KARAKORAM RANGE
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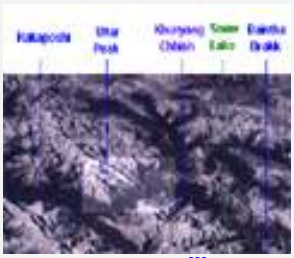
Version française

Summary

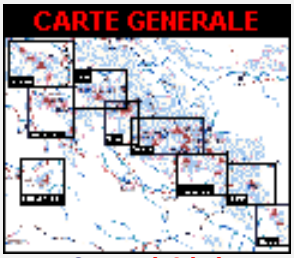
Maps of Karakoram range range : Cartes US U502



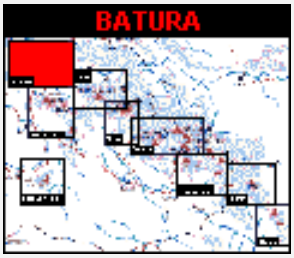
Images satellites du Karakoram range (58 ko)

NEW Cartes russes 1/500 000 (30 ko)

NEW Images satellites Google Earth



Cartes (72 ko)



Carte (57 ko)
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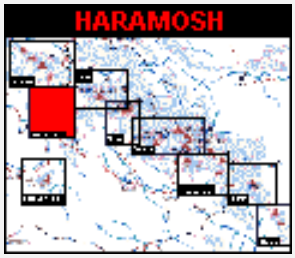
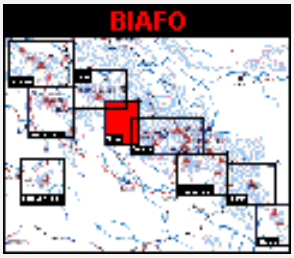


Carte (57 ko)
Description

The Karakoram range mountain range is 400km long and called "Khara-Khelem" which means "big barrier" in Mongolia and "Tsagaan-Kherem" which means "white barrier" in Chinese. A pass of the Karakoram range pass, which means the "black Rocks" pass in turkish, allows to go through the sharing line of the waters between the Indian Ocean and Central Asia for those existing caravans that travelled the silk road - this also, to avoid the Karakoram range mountain range of the east - this pass gave its name to all the mountain range and is today at the argued border of China and India (north of Ladakh). Aside the colour of its black rocks, the Karakoram range pass has, for a long time, had a bad reputation based on the myths which the merchants, who took these high commercial mountain roads, told about. Everything concerning this massive is extreme and unique on Earth. It's probably the highest mountain region on the globe (an average of 3800m altitude, world record). Surrownded and isolated by the six highest mountain ranges of the world, which are - Himalaya, Hindu Kush, Hindu Raj, Pamir, Kun Lun and Tien Shan, this area is in the heart of the strongest orographic earth knot, one of the wildest of the world. The mountain range has 4 of its 14 summits more than 8000m (K2, Broad Peak, Gasherbrum I and Gasherbrum II) 10 out of 30 are the highest mountains on earth, more than hundreds of 7000 over a stretch of only 400km by bird's flight. These aglomerations of mountains called "group" or "muztagh" (Muz means ice and Tah mountain - similar to Mont Blanc or Dhaulagiri) reach for the sky, whereas, some of the longest glaciers of the world, the 8 longest aside the polar regions, erode



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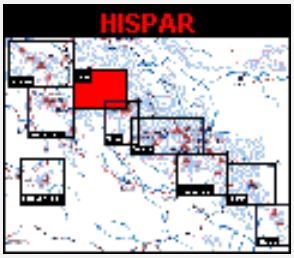

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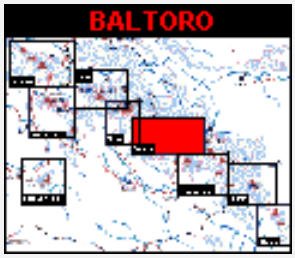
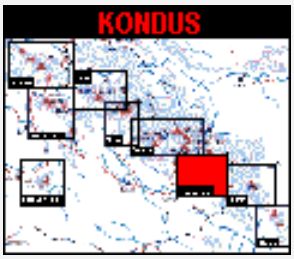


Carte (72 ko)
Description

non-stop the earth's crust. These glaciers melt during summer at an incredible speed under the burning sun as the temperature goes up to 40°C, thus transforming the rivers into fiery mountain streams, the highest sediment volume of the world. The strength of the size of huge buildings. To travel in the Karakoram range is to witness one of the world's biggest, active geological demonstration.



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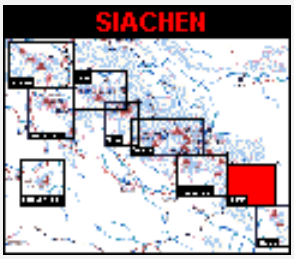

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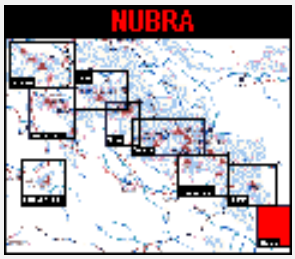


Carte (65 ko)
Description

The Karakoram range Glaciers

We note approx 135 important glaciers in the midst of the mountain range. Underneath are the main ones (excluded are those coming from ice caps) Please notice that even though the Karakoram range glaciers are far away from the polar region, they compete with the polar glaciers.

Vue from the summit of Nanga-Parbat to the East, from left to right (North to South) : K2, Broad Peak, Gasherbrums Group and Masherbrum.

Vue from the summit of gasherbrum II, to the Noth west, from left to right, Broad Peak (center left), Abruzzi ridge of K2 in the backside the Skyang Kangri. Far on the skyline, the Hindu Kush and Pamir.

Polar Pegions

* Bagley icefield et Behring (Alaska) 185 kms
* Seward et Malaspina (idem) 100 kms
* Logan (idem) 95 kms
* Hubbard (idem) 80 kms
* Muldrow (Alaska)
* 72 kms, Monaco (Spitzberg) 48 kms,

Le glacier de Siachen, le plus long des glaciers hors des régions polaires

Non-Polar Regions

* Fedtchenko (Pamir) 77 kms
* Siachen (Karakoram range Est) 75 kms

* Baltoro (Karakoram range Est) 66 kms
* Inyltchek (Tian-Chan) 65 kms
* Biafo (Karakoram range Ouest) 60 kms

* Koilaf, Uppsala (Patagonia) 60 kms
* Hispar (Karakoram range) 59 kms
* Batura (idem) 58 kms
* Tasman (New-Zélande) 28 kms
* Aletsch (Switzerland) 24,7 kms
* Ngojumba (Népal) 22 kms
* Mer de Glace (France) 12 kms

Godwin Austen glacier at the foot of K2, down is Concordia and the Upper Baltoro glacier to the far south (Chogolisa - 7665m- on the skyline)

We find the highest concentration of glaciers of the Asian continent in the Karakoram range mountain range, 8 of which are longer than 50km ; 20 more than 30km ; the following glaciers, Batura, Biafo, Hispar, Panmah, Siachen, Saser, Chogo Lungma and Rimo are all over 350km2 surface, the total stretch of this ice is above 16,000km2 and represents an enormous reserve of soft water which is of great richness for all the downstream regions known for their bareness and dryness. The waters of the melting glaciers bring an important contribution to the Indus river in the south and Yarkland to the north and bring life to approx 130 millions of people. When Jinnah stated that "Indus is the jugular vain of Pakistan" he underlined a geographical statement of strategic importance still valid today.

Biafo glaicer to the Snow Lake plateau :

The Geological and Climatic Exception of the Karakoram range

The first ice stage of the Himalaya can be dated back to the inferior Pleistocene and started in the Karakoram range mountain range, because of its septentrional position and its average altitude.This ice stage was followed by strong erosion phenominas and bareness. The retreat of the Pleistocene ice made apparent the base of the rocky surface of the Karakoram range mountains and furthermore, washed away huge masses of sediment into the valleys downstream.The recent orogeny of the Himalaya and Karakoram range represents the youngest evolutionary stage of the Alpino-Himalayan belt which started in the superior Paleozoique (pre-quarternary). Thereafter, Himalaya, Karakoram range and other neighbouring mountain ranges, during Holocene, became what they are today and obtained their tectonic and orographic aspects as we know them today. The morphology, so characteristic of the Karakoram range mountains, was thus shaped by the climatic morphology and directed by global changes of climat during the quaternary as well as its movements at an exceptional elevation. The Himalaya and Karakoram range have not yet reached their isostatic balance seeing the global elevation of the sheets is beyond the erosive work and the bareness which is exceptionally active.

The Sudden Surges of the Glaciers and their devastating results

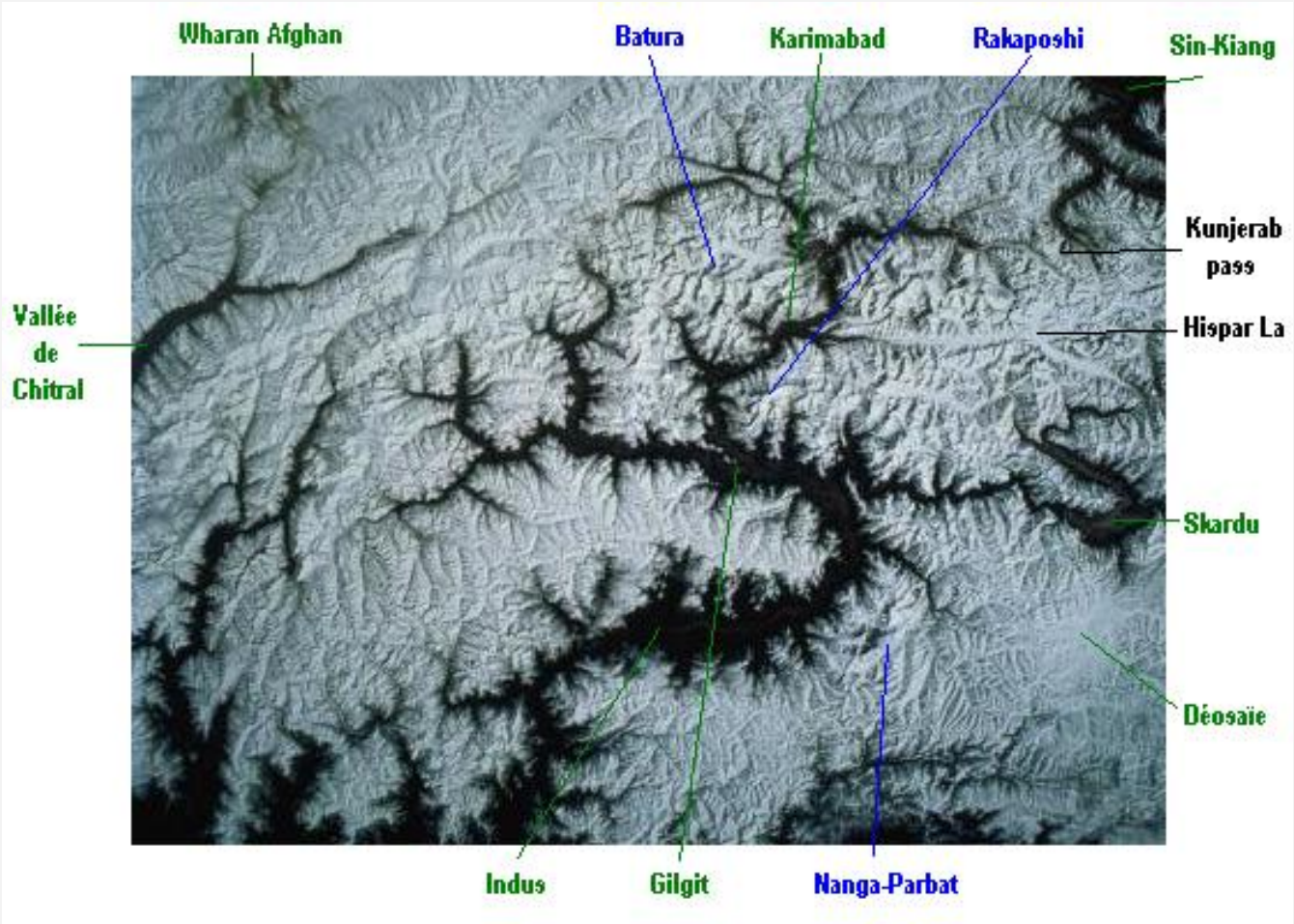
Rimo glacier (North Siachen area)

The Karakoram range glaciers undergo regular upsurges which are difficult to explain by those who study them. In only a few years, the silant ice tongues can become enormous and be devastating flows of ice and rock. Already, this suddeness was known to the pilgrims who travelled the silk roads at the east of the mountain range. The three dangerous glaciers of the Shyok valley, when they were in rapid movement, would block the uphill valley - even their names are based on cataclismic phenomenas they created : Chong Kumdan (means "big obstruction"), Kichick Kumdan (means "small obstruction"), the

inhabitants afterwards gave it another name - Thangman (means "scar"). The glaciers closed the roads of the pilgrims. After an ice upsurge the road which was already difficult, became impossible. Thereafter, a little lake came into being, just behind the obstruction and when the glacier retreated, it exploded under huge accumulation of water. The flood, not foreseeable, was of extreme violance : in June 1835, it destroyed everything for 250km up to Deskit and Tegur, at the Nubra junction. The caravans had no other choice but to wade through the river and go through the high desolated Depsang plains.

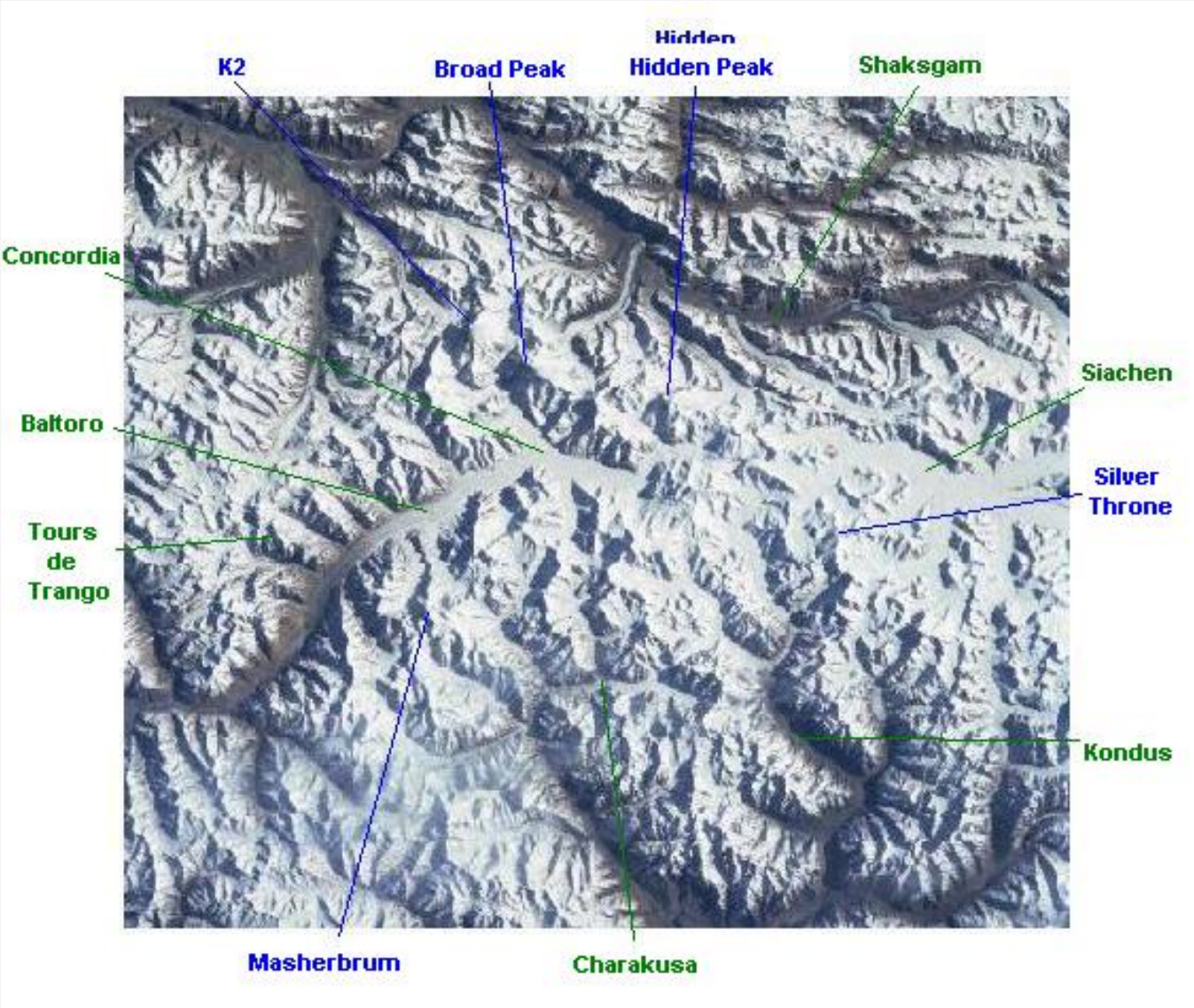
These unexplained sudden glacier surges often occur in the Karakoram range mountain range and this, in spite of a general retreat of the glaciers of the rest of the world. Since a century, 26 surges were detected in the Karakoram range, rapid advances were noted that involved at least 17 glaciers : the only other explosions known are in the Yukon range (Alaska) and the arctic islands of Svalburd. However, all the sudden rises of the Karakoram range glaciers have not yet been observed.

Thangman Glacier (Kichik Kumdan) fall down quikly in Shyok valley and build a dangerous wall of ice.



Satellite image of Batura, Nanga-Parbat, Haramosh Biafo et Hispar glaciers

Source : Nasa (http://eol.jsc.nasa.gov)



Satellite image of Baltoro, Kondus et Siachen glaciers

Source : Nasa (http://eol.jsc.nasa.gov)

Recently, the expansion of the Pumari Chhish glacier, between 1994 - 1996, affluent of the Hispar glacier as well as Chiring and main affluent of the Panmah glacier, are recent life proofs. Below are extracts of two scientific reports followed by witnesses of the greatest 19th century explorers.

The Rapid Advance of the Pumari Chhish Glacier since 1985

The Pumari Chhish is approx 7 km long and flows south from the main Karakoram range range. It's one of the main affluents of the Hispar glacier which is 62km long and starts west from the Hispar pass (5150m), thereafter, it flows into the Hunzan river. This glacier has received an enormous amount of growth since 1985. Hereafter are extracts of a scientific observation report, edited by the University of Science of New Hampshire and translated by the webmaster of this site.

The Pumari Chhish glacier is mainly fed by the avalanches which come from the north face of the mountain which has the same name, the Pumari Chhish (7429m) the Khinyan Chhish (7854m) as well as unknown inferiour summits. The avalanches deposit the snow, the ice and the rest into a small basin on a gentle slope at 4600 - 4700 m. The 4 km, inferiour to the Pumari Chhish glacier go slowly, little by little, down from this small basin of accumulation of 400m into an at least 55m large bowl.

Kani Basa glacier, up of Hispar glacier

The explorer Conway went through and examined the Hispar and Pumari Chhish glaciers in 1892 and noted the following "It's remarkable to see that, whereas the Lak glacier becomes considerably smaller, the Chur glacier (Pumari Chhish glacier), its immediate neighbour, has, on the contrary, become considerably bigger. It overflows its moraines and poars a huge wave of remains over the surface of the Hispar glacier" Non of the other explorers, eg the Dr Kooncza and Cahate in 1908, the Bullocks couple in 1910 (their map shows a gentle junction) nor Erik Shipton (his map set up in 1939 gives more or less the same junction) gave any indication of a difficult path of this glacier. No mention was made of the Pumari Chhish glacier in the revues edited by Mason (1930) Hewitt (1969) Mercer (1975) or Mayewski and Jesclike (1979).

Hard walk on Pumari chhish glacier

Our own observations of the glacier started in 1985 when the glacier was crossed during a recognition trip from the Hispar basin, a study which was part of an hydrologic project. At that time, it was easy to cross the glacier. There was a path easy to detect on the two lateral moraines and through the glacier, a path that was used by the shepards who took their yaks to their summer pasture fields uphill of the Hispar glacier. The surface of the ice was more than 10 meters under the lateral moraines. The aspect of the glacier had changed little when we took the road the second time for the Hispar pass on August 8, 1987. However, in 1988, the tongue of the glacier had become thicker by at least 20 m. There was no way to cross the glacier and we had to cut our steps through the ice with our tools to advance.

Other observations were made during July and August 1989 when the scientific base camp was established in Bitammal, 3km west from the glacier. The glacier's tongue had become that much more thicker and the ice was between 16 - 22m above the lateral moraine. The glacier also progressed like 1 km, nearly reaching the middle of the Hispar glacier which, at that particular point, was 2 - 2.5 km large. The whole length of the Pumari Chhish glacier had crevasses, to a point, where it became impossible to

cross. The pasture fields next to the ablated valley and close to the Hispar glacier, uphill of the Pumari Chhish glacier, had been seperated and the yaks had to stay in Bitammal. A brief survey towards the top of the Pumari Chhish glacier did not show more snowfall, ice, or rocks indicating an avalanche or an important land slide. The nature of the surge of the Pumari Chhish glacier described by Conway, ressembles incredibly to our own observations during the 1989 summer, which leads to think that the glacier had known at least two rapid seperated growing periods during one century.

An article on the site of The University of New Hampshire, Institute for the Study of Earth, Ocean and Space, More Hall, 39 College Rd, Durham http://www.ccrc.sr.unh.edu/~cpw/Searle93/searle.html

As for my own observations concerning the Pumari Chhish Glacier


Moraines du glacier du Pumari Chissh

In 2000, I myself, crossed the Pumari Chhish glacier, going down the Hispar pass. I noted in my travel book that it was very much distorted. "At the moment, we are preparing ourselves to cross the Jutmo glacier (the local name) an affluent of Hispar who directly descends from the north circle formed by the Kanjut Sar mountains (7760m) of the east, the Yutmar Sar (7330m) north, the Khumyang Chhish (7852m) west. The glacier is very distorted, it's like a labyrinth of a number of sharp rises in the grownd seemingly impossible without climbing tools and between profound crevasses - thus we have to go around the obsticles hoping to find the best way by our own intuitive initiatives. Everyone goes by its own gut feeling and we loose each other. It's a real orientation race, Hassam, the porter, seems to be the best at this game, it looks like he found the solution befor us : Hassam and I are lost : but not as bad as Mohammed, already at a distance of 55 meters uphill of the glacier : Ali and Rasoul are still behind and have difficulies to follow. We remeet on the other side of the glacier after two hours of struggle. We go up the moraine and find some greenry. There we find the grave of a porter and Hassam tells us that he died the year befor on the Jutmo glacier. Rearly, this glacier gives cold shivers".

Tombe d'un porteur tombé dans une crevasse du Pumari Chhish aux abords du glacier

Extract of my notes Biafo-Hispar trek, Bitammal stage.

The Sudden Surge of the Chiring Glacier in 1992

The Panmah glacier, the sixth biggest of Karakorum range, is situated approx 30km west of K2. It's main affluent, the Chiring glacier, has been under observation because of major growths of ice.

Click to enlarge

These scientific observations become extremely interesting when compared to those of the English explorers commenting the Chiring glacier in the 19th century which they knew because they were on the famous Mustagh pass. Hereafter, an extract of a scientific observation report coming from the research center of the Ontario-Canada Polar Regions :

[At the head of the Chiring is the New Mustagh Pass (5,800 m), an ancient route to central Asia. The discovery that Chiring is a surging glacier gives a new slant to an old debate about the role of glacier fluctuations in historic closings of this and other glacier passes to Inner Asia. Maps, drawings, and photographs from 1856, 1861, 1929 and 1937 show the lower Chiring was easily crossed by travelers [Godwin-Austen in 1864; Desio in 1929; Shipton in 1938; and Kick in 1993). Although altitude and bad weather posed problems, the upper glacier also offered a relatively straightforward traverse to the pass. However, in 1887 a British explorer, Francis Younghusband, coming from the Chinese side, found the pass closed. After crossing by another route, he attempted to ascend the Chiring but found it impassable because of "... an immense ice-slip on to the glacier and gigantic blocks of ice... tumbled about on top of one another" (Younghusband, 1896). His descriptions accord with the effects of a surge and strongly suggest that the Chiring last surged in 1885B87, giving a surge cycle of about 110 years.]

(coming from an article of the AGU site, of Cold Region Research Center, Wilfrid Laurier University, 75 University Avenue West, Waterloo, Ontario, Canada :http://www.agu.org/eos_elec/97106e.html).

Map of Panmah glacier in Karakorum with the Chiring surge:

Satellite Image of Sarpo Laggo bassin in Karakorum with the not far Chiring glacier:

The Rapid Ice Surge, seen by the Explorers of the 19th Century

The fact that the Chiring glacier may also have sudden surges, bring back alive an old discussion concerning the roles of fluctuation of the Karakorum range glaciers. The Chiring glacier had been in use for a long time by the following explorers : Godwin Austen in 1864, Younghusband in 1887 and 1896, Desio in 1929 and Shipton in 1938. The following remarks were taken frrom the book "Blank on the Map" wherein Erik Shipton compares the observations made by his collegues concerning the glaciers around the Muztagh pass.
John Auden, our expedition geologist, gives comments about the rise of ice in an article of the Royal Geographic, on January 10, 1938.

We were all impressed by the recent decrease of the thickness of the Sarpo Laggo glacier and the "crevassed glacier" close to their final tongues. It's been confirmed that these glaciers undergo various periodical changes of growth, this according to certain witnesses, because at that time, they were either easy or difficult to approach. The affluent of the Nobande Sobane glacier, who contributes to the swelling of the ice coming from the Panmah glacier, was inaccessible to Younghusband in 1887, as from Skinmag. It was however, smooth and without crevasses in 1929 when Desio skied through, up to its final tongue. In 1937, the ice was severely brocken near the top.

In 1892 Conway, trying the Nushik pass, found a passage between Skardu and the Hispar glacier and then indicated the following :
"The passage was not supposed to be extremely difficult, live stock was to have gone through the pass. However, the natives admitted that they rarely used it, if at all, had it become necessay. They declared that the path disappeared under the ice and that it ceased to exist as useable itinary. The explication of the natives was confirmed by Godwin-Austen and later by Mayor Cunningham. What they found at the Nushik pass was a rocky passage of ice pinnales which led them to a difficult snowy slope under the pass. Neither one or the other were able to climb the pass. Bruce and Eckenstein had lots of problems when they went through in 1892".

Remarks translated from the book "Blank on the Map" "The six mountain travel books" (Diadem Books Ltd - 1985 edition p189 Erik Shipton 1939)

The Ice Surge and abandom of commercial routes

In his book "Blank on the Map" Erik Shipton wonders about the sudden growths of certain glaciers and the consequences of passage for the men in these high Karakorum range passes. Shipton, whose project it was to rejoin the Baltoro and Shaksgam by passing by a hypothetical pass, wonders if the passage will be easy or not. One by one, he re-examinds the remarks made by his collegues concerning physionomical changes of this or that glacier pass and compares their viewpoints regarding the curious phenomena of the sudden glacier surges.

Before continuing with my narrative 1 should like to discuss briefly the causes of the abandonment of these ancient routes across the passes of the high Karakorum range. In the passage quoted in this chapter from Sir Francis Younghusband's book, there are several allusions to this question. He aiso refers to it in the letter which he wrote to his father in 1887 describing his crossing of the Mustagh pass: "On ascending towards the Mustagh pass my real difficulties began. Since my guides had crossed, an immense glacier had advanced, completely blocking up the valley with ice and immense boulders." In each case the suggestion is that the increase in the size of the glaciers is the principal reason for the disuse of the passes into Yarkand. This theory agrees with the view, stated many years before, of Godwin-Austen, who was the first man to do any detailed scientific work in the district. He states in his paper, "On the Glaciers of the Mustakh Range" (Royal Geographical Society, 1864), that when he visited the district in 1861, the main Mustagh pass was aiready closed, "owing to the great increase of snow and ice", and an alternative route had been found (the New Mustagh pass). He mentions that in his time pontes and yaks were frequently brought over the new pass from Yarkand. While he was camping on the Panmah glacier in August of 1861, four men came ovei>tne pass from Yarkand. They were Baltis who had emigrated to Turkestan some years; before. They had experienced much difficulty on the actual pass. In discussing the question in his paper, Godwin-Austen says: "I have often been struck by the indications of considerable amounts of change of temperature within what we may call our own times. Many passes which were used even in the time of Rajah Ahmed, Shah of Skardo, are now closed. The road to Yarkund over the Baltoro glacier, which before his time was known as the Mustakh, has by the increase of the ice near the pass become quite impracticable. The men of the Braldoh valley were accordingly ordered to search for another route, which they found in the present pass, at the head of the Panmah glacier above Chiring. Again, the Jusserpo La can now be crossed on foot whereas in former times pontes could be taken over it. The pass at the head of the Hoh Loombah ts now never used, though there is a tradition that it was once a pass; no one, however, of the present generation that 1 could hear ofhad ever crossed it. Certain large glaciers have advanced, such as that at Arundu, of which the old men assured me that in their young days the terminal cliff was one and a haïf miles distant from the village. Mr. Vigne says, 'It was a considerable distance' ; it is now oniy about four hundred yards. A like increase has taken place at Panmah, where within the last six years the old road has been completely covered by the ice and moraine, and where Mahomed, my guide, told me the old camping ground was, now lies a quarter of a mile under the ice: the overthrown trees and bushes plainly testified to the recent advance which this mass had made; this evidence was equally well seen along the side of the Arundu glacier." In the same paper, however, Godwin-Austen mentions the decrease in the size of the main glaciers of the Karakorum range. This apparent discrepancy is supported by present geological opinion, which hoids that there are cycles in the

increase and decrease of these glaciers, not necessarily simultaneous in the case of ail glaciers of the district. John Auden, the geologist of our expedition,
in his appendix to the paper 1 read to the Royal Geographical Society on January lOth, 1938,says: "All of us were impressed by the recent decrease in thickness of the Sarpo Laggo and Crevasse glaciers near their snouts. That these glaciers are subject to periodic changes is suggested by historical records, since at different times they have been easy and difficult of access. The Nobande Sobande branch of the Panmah was inaccessible to Younghusband in 1887 beyond Skinmang. It was so smooth and uncrevassed in 1929 that Desio was able to ski up to its head. In 1937 it was again highiy broken up." In 1892, Conway, discussing the Nushik La, a pass lying between Skardu and the Hispar glacier, says: "The pass was believed not to present any extraordinary difficulties, and even cattle were stated to have been taken over it. Of late years, however, the natives admit that they have rarely crossed it, if at ail. They state that the road became buried in snow, and that it ceased to exist as a practicable route from their point of view." The natives' explanation was corroborated by Godwin-Austen and subsequently by Major Cunningham, who both found this pass to be corniced with an overhanging wave of snow, leading to a difficult snow-slope below. Neither of them crossed the pass, though Cunningham attempted it. Bruce and Eckenstein, members of Conway's party, experienced a good deal of difficulty in crossing this pass in 1892.

The Biafo glacier

Colonel Schomberg in his book Unknown Karakorum range, which describes his expedition to the Shimshal district in 1934, agrees with the theory that the ancient routes have become impracticable because ofincreased glaciation. He adds that in his opinion the change is exceptional and comparatively recent. He writes: "From what 1 have seen of the glaciers of this region, and have gleaned from the large volume of tradition, 1 am certain that the extensive glaciation is recent, at a hazard not more than about one hundred years old. Before then, the accumulation of ice and snow did not prevent people from crossing to and fro from Baltistan to Hunza and Nagir, and certainly into several parts of the Mustagh valley . . . 1 think, moreover, that the time is coming, but it will not be for some decades, when these routes will be again open, provided, of course, increased glaciation does not take place. There is no reason why it should, as judging from past history the great increase in the glaciers was definitely exceptional."But though Younghusband, Schomberg, and the other explorers ail agree that the old passes have become impracticable because of the increased glaciation, it is probable, in my opinion, that this theory is incorrect, and that the present blocking of the passes is in most cases due to the disintegration of the glaciers: not to increased glaciation, but to the breaking up of the ice. In the earlier days there may have been easy snow-covered ice-slopes leading up to the passes, which in the graduai deterioration of the glaciers have become jagged, steep and impassable.
It should be remembered that the local reports on which the explorers have founded their theories, are those of untrained observers, who having encountered greater difficulty with the ice on the passes, assumed as a matter of course that there was more ice than before. Whereas, in my experience, glaciers which are in a rapid state of decay present many more obstacles than are met with on the smooth surfaces of actively growing glaciers. The decaying condition of the Sarpo Laggo glacier, which will be described later in my narrative, illustrates this theory. It was on the lower reaches of this glacier that the decay was most evident. And it was this condition that caused so much difficulty both to Younghusband in

1887 and to ourselves fifty years later.
In spite of this 1 do not question the fact that there has recently been an increase in some of the glaciers, and the passages quoted from Godwin-Austen's paper, read to the Royal Geographical^Society in 1884, give definite proof of this. Later in the same paper hevSays,^"As we skirted the Kero Loombah glacier, evident signs that it was nowon-the increase were constantly to be seen in the masses of upturned and broken turf."Also, we ourselves found an astonishing increase in the side glacier which barred our way down to Mone Brangsa. This glacier had been reported by Desio, in 1929, to be an insignificant ice-stream, but by 1937 we found that it was a formidable obstacle.

Ice of Biafo glacier

With so much conflicting data it is extremely difficult to assert the correct solution of the problem. But personally, 1 do not think that the main reason for the closing of the passes is due to the increase of the ice. But whatever the reason, it is certain that these passes across the main range of the Karakorum range were used extensively in former times by native travellers going from Baltistan into Yarkand, and are now completely impracticable for native transport. Of course the disuse may be due to other causes besides the difficulty of snow and ice conditions. Schomberg suggests that there is no incentive now for trade between Baltistan and Shimshal. For the Shimshalis can now get ail they require from Hunza, owing to the development of the Hunza valley in the last century, without having to cross any difficult country to obtain supplies. This, however, does not explain the cessation of trade between Baltistan and Turkestan across the Mustagh pass, nor between Hunza and Baltistan across the Hispar pass. Another theory is put forward by Godwin-Austen, who suggests that the old routes were abandoned because they were frequented by robbers. He says that the former route over the Hispar pass was given up because of the danger of these raids, and an alternative route was adopted, which seemed to be free from the menace of attack by bandits. This route must presumably have been up the Crevasse glacier which we explored. But in my opinion it is almost unbelievable that this route was ever used, for its length would have been enormous and its difficulties considerable.
But whatever the reason for the present disuse of the passes, it is a noteworthy fact that travellers nowadays not oniy find that the passes are closed, but they have great difficulty in getting any information about the former existence ofthe routes across them.
It would be valuable historically to send an expedition into this country to try and trace the remains of old routes and disused habitations, and to determine the migratory history of the primitive people of these remote districts.

(remarks translated from the book "Blank on the Map" "The six mountain travel books" (Diadem Books Ltd - 1985 edition, p190-191, Erik Shipton, 1939).

The Glciologists outline an answer :

The following article comes from an AGU site, which, in turn, comes from a research center of the polar regions (Ontario-Canada). It proposes means of reflection without however affirming for sure the reasons of this particular phenomena concerning the sudden glacier surges so special for the Karakorum range glaciers.

Surges raise some special and partly unresolved questions for glaciologists, including the conditions that initiate surging, the nature of fast glacier flow, and whether deposits left by surges can help identify their role in the history of glaciation. Sharp [1988] and Menzies [1995, pp. 179B199] provide useful summaries and bibliographies.
There is a consensus that, whatever the controlling factors and exact mechanisms, the key to surging lies in conditions that promote large, episodic instability at the glacier bed. Proposed trigger mechanisms include fluctuations in thermal or hydrological conditions or in deformable subglacial sediment, acting alone or in combination.
Nevertheless, the geography of surges is highly uneven. There are large numbers in just a few regions, while none have been recognized in most glacierized areas. This suggests there are special but varying combinations of environmental conditions that promote or suppress surging. It is in relation to these questions that the Karakorum range glaciers and the kinds of evidence available for them are of broadest scientific interest (Table 2).
These glaciers lie between 3,000 and 7,500 m above sea level, much higher than the more intensively studied examples of the Alaska-Yukon ranges, Svalbard, or Iceland. They lie in subtropical latitudes similar to examples in Andean Argentina and have an extreme continental location comparable to the nearby Pamir surging glaciers. However, there is heavy snowfall and year-round avalanching at high elevations, which promotes rates of flow and throughput of ice comparable to more humid conditions and maritime glaciers.
As with the Chiring, the glaciers are surrounded by precipitous rock walls of enormous extent and elevation range. This relates to, perhaps, their most distinctive feature. Many Karakorum range glaciers, and all of those known to surge, are predominantly or wholly avalanche fed. The highest precipitation occurs in the perennial ice climate zone between 5,000 and 7,000 m. Avalanches carry this more abundant snow directly to the glaciers. Much of it accumulates at or below the regional snow and firn limits, which are at about 5,000B5,500 m. The succession of relatively warm and dirty summer avalanches and cold winter ones can result in complex thermal layering and debris-rich horizons in the ice. Avalanche-derived ice tends to be heavily freighted with debris. This relatively dirty ice contributes to higher melting rates in the upper and middle ablation zones, while thick supraglacial debris suppresses melting in the lower ablation zones. Enormous ramps of debris develop and build outward beside and beneath the ablation zones of these avalanche-fed glaciers. Surging may be influenced by an unusual buildup of deformable sediment beneath these zones and/or by unstable transitions from frozen to unfrozen bed conditions.
Karakorum range surges occur in a highly active tectonic zone with globally extreme rates of uplift and denudation. The glaciers drape the highest parts of the range, where a series of steeply inclined lithospheric thrust faults occur. However, structures and rock types are complex and poorly known where blanketed by snow and ice. Most surging glaciers cross two or more major formations. No specific or distinctive relationship of surging to lithology, indicated in some other regions, has yet been found. Hot springs are widespread across the region and it has been suggested they, or the geothermal heat flow implied, could be a factor in surges.

Impressive front of the Teram Shehr Glacier (North Siachen area)

(Remarks coming from an article published on the AGU site of Cold Research Regions Center, Wilfrid Laurier University, 75 University Avenue West, Waterloo, Ontario, Canada Canada : http://www.agu.org/eos_elec/97106e.html).

Références :

This page was set up based on the following elements
- An article published on the University of New Hampshire, site, Institute for the Study of Earth, Ocean and Space, Morse Hall, 39 College Road, Durham :
http://www.ccrc.sr.unh.edu/~cpw/Searle93/searle.html

- An article published on website of AGU, Cold Regions Research Centre, Wilfrid Laurier University, 75 University Avenue West, Waterloo, Ontario, Canada :
http://www.agu.org/eos_elec/97106e.html

"Blank on the Map" "The six mountain travel books" (Diadem Books Ltd - 1985 edition) Erik Shipton (1939)

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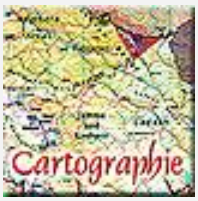

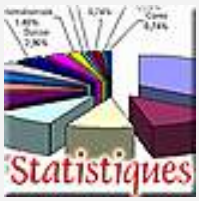

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