January 1981

Alaskan Caver, Volume 6, No. 1, January-February 1981

Richard A. Hall

THE ALASKAN CAVER

Volume 6 Number 1 January - February 1981

CALENDAR OF EVENTS

Winter	Glacier Caving at Byron Glacier some weekend or elsewhere as weather permits. Contact Jay Rockwell at 277-7150 if you are interested.
Winter	Rusty Rubeck may be interested in trying to snow machine in to Star Cave from McCarthy sometime this winter. If you are interested contact him at 694-3571.
February 19	Glacier Grotto Meeting. Meetings are held in room 312 Grant Hall, Alaska Pacific University at 7:30 pm. The program will be an NSS slide show on Caves of Oregon.
March 19	Glacier Grotto Meeting.
April 16	Glacier Grotto Meeting. The program will be an NSS slide show.
May 21	Glacier Grotto Meeting.
June 18	Glacier Grotto Meeting. The program will be an NSS slide show.
July 16	Glacier Grotto Meeting.
July 18-24	Eighth International Congress of Speleology in Bowling Green Kentucky. This is the first time that the International Congress has been held in the United States. There will be a week of sessions, meetings, and trips as well as pre-congress, post-congress and daily excursions to caves and karst features. For further information request the Second Circular from: Eighth International Congress of Speleology, The Secretariat, Department of Geography and Geology, Western Kentucky University, Bowling Green, Kentucky 42101. Fees range from $5 for a single day's sessions to $130 for full membership. An abbreviated NSS Convention will be held the weekend following the Congress (July 25-26).

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The cover picture of Bob Bastasz traversing to the entrance of Sweetwater Cave was taken by Jay Rockwell.

CHITISTONE VALLEY - NOTES FROM THE 1980 TRIP

by Bob Bastasz

Friday August 12:

After several weeks of planning by phone, Kathy Tonnessen and I arrived in Anchorage and were met by Rich Hall and Jay Rockwell to begin our nine day trip in the Wrangell-St. Elias National Monument (now a National Park). Our plan was to drive to Glenallen where a plane would fly us across the Wrangell Mountains to Chitistone Valley and pick us up a week later. We would camp in this limestone valley to search for and hopefully explore new caves.

We began the drive to Glennallen early that evening and stopped at the Sheep Mountain Lodge near Eureka for a late dinner of burnt hamburgers and fresh pie. Burping afterwards, we continued our drive, which was interrupted only by an occasional frost heave in the road that served to keep Jay awake at the wheel. We arrived shortly after midnight in Glenallen and went directly to a state campground to spend the remainder of a short night.

Saturday August 23:

In the morning the skies were clear and soon we found ourselves at the local airport where we waited about an hour for a pilot at the Ellis Air Taxi Service to show up. Someone more perceptive than us might have felt this to be a premonition, but we were excited at the prospect of flying near the Wrangells on such a fine day and we cheerfully helped stuff our gear into the small Cessna. Airloft into calm air, we flew close to the southern flanks of the Wrangells passing Mt. Drum (12,010'), Mt. Wrangell (14,163'), and Mt. Blackburn (16,390'). The resurgence of a large river draining the Kennicott Glacier was clearly visible as we neared McCarthy, the only settlement in the area. Shortly afterwards we landed at Dan Creek to look up a fellow reputed to have some firsthand knowledge of caves in the area. He wasn't there, but the claim site was at the entrance to an exciting valley having very high limestone cliffs. The residents at Dan Creek told us that a short distance up this valley a waterfall spouted from the cliffside. Due to the pilot's insistence that we leave quickly, this possible cave site was not checked. Only a short leg of the journey remained to our destination in Chitistone Valley. Along the way we caught sight of the waterfall from Star Cave, a familiar sight to Jay and Rich who had visited this area two years before.

Upon landing, the plane left immediately, leaving us alone in the valley. We decided to make our camp near the trailhead leading up to Star Cave that was established on the previous trip and we spent the rest of the day moving two loads of gear about four miles to the site. Early that evening we set up camp beside the creek cascading down from Star Cave nearly 1000 feet above us.

Sunday - August 24:

On our first full day in Chitistone we visited the entrance to Star Cave, which appeared to us to be unreachable without specialized equipment, and searched out a route to nearby Bucklegrind Cave. By following a rock chute to a ledge above the cliffside opening to Bucklegrind, we could walk a good distance in each direction over the tundra and scree of the ledge. We found that descending into Bucklegrind would be possible only if ropes were used so we moved on west and

descended a long scree slope just west of Chitistone Junction Cave. Judging from the plentiful droppings, this ledge must be a popular trail for Dall Sheep. The fine weather made sightseeing as important an activity as searching for caves.

Monday - August 25:

Setting out from camp in the morning we brought along ropes to aid us in getting into Bucklegrind. Jay stayed on the main tundra slope to direct us while the rest of us went to the upper ledge directlyabove the cave entrance. I managed to get near the top of the cliff face, but the unstable nature of the ledge and the lack of a convenient tie off point was enough to dissuade me from attempting to enter Bucklegrind Cave.

Meanwhile, Rich went hiking to the west of Chitistone Junction Cave and found a promising entrance in the cliff west of the long scree slope. Water was trickling from it and formed a little shower in dropping to a splash pool in the gravel. When we joined him, I climbed up a scree pile left of the entrance and onto a ledge slightly above the four foot oval opening. It appeared possible to reach the entrance from this point, but not without the comfort of a belay;. We decided to return to this spot the next day and try this.

Continuing our hike along the bottom of the cliff in search of more entrances, we spotted several but none were easily accessible. One particularly intriguing hole about 30 feet up the cliff face seemed to be a walking height solution conduit.

Tuesday - August 26:

The beauty of the valley lured us away from the limestone cliffs and we began the day by hiking down to the Chitistone River. Ostensibly we did this to gain a better overall picture of the limestone in the area. The Chitistone was brown-gray with glacial silt, fast flowing, and often braided itself into complex channels through its mile wide graded bed. Walking in the gravel was fast and easy, so we headed for a distant stand of isolated birch trees we called Snake Island. Just before reaching this "island" we spotted some rather fresh bear tracks. On the island itself we found very fresh bear droppings. I felt somewhat apprehensive when we stopped for lunch and I sliced up a salami.

In the afternoon we climbed up a forested slope from the river valley to the cave entrance Rich had discovered yesterday. Once there, we fixed a rope and on belay I reached the entrance. Looking inside, to my delight, the twilight extended straight into the mountain. A quick check with a flashlight revealed a semi-circular passageway with a floor of six to eight inch cobbles and intermittant breakdown. The ceiling height was approximately three to four feet at midpoint. Some 30 feet from the entrance the low passage curved gradually to the left and extended in the same fashion for a far as my flashlight beam projected. Hurrying back to the entrance I described the passage and we immediately decided to return again with proper caving equipment. I fixed the rope inside the entrance, rappelled out, and we headed back to camp in a jubilant mood, for we had found a new cave in Chitistone Valley. That night after dinner Jay suggested the cave be named "Sweetwater" since we had filled our water bottles with water dripping from the entrance.

Wednesday - August 27:

Due to a late breakfast and too many snacks at berry patches along

the tundra slope to the cave, it was afternoon by the time we arrived at Sweetwater. An hour or so later we all had negotiated the entrance climb and were assembled there like bats in a stovepipe. Jay drilled a bolt hole for anchoring the rope while Rich led a tape and compass survey of the cave. The cave raised our hopes as it headed deep into the mountain but dashed them in a terminal breakdown room about 300 feet from the entrance. We rappelled out of the cave somewhat disappointed but nevertheless satisfied at having been the first to visit this solution cave. It was late when we returned to camp and the rain that began in the evening and threatened to confine us to our tents was not unwelcome after a long day.

Thursday - August 28:

We awoke to rain and spent the entire morning in our tents. Shortly after noon the sun broke through the clouds and we took a walk to the river for picture taking and exercise. Near the river we saw more bear prints and knew they had to be fresh. The retreating clouds provided the best setting yet for photographing the valley and surrounding mountains. We visited the spot where Star Cave Creek enters the river basin in a sheltered cascade 50 feet high before returning to camp. At dinner Rich commented that our food bags were finally becoming light enough to make hoisting them up a tree for storage an easy task.

Friday - August 29:

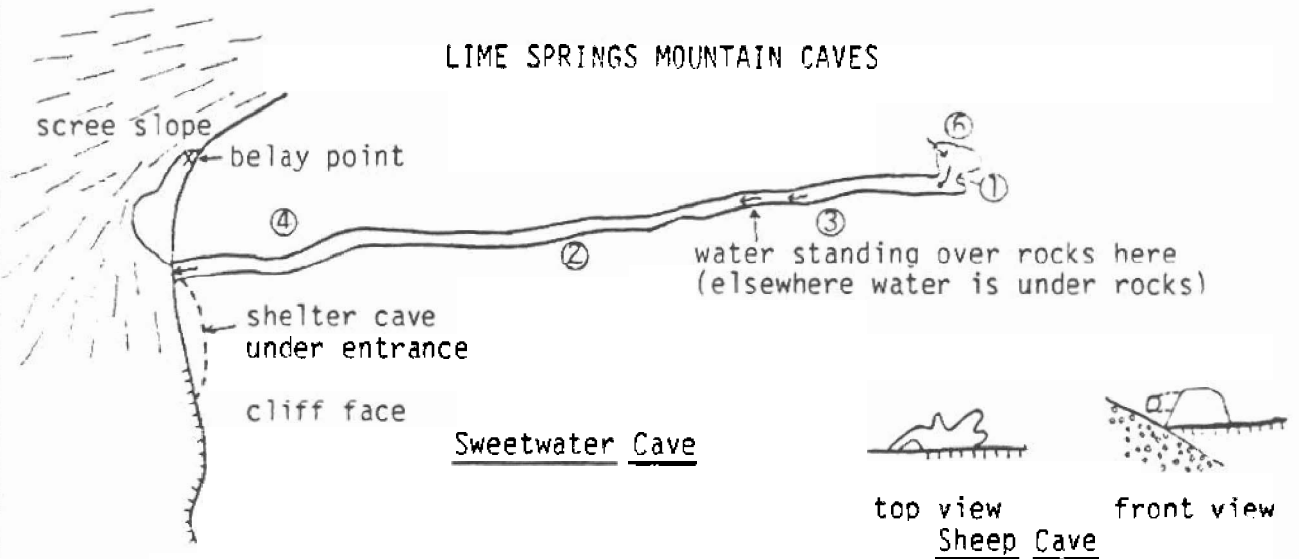
Today was devoted to exploring the springs of Lime Springs Creek which we had crossed on our way over from the airstrip. To reach Lime Springs Creek, we went up to Star Cave and then along the tundra gaining elevation until we reached a divide providing access to the creek drainage. At the divide I found it possible to continue a good distance upward in a southerly direction. When I finally turned back I could see directly up a broad, traversible slope that appeared to lead to a prominent saddle at 5500 feet elevation. The view from the upper saddle must be magnificant, but to find out whether or not one can reach it must await a future trip.

Dropping down into the drainage from the divide we followed the creek to its source at Lime Springs. Three separate springs issue from scree piles about 30 feet down from the contact of the scree with the surrounding limestone cliffs. Considering the location of these springs and the substantial volume of water pouring forth (probably more than 5 cfs) there is likely to be a considerable subterranean drainage system feeding them. No entrances were found at the springs so removing an immense amount of scree at the cliff face seemed the only way to open a passage. We returned to camp by following the creek to its mouth at the Chitistone River, talking along the way about dynamite. A quarter mile before its end, the creek forms a narrow canyon with 150 feet walls and a waterfall, which made detouring above the canyon necessary.

Saturday - August 30:

We began the day by carrying one load of gear apiece from our camp to the landing strip in preparation for our departure the next day. Along the way we checked out a possible cave we had noticed and prenamed Kathy's Cave about one half mile from the airstrip. A stiff hike halfway up a thickly forested hill brought us to the entrance, which turned out to be a crevice in the greenstone roofed by rocks and trees.

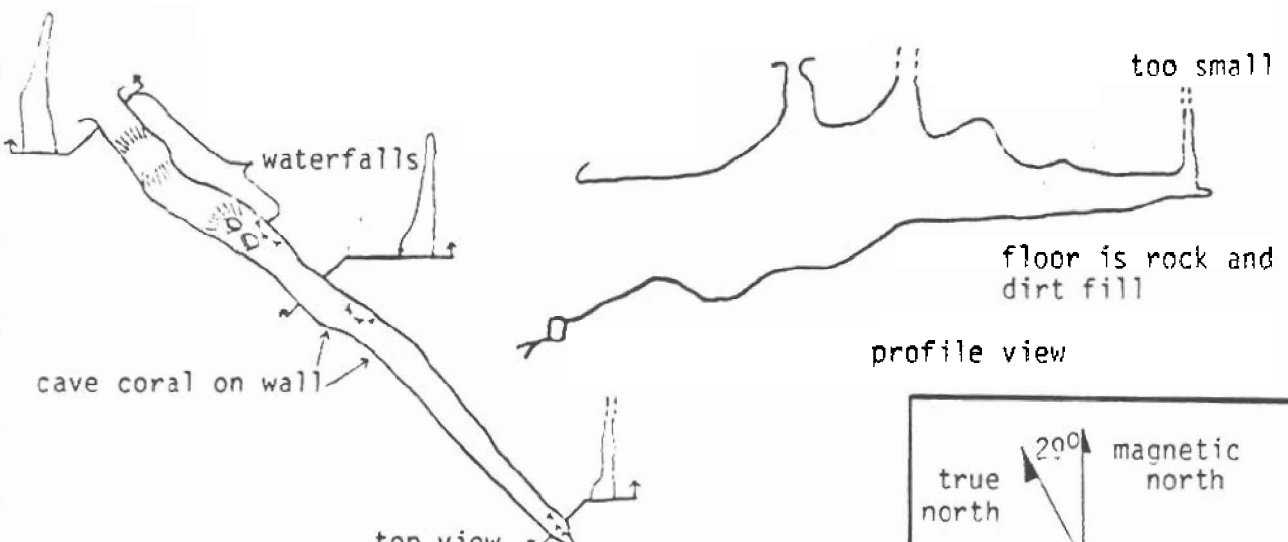
LIME SPRINGS MOUNTAIN CAVES



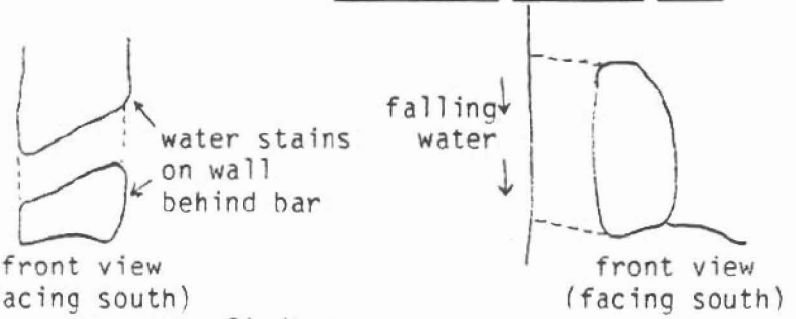
Sweetwater Cave

top view front view

Sheep Cave

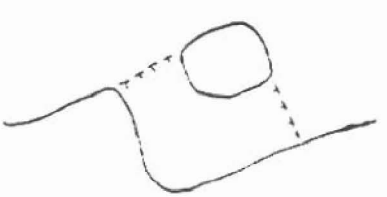


Chitistone Junction Cave



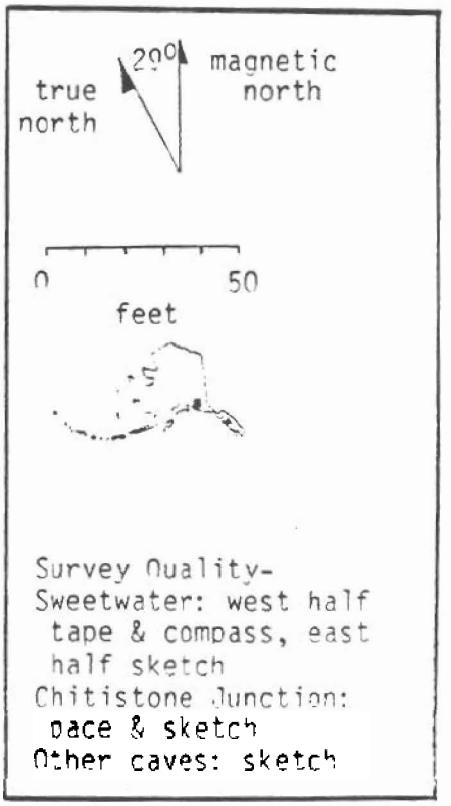
8' drop

Bar Cave



top view

Upper Junction Cave



Survey Quality-
Sweetwater: west half tape & compass, east half sketch
Chitistone Junction: pace & sketch
Other caves: sketch

Arriving at the strip we dropped off our loads and continued upriver until we neared the confluence of Glacier Creek and the Chitistone River. Before turning back we surveyed with binoculars the limestone gorge across the river containing Grotto Creek. If it were possible to cross the Chitistone this area would be worthwhile checking for caves.

Sunday - August 31:

We awoke early to pack and be on our way by eight. Although our pickup plane was scheduled to arrive at noon, we wanted to be on the landing strip two hours early in case the cloudy weather forced an earlier pickup. By the time we reached the strip a light rain had begun. Noon came and the afternoon passed as the clouds and our hopes for a pickup lowered. During the day our ears became atuned to the sounds of planes and we heard several but saw only three. One apparently took off from Glacier Creek and flew out the valley passing over us. Two other planes, late in the afternoon, circled high over the Chitistone area as if searching for a break in the weather. They turned back leaving the valley in silence.

By seven, darkness came and the clouds had lowered further, so we concluded that our plane would not come. We ate our last remaining dinner and bedded down for the night with the prospect of spending an indefinite period of time waiting.

Monday - September 1:

In the morning the cloud layer had descended to within a couple hundred feet of the valley floor. Our thoughts now focused on two matters: first, rationing our remaining food, and second, how we would go about contacting someone to get us out of the valley. We of course spent a good deal of time wondering what happened to our plane. After much good humored discussion we concluded that the pilot had forgotten about us.

We ate that morning by augmenting our food supply with fresh cranberries. Jay found an extensive patch so we made a hot cranberry-granola mush which was tasty and left us enough granola for another few breakfasts. Eating this creative meal we were startled to hear a plane loud and close. Running out, we saw our plane swoop out of the mist and signal to us. In a matter of moments the plane landed and our situation was completely changed.

With great urgency we threw our gear, including the bottle of hot cranberry mush, into the plane and took off before the weather grounded us. We learned meanwhile that the pilot really had forgotten about us and it took a phone call from Jay's wife to jog his memory. The pilot at this point lived up to the traditions of Alaska bush pilots by flying adventurously low out of the valley in conditions that could only with generosity be called marginal. Soon we entered the Nizina River valley, the clouds lifted somewhat, and the road from McCarthy was located, which provided the needed guidance back to the Copper River basin. An hour later we found ourselves back in Glennallen, amid sunshine and the comforts of civilization. In celebration we ate the leftover cranberry mush and talked of plans for another trip into Chitistone next year.

CAVES AND HYDROLOGY OF LIMESPRINGS MOUNTAIN

by Rich Hall

Although we never got into the trunk passage that we hoped to find on our trip during August 1980, significant discoveries were made. We now have a better layout of the probable stream patterns under the mountain we've been investigating. The main objective of the trip was to get into Bucklegrind Cave which Joe Head had entered in 1976. Alas, we were not rock climbers enough to assault it frontally and though we brought bolts there was no safe place to put one above the entrance; ergo, we did not get into Bucklegrind. Our second objective was to explore more cliff face for other caves. That was a large success. Several small (and some nice sized) solution caves and some tectonic caves were investigated.

Major Caves and Hydrology

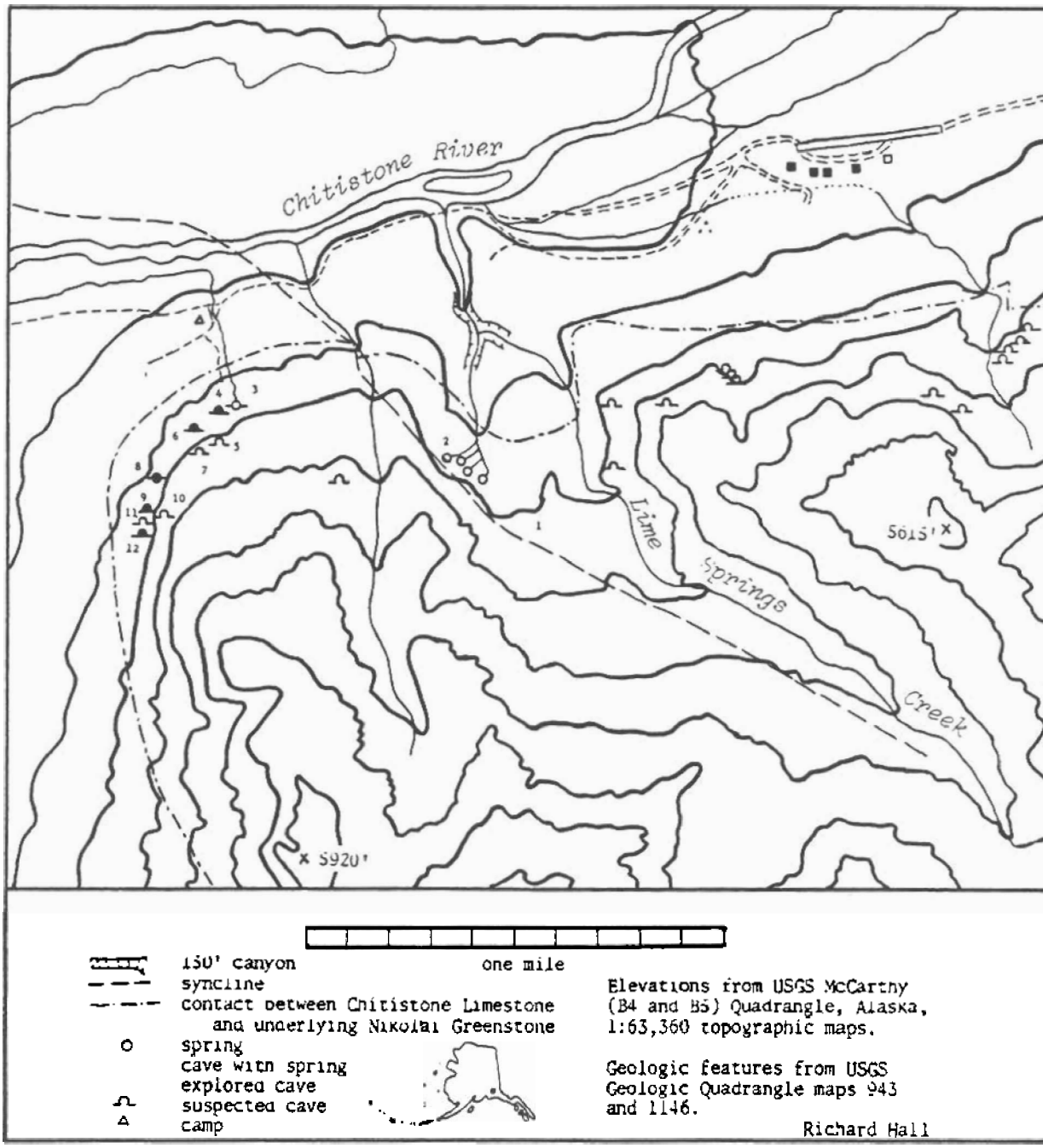
Four major features provide enough information to get an idea of where the water goes through the rock. They are, as numbered on the map on page 9: 1. a major syncline, 2. Lime Springs, 3. Star Cave and 11. a new large cave entrance we found. As shown on the map, the Lime Springs seem to fall along the syncline, and Star Cave is not far away, suggesting that they may be related to each other. A closer examination of both features supports that thesis. Looking into Star Cave from a nearby scree slope it appears that the cave heads upstream in a southeasterly direction, the same as the syncline. Likewise, Lime Springs seems to be made of at least four separate springs, all in a line along the syncline.

The springs seem to be of different ages. The furthest (upstream) one appears to be the oldest and largest with the water issuing from beneath moss and grass covered boulders. The second is newer and half the size of the first. The third is fairly new and small. The last spring is the size of the second and appears to be very new because its stream has cut a deep, steep-sided V in the tundra which has not yet stablized. It also is the spring nearest the rock face (about 20 feet) and hence probably the easiest one to open up if anyone were so inclined. It is also of interest that 90% of the water running from Lime Springs Creek into the Chitistone River comes from the springs as apposed to the three mile long creek which runs down the valley.

Without actually going into the passage many possible explanations for relationships among the features can be dreamed up. Possibly the springs are pirated water from Star Cave (both had lower water this year than two years ago) and maybe some day when they open more there won't be any water issuing from Star Cave during drier periods. Or maybe all the water coming down the syncline now goes out through the springs and Star Cave has pirated another major stream.

That brings to question the large (8 foot round) hole we found around the corner (on the west side) of the mountain. Its orientation appears to be approximately east in the direction of the springs, three quarters of a mile away. Unlike the others, this entrance was dry at the time we were there. However except for the lack of water it is very similar to Star Cave. It is also round and is only two feet narrower than Star Cave. Below both are large shelter caves which appear to have been created by large volumes of water splashing on the rock face. They also both have a deep gully below their entrance where the waterfall does or

CAVES AND TERRAIN OF LIME SPRINGS MOUNTAIN



1 syncline
2 Lime Springs
3 Star Cave
4 Bucklegrind Cave
5 Bar Cave
6 Chitistone Junction Cave
7 Upper Junction Cave
8 Sweetwater Cave
9 Sheep Cave
10 Upper Sheep Cave
11 new unnamed cave
12 Fern Cave

would fall. It is therefore quite possible that this cave is an abandoned or overflow passage with the water now exiting through Star Cave.

All three caves are about the same elevation, 3000 feet or a little less and within a few hundred feet of the contact between the Chitistone Limestone and the Nikolai Greenstone, again suggesting correlation.

Other Caves

In addition to these major caves and land forms, several smaller features exist in the area. Bucklegrind Cave (4) was discovered several years ago, explored for 100 feet, and described in the Alaska Caver V 5 No 2. It is a small tube which angles toward Star Cave and may be an overflow for it. Chitistone Junction Cave (6) was discovered in 1978 and was described in the same issue of the Alaska Caver. But this cave is probably only related to surface runoff as are Bar Cave (5) and Upper Junction Cave (7) in this issue. The Sheep Cave (9) and Fern Cave (12), although solutional in origin and features, are probably of minimal concern in the overall hydrologic picture. Whether or not Sweetwater Cave (8) has any hydrological connection to any larger system in the mountain can not now be guessed.

There are also some higher elevation caves in this vicinity such as the one above Sheep Cave (10) which, although it looks huge from the ground, is not necessarily anything more than a large frost pocket, plus several further to the east that have not been checked. And there are miles of mountain to the south, of which over ten square miles fall within the Lime Springs Creek surface drainage area, waiting to be explored. Then to top it off there is the entire extent of the Chitistone and Nizina Limestones which also appear in some neighboring quadrangles but are most extensive in the McCarthy Quadrangle as shown on the map on page 12.

Sweetwater Cave

There is nothing sweeter than a waterfall from a cave entrance when your water bottle is dry and your cavethirst is high. After reexploring the area which had been covered two years ago, we headed west around the mountain. To our wonder there was a cave, just around the corner. A nice round hole, the schoolbook example of a phreatic tube, with a trickle of water running over its lip.

The general dimensions of the cave are always within a foot of four feet round with rubble filling the bottom foot. The size of the rubble however is too large for the amount of water in the cave and the hole at the end of the cave is too small to allow enough water in to have moved the rocks. Therefore the passage is probably quite old and connected to a larger system downstream before glaciers scoured out a valley and removed the middle of the cave. The fact that it hangs above the scree on a wall supports this same conclusion. The end of the cave is the only exception to the general rule for size of the passage. The main tube ends suddenly and a 10 inch squeeze to the left puts you in a small room. At one end of the room, the water enters through a small hole; at the other end of the room is a mud bank behind some solid rock barricades. The surveyed length (13 stations) was 122 feet and the estimated total length is 300 feet. This puts the end of the cave

directly below a large scree covered amphitheater cut into the rock wall and Sweetwater Cave may have pirated some water from the surface even though it is at least 100 feet below it. If this is the case, the likely scenario is that the passage filled with mud and rock during the glacial period and the new stream cleared out the end of the passage. It would therefore, be unlikely that the passage beyond the distance we explored could be opened up to connect to passage beyond.

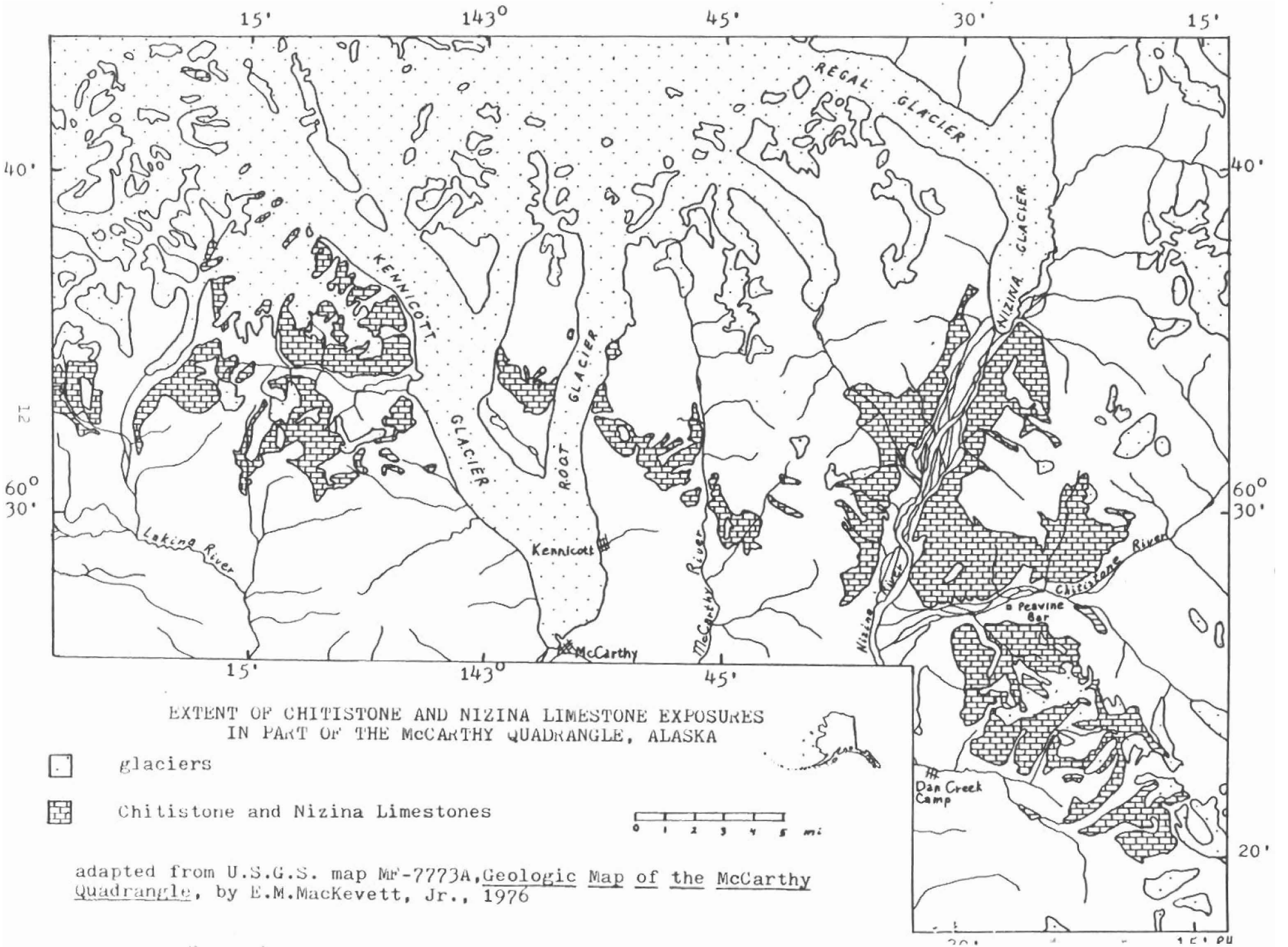
Fern Cave

Fern Cave seems to have originated partly from solution and partly by breakdown. There is probably about 70 feet of passage in the cave and would be a good survey. It consists of two levels which connect in the back. The upper and lower levels both have a solution origin but the rear of the cave has recently been modified by frost action. There is a lot of loose damp rock there which would freeze in the winter and break off new rocks over time.

Sheep Cave

Although Sheep Cave is really rather small, it consists of a nice room of solution origin with many small solution tubes running off of it including one which returns to the cliff. It, as well as several shelter caves in the area, are used by sheep for shelter as evidenced by the amount of feces at each location. They are all connected by a sheep trail which rings the mountain along the top of the scree.

"I'M INTERESTED IN A CAVE IMPROVEMENT LOAN!"



EXTENT OF CHITISTONE AND NIZINA LIMESTONE EXPOSURES
IN PART OF THE McCARTHY QUADRANGLE, ALASKA

glaciers

Chitistone and Nizina Limestones

adapted from U.S.G.S. map MF-7773A, Geologic Map of the McCarthy Quadrangle, by E.M.MacKevett, Jr., 1976

This description of the Chitistone and Nizina Limestones is copied from "Geologic Map of the McCarthy C-4 Quadrangle, Alaska" by E. M. MacKevett, Jr., an accompaniment to USGS map GQ-844.

NIZINA LIMESTONE

The name Nizina Limestone was applied by Martin (1916, p. 693) to predominantly thin-bedded limestones that previously were relegated to the upper part of the Chitistone Limestone. The Nizina Limestone is exposed locally in the southwestern part of the quadrangle, where it attains a maximum thickness of 400 feet. Its contacts with the underlying Chitistone Limestone are broadly gradational, difficult to map with fidelity, and regionally transgress time boundaries.

The Nizina Limestone conformably underlies the lower member of the McCarthy Formation or unconformably underlies the Kennicott Formation and is cut by a few small Tertiary plutons. Its characteristic beds are 1/2 to 2 feet thick, medium or dark gray when fresh, and brown or brownish gray when weathered. The formation contains moderate amounts of erosion-resistant black chert that forms irregular nodules as much as 6 inches long, extensive lenses as much as 6 inches thick, and coalescing tuberous aggregates. Commonly the formation forms moderately rugged outcrops.

The Nizina Limestone is mainly lime mudstone, pelletoidal grainstone, and fine-grained wackestone (terminology of Dunham, 1962, p. 117). These rocks are intergradational and include relatively undisturbed lime mudstones, rocks characterized by disarrayed aggregates of lime mud, and rocks that contain fairly abundant mud-supported bioclastic fragments. Their typical clasts are calcareous and derived chiefly from echinoderms, crinoids, and pelecypods. Less commonly the clasts comprise quartz, dolomite, and siliceous spherical or rodlike remnants of microfossils. Argillaceous minerals and scattered opaque minerals are lesser constituents of the Nizina Limestone. Quartz or calcite veinlets cut parts of the formation.

The Nizina Limestone was deposited in a shallow marine environment, generally in deeper water than the Chitistone Limestone (A. K. Armstrong, oral commun., 1968). It is Late Triassic in age. No diagnostic fossils were collected from the Nizina Limestone in the C-4 quadrangle, but fossils from Nizina Limestone in the adjacent McCarthy C-5 quadrangle indicate the late Karnian, early Norian, and early middle Norian Stages (N. J. Silberling, written commun., 1963).

CHITISTONE LIMESTONE

The Chitistone Limestone was named by Rohn (1900, p. 425). It crops out in the southwestern part of the quadrangle, where it is as much as 900 feet thick, although its base is not exposed. Elsewhere in the southern Wrangell Mountains the Chitistone Limestone disconformably overlies the Nikolai Greenstone. It is gradationally overlain by the Nizina Limestone. Beds in the Chitistone Limestone are between 1 and 20 feet thick. They are light or olive gray and, uncommonly, medium or dark gray; they weather light or medium gray or light or yellowish brown. The formation forms bold outcrops and cliffs and in places contains caves and other solution cavities. It consists of limestone with less abundant dolomite, dolomitic limestone, and chert. The dominant carbonate rocks include limy mudstone, packstone, wackestone, and grainstone (terminology of Dunham, 1962, p. 117). They mainly are characterized by scattered bioclastic fragments and by pellets of limy mud that locally are cemented by carbonate minerals or by younger limy mud. Rare constituents of the carbonate rocks include quartz, opaque minerals, and clay minerals. The chert forms nodules less than 6 inches long and uncommon interlacing networks. Veinlets of calcite and uncommonly quartz transect parts of the Chitistone Limestone.

Some of the Chitistone Limestone is difficult to distinguish from the Nizina Limestone. Generally the Chitistone Limestone is thicker bedded and lighter colored and contains more dolomite and less chert than the Nizina Limestone.

The Chitistone Limestone was deposited in shallow seas, in part in intertidal, supratidal, and shoaling environments (A. K. Armstrong, oral commun., 1968). Its Late Triassic age is documented by fragmentary remnants of the ammonite Tropites (identified by N. J. Silberling, written commun., 1965), indicative of the late Karnian Stage.

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LAST DUES NOTICE

As of January 1, 1981 dues for 1981 are due. An envelope with a form in it was enclosed in the last issue. Please answer the questions on the form, figure your dues, and return the form with your dues as soon as possible so you will not be dropped from the membership list. If you do not have a copy of the form just send three dollars for a regular membership and one dollar for each additional family membership to Liz Rockwell, 2944 Emery St., Anchorage, Alaska, 99504.

Glacier Grotto
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