Comments on “Origin of Soil Materials in Foothill Soils of Willamette Valley, Oregon”

We have no question about the validity of data in the recent paper by Glasmann and Kling (5). However, study of 285 ha and 15 to 25 quartz grains per sample is hardly a basis for conclusions compared with field studies of about 788,000 ha (2,3,6).

The events related to the Champoeq surface (2), which represents the Spokane (1) floods of the Portland Delta and the Willamette Valley sand facies of the Portland Sand and Gravel, are ignored. The Champoeq surface incises the Calapooyia-Senecal-Bethel surfaces and the associated Irish Bend sediments of the Willamette Formation (2). If Glasmann and Kling conclude that sediment from ancient glacial Lake Missoula filled a “temporarily ponded” Willamette Valley, this must have occurred 123 times, because we find at least this many beds in the Irish Bend Member. Are all of these strata from the Spokane Flood and yet are truncated by the Champoeq surface? We have previously described ice-rafted erratic pebbles and cobbles in the Irish Bend (2,5) and erratic boulders on the contour at slope inflections of the Bethel surface (4). Littoral surge channels associated with Irish Bend also attest to the presence of a sound that was stable for a sufficient time to be tide affected. Therefore, the presence of a few erratic sands is not surprising. They present no comparison with sediments known to have come from glacial Lake Missoula.

In the Willamette Valley, the Pleistocene surfaces are incised by the Holocene Winkle surface with 14C dates from Oregon, Idaho, and Washington, indicating Winkle dissection began around 10,000–12,000 years ago. Studies in the Idaho Panhandle show that the last five Spokane floods occurred shortly before Winkle time. There were many Spokane floods—one documented at 450,000 years ago at least and five since about 20,000 years ago. Which one(s) do they mean?

There is no mention by Glasmann and Kling (5) of the commonality in particle size and mineralogy between the Irish Bend and the Tyee Formation of the Coast Range. The abundant micas, etc. from Tyee are diluted with erratics (3). “Micas are conspicuous to the field observer and serve as a distinctive feature” (5, p. 126). The Tyee is a “prolific local source of mica” (5). Is it reasonable that all angular quartz grains be attributed to glacial action? It seems that the determination of provenance should consider all possible data rather than drawing sweeping conclusions from restricted information on a small area.

In summary, the stratigraphy and geomorphology of an area as large as the Willamette Valley done with 11 man years of investigations can hardly be generalized by Glasmann and Kling in a small area when the gross stratigraphy and geomorphology are ignored. It seems that they have not considered the regional relationships of these Pleistocene events. Somehow the story as presented by Glasmann and Kling lacks regional credibility in the setting of the Pacific Northwest despite excellent “lab data.” One is reminded of the old tale of blind men describing the elephant.

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Literature Cited


Reply to Comments on “Origin of Soil Materials in Foothill Soils of Willamette Valley, Oregon”

We are pleased that Parsons and Balster do not question the validity of data presented in our recent paper (5). We add that we do not question the validity of their voluminous data, which served as the primary foundation for our study of soil geomorphic relationships in the foothills of the Willamette Valley. We in no way intended to destroy or degrade that which we respect as meaningful scientific research. Our intent was to carry this research forward and add to our knowledge of Willamette Valley geomorphology.

We have not ignored the events related to the Champoeq surface (3), nor do we disagree with the evidence indicating this surface truncates the older Calapooyia-Senecal-Bethel surfaces and associated Irish Bend sediment. The Champoeq surface and associated coarse sediments represent in part the effects of the last catastrophic Columbia River flood that entered the Willamette Valley. This flood occurred 13,000 ± 300 years ago (7) and is considered the largest of all Columbia River floods (1, 4, 6). This flood scoured soils and sediment from the floor of the Willamette Valley and mixed these materials with previously entrained debris and erratics scoured from the Columbia River headwaters. A flood-produced lake formed in the Willamette Valley once again, filling the valley to the 122-m elevation. Sands and gravels were deposited in the mouth of the valley, and a thin layer of silt (Greenback Member) was left mantling valley landscapes below 122 m. Dissection of the valley began anew as soon as the lake drained, leading to the development of the Winkle surface, which started 10,000–12,000 years ago as Parsons and Balster suggest.

It is unfortunate that the term “Spokane Flood” causes such confusion to Parsons and Balster. We agree with their suggestion that there must have been at least 123 Columbia River floods that entered the Willamette Valley during the Pleistocene. It was these earlier floods that resulted in the deposition of Irish Bend sediments. Glenn (6) documents the occurrence of at least 40 such floods through extensive heavy mineral analyses. Glenn’s data must be scrutinized to remove several poor sampling locations, but this process yields a large body of excellent mineralogical data that conclusively demonstrate the Columbia River provenance of the Irish Bend Member of the Willamette Formation. Parsons and Balster have never published any detailed mineralogical data to support their field observations and conclusions. Such data are critical to properly interpret the geologic history of the valley. Without such data, how can we be sure of the existence of littoral surge channels or tidal scour features? Where the the fossils characteristic of such an estua-