GEOLOGY OF THE WINNEMUCCA QUADRANGLE, NEVADA

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INTRODUCTION

The geologic mapping of the Winnemucca quadrangle, here described, was undertaken as a study of the geology of the Sonoma Range quadrangle by the United States Geological Survey. The preliminary results of this work are published as four 30-minute quadrangles, of which this is one (fig. 1). For regional relations reference is made to the adjoining quadrangles: Mount Tobin (E.), Mount Moses (SE.), Golconda (S.), and Antler Peak (SW., quarter of the Golconda quadrangle). The field work, begun in 1909, was continued in 1910–11, with additional study in 1915–17, combined detailed and reconnaissance mapping; detailed work was largely confined to areas of structural and stratigraphic complexity, chiefly those underlain by Triassic rocks. A geologic map of a part of the west flank of the Sonoma Range, made in 1908 and 1909 by the State-land Surveyor-General of Nevada under the direction of G. W. Weller (1911), has been found to contain valuable contributions to the study of this complex area.

The Geological Survey project was under the general direction of H. G. Ferguson, who is also chiefly responsible for the present text. S. W. Muller is responsible for the descriptions of Triassic formations and identification of Triassic fossils; Ralph J. Roberts, for the study of Paleozoic rocks and fossils. The age assignments of the Permian and Carboniferous sedimentary rocks in this and adjoining quadrangles rests on fossil identifications by J. S. Williams and G. Dutcher and identification of the Cambrian and Ordovician rocks by C. A. Cooper. Ward C. Smith was associated with the field work for part of one season. Efficient assistance in the field was given as follows: by Y. Phoshihara, A. J. Gruger, W. F. McAllister, and Lloyd Cress. The text has been critically reviewed by P. B. King, and his many valuable suggestions have been adopted.

GEOLOGY

The lithologic character of formations in the Winnemucca quadrangle is described in the accompanying map explanation. Late Jurassic (?) plutonic rocks intrude, and Tertiary (?) lavas overlie, the sedimentary and volcanic rocks; a great thickness of sedimentary and volcanic rocks of Triassic and Paleozoic age, which are strongly deformed and whose mutual relations are highly complex.

The series of Paleozoic age consist of at least two facies whose relations are unknown. There were at least two synclines of Paleozoic folding, trending northeast, in the Sonoma Mountains and the mouth of Slide Mountain. Superposed on these older structures is a complex series of thrusts that developed after the close of the Triassic. The largest of these, the Tobin thrust (fig. 9), brings together two segments of Triassic rocks that were originally deposited a considerable distance apart. Closely following this period of thrusting and folding, the region was invaded by granitoid rocks akin to the Sierra Nevada batholith. After a long period of erosion, flows of Tertiary lavas were extruded. Contemporaneous with and later than this volcanism was large-scale normal faulting, to which the mountain ridges are indebted for their present relief.

STRATIGRAPHY

CAMBRIAN AND ORDOVICIAN ROCKS

The Cambrian (?) Osgood Mountain quartzite and Cambrian Valmy formation are in thrust contact with other Paleozoic formations, but in the Golconda quadrangle the Preble formation is apparently conformably overlain with the Ordovician Comus limestone, which in turn is overlain conformably by formations of Devonian age.

The Sonoma Range formation resembles the Mississippian (?) Battle Canyon formation (Golconda quadrangle) but is apparently overlain by the Valley formation of Cretaceous age and locally contains interbedded quartzite and slate resembling the Valmy. The contact of the two is not exposed, but the unconformity is believed to be of minor extent and due to the difference in competency of the two formations; but in one point an apparently normal contact was observed. Recent mapping in the Mount Lewis quadrangle (Gilluly, written comm.) and Golconda quadrangle (Ferguson and Muller, unpublished), has shown similar relations and closer study of the Sonoma Range formation, with additional study in the field work for part of one season, Effective sustenance in the belief was given as follows: by Y. Phoshihara, A. J. Gruger, W. F. McAllister, and Lloyd Cress. The text has been critically reviewed by P. B. King, and his many valuable suggestions have been adopted.

CARBONIFEROUS AND PERMIAN ROCKS

Rocks of Carboniferous and Permian age are widespread, but the complete sequence is unknown and most of the formations have yielded no fossils that can be identified. With the possible exception of the Edna Mountain formation, the Carboniferous rocks of the quadrangle appear to belong to a widespread eastern facies whose relations and distribution are as yet little understood. In this quadrangle relations are further confused by folding and thrusting in at least three periods. Instability of the area during later Paleozoic time is also indicated by the thick clastic and volcanic formations and by several angular and erosional unconformities.

The Harmony formation is overlain unconformably by the Middle Triassic (?) Antler Peak limestone and by the Golconda quadrangle by the Lower Pennsylvanian Battle formation. The formation is present only in three places, and the lower contact is not exposed. In the Golconda and Mountain quadrangles, about 30 miles to the northeast, mapping by W. H. Hobbs (1907) indicates that rocks of similar diminutive lithology are overlain with metamorphosed rocks which may be correlative with the Mississippian (?) Ione? Group.

The Edna Mountain formation, resembles the Mississippian (?) Battle Canyon formation (Golconda quadrangle) but is apparently overlain by the Valley formation of Cretaceous age and locally contains interbedded quartzite and slate resembling the Valmy. The contact of the two is not exposed, but the unconformity is believed to be of minor extent and due to the difference in competency of the two formations; but in one point an apparently normal contact was observed. Recent mapping in the Mount Lewis quadrangle (Gilluly, written comm.) and Golconda quadrangle (Ferguson and Muller, unpublished), has shown similar relations and closer study of this relation was considered necessary. The Edna Mountain formation is overlain unconformably by the Middle Triassic (?) Antler Peak limestone and by the Golconda quadrangle by the Lower Pennsylvanian Battle