

Canadian Rockies -11,000' plus
a series by Peter Rowlands
including articles by Orvel Miskiw
and Christine Grotefeld

This series of articles originally appeared in "The Chinook" - the newsletter of the Calgary Section of the Alpine Club of Canada and is reprinted courtesy of Peter Rowlands. Peter has been climbing throughout western Canada for the past 25 years and is currently residing in Calgary, Alberta. This series is being distributed in four logical parts. Part One (the first article) is an introduction to the topic. Part Two provides the "list" that fuels the topic. Part Three contains further ruminations by Orvel Miskiw. Part Four further expounds upon the topic and contains a summary article by Peter Rowlands with some thought provoking questions. Part Four also contains a follow - up to the subject by Christine Grotefeld.

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11,000'+ ...A Revision to "The List"?
Part 1 in a series about the highest peaks in the Canadian Rockies

by Peter Rowlands

Climbers who frequent the Canadian Rockies are undoubtedly aware of the list of elite peaks that rise above the elevation of 11,000'/3353m. To climb all of these peaks is the goal of many local alpinists. There exists, however, the distinct possibility that the number of peaks that are over 11,000' is different from what is currently assumed, and that this list of peaks may need revising. In three articles over the next few months, I propose to discuss:

1. Why there is some question over which peaks belong on "the list".
2. What the "new" list might look like.
3. Our reasons for even caring about such things, and how it affects our choices of where and what we climb.

The question of how many 11,000' peaks there are in the Rockies probably came into focus when Don Forest became the first to climb the 51 peaks on the "official" list, based on the elevations given in the "Climbers Guides to the Rockies, North and South". Don completed this tremendous achievement with the ascent of Lunette Peak in 1979; it took another 15 years for the feat to be duplicated, this time by Rick Collier, who climbed his final 11,000'er in the summer of 1994.

In recent years however, the "official" list has grown to include 54 peaks. One of these peaks was always shown as being just over 11,000' on maps, but being unnamed and close to larger, more

famous peaks, was somehow shunned in the listing of the big peaks. The second peak also has always been shown on maps as breaking the 11,000' contour, but was often considered to be a sub-peak of a larger, more famous neighbor. Most interesting is the third peak, traditionally thought to be just under 11,000', which has only recently been shown on new editions of maps as breaking the "magic" 11,000' barrier. If you're not sure what these "new" peaks are, you'll have to wait until next month, when I will provide an updated list to check over.

Curious as to how a peak that for years was listed as being under 11,000' could suddenly be shown on maps as breaking the 11,000' contour, I made a few phone calls to Ottawa to talk to the people who actually produce the National Topographic Series (NTS) of 1:50,000 maps. From those conversations, I will show (again, on a list to follow) that the number of 11,000' peaks in the Rockies could in fact be as low as 44 peaks, or more interestingly, as high as 61. Also of interest is that it is probable that we only have 3 (as opposed to the current 4) peaks over 12,000', and that the peak currently listed as 4th highest may in fact only be 5th!

These differences in the potential number of 11,000' peaks come from the inaccuracies inherent in the survey systems used to determine the elevations of our mountains. Without going into detail, the history of determining elevations in our mountains can be said to have gone through three distinct phases (with a fourth just now beginning).

1. Land-based Surveys

From the time of the first European explorers until the early 1900's, elevations were determined by surveys taken in the field. The history of the Canadian Rockies has many stories of the men (and a few women too!) who packed heavy instruments and equipment through the range in an attempt to chart what they were seeing.

Initially, the techniques used were crude (dead reckoning, boiling point of water, etc.). While these techniques gave a rough idea of elevation, they were used primarily in the valleys by explorers looking for convenient routes through the mountains. Elevations of the peaks overhead were at best guesses, often greatly in error; witness the story of the fabled Mts. Hooker and Brown, both of which were thought to be in the 15-17,000' range!

The coming of the railway brought the first accurate surveys of the region, with established benchmarks, survey stations on top of peaks and better instruments. While these surveys gave a good idea of what was along the path of the railway, they still did not produce accurate elevations for the vast majority of the peaks stretching off in the distance.

With the railway completed, the government of Canada and the various provinces and territories undertook more detailed and accurate surveys of the Dominion. A series of surveys were commissioned (Alberta/B.C. Boundary Commission, National Geological Survey of Canada, etc.). These surveys, still done by people in the field, produced the first sets of listed elevations for many of our peaks. Accuracy was certainly better than that of the fur traders and railway builders, but as the crews moved away from the established benchmarks along the major transportation corridors, the margin of error increased. Glare from snowcapped peaks, atmospheric disturbances and readings taken over great distances meant that the margin of error in published elevations of many peaks was as much as +/- 100'/30m.

2. Aerial Surveys:

With the coming of the air age, map-making and surveying was revolutionized. An aircraft equipped with cameras could cover more ground in a day than a survey crew could in an entire season. The advent of stereo photography enabled map makers to determine vertical as well as horizontal relationships. Beginning in the 1930's and continuing through the 1960's, the entire

country was photographed from the air and updated maps were produced. Using the aerial photographs, map makers looking through stereoscopic viewers produced the contour maps that we use today; when you hold an NTS 1:50,000 map, you are looking at the direct result of these initial aerial surveys.

With the advantage of aerial photographs, the accuracy of elevations improved, but still included a significant margin of error. A contributing problem was that even when using modern aerial photographs, many of the same (older) benchmarks and "known" elevations of peaks were used to determine "starting" elevations for the new generation of maps. For most of the NTS series of maps in use today, the government will claim an accuracy of no more than +/- 65'/20m for elevations of peaks, even for areas that were re-surveyed between the 1960's and the 1980's.

What does this mean to us as climbers? In practical terms, peaks between 10,935'/3333m and 11,065'/3373m may or may not actually be over 11,000'.

3. Re-Surveying & Computer Assisted Map-Making:

Once the initial session of aerial photography for the entire country was completed and maps produced, revisions and re-surveying began. Maps were periodically updated, but most of the revisions were of cultural features (new roads, buildings), and features that had changed over the years (glacial recession, river channels). Changes to listed elevations of peaks were infrequent. The government of Canada is currently re-photographing the country with the latest in aerial photography technology, and is also using the latest computer programs to re-examine the older photographs used to produce the original NTS maps. Maps that have undergone the latest revisions now claim an accuracy of +/-5m/16', but the process of revising all the maps for a country as large as Canada is a slow one.

Based on the photographs and the more accurate computer-driven map-making equipment, some surprises are beginning to appear. At least one "new" 11,000' peak has been "discovered", and one 12,000' peak has been reduced to 11,900'. As well, several peaks have had their rank order changed; they are still on the list, but in a different order. Curious? Well, you'll have to wait until next month, when you can check out the revised list.

4. GPS and the Future:

With the coming of Global Positioning Satellite technology, it probably won't be long until many uncertainties are cleared-up. Hand-held units are already available, and as the cost comes down (already available for under \$1000.00) many more of these units will appear in the field. With this new technology in the hands of both official surveyors and curious alpinists, we should be able to determine with even greater accuracy the elevations of the peaks in the range.

In closing, please don't take the tone of this article as a critical one. To survey a country as large as Canada and determine the elevations of it's mountains to within 20m is a remarkable feat. Anyone who uses the excellent maps produced by the government should appreciate the accuracy contained therein. At worst, the possible variation in heights is little more than the size of a tree; hardly important when looking at the overall height of a peak, and certainly not a negative reflection on the generations of surveyors and map makers who have worked in our mountains and on our maps.

Next month look for a complete list of all the peaks that are, or could be, on the list of 11,000'ers, and an examination of some of the interesting changes and possibilities that the new list presents. Following that, I hope to discuss whether any of this is really important; as climbers, why are we so concerned with lists and elevations, and how it affects our choices of what to do when we head for the hills. Hope you enjoy it!