In the regions adjoining that under particular consideration an erosion surface of Eocene age has been described by various writers. Dawson* considered the interior plateaux of British Columbia an elevated peneplain of Eocene age. Lindgren† describes the Salmon River district as an area worn down to a gentle topography and then elevated. Calkins‡ describes the Cabinet and Purcell ranges of western Montana as appearing like a "maturely dissected plateau." Smith§ recognizes a peneplain in the Cascades which he believes is Pliocene, and he is of the opinion that in that district there never has been a n earlier one. Willis recognizes a peneplain over the Galton range, and Umpleby‖ describes one in Idaho, which he refers to the Eocene. From these views it seems that an Eocene pepeplain was developed in the interior which was not developed, or was completely destroyed by a Pliocene peneplain, in the Cascades.

If any peneplain of Eocene age was ever developed over the Rossland mountains no remnants of it are to be found. The Cretaceous and probably the early Eocene represent a period of erosion which was ended by the deposition of river-gravels. These are believed to be Eocene-Oligocene in age. They may represent the deposit of rejuvenated streams carrying down great loads of material from a newly uplifted land surface that had suffered deep sub-aerial decay and had been approximately base-levelled. Such a sequence of events seems quite possible, but, so far as observed, no physiographic proofs of it remain.

The early Tertiary sediments are intruded and tilted by granite rocks which now underlie most of the conglomerate remnants. The tilted beds are bevelled by the upland surface, a large part of which consists, however, of the granite of these Tertiary batholiths. The coarsely crystalline character of the igneous rocks shows that a considerable depth of overburden has been removed since their consolidation. It is evident, therefore, that the age of the upland cannot be earlier than Pliocene.

This long period of base-levelling was closed by uplift and the rejuvenated streams began to incise narrow steep-sided gorges in the old surface. It seems as if the uplift was progressive with temporary base-levels which allowed the streams to broaden out their valleys. Further uplift left the former valley-bottoms as rock benches. The gorges were cut to a considerable depth, but before much dissection of the interstream areas occurred, climatic changes brought on glacial conditions. The beginning of this period was, no doubt, marked by valley glaciers which finally became large enough to unite into a continental glacier covering all but the highest mountains. The close of the period was again marked by valley glaciers.

The effect of the continental glacier was to round and smooth the surface The valley glaciers, on the other hand, deepened the gorges already cut, leaving an evidence of their activity in hanging valleys. McCambridge creek, a tributary of Trail creek which joins it half-way from Rossland to Trail, has a decidedly hanging relation to the main stream.

At the close of the glacial period large supplies of debris were emptied into the rivers from the valley glaciers still existing about their headwaters, and, as a result, their beds were aggraded. The Columbia was filled to a depth of probably 400 feet with stratified gravels. With the disappearance of the glaciers, the supply of debris diminished and the river began to cut into this deposit, and, as it swung from side to side, terraces at different levels were produced. This process is still active in parts of the Columbia's course. The terraces of Trail creek are cut in fine white silt, with a thin surface layer of pebbles on each terrace. These terraces are found almost to the altitude of Rossland. The formation of deposits in the Columbia would normally produce a ponding of water in its tributary, but as the terraces occur almost 2,000 feet above the Columbia, this explanation is insufficient. It is possible that a tongue of ice occupied the main valley after Trail Creek valley was free, and in the lake thus formed the white silts were laid down. The withdrawal of the barrier was followed by the production of terraces in the usual way.

A peculiarity in the drainage relation of Trail creek and Little Sheep creek may be related to the same phenomenon. The headwaters of these two streams are fairly close together and for a little distance they flow in nearly parallel valleys. At the town of Rossland the divide is notched by a low and fairly wide gap. If we assume that the ponded lake in Trail Creek valley

* Transaction, Royal Society of Canada, 1890, I.
† Professional Paper 27, United States Geological Survey.
‡ Bulletin 384, United States Geological Survey.
§ Professional Paper 19, United States Geological Survey.
‖ Journal of Geology, Vol. XX., page 139.