

the boundary line the ridges range in altitude from 995 to 1,230 feet above the sea,* while on the eastern face of the Duck and Riding mountains they were found to ascend as high as 1,460 feet above the sea, showing a rise in the upper boundary beach, supposing it to continue this far north, of about one foot to the mile from the point of crossing latitude 40° north to the Duck river, where the highest beach was seen. If the highest beach at the boundary does not extend so far north, the rise per mile will be somewhat greater.

Very few fossils that can be clearly identified have been found in these gravel ridges; but on Valley river in lat. $51^{\circ} 13' N.$, long. $100^{\circ} 20' W.$, at a distance of two feet below the surface, some roughly clipped fragments of quartzite have been discovered, lying horizontally among the disk-shaped waterworn pebbles, along with a small bone of a mammal. Precisely similar fragments are now to be found on the shores of lakes Winnipegosis and Manitoba in association with well-formed arrow-points, and the traditions of the Indians go back to the time when they were formed and used by their forefathers. As the gravel had been laid down by water action and was quite undisturbed, they clearly indicate the existence of man at the time when this lake beach was being thrown up, and it is probable that here, near the mouth of the former representative of Valley river, was one of his favorite haunts. The summit of the beach in which these "chipped flints" were found is 425 feet above lake Winnipeg or 1,135 feet above the sea.

The positions of the northern and eastern shores of Lake Agassiz have not yet been determined; but from what we know at present we can safely say that there is no land in that direction sufficiently high to form a shore line with an elevation of 1,400 or more feet, and there has been no evidence forthcoming to show that there has been any other disturbance of the country since the lake was at its highest level than the slow uplift towards the north shown by the gradual rise of the ridges in that direction. The theory has been suggested that the face of the retreating continental glacier held back the water on these two sides. It is not improbable that as the glacier retired from the face of the country, which was sloping towards it, a lake would be formed at its foot. If this be the true explanation of the cause of the formation of Lake Agassiz, it discharged its surplus water through the valley of Lake Traverse until the glacier had retired far enough or had decreased sufficiently in size to allow of a discharge for the lake over or around it. The position of this river has not been and may possibly never be determined, as all traces of it may have since been swept away.

Much has yet to be learned of the history of all of these post-glacial lake beaches, but a long array of interesting facts is now being gathered together, which it is hoped will before long solve some of the mysteries of Quaternary dynamical geology.

*The Upper Beaches and Deltas of the Glacial Lake Agassiz, by Warren Upham: Bull. 39 U. S. Geol. Survey, 1887, p. 17.