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Item 12

Field Trip to Steamboat Springs
for
Geology 370

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by Mark Lyons

Field Trip to Steamboat Springs

At Mount Rose Hot Springs 8 miles south of Reno via U.S. Highway 395 the party stopped to get a close up view of the steam blowing from the well. This well taps the same water supply as that at Steamboat Springs a few hundred yards south. The water contains relatively large amounts of silica, sodium chloride, sodium carbonate, and borates. A little hydrogen sulphide may also be noted. Despite the fact that the calcium content is low, 98 to 99 percent of the precipitate in and around the pipe leading from the well is calcium carbonate. Calcium carbonate is relatively insoluble when the pressure and heat (280°F) are reduced to conditions at the surface. Copper, lead, silver, gold, mercury, and antimony are also in the waters. The large assemblage of elements in the water gives rise to many rare minerals such as Butlerite[$(Fe,Al)_2O_3 \cdot 2SO_3 \cdot 5H_2O$], Sassolite [$B(OH)_3$], Atacamite [$CuCl_2 \cdot 3Cu(OH)_2$], Metastibnite ($Sb_2S_3$).

The hot springs are probably due to faulting (Fig. 1). A short distance east of the fissures in the sinter at

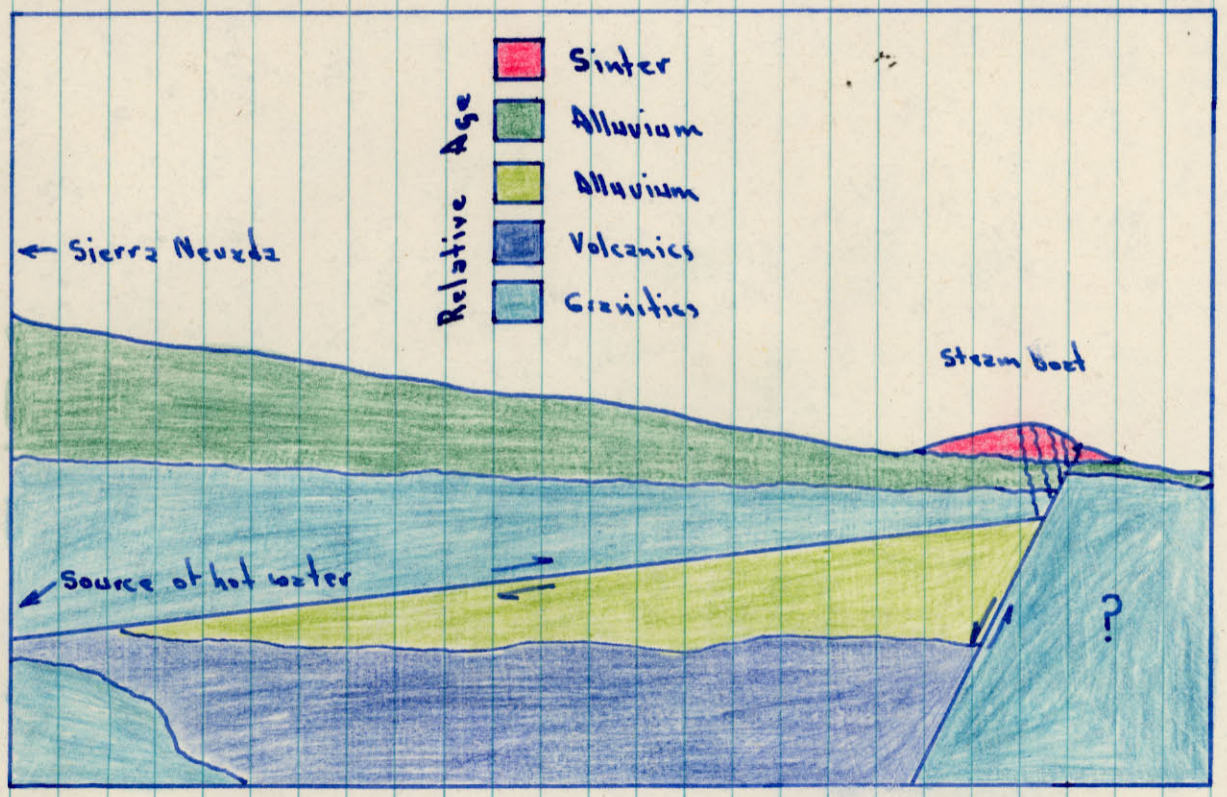

Figure 1. Idealized Cross section. Not to scale.

Steamboat Springs there aren't any hot springs. None of the wells beyond the margin of hot spring activity a short distance to the east have encountered hot water. A well which was drilled near the Steamboat Springs Resort passed into a zone of hot water below which the temperature decreased. The water comes to the surface at the sinter terrace. Sometimes the action is violent and geysers of 25 feet and more may be seen. To the west of Steamboat Springs drill holes have indicated the granite to be overlying Tertiary volcanics and alluvium. These facts indicate a thrust from the west to be cut off by a normal fault in the vicinity of the hot springs.

The hot water may be derived from a depth of several hundred feet to the west. The hot water would gradually cool as it travelled eastward along the thrust. When it intersected the steeper normal fault at Steamboat Springs the pressure would suddenly be released. This sudden release of pressure would cause the water to come toward

the surface much like an artesian well but in this instance it results in a hot spring and at times geysers.

Following are a few dissociated facts of interest: a) The water oscillates with the moon and sun similar to the tides but differs in that there isn't any time lag. b) Steamboat Springs is one of the three places in the United States where there are natural geysers. c) The sinter on the active terrace contains an abundance of fossilized beetles. d) Algae of different color indicate various degrees of heat along the fissures.

West of the present line of hot springs is an old terrace of siliceous sinter which has been eroded to a considerable depth. This deposit does not show any evidence of fissuring as noted on the lower terrace of active springs. It has been eroded to the denser sinter which at one time was probably a hundred or more feet below the surface.

This terrace is of further interest because the siliceous sinter contains a small percentage of silicified cinnabar which weathers black. On the fresh surface the rock is a brilliant red.