

The evident marks of prolonged subaërial denudation which exist on all the islands of this chain which I have seen, appear further to show that it has been long exposed to such action since the main period of its formation; that as a rule it has stood unsubmerged since the Miocene, and that though it may at some period have been more elevated, it has either not been more deeply submerged than it is at present, as, if so, that such submergence has endured for a comparatively very brief period.

Saint Matthew and its adjacent islands, with the Commander islands, appear to have much the same history with the Aleutians, and may very well have been coeval with them in origin. The later eruptions, to which the Pribilof islands and Nunivak island are due, have doubtless also left their traces in the Aleutian chain, while the volcanoes of Kamchatka may have originated at this later period and have continued their activity with little relaxation to the present time.

The planes of marine denudation, noted particularly at Saint Lawrence island and at cape Japounski, on or near the western border of Bering sea, seem to require prolonged stability at a level some hundreds of feet lower than the present in that part of the region, and the fact that this plane appears to be capped by volcanic rocks at Saint Lawrence island (particularly if no evidence of existing volcanoes is found there), makes the date of this submergence somewhat remote. It may be conjectured that it corresponds with the general submergence of the later Miocene. That the amount of such submergence should vary in different localities is quite in accord with what might be expected, perhaps, in any region, certainly in one in which volcanic forces of a local kind have to be allowed for.

The difference of climate which would result in the northwestern part of North America from the closing of Bering strait and the addition of the shallow eastern part of Bering sea to the continental land may not have been very great, inasmuch as the strait is even now a shallow one and no very great volume of abnormally cold or warm water flows through it in either direction. The effect would be to slightly lower the temperature and decrease the precipitation on the adjacent lands. Evidence has, however, recently been obtained of a much more important factor in regard to late changes of climate in this region, in the observations of Mr I. C. Russell, which show that the great mountain range of the Saint Elias alps must have been entirely formed in Pliocene or post-Pliocene times.* The crumpling and upheaval of the beds which now form this range must have relieved a notable and accumulating tangential pressure of the earth's crust, the result of which it is yet difficult to trace; but that it must have brought about extensive changes of level

* National Geographic Magazine, Washington, p. 174. Bull. U. S. Geol. Surv., no. 84, p. 259.