The Height of Mount Logan

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ALTHOUGH Mount Logan is visible from the coastal fringe and from far off-shore in the Gulf of Alaska, its giant stature—indeed its very existence—was recognized only in 1890 when I. C. Russell saw the mountain from the eastern retaining slopes of the Seward Glacier. Later, after the great mountain had been officially named, it was mentioned by explorers and travellers in Yukon Territory who saw it from more than 100 miles away. From these sightings there emerged a suggested height of 19,500 feet; but as far as I know this figure was not reached as the result of instrumental observations.

In 1913 surveyors of the International Boundary Commission carried a triangulation network up the Chitina Valley and below the north face of Mount Logan. Numerous prominent points on the mountain were intersected and an elevation of the highest summit was among the results of this work. The figure 19,850 feet (6050 meters) was officially accepted as the height of Canada's highest mountain.

In the years 1948-51, Project Snow Cornice of the Arctic Institute of North America established a semi-permanent research facility on a nunatak of the upper Seward Glacier, and from this spot a number of interdisciplinary studies were carried out, among them topographic surveying, my own responsibility.

During the four seasons' field work, a semi rigid network of prominent points was developed and these included the east peak and the summit of Mount Logan. However satisfactory our survey network was in terms of horizontal positions, it lacked a reliable vertical datum. We had no practical way instrumentally to relate points at sea level to our Seward Glacier network. To determine a datum we turned to points of our survey whose heights had been determined by the International Boundary Survey parties of 1906 and 1913. Of these Mount St. Elias was the most reliable, its position and elevation having been carefully determined by the U.S. Coast and Geodetic Survey.

Instrumental observations at six of our occupied survey stations included sightings on Mount St. Elias, and from these satisfactory heights were obtained for all of our observing stations as well as for intersected points. Two of the latter category were the east peak and the summit of Mount Logan, and they were observed from seven stations. The resulting calculations produced a height of 19,335 feet (5893 meters) for the east peak and 19,545 feet (5957 meters) for the summit. They also
MOUNT LOGAN from the south over the Seward Glacier.
produced an embarrassing disparity of about 100 meters between my result and the official height of the mountain.

This disparity stood for some nineteen years until, in 1968 Gerald Holdsworth, then at the Institute of Polar Studies, Ohio State University, carried out a field program in height control of features of Mount Logan aiming at a check of the official elevation of the summit. He succeeded in determining the position and height of the north peak relative to stations of the 1913 survey and to Mounts Lucania and Steele whose positions and elevations had been redetermined in 1967.

Holdsworth then observed the east peak from the summit of the north peak and, through a semi-graphic determination, arrived at a height of 19,345 feet (5897 meters) for the eastern summit, an almost unbelievable confirmation of our 1948-49 work and especially gratifying since the triangulation networks used by Holdsworth and by me had no single point in common. He approached the east peak from the north; I from the south of the mountain.

My own work determined a 210 feet (64 meters) difference of height between the east peak and the summit of Mount Logan. As cloud had prevented Holdsworth observing the summit from the north peak, my observations must be accepted for the present in defining the height of Canada’s highest mountain. If we accept the height of the east peak to be the mean of our respective results—19,340 feet—the summit of Mount Logan must be considered to be close to 19,550 feet (5957 meters).

This figure is by no means official. Holdsworth returned to the field in 1974 and, with refined procedures and modern instrumentation, resurveyed the high summits. His results are now undergoing critical evaluation before a final figure becomes accepted by the Canadian Government. In a personal communication he tells me that he does not expect the final verdict to differ greatly from what I have written above.