960, fig. 133.1, p. B292). These maps are a necessary adjunct to the following discussion.

*Silver.*—The Weaver Rhyolite and immediately un-

derlying parts of the Rochester Rhyolite are the host rocks for the Rochester and Packard silver districts (Knopf, 1924). In addition, the larger bodies of rhyolite porphyry, which are believed to be feeders for the Weaver Rhyolite, commonly have silver related to them. This type of mineralization is believed to be genetically related to the igneous rocks and thus is of Permian (?) or Early Triassic age.

In prospecting, pay special attention to the Weaver Rhyolite and the rhyolite porphyry stocks that are in a crude line between South American Canyon and Unionville. The silver minerals characteristic of the area are difficult to identify by naked eye and commonly are in rather indistinct silicified zones in the rhyolite. Without thorough testing, such silver-bearing zones may easily be overlooked. Best values are probably within a few hundred feet of the surface.