

## In the Mountains of the Moon, A Trek to Africa's Last Glaciers

*The shrinking ice cap atop Mount Kilimanjaro is Africa's most famous glacier. But the continent harbors other pockets of ice, most notably in the Rwenzori Mountains of western Uganda. And as temperatures rise, the Rwenzori's tropical glaciers — located as high as 16,500 feet — are fast disappearing.*

by Tom Knudson

I am hiking through a moss-draped forest more than 10,000 feet above sea level in the Rwenzori Mountains in western Uganda, not far from the border of the Democratic Republic of the Congo. The trail ahead is steep as a ladder and slippery with mud, and every few minutes my guide and I stop to rest.

Most people who come to this part of Africa do so for its wildlife, especially the endangered mountain gorilla. I have made the journey for another reason. I am looking for a glacier.

In the popular imagination, glaciers and Africa intersect at one location: Mt. Kilimanjaro, the iconic dormant volcano that rises from the grasslands of Tanzania and whose shrinking snowcap has become a symbol of climate change.

But there are glaciers in steamy Uganda, too, hidden in the eaves of jagged 16,000-foot peaks that are lost in the clouds most of the year. And these glaciers have a climate change story to tell, too — one that scientific research suggests better reflects the impact of global warming than the fading snows of Kilimanjaro.

But their story is also nearing its close. In just two decades, scientists expect the Rwenzori glaciers — as well as Africa's few other remaining ice fields — to be gone. Kilimanjaro has already lost 84 percent of its ice since 1912, and what's left is not expected to last more than a couple of decades. The Lewis glacier on Mount Kenya is also expected to wink out soon.

That prognosis comes as no surprise to my guide, a local Bakonjo tribesman named Baluku Josephat, who has guided climbers through the Rwenzori range since 1982 and has seen the consequences of global warming firsthand.

"If you go to Mount Baker," he says, referring to a massive, ship-like peak in the center of the range where glaciers have already melted, "you can now go without crampons. It was not that way in the past. Now people just walk over rocks."

And not all of the impacts are playing out in the snow zone. Two years ago, Josephat spotted something in a brushy thicket at 10,900 feet that startled him — an upwardly mobile chameleon.

"Chameleons are supposed to be at lower elevations. Now they are moving up and up," he said, echoing an observation scientists have made about animals and plants in other mountain ranges worldwide. "When I found that chameleon, I was puzzled. I thought, 'My God, what is happening?'"

With its snow-capped peaks looming over the tropics, the Rwenzori are a geographical marvel that has haunted the Western imagination for centuries. As early as 500 B.C. the Greek dramatist Aeschylus wrote about "Egypt nurtured by the snows." In 150 A.D., Claudius Ptolemy, the most distinguished geographer of his time, produced a celebrated early map of Africa that fanned speculation about a snowy source of the Nile. Without ever setting foot in Africa, he sketched an icy range rising from the heart of the continent that he called Lunae Montes — the Mountains of the Moon — a name widely used for the Rwenzori today.

But it wasn't until 1888 that the American explorer Henry Stanley proved Ptolemy correct. Looking up from a camp in the Congo, he spotted what he first thought was a silver cloud in the shape of a mountain.

"Following its form downward, I became struck with the deep blue-black color of its base," Stanley wrote. "Then I became for the first time conscious that what I gazed upon was not the semblance of a vast mountain, but the solid substance of a real one with its summit covered with snow."

Even today, hiking into the Rwenzori range is like stepping into a lost world. Fewer than 2,000 people a year visit the place. For long stretches, you see no one. And there are surprises by the hour, from worms as long as your walking stick, to iridescent greenish-purple sunbirds and the elusive, brilliant-blue Rwenzori turaco.

Also astonishing is the kaleidoscope of chlorophyll, the staircase of forest zones that clings to the range from the foothills at 5,400 feet to the treeline around 13,500 feet. On our second day, we entered a forest of giant heather so ensnared in moss it was hard to see the sky. “No forest can be grimmer and stranger than this,” wrote Filippo de Filippi in his epic account of the first expedition to thoroughly explore the range and climb its major peaks, led by the Italian mountaineer and adventurer, Prince Luigi Amedeo of Savoy, Duke of the Abruzzi, in 1906.

As we climbed higher, the heather disappeared, replaced at 11,200 feet with something stranger: two species that looked like cactus, but weren’t — the torch-like giant lobelia and the giant groundsel, which reaches upward with woody branches topped by enormous cabbage-like leaves.

But the most astonishing sight of all is the snow you begin to glimpse hovering above the tropical landscape. When Abruzzi tramped through the range a century ago, ridges and mountains were shellacked with snow and glaciers. He discovered glaciers on six peaks and estimated their total size at 2.5 square miles.

“Members were full of excitement and satisfaction,” wrote de Filippi, describing the expedition’s initial ascent into the alpine zone. “The place was rough and wild. A cold and biting wind blew off the glacier and suggested surroundings very different from those usually associated with Equatorial Africa.”

Today, less than half a square mile remains. On three peaks, glaciers have disappeared altogether.

In the Andes and Himalaya, the melting of high-altitude glaciers is expected to trigger water shortages downstream in coming decades. But Uganda’s ice is much too small to have such an impact. Nonetheless, ice is disappearing so swiftly that much critical scientific information may already have been lost. Josephat and his fellow tribe members are worried. For them, melting glaciers are an economic threat.

“The snow and ice you are seeing are a tourist attraction,” said our cook, Donald Philly, over dinner one evening. “Clients come to see the snow and we get employment opportunities.” And when the snow is gone, he added, jobs will vanish. Standing nearby, Josephat said the Bakonjo would simply have to adapt — like the chameleons. “We are going to train our guides on rock climbing,” he said.

Precipitation patterns are also changing.

“Years ago, it would rain cats and dogs, from morning to evening, for seven days straight,” Josephat said. “Rivers were flooded. There would be a lot of fog, even down to the lower elevations. These days, that is not happening.”

Such changes, he believes, are contributing to a rise in mortality he has observed among the iconic giant lobelia. “The trees are withering at a rapid speed,” Josephat said. And as they die, he said, other plant and moss species are likely to suffer, too.

Ultimately, Josephat said, he fears climate change may set off a domino effect of forest decline that could one day diminish the range’s ability to soak up and store water, putting downstream villages at risk. The Bakonjo guides take the threat so seriously they have recently formed an organization to plant more trees around the base of the range, both to battle deforestation and increase carbon sequestration.

The Rwenzori Mountains are located in western Uganda, not far from the border of the Democratic Republic of the Congo.

The changes here also pose a challenge to climate scientists. Inside the Rwenzori’s receding glaciers are specks of pollen and dust that could unlock secrets about past climatic upheavals. But there’s a problem: no one has managed to access to the glaciers amid the daunting terrain. Seven years ago, Lonnie Thompson — the well-known U.S. scientist who has sampled high-altitude tropical glaciers worldwide and uncovered evidence of dramatic pre-Incan climate swings from ice core samples high in the Andes — was scheduled to work in the Rwenzori. But he had to cancel his trip because of security concerns in East Africa at the start of the Iraq war.

Time is running short.

“The whole atmosphere is warming in the tropics,” Thompson told *Science News*. “But the greatest risk is taking place at the highest elevations — on the order of 0.3 C (0.5 F) per decade.”

Ice in the Rwenzori is disappearing so swiftly that much critical information may have already been lost. “There is a lot of concern about whether there is even a viable [ice] core,” said Richard Taylor, a hydrologist at University College in London. Without such solid evidence, he added, scientists can’t even determine the age of the range’s glacial cover.

Taylor is the lead author of a 2006 study in *Geophysical Research Letters* that links the melting glaciers in the Rwenzori more directly to rising temperatures than the shrinking snowcap on 19,340-foot Mount Kilimanjaro. “The ice fields on Kilimanjaro are substantially higher” than the Rwenzori and therefore less prone to melting, Taylor told me by phone from London. “The glaciers that still exist in the Rwenzori reside somewhere between 4,800 meters and 5,050 meters” — 15,750 to 16,570 feet — making them “more vulnerable to fluctuations in temperature.”

By contrast, the shrinking snowcap on Kilimanjaro is likely due to decreasing humidity, not rising temperatures, he said, adding, “The Rwenzori mountains are the icon of global warming — not Kilimanjaro.”

But as I climb higher into the Rwenzori, it’s clear that getting close to even one African glacier is going to be more of an ordeal than I expected. And it’s not just the steep trails and thin air that conspire to halt my progress. It’s the mud. Never have I seen mud in such quantity or variety. Sludge-like in places, syrupy in others, it filled two enormous high-altitude bogs. In spots, a boardwalk helped. But where it ended, chest waders would have come in handy, too.

Finally, after scrambling up a nearly vertical wall of rock and moss, I stepped onto a ledge at 14,400 feet, where a century ago Abruzzi encountered a nine-story-high wall of ice known as the Speke glacier, named for the British explorer — John Hanning Speke — who discovered the source of the Nile at Lake Victoria.

In Abruzzi’s day, the glacier snaked down the side of 16,080-foot Mount Speke for 1,600 feet before ending abruptly near the rocky cliff face where he — and now I — stood. A century ago, the glacier covered about 540 acres, and de Filippi recounts listening to the roar of gigantic columns of ice crashing into the valley below.

In the thickening mist, I searched for ice but saw none. Instead, I looked out on the ghost of a glacier, a rubble of smooth slate-gray stone sloping up from a small green lake, formed by glacial melt. Here and there, giant groundsels were starting to grow between rocks that not long ago were entombed in ice.

Then the sky opened up to reveal a narrow band of silver and white more than 1,000 feet up the mountain — the last receding remnant of the Speke glacier, which has now shrunk to just a few dozen acres.

A few seconds later, the clouds zippered back up and it was gone.



The Speke Glacier, right, and the Vittorio Emanuele Glacier, left, are the two remaining glaciers atop Mount Speke. Much of the mountaintop was covered in ice a century ago.



The view west across the Stanley Plateau to the Democratic Republic of the Congo. The glacier atop Mount Stanley is the largest ice mass remaining in the Rwenzori Mountains, and one of the few glaciers **left in Africa**.



Mountain guide Baluku Josephat on the glacier atop the Stanley Plateau.



Mountaineering guide Baluku Josephat stands near the former terminus of the Speke Glacier, which once snaked down the side of Mount Speke for 1,600 feet.



A glimpse of 15,889-foot Mount Baker, where ice loss also has been extensive. Patches of the range's giant groundsel forest are visible in the foreground.



The Rwenzori three-horned chameleon, traditionally found at lower elevations, is now moving higher as the mountain range warms. Guide Baluku Josephat was startled to find a chameleon around 11,000 feet in 2008, noting, “chameleons are supposed to be at lower elevations. Now they are moving up and up.”



Bakonjo porters take a break in the fog above Lower Bigo Bog at around 12,000 feet. The Rwenzoris are draped in fog and clouds much of the year.



Baluku Josephat helps the author's daughter, Kristin Knudson — a Georgetown University student — navigate a muddy stretch near Lake Bujuku at 13,000 feet in the Rwenzori Mountains.



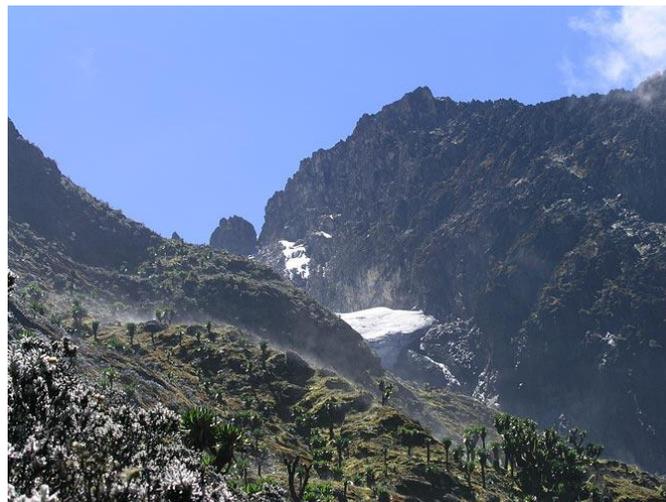
A rare break in the clouds reveals the northern face of Mount Stanley, which, at 16,763 feet, is the highest peak in the Rwenzori Mountains. Giant groundsel trees are in the foreground. The photo was taken near the border of Uganda and the Democratic Republic of Congo.



The site of the former terminus of the Speke Glacier, at 14,440 feet. According to Henry Omasston's *Guide to the Rwenzori — Mountains of the Moon*, the Speke glacier ended at this spot in an ice cliff 30 meters high as recently as the 1950s. "Since then, the glacier has retreated about 600 meters and greatly thinned, leaving this pool in front of it," Omasstan reported in his guidebook, published in 1972.



A Rwenzori turaco, perhaps the most striking of many colorful birds species found in the mountain range.



The glacier atop 16,080-foot Mount Speke in Uganda's Rwenzori Range covered roughly 540 acres a century ago. Today, after decades of warming, only a few dozen acres of the glacier remain.



### **Day 1 Nyabitaba Hut (2650m).**

Early in the morning, after having a cup of coffee, drive to Nyakalengija trailhead (1600m). Meet porters and guides and begin hiking up to Nyabitaba hut. Walk through the matooke plantations on the side of the steep foothills, past the local Bakonjo homesteads. Continue with the trail along the Mubuku River, through landslides. After crossing the Mahoma River, climb steeply through bracken fern slopes and Podocarpus forest to Nyabitaba Hut. Dinner and Overnight at Nyabitaba Hut.

### **Day2 John Matte Hut (3350m)**

From Nyabitaba follow the trail that drops down through the forest to the Kurt Shafer Bridge, just below the confluence of the Mubuku and Bujuku rivers. Passing through the bamboo forest, traverse through a long and exhausting stretch of slippery moss-covered rock. From the Nyamileju rock shelter, Mount Stanley and Mount Speke can be seen before passing into the zone of the giant heather, lobelia and groundsel. Finally reach John Matte Hut after passing through the tiring bog, for Dinner and Overnight at the Hut.

### **Day 3 Bujuku Hut (3977m)**

From John Matte Hut the trail drops down to cross the Bujuku River and enters Lower Bigo Bog, the home of giant lobelias. Jumping from tussock to tussock, the bog is finally crossed but rarely without the feet sampling some of the freezing ooze below. The Upper Bigo bog gives way to Bujuku Lake, with views of Mt Baker to the South and Mt Stanley to the West. Bujuku Hut, well located in the shadow of Mount Baker and Mount Speke, is set in a narrow valley below Stuhlmann Pass. Dinner and overnight at Bujukuhut.

### **Day 4 Elena Hut (4541m).**

Leaving Bujuku, the trail takes you through more bog, while climbing the steep slopes west of the lake and through the magical Groundsel Gully as it ascends to Scott-Elliot Pass at 4372m. At the head of the gully a metal ladder takes you over a steep section after which the trail is divided into two. The trail on your right leads up to Elena Hut and Mount Stanley on a steep trail over large boulders, while the trail on your left leads to Scott-Elliot Pass and down to Kitandara Lakes the trail on the left leads those who are not climbing Margherita Peak to Kitandara Hut. Those climbing the peak will have their Dinner and Overnight at the Coolly and Icy Elena Hut

### **Day5 Margherita peak**

For those aiming at reaching Margherita peak (5109m), continue to the base of the Stanley Glacier. To reach the summit of Margherita, the climb takes about 5-7 hours depending on the weather conditions and the pace of climbing this mountain. This tough walk takes you over three glaciers, slippery rock, ice and very exposed areas which are open on many sides. Note that this climb is for only physically fit and technical climbers. Climbing on to the glaciers, cross the Stanley Plateau and proceed with the ascent. Acclimatized to fog, altitude sickness and coolly weather, scramble up to the summit of Margherita the highest peak of the Rwenzoris. Given the high altitude and the tough conditions even if you do not reach the peak, don't get disappointed. Prepare for your return through the Scott-Elliot pass, where there are spectacular views back to Bujuku Lake and Mount Speke, up to Mount Stanley and down to the Kitandara Lakes. After the trail that passes you through an alpine zone of sparse vegetation and rough boulders, descend past the Kitandara Lakes for dinner and overnight at the Kitandara

### **Day 6 Guy Yeoman Hut (3260m)**

From Kitandara, take on the trail that ascends steeply up the headwall, spreading out from the base of Mount Baker and continuing along the south side of the mountain to Fresh field Pass. At this point you can view into the Congo to the west and Mount Stanley to the north. From the pass, take on the long trail passing the rock shelter at Bujongolo, the base camp for the historic expedition by the Duke of Abruzzi in 1906. Over night at Guy yeoman

### **Day7 Nyabitaba (2650m)**

Take on the path down to Nyabitaba hut. The path can be slippery and muddy and there fore requires careful balancing over the vertical mud or steep rock. Remember this is part of the adventure with in this mountain. Overnight at Nyabitaba Hut, here depending on your fitness you can continue to the starting point.