

LEAFLET CAVING TRACK

UNIVERSITY OF CALIFORNIA HIKING CLUB

APRIL, 1963

CAVING IN THE CARIBBEAN

by our Jamaican Correspondent: Tom Aley

If you like guano, mud, and caves in that order, then Jamaica is the place for you. It's a land of big caves, long ladder drops, and enough virgin passages to last a lifetime.

The natives are afraid of the caves and the duppies (spirits) who live in them. To get around this problem I use 6-12 for both the duppies and the swarms of mosquitos. It works best on the duppies. Because of the local fear of caves most of the caves have no vandalism at all. In fact, most of the caves have never been entered beyond the twilight zone.

When I first came to the island I turned back whenever I came to large numbers of bats. This was partly because I was worried about histoplasmosis. Also I didn't have an umbrella. Then I went to Oxford Cave.

Oxford Cave is one of the better known caves on the island. With the exception of one stoopway near the entrance, you can walk for a mile. I had gone in about $\frac{1}{4}$ mile when I heard a big waterfall. I rounded a corner and was in a passage about 50 feet high and 75 feet wide which extended almost to the end of the cave. Rather than a waterfall I had heard the bats flying around. I thought about retreating. After all, when you are solo caving you can quit anytime and people don't know about it. Not being able to talk myself into going back, I pushed on to the end of the cave through a drizzle of bat guano.

Then there was Tom's Pit. The party consisted of a rummy Negro guide, the president of the University of the West Indies Caving Club, one other club member, a campus beauty queen, and me.

The guide took us to a hole that went down about 80 feet. The shaft was about 30 feet in diameter. I was the only one who would go close to take a look at it. I could see a lead at the bottom, so I went back to the car to get my rope and ladder.

The following is a dialogue at the top of the drop.

"On belay?" I asked "You do know how to belay, don't you?"

"No," replies the president of the Caving Club.

"Oh, don't go down. It's hell on earth down there. Ah'd never brought you if Ah'd known you was goin' down." screamed the guide as he stumbled around through

the banana patch.

"Please sit down," says the beauty queen.

Dialogue at 10 feet:

"Quit throwing rocks on me!"

"Which hand don't you let go with?"

"It goes below hell! Come back."

Finally I reached the bottom. The president of the Caving Club wouldn't come down after tying in and taking a look at the drop. He did the next best thing-- he knocked a twenty-pound rock loose. The solo exploration at the bottom was the safest thing I did that day.

I went to the Dominican Republic for five days to recover from various Jamaica wounds. Although I found some limestone I couldn't find any caves. I did find that Mexican Spanish and Dominican Spanish might just as well be two different languages.

I returned to Jamaica a week and a half ago. I'm now waiting for the monsoons to stop so I can go back to work in some virgin stream passages that an English caver and I found three weeks ago. I'm trying to map the 2½ miles of passage. It's hard work holding both ends of the tape.

Tom Aley

THE FROZEN HELL OF THE GLEN CANYON

by Barbara Tihen

The Glen Canyon again? Certainly, and why not! The Hiking Club took their fourth trip down the River at semester break. It was a 3-men, 1-woman party which departed from Berkeley early the morning of January 23.

The 1½ day trip to Escalante was uneventful except for running out of gas 3 times. The pack down Hole-in-the-Rock is "interesting" carrying a kayak with ice on the trail.

As we prepared for the plane ride from Page the pilot jokingly asked us where our axes were for breaking River ice. We asked him if he was serious and the answer was "No, just kidding; the River might have a little ice but never so thick you can't break it with your boat paddle." So with the greatest of confidence for a leisurely trip, we boarded the plane and flew back to Hole-in-the-Rock.

With this same confidence we put into the River the next morning--3 rafts and a kayak. We went a roaring 100 feet and came to a smashing halt against a two-foot thick layer of ice. The procedure followed for the next four days was pulling boats across the ice. The crystal formations were very beautiful; we felt like bulls in a china shop walking through them. The sound of the crystals breaking under foot was as that of fine crystal being broken. On the second day trees were formed into runners for sleds to make pulling easier on both man and boat. Since most had wet suits, the incidences of being dumped from your raft or just falling through the ice were humorous rather than disastrous. Whenever a patch of open H₂O appeared we eagerly launched and happily floated for a few feet. The take-out points were not always too desirable however. As official scout I got to see a few more canyons than the others. Due to an inexperienced and out-of-condition crew we made only three miles on some days.

At the San Juan the ice was melted so the next morning was spent patching large holes in all crafts. And with new hopes, we drifted on, stopping at Music Temple which had a gorgeous circular frozen waterfall...only to run into more ice around the corner.

The weather being fairly warm and getting warmer all the time, the ice was getting patchy and more undependable all the time. However, after spending 3 hours crawling through brush, making negative progress, the ice was still preferred for down-river progress. The only bad weather was two days of sporadic rain and snow

and the only really cold night was the one spent on a frozen sandbar in mid-stream (that's where we were when the sun set; that's where we slept.) The rafts were used as wind breaks on several nights.

As the ice melted and broke up, large (seventy-five foot) chunks came crashing by, giving us a helpless feeling. With the aid of these slabs, however we managed to ride through the last ice block and spend the last two days of our nine day trip on good fluid water.

Indian ruins of both Navajo and Moky were observed and a few canyons were glanced at. The folk dancing on the ice, the laughs at falling through the ice 20 times within 20 feet, the beautiful canyons, sunsets, frozen waterfalls and all, added to the cold mornings and clammy wet suits, late starts and hard work, made it an interesting, unforgettable and enjoyable (believe it or not) trip.

THE CLEN CANYON, JUNE 1962

(Conclusion)

by Sam Greene

While Phil Pennington and Roger Ulrich went a short distance up Oak Creek Canyon, the rest of the group waited at the entrance, where some people from Denver, Colorado were drying out equipment, after having turned over in the same hole that Dave and Barbara found. This had made them afraid of some relatively harmless-looking rapids below. But the Hiking Club ran them in its usual transcendental style and that afternoon explored Twilight Canyon. Its name is appropriate, for the canyon writhes and twists through 1500 feet of Navaho sandstone, which constitutes one of the deepest exposures of the strata on the river. The walls grow together leaving a thin slice of blue sky above. The sun does not often fall on the canyon floor. There is a desolation like the moon, the bottom of the canyon is a lifeless collection of jumbled stone, hardly a lizard lives in the immemorial gloom; there are no plants or birds. Light reaching the bottom is mostly reflected from the cliffs rushing high above and a faint dark red glow suffuses the tumbled and unmoving stone.

The group moved in the still twilight like creatures through the ocean depths, slowly floating onward into dying dusk, in a stupendous silence and strange light, following the torturous entrenchments of the cut through a desert laid down past thirty million years.

Returning, they found at the entrance to the canyon, petroglyphs hacked into the rock by Moki Indians who vanished from these canyons long ago.

The moon came late that night and burned high upon the river, flashing as it leaped from rocks and running with a low thunder against the opposite wall of sheer stone.

But with morning the sun came over the red walls and fire fell into the canyon. Everyone leaped out of burning sleeping bags and shoved off into the swirling river. That day they saw Rainbow Bridge, five miles up Aztec Canyon. Phil and Roger left early and when the other arrived at the entrance to Aztec the canyons were on fire. The sand threw up the rays; the walls threw them down; they moved panting through an oven formed by glowing walls.

The heat increased as the sun rose, and the sand burned as it entered tennis shoes, as most of the latter were full of holes. They hunted shade where they could find it but even in shade they gasped from the heat. After three miles the canyon forked; there was no longer a stream but a series of pot-holes covered with green scum. They drank from these, pushing the scum aside. Then the pot-holes dried up. Farther on a spring was found, where water dripped slowly from a gigantic cantilevered boulder. The water was cool, velvety and rich.

They saw a red arch, silhouetted against a burning blue sky. It increased in size until they stood before a gigantic wing of red stone curved perfectly against

blue sky. It rose three hundred feet above them and three hundred feet across, arched over the stream bed of Aztec Creek, cut by thirty million years of running water.

Roger and Phil, together with some tourists, had already arrived and were upon the bridge, where they were small black sticks thrust against the sky. As Roger and Phil got the tourists down, Sy, Ed, Barbara and Sam started up. The sheer places in the climb had Moki steps; it was necessary to climb up the canyon wall below the bridge, then ascend above it and climb down a final set of Moki steps onto the bridge. The latter set of steps were somewhat hairy, as one could theoretically fall 300 feet, since no rope was being used. However the chopped out steps were large and were made without difficulty.

When Barb, Sy and Sam were on the bridge, Ed Leeper appeared at the top of the Moki steps with the rope which he had carried all the way up Aztec, slung around his shoulder. The rope was heavy and hot on that five mile trek and so Ed was determined to use it. He had the satisfaction of rappelling down.

From the top of the bridge the sandstone stretched out in a stupendous arch to East and West. To the East there were triple shell-like amphitheaters each several hundred feet across, carved out of the canyon wall. From the edge they could see Phil far beneath, trying hard to use up another of the 20 rolls of 36 exposure Kodachrome with which he had thoughtfully supplied himself before the start of the Glen Canyon trip.

At this point there was a clamor below from Roger Ulrich. Those on the bridge got the idea Roger was trying to pioneer a new route to the top up the west buttress, and while Ed and Barb descended to as low a point as possible, Sam climbed back up and walked around to view the situation. He beheld Roger about six feet off the ground looking up at 300 feet of sheer stone. A lack of bolts and rock drills, not to say sixth class slings, ended this valiant attempt.

The group reassembled below and jumped into a cool and shallow pool under a ledge of the canyon wall, and a few water fights later they left for the river which they reached just at dusk.

As usual, Phil got to the river before anyone else and shoved off immediately, together with Christy and Dave, who had not gone up the canyon, eschewing the tourist-infested but otherwise fine camping spot at the mouth of Aztec for an interesting spot on the right bank a short distance downriver. This spot, seen by the others as they swept around the bend, consisted of a ledge ten feet above the water, large enough to sleep three midgets in an emergency. At its foot the river ran deep and at full speed, making it difficult to land; just below were large sand waves extending across most of the river and sending an ominous roar through the growing darkness. After a considerable number of choice words had been used to describe their opinion of the chosen camping spot, the rest moved downriver a few yards, landed in deep, rushing water and beat their way ashore through tamarisk to a small ribbon of sand.

By this point in the trip many of the group were not completely healthy, most had diarrhoea, probably as a result of drinking the mud-filled river water, and one or two were genuinely unhappy. Yet many of the greatest wonders of the Glen Canyon lay below them.

The next morning, while Phil swam through the thick brush and went a short way up the canyon at which they were camped (which later, they found, had the name Spring Pool) the rest pushed off downriver, first running the sand waves which had roared before them all night.

Below Spring Pool the Colorado rushed in a series of whirlpools and cross-currents, and the canyon entrances were narrow slits, sometimes with a whirlpool before them, difficult to enter. In this way Barbara and Sam passed Driftwood, which was found in September to be the most spectacular of all the side canyons. Instead Barb and Sam crossed to the left bank and entered a high narrow slit in the wall.

They paddled up a long backwater, to find Phil and Christy tying up their rafts to rocks at the end of it! As there was no place there for kayaks, Barb and Sam had to land fifty feet away and after putting their cameras in water-tight bags, swam through the cold water.

They went around several bends, swimming a few yards occasionally, until they saw the familiar red bathing suit of Christy. Beyond was a long swimming pool which Phil had just entered; it bent to the left so that the end was not visible. As they sat there for a moment there was a great splashing, after which they heard Phil shout, "Are you people coming?" They said they were and that he need not wait; later Barbara and Sam were rather astounded to learn Phil had been near drowning.

They went along a trickling stream, joining a chain of dark and cold emerald pools and the walls above glowed at noon while on the floor the sun fell in arcs of molten splendor. The canyon became narrow; the walls were high and a red dusk shown in the depths of the alcoves running hundreds of feet back into the stone. Bands of violet fell straight down the twisting overhangs while above a hot sky ran in jagged leaps past the towering rim.

At the next long swimming hole Phil turned back, and Barbara and Sam climbed and swam on, over foot-high waterfalls reverberating like cataracts in those immense chambers, over chockstones and finally by horizontal stemming, over an eight foot waterfall. They saw the canyon widen and trees flashing in the sun. They sat on the hot stone, shivering from the cold water, and there was a coyote track, the first track seen that day.

They returned, into a canyon changed by the falling sun, into deathly cold pools, into shadowy and sinister chambers suffused with a menacing and uneasy twilight, while the great red walls were now the dark sides of a tomb, a Jurassic stone womb where only stillborn were. So in the late afternoon they left Cathedral Canyon and went downriver to a sandbar where a great log was tossed by some previous flood and where the sun fell slowly into buttes made luminous silver, shadowed by the coming dark.

In the morning people were again strung out all over the river, Barbara and Sam went up Catfish Canyon, entering through a narrow gap in a sandbar on the left bank. They followed Phil's tennis shoes and Christy's long, slender barefoot track along a thin and exhausted stream, to an alcove which was the largest they had ever seen, succeeded by another of like size. On the ceilings of these alcoves the water had exposed particularly fine examples of crossbedding in the Jurassic sand dunes. The canyon became narrow, finally, as the sandy floor grew watery and changed into quicksand. Barbara nearly sank out of sight before Sam could get a picture of her standing in a quicksand pool. The walls closed together in jagged overhangs so that they walked, stooping at times, through a dark red tunnel where the sun fell in pools of fire on the clear green water. They had seen no tracks for a long time when they came to a lengthy swimming stretch, beyond which the canyon seemed to open, and they returned. On the way back they met Ed Leeper trotting around a bend hunting a warm pool where he could float while eating a can of Mandarin oranges.

Late in the afternoon they paddled up the mile-long backwater of Last Chance Creek, where they expected to meet the others. But no one came that night, while the falling stars flashed in a vast and lonely desert sky and constellations wheeled past shadowy buttes and walls. In the hills far off, lost in the desolation of stone, a coyote hunted the night wind, singing in the night of no moon, in the Jurassic stillness of naked rock, waiting for the redness of the Cenozoic dawn.

In the morning Ed Leeper came rowing up the backwater, and stepped into six inches of slime and went a short way up Last Chance and came back, looking mournful, for Last Chance was not beautiful.

Then for the last time they pushed off into the river, and were spun past mile-long, glowing walls, where the echoes wheeled, and rounded the final bend as

Phil came dashing out of his last canyon, rowing like a maniac to catch up for photographs. Ahead they saw the cars at Kane Creek; they landed on a rocky ledge and the trip was over.

Behind them the green-brown flood rushed on, under buttes and crags rearing thousands of feet above, running as it had run for thirty million years, carving a jewel from jurassic stone.

Soon the Glen Canyon will lie under hundreds of feet of water. But the river, and the Glen Canyon, will return, and will exist when man is remembered only as a hiatus in the history of a star.

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Anyone interested in going on any trip this summer should sign up on the sheet in Room C or contact Helen McGinnes. A summer schedule will be organized if there are enough trips suggested with people willing to lead them.

SUPPLEMENTARY MEMBERSHIP LIST SPRING 1963

Adams, Ray	2353 Prospect	Th 5-9210
Barr, Barbara	1412A Spruce	Th 1-4848
Degner, Dennis	2799 Benvenuto	Th 5-8154
Faist, John & Suzanne	2214 Ashby	Th 1-1377
Gordon, Jim	2425 Warren	Th 5-9275
Green, Harlan	2226 Stuart	Th 5-2768
Hammel, Trudi	374 International House	Th 8-6600
Knoebel, Art	2122 Acton	Th 3-7376
Kunasz, Paul	2613 Hillegass	Th 5-9019
Kuszynski, John	2140 Roosevelt, #101	Th 1-2272
Mc Farland, Judy	2711 Woolsey	Ol 8-1893
Maxwell, Joe	1130 Spruce	La 4-5762
Nelson, Dick	2682 Parker	Th 3-9069
Papazian, Domenica	1638 Hearst	Th 5-1964
Pennington, Phil	2645 Shasta Road	Th 5-7406
Reed, Marshall	2650 Haste	Th 1-7622
Rhodes, Dave	1733 Bancroft Way	
Vald, Wilda	2430 Piedmont	Th 5-9071
Wainwright, Don	656 Woodmont	La 4-3131
Weamer, Dave	15 Windsor Ave.	La 5-9503
Weston, Art	625 52nd St., Oakland	Ol 2-3874
Westbury, Paula	2430 Piedmont	Th 5-9071
Walley, Roc	2079 Delaware, Apt. 23	

As nearly as I can gather from some half-hearted historical research, the "new piton technique" (i.e., their use in climbing) was introduced in Europe around 1930. For a decade or more "the treacherous security of mechanized climbing" was resisted by many climbers here and in Europe. It seemed at first unsporting to take less risk than earlier climbers; and red-blooded sorts continued to kill themselves with the old accustomed frequency.

But in the thirties and forties, modern belaying techniques were developed (largely by some Bay Area members of the Sierra Club--see the Sierra Club book, "Belaying the Leader"). The Second World War and the mountain troops introduced nylon rope, good carabiners, and some new pitons. And by the late forties it had become hard to find a climber who opposed the use of pitons. (except perhaps in England).

The earliest pitons were hand forged "horizontal" or "vertical" pitons, roughly like those now made by Holubar or CCB.

The mountain troops introduced the wafer piton, which is essentially a vertical with a ring, and was probably designed because there are many vertical cracks which are in such tight corners that one could not clip carabiners into vertical pitons placed there.

But a more important design coming out of the war was the ring angle piton. The rings on the two army models make them particularly versatile, but the main innovation of the angle was that it was designed for a wide crack that would not previously have been thought of as a piton crack.

After the war, the knife blade piton was introduced. Somewhat later an assortment of large angles ("bong-bongs" or "stove legs") were invented. Once again new sizes of cracks became piton cracks. In fact the range from a good sized jam-crack on down was fairly well covered, except that the newer sizes were often not available and there were some gaps.

Another effect of the war had been to make alloy steels readily available. The alloying metals (tungsten, molybdenum, chromium, etc.) make a steel which can be hardened to very high strengths. And certain alloys containing chromium and molybdenum show particularly good ductility (the opposite of brittleness) at high strengths. High carbon steels had wisely been avoided for piton making, because they are brittle if hardened. But the value of alloy steels for pitons began to be appreciated, and they were first used in some early knife blade pitons.

Proper design and material for a piton depend upon its use. In Europe and the eastern United States, pitons are often pounded in and left there. "Holding power" is then the main quality that is important, for in most circumstances a piton will pull out before it will break. And of course low cost is also desirable.

But western climbers developed a tradition of removing and reusing pitons. Durability became important.

The standard horizontal design had a weakness in its flattened eye which could be easily bent by pounding sideways. The army horizontals produced during the war probably had better lateral strength because the full cross-section of the blade was carried out toward the eye slightly more. But most horizontals manufactured since have been in the old style with its weak point where the eye joins the blade. Only Yvon Chouinard made a standard forged horizontal which did not have the eye section completely flattened laterally. And Chouinard was beginning the use of chromium-molybdenum steel (chromolly) in his horizontal pitons.

Later Chouinard came out with two excellent "durable" piton designs, a horizontal and an angle piton, both using 4130 chromolly steel. He saw that durability depended on lateral strength. He got lateral strength by

simply carrying the full blade cross section out past the eye. In his angle he used a U instead of a V section and did not flatten the eye—both contributing to lateral strength.

But equally important, his two new designs at least partially used sheet metal techniques of manufacturing rather than hand forging. U.S. labor costs make hand forging extremely expensive. With the recent death of Holubar's aged blacksmith, the standard hand-forged horizontals will now all come from Europe.

In the mean time (this was all several years ago) other climbers were experimenting with making various types of piton. Dick Long has kept it up with large angles, small knife-blades, and a "channel" piton. His channel uses the principle of carrying the blade out past the eye. His large angles, however, have a flattened and spot-welded eye, which may or may not help durability. Very large angles present a specially tough design problem, to which Chouinard had a fairly good answer in his riveted aluminum U design that he made for a while, but his recently introduced $1\frac{1}{2}$ " angle doesn't incorporate all the most desirable features of that design (the problem is apparently one of efficient manufacturing).

Gerry Cunningham (of Gerry Mountain Sports) entered the market with a number of chromolly piton designs that made good use of mass production sheet metal techniques, so that his pitons were economical. His designs were moderately well executed, but he made the mistake of getting a little extra durability by hardening his pitons to a very high degree. One of his pitons was broken in a fatal accident at Hunter's Hill. It is not obvious to me that a softer piton would not have quietly pulled out of the crack, leaving the climber just as dead. But a piton breaking is a rare thing, and the blame was fixed on the manufacturer.

In my opinion, the true strength of a piton is not the force required to pull or break it in half, but the force it will hold in a typical placement. An example of that principle is the case of the vertical piton: The original designers must have reasoned that the stresses would be most uniform for a piton in a vertical crack if the piton were of a flat design with the eye downward. The only catch is that a vertical piton is easily pulled out of a vertical crack; a solid placement might hold 1000 lbs or more, but many would hold only a few hundred. Gradually climbers have come to realize that a horizontal piton in a vertical crack will hold at least as much because the piton will twist and bite into the crack rather than sliding out. (There is also not the difficulty of clipping a carabiner into a vertical in a tight corner.) I would be surprised if any vertical piton in a vertical crack has ever in the history of climbing been broken in half by a fall, and so the manufacturers have probably slept soundly at night. But how many times has a vertical piton come out where a horizontal would have held? And in the few cases where the twist would have broken a horizontal, did the vertical stay in the crack? From the point of view of structural strength, the standard vertical is one of the best designs ever put forward; from the point of view of the climber it is one of the worst.

The holding power of a piton in the rock is partly the responsibility of the climber who put it there. Various principles for piton placement have been suggested. Those involving the moment of force on a blade in a vertical crack seem to me most important, and those intended to avoid straining the metal of the piton seem least important. I would add the principle of pounding the Hell out of a piton. The piton should be a little bigger than the crack, and then be pounded in anyhow. It is easier to demonstrate than describe the violence of pounding I have in mind. A heavy hammer is valuable; and a lightweight 12 oz. hammer is simply a dangerous piece of equipment.

The qualities of piton design that affect holding power are extremely elusive. Generally, angle pitons seem to hold better than solid blade pitons (the old army ring angle deserves the respect it has won). It has been argued that soft mild steel pitons hold better than hardened pitons, but I believe that at least in granite that difference can be more than offset by the violent pounding that a chromolly piton will withstand--provided the climber does in fact pound hard.

A rigid blade probably also contributes to holding power in many cases (a soft blade simply "flows" out of the crack under heavy loads). A given blade can be made rigid by hardening, but there will be a loss in internal strength, because the blade cannot bend and deform to relieve stress concentrations which will start a tear in the metal. If the blade has a large and well-designed cross section, the strength reduction will not matter. Nobody cares whether it would take 16,000 or 10,000 lbs. to break the blade of a Chouinard angle.

But in thinner blades the design problems become more delicate: and the degree of hardness must be a careful compromise between rigidity and strength. Chromolly helps the designer to have his cake and eat it too, because it has good ductility in the hardened state. But the compromise must still be made. Frugal climbers like the durability of a hard piton, and manufacturers feel the pressure to produce a durable piton. But especially since the furor over the Hunter's Hill accident, manufacturers are reluctant to run the risk of the unpopularity of an occasional broken piton, even though the harder piton might be a better piton in the important respects. Recall that a vertical piton pulling out would always be blamed on the climber, while a horizontal piton that held a higher load and finally twisted and broke would bring a condemnation of the designer.

In this somewhat tense atmosphere, I undertook to design and produce some thin bladed angle pitons. I started from Long's channel design and modified it for efficient fabrication with inexpensive hand operated sheet metal tools. I moved the eye forward so that one would not pound on the eye in placing the piton. And I redesigned the blade to a Z shaped cross section. One of the problems with thin angle blades (as Gerry's stubby angle or Long's channel) had been that a rip could start at both edges if the blade were loaded in the "wrong" direction. With the Z section loaded in either direction, a rip will start at the upper edge, but not at the other; and the blade, while ripped on only one side will hold together to very high forces. I have used relatively low hardness--partly because I value my popularity and because there is a crowd of jokers bending pitons over the sharp edge of a vise to see what will happen. Seriously, I hope that I have made the point adequately that the ubiquitous "vice test" is not the only gauge of piton quality.

To my way of thinking, these considerations of blade strength ought to be taken less seriously than they are. The real problem in the use of pitons is that the majority of placements used in actual climbing are too poor to hold the force required to break any blade. Designs are needed that will have good holding power under adverse conditions. And a complete variety of lengths and thicknesses should be on the market.

THE BEAR TRACK is published by the University of California Hiking Club, Room C, Eshelman Hall. Published whenever enough articles have accumulated to make an issue.

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