

## Karakoram

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### BACKGROUND

The author introduced himself as a non-geologist. He is in fact a land surveyor who has studied glaciology in Antarctica. He assembled the surveying team and raised £15,000 for one part of the International Karakoram Project which was undertaken to celebrate the Royal Geographical Society's 150<sup>th</sup> anniversary. The project was chosen because of its international, interdisciplinary possibilities and was aimed at looking ahead to the future shape of expeditions, not looking back over the previous 150 years. The area is in Northern Pakistan, on the border of Afghanistan, Russia, China and India.

The Spring of 1980, just after the Afghan invasion, was not an auspicious choice and the project only just got off the ground. About 100 scientists from UK, Pakistan and China worked together to convince the authorities that they were *bone fide*. The Indian press was very suspicious, describing the scientists as searching for sites for the Islam bomb.

The Karakoram expedition was so huge – 100 scientists, in 5 different groupings – that it was impossible for one person to know everything that was going on. The 5 groups were:

- Glaciology: testing out echo sounding equipment on pressure melting points (a very new technology at that time)
- Seismology: monitoring of hundreds of micro- and bigger earthquakes
- Natural hazards: expecting to look at how people cope with living in an earthquake zone but found that the local people were much more concerned about mudslides, rock-slides, avalanches and floods

- Geomorphology: to study the complex landforms of the area
- Survey: a group which had its own project but also acted as a service industry to the other groups. The surveyors thus had the opportunity to see the work of the others.

The author's first slides were of spectacular views such as the 25,000 foot peak of Rakapushi viewed from base camp at 6,500 ft together with maps of the area. Operations were based on Gilgit but to get there took some organising. The author himself worked for six months full time before leaving – fundraising, planning, organising, borrowing, etc. Landrover lent four vehicles which were driven the length of Pakistan quickly in order to meet equipment which had been sent on by train to Islamabad. The drive was done in two days of very hot weather by drivers who had been anticipating the cold climate of the Karakoram.

Fifteen years ago it was difficult to get to Gilgit, the expedition base, but in 1978 the Karakoram Highway was opened. This is a magnificent piece of engineering: a two lane tarmac highway running from Pakistan up and over the Himalayas into China. From the slides we began to get an idea of the achievement in building this road. Each mile had to be blasted out by men being lowered down by rope to drill holes for explosives. The construction was an enormous feat and keeping it open, as it is subject to landslides in summer and avalanches in winter, is also a considerable achievement. In 1977 to drive from Gilgit to Hunza in a four wheeled vehicle took about two days. In 1978 it took 1 hour and 20 minutes with peaks towering 12-15,000 ft above the road and 6,000 ft scree slopes. Huge chunks of rock overhang the highway and occasionally drop off and break up the road.

Karakoram contrasts with Nepal, which is lush and green and has a monsoon, for Karakoram has no monsoon and is a much drier area. At the Hunza oasis, water is in short supply and terraces are cultivated with a complex irrigation system controlled by sluices diverting the heavily silt laden water of the Hunza river. Much fruit is grown here: plums, apples and especially apricots.

From a satellite photograph of the area one could see the Hunza valley in which the expedition worked. The logistics were considerable. The Landrovers did about 5,500 miles each in two and a half months on the Highway and on rough tracks. The expedition also had up to 10 jeeps at any one time getting 90 scientists from base to their places of work.

The expedition went up the Hunza valley knowing the work that was planned but not knowing where to set up the vital base camp. However, at the Hunza oasis they discovered the Pakistan Tourist Development Corporation had just opened a camp site, complete with tents, beds, bedding, professional cook, washer up, nightwatchman. No tourists had arrived so the expedition booked in at an advantageous rate!

The camp was very interesting: 90 British, Chinese and Pakistan scientists plus some tourists - a Scandinavian cyclist, German archaeologists - made a cosmopolitan, stimulating company. Thus there was a lot of cross expertise support and stimulation.

The hazards included glacier meltwaters changing directions to make the road only fordable by bulldozer because of the strength of the current. In addition to the Karakoram Highway there are six inch roads, i.e. 6 inches wider than a jeep, and three inch roads, 3 inches wider, giving the three grades of road, all of which were often blocked by landslides. Lord Hunt, with vast experience of the Himalayas, visited the expedition and said that he knew mountains were dangerous places but had not realised how dangerous valleys could be.

In 1912-13 an international team had surveyed this area going right over the Himalayas to link Russian and Indian maps. This amazing feat used large baulks of timber (heliographs) as targets and hundreds of porters. It was a triangulation survey, with the highest station being at 19,300 ft. In 1980 the survey team of the Karakoram Project set out to find the 1912 survey points and remeasure them in an attempt to detect any tectonic deformation resulting from the Indian plate colliding with the

Asian plate and link it to observable fault zones. From very vague directions the team did find the original survey stations. The slides showed the immensity of the task and the relationship of one survey station to another - rather more than had been anticipated in London!

The procedure for the surveyors was to be driven along the Karakoram Highway, dropped at a village and climb about 10,500 ft to a survey station. This would take 2 to 3 days. They then surveyed the station and walked down - another day. Each of the four survey teams had to reach their respective stations on different peaks at the same time. At the foot of a climb it was imperative to hire porters for even the modern surveying equipment used weighed about 50 kg. This involved haggling over distances and weights - scales being an essential part of the bargaining. The author showed pictures of the porters and some of their families - a great honour as porter's families are usually kept out of sight. The porters were shepherds, farmers, and even a student. They worked hard if they were treated fairly and were good company. They wore goatskins wound round their legs as footwear.

Higher up the terrain became more arid. The bridges were primitive but effective - single cantilevers, etc., and unsafe looking but serviceable rope bridges. The narrow tracks with steep drops must have been very difficult to build. Whole families and herds could sometimes be seen hurrying along them. In one valley they were the first non-Pakistani or Chinese to visit for five years and needed special passes. The people were friendly and smiled a lot until a camera appeared when they went rigid. Sugar was a real treat to them.

They came across high camps where shepherds stayed for a few months. The shepherds gave the author and his party a warm welcome, and invited them to sleep in their huts while they slept outside. Hospitality is very important to Muslims.

The survey work coincided with Ramadan which caused problems as it was difficult for porters to carry a load all day and fast. The solution was to hire porters from villages 20 miles away who were then travellers and exempt from the Ramadan fasting. The biggest problem climbing was not the climb but carrying enough water and they incurred several cases of bad dehydration. Often they camped out under the stars. The porters put the scientists to shame with

the small amount of equipment they required. Some of the camp sites of the 1912 expedition were found. Indeed sometimes it was possible to sight an original survey station from 40 km because the air was so clear. By the end of August snow was frequent. At one point they had to be roped up and use ice axes.

The terrain in this area is very jagged. There are many earthquakes with 100 microearthquakes a day. There were enormous faults with rotten rock which was very weathered and crumbling everywhere, and with huge scree slopes. The survey results showed some movement but with rather large uncertainty. Garnets strewn in the valleys indicate considerable rock deformation. Rubies and emeralds were also found. The survey was expecting to find about 4 or 5 m of movement between India and Russia in 70 years. In fact they only detected about 2 m and this was not conclusive. However, another resurvey in 30 years time could probably find out something more definite by comparing two very accurate measurements.

The pure survey was interesting, stimulating and great fun, though not academically conclusive. However, a lot of work was done for other parts of the expedition. The 1912 expedition lost its deputy leader who died with appendicitis and was buried in Gilgit. The 1980 party realised that out of 90 members it was likely that by the end of the summer there would be a serious accident, but it was a great blow when it came. Jim Bishop was

climbing up to erect a survey beacon when he fell and was killed. This was a great loss to Jonathon Walton as Jim Bishop was his brother-in-law and close friend. They went back to the area where he fell and built a memorial and Jim's wife went out three years later to visit the memorial.

The programmes of the other teams were complex and details are published in the book "*Continents in Collision*" by George Philip. There was also a conference from which came two volumes of scientific papers, mostly intelligible only to the specialists!

The author enjoyed the work, meeting the children, the friendliness of the locals and the pleasure of working with Chinese scientists and the beautiful scenery. Lord Hunt was very popular with the local people, especially as he spoke Hindi with them. A lively question session followed.

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