IDAHO MUSEUM OF MINING AND GEOLOGY

Field Trip Road Log

September 12, 2012: Table Rock Sedimentology and Shorelines of Ancient Lake Idaho
Leader: Dr. Walt Snyder:
Note: odometers vary, mileages are approximate.

From the Museum return to Warm Springs Avenue, turn right toward downtown, then turn right on Haines St. Continue on Haines to the intersection with Shenandoah Drive, turn right and proceed to Shaw Mountain Road, turn right. Very shortly turn right onto Table Rock Road and follow to top of the hill to the parking area (road turns to dirt about ¼ mile from the top).

Walk to the south boundary of the parking area and look at the large boulders. One shows "rip-off" clasts – these are cemented pieces of beach sand that have been torn from their substrate and carried downstream by forceful water flows, then deposited and incorporated into the sandy deposits that later solidified and cemented into sandstone. (This boulder actually is upside-down from its original position).

Stop 1:

From the parking area, walk south to Stop 1 (GPS N 43.594; W 116.144), which is located in a row of large boulders marking the boundary of the private quarry area about 0.2 miles for the edge of the parking lot. This boulder exhibits rusty-colored "root casts" of woody plants that grew at the margin of ancient Lake Idaho (Photo 1). This phenomenon is useful in delineating the shoreline of lakes where woody shrubs and trees could grow above the waterline.

Stop 2:

Walk south on a vague jeep path to Stop 2 (GPS N 43. 593; W 116.144), about 0.5 miles from Stop 1; look uphill at a curved outcrop. This outcrop shows "hummocky" cross-bedding diagnostic of sediments disturbed by storm waves at shallow lake depths – off-shore to perhaps 60 feet in Lake Idaho (Photo 2).

Stop 2A:

Stop 2A is only about 100 feet downhill from Stop 2 and is a large exposed quarry face with several distinct features (Photo 3). Use caution in this area as the drop-offs are steep and slippery. As you look back uphill at the quarry face, the top right layer shows evidence of fossilized root casts, indicating that it was at or above water level. Below this are well-demarcated shallowly-sloping beach strata sloping down to the left. Below this is a rather sharp boundary with massive-appearing sandstone (ie., no obvious stratification); however, on close examination, this area shows subtle evidence of the hummocky-type cross-bedding, indicating that it was deposited within the reach of surface storm waves. The area below the root casts has "rip-off clasts", indicating that there were areas of rapid cementation and subsequent high flow energies that removed them.

Stop 4:

Proceed back along the edge of Table Rock for about 100 yards to an area of flat rocks to Stop 4 (GPS N 43.594; W 116.145). This is another beach surface that is higher than that of Stop 3 and therefore is at a higher water level in Lake Idaho.

Stop 5:

Proceed northwest along the edge of Table Rock following old jeep roads for about 200 yards to another flat rock surface at Stop 5 (GPS N 43.594; W 116.147). This location exhibits "cross-trough bedding" with water flow from left to right (Photo 4). The depositional environment of this location was on a beach; although cross-trough bedding can occur in rivers; that can be differentiated from this beach site by other fluvial (river) characteristics. Cross-trough bedding occurs at lower energy levels than hummocky cross-bedding.

Stop 6:

The quarried face at Stop 6 (GPS N 43.598; W 116.147) (with graffiti) (Photo 5)shows hummocky cross-bedding and trough cross-bedding with flat strata; these features occur repeatedly from bottom to top of the face and create "units" of features that represent recurrent storm events: first, a big deposition of sediment from upslope, then storm waves creating hummocks, then normal waves creating troughs.

Stop 7:

Stop 7 is on top of Table Rock near the cross about 150 yards from the last stop. This is another beach level of flat strata, but it is not possible to place it in the stratographic sequence relative to the other beach levels because the out5crops are not continuous from Stops 5, 6 and 7.

Return to the parking area along a well-developed path (about 350-400 yards). The trip then will drive to the Military Reserve along the following route:

Return along Table Rock Road to Shaw Mountain Road and turn downhill to stay on Shaw Mountain to the intersection with Reserve Street; turn left and then take the first right onto Mountain Cove (about 0.2 miles). Go 0.5 miles to the parking area on the right.

Stop 8

Take the main path from the parking area and walk about 400 yards to a small outcrop of sandstone at Stop 8 (GPS N 43.620; W 116.183)(Photo) – you will have passed a small outcrop of basalt about halfway there; just keep this in mind. This sandstone is very fine, with silts and muds indicating a lake depositional environment.

Stop 9

Walk another 250 yards to Stop 9 at a large cliff face with marked angled stratified sand depositions below a large cobble "cap" (Photo 6) This is a classic example of "Gilbert Delta Foreset Bedding,"

indicating a steep drop-off of river flow into a lake. The beds are angled at the “angle of repose” of the sediment grains. The steep angle was established by a fault, rather than the shallow angle of the previously-observed beach depositions. The rough cobble cap is a terrace gravel deposited by a river long after the lake had dried up – the Boise basin was pretty much all a fluvial environment at that time and the multiple gravel terraces (5-mile, 10-mile, Gowen, etc.) represent phases of that process.

Stop 10

Walking back to the parking area, consider that the stratigraphic sequence in this area is basalt at the bottom, then fine mudstone, then foreset sands, then gravel terraces. Back at the parking area (Stop 10), look across the road to a small outcrop of sandstone next to basalt (Photo 7). To the left at the skyline one can see more sandstone and gravel terrace on top. What happened to bring the basalt and sandstone together across the road? A fault! This dropped the deep depositional sandstone to the level of the basalt (about 300 feet) and later the whole thing was covered by the terrace gravels. Here is evidence of a fault that you can literally put your hands on and was only figured out by Walt Snyder in the preparation of this trip!