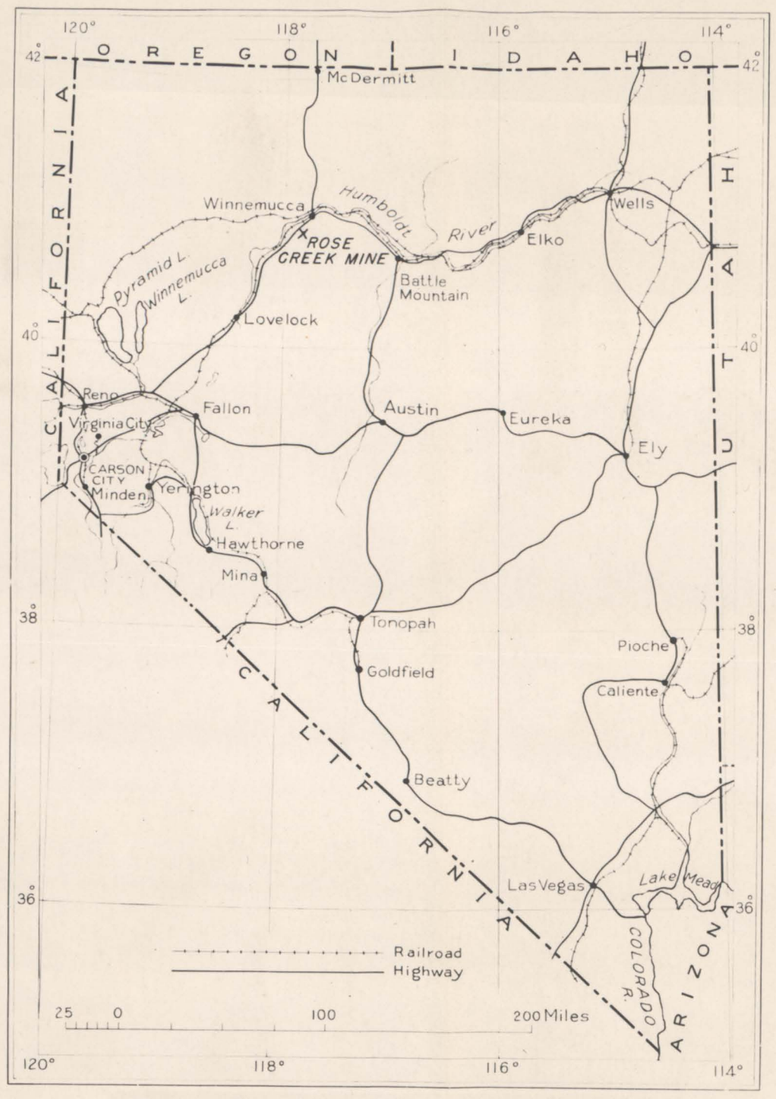

FIG.1 INDEX MAP OF NEVADA SHOWING LOCATION OF THE ROSE CREEK MINE

EXPLANATION

- Qal — Alluvium — QUATERNARY
- gr — Granite, granodiorite, and diorite
- Trls — Limestone
- Tra / Trls — Argillite and quartzite, limestone members (ls) in lower part — Mesozoic, TRIASSIC
- Trd — Dolomite
- ⊗2 — Scheelite occurrence
- Fault (Showing downthrown side)
- Thrust Fault (Hachures on overthrust side)
- 20 — Strike and dip of beds
- Strike of vertical beds
- 75 — Strike and dip of joint
- Adit
- Prospect

Note: Geologic contacts on nose southeast of Rose Creek mine are generalized

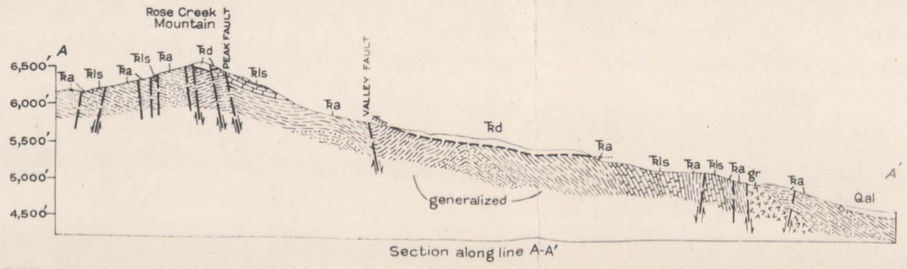

FIG. 2 GEOLOGIC MAP AND SECTION OF THE ROSE CREEK AREA, PERSHING COUNTY, NEVADA

1,000 0 5,000 Feet

Contour interval 50 feet, datum is mean sea level

GENERAL FEATURES OF THE ROSE CREEK TUNGSTEN MINE AND VICINITY, PERSHING COUNTY, NEVADA

Tungsten deposits near Rose Creek, in Pershing County, Nev., were studied in the field seasons of 1939, 1940, and 1941 by geologists of the Geological Survey who were mapping the geology of the Sonoma quadrangle. The deposits were revisited in the fall of 1942 by Ralph J. Roberts of the Survey, who has prepared geologic maps of the Rose Creek mine and adjacent ground.

The Rose Creek area is in the north end of the East Range, 11 miles southwest of Winnemucca, Nev. (fig. 1). The sedimentary rocks in the area (fig. 2) are interbedded argillite, quartzite, and limestone of Triassic age, which have been folded into northwest- and north-trending folds and overthrust by dolomite. The folding and thrusting were followed by complex faulting and by the intrusion of granite, granodiorite, and many dikes. Near the intrusive bodies the noncalcareous beds of argillite have been metamorphosed to hornfels and the calcareous beds to tactite, and the dolomite, limestone, and quartzite have been recrystallized. Scheelite (calcium tungstate) occurs in the tactite, where it is accompanied mainly by diopside, actinolite, and quartz, and it also occurs in quartz veins that cut the other rocks. Pyrite and chalcopyrite also are found in the quartz veins and are disseminated through the tactite and adjacent rock. The tungsten deposits were formed by hydrothermal solutions, probably related in origin to the granitic rocks. The scheelite, a product of reaction between the tungsten-bearing solutions and calcium carbonate, is especially abundant in certain beds, and much of it is localized in and near fractures.

The scheelite-bearing ore bed explored in the Rose Creek mine is the only deposit of commercial size and grade that has thus far been discovered in the area. Other showings of scheelite are known to occur near the Rose Creek ranch and in the Canyon east of Rose Creek, but further exploration will be needed to prove whether they represent commercial ore bodies.

The ore bed in the Rose Creek mine lies parallel in general to the bedding of the enclosing argillite, but it thins and swells along the strike and down dip (fig. 3). In most places it strikes east and dips 30° to 45° N., but there are many minor flexures, and locally the strike is northeast. The bed has been explored for 400 feet along the strike and 200 feet down the dip. Its thickness is as much as 4 feet in places but averages about 2 feet in the workings as a whole. The ore averages about 1.5 percent WO_3 (tungstic trioxide), although in places it contains as much as 5 percent WO_3. In the surface workings, the average thickness of the bed appears to be about 2½ feet and its average content about 1 percent WO_3.

The scheelite, in the form of crystals ranging in size from those too small to be seen with the unaided eye to those half an inch in length, is mostly disseminated through the tactite, though locally it is distributed as grains along cracks or in veinlets of quartz. Differences in fluorescence color under the ultraviolet lamp indicate that there are two varieties of scheelite in the ore. One variety, fluorescing bluish white, contains about 0.05 percent of molybdenum; the other, fluorescing light yellow, contains about 1.8 percent of molybdenum. Intergrowths of the two types also occur, with a central core of one variety surrounded by a shell of the other, and the molybdenum content of these cannot be estimated from fluorescence color.

The ore bed has been broken and displaced by dikes of lamprophyre and diabase, which probably cut out about 30 percent of the ore layer in the mine (fig. 4). The lamprophyric dikes fill irregular fractures which have no uniform strike and dip. Locally they contain scheelite near their contacts with the ore bed, and were evidently intruded before the close of tungsten mineralization. The diabase dikes, most of which trend north to northeast and dip steeply, were intruded after the tungsten mineralization. Some of the dikes follow normal faults of small displacement which offset the ore bed, and as much as 10 percent of the ore in the underground workings may be so isolated by this faulting that it could not be mined profitably.

Little ore could be regarded as blocked out at the time of the examinations in 1941 and 1942, but the ore body was sufficiently developed to permit a fairly accurate estimate of reserves. The ore bed had been proved to extend continuously throughout the workings except where it was cut out by dikes. The ore reserves were estimated to be about 6,000 tons containing 1.5 percent of WO_3. If it is found that only the thicker and richer portions of the bed can be profitably mined, the reserves would be reduced to about 4,000 tons of 1.7-percent ore. Losses in mining might further reduce these tonnages by about 10 percent, but on the other hand the reserves might be increased by finding ore east and west of the present workings and at greater depth.