September 1981

Alaskan Caver, Volume 6, No. 5, September-October 1981

Richard A. Hall

THE ALASKAN CAVER

Volume 6 Number 5 September-October 1981

NSS Convention '82

BEND, OREGON

"39th Annual Convention of the National Speleological Society"

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NSS CONVENTION 82

Dates: June 27th to July 3rd, 1982

FIRST CALL FOR PAPERS

The 1982 Convention staff is putting out a call for papers for the sessions to be held in Bend, Oregon during 1982. Please share your information and experiences at one of the sessions. Papers on all types of caving subjects are encouraged. If you are willing to give a paper, please contact either your section chairman or the Program Chairman for the Convention.

Abstracts of 300 words or less are needed by March 1st. **These are to be printed in** the PROGRAM of the Convention and in a special NSS BULLETIN. You will see the name and address of the person to send your abstract to in the NSS NEWS.

We will hold all of the regular sessions, e.g. Biology, Geology, Vertical, Social Science, Women's, etc. as well as some special sessions such as:

A Safety & Techniques Symposium with mornings session of papers and an afternoon session in a cave. Chairman, Joe Fackler, 2404 Kootenai St., Boise, ID 83702. Joe and his Idaho Rescue Group have some great ideas!

Vulcanospeleology Symposium. Bill Halliday is organizing this one! Bill's address is 1117 36th Ave. E, Seattle, WA 98112.

Northwest Diversity Symposium. In case you think all caves in the West are formed of basalt (i.e., lava), Phil Whitfield is prepared to show you the wide diversity of caves! Richard Hall has already volunteered to tell us about "Caves & Cave Potential In Alaska." You will hear about other great caving areas that you may not know exist in the West!

Special Program on Mt. St. Helens. Rick Pope, 3539 S.W. Nevada Court, Portland, OR 244-0908. Phone 503 244-0908. Rick is putting this one together. If you have pre and post St. Helens pictures and slides, please let him know!

The Convention won't be all talk, but will include CONTESTS, FIELD TRIPS, CAVES, BEAUTIFUL SCENERY, CAVES, HOWDY PARTY, OTHER PARTIES, A TALENT SHOW, BANQUET, CAVES, MOUNTAINS, THE SQUEEZE BOX, AN AUCTION and more, and more!

CAVE IN THE WEST IN '82!

CALENDAR OF EVENTS

October 15 Glacier Grotto Meeting. Meetings are held on the third floor of Grant Hall, Alaska Pacific University at 7:30 pm. The program will be an NSS multimedia show based on John Denver's tune 'Country Roads' and titled 'Caving Roads'.

November 19 Glacier Grotto Meeting. Meetings are held on the third floor of Grant Hall, Alaska Pacific Univ. at 7:30 pm.

December 17 Glacier Grotto Meeting. Meetings are held on the third floor of Grant Hall, Alaska Pacific University at 7:30 pm. The program will be an NSS slide show on the C-3 Expedition into Floyd Collins Crystal Cave, Kentucky.

January 21 Glacier Grotto Meeting. Meetings are held on the third floor of Grant Hall, Alaska Pacific Univ. at 7:30 pm.

February 18 Glacier Grotto Meeting. Meetings are held on the third floor of Grant Hall, Alaska Pacific University at 7:30 pm. The program will be an NSS slide show.

June 27-July 3 NSS Convention in Bend Oregon. Don't miss the Convention that is and will be the closest one to Alaska in years. Plans are in the making for an expedition to the Chitistone Valley right after the Convention.

The ALASKAN CAVER is a periodic publication of the Glacier Grotto of the National Speleological Society. Subscriptions are free to members. Membership dues are $3 per annum. Dues can be sent to Elizabeth Rockwell at 2944 Emory St, Anchorage, AK 99504.

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EIGHTH INTERNATIONAL CONGRESS OF SPELEOLOGY

Lis, Matt, and I attended the International Congress and the NSS Convention in Bowling Green, KY this summer as representatives to the NSS Congress of Grottos from Glacier Grotto. There were four days of talks/slide shows on various topics given by people from all over the caving world running four at a time and changing every twenty minutes so you had to constantly choose one of them or one of the other activities such as vertical techniques, diving, mapping, equipment sales etc. There were also trips to Mammoth Cave and Cumberland Caverns and tours available for other caves. In addition each evening there were feature slide shows, cave movies or parties.

It was a chance for Lis and I to meet old friends from the East Coast and find out how their projects are going. It was also a chance to push caving in Alaska which I did whenever possible. The main result of this was to make plans for a trip to Chitistone Valley after the NSS Convention in Bend next year; Doug Medville of the DC Grotto and I are organizing it.

Rich Hall

From the President's Corner.

From time to time I am asked, "What do I need to go caving?" Like all other human endeavors, the proper equipment and skills required vary from trip to trip. Even for the same trip, opinions will vary from person to person. However, it is well to think about what will be required before departing. It is also imperative to ensure that all is in good working order. In Alaska, the trip to the cave can well be more arduous than the trip in it. We generally take the minimun amount of specialized gear until we know we will have need for it. Being over-equipped also has its hazards. In the Minutes of the Board of Governors of the National Speleological Society for July 28, 1980, there appeared a List of minimum standards for safe caving. Although it has not been adopted officially, it is so general that it cannot be faulted as a general guideline in Alaska. They are as follows:

LIST OF MINIMUM STANDARDS FOR SAFE CAVING

1. GROUP SIZE: Normally 3 or more persons with groups larger than 12 discouraged.
2. REQUIRED EQUIPMENT: (for each individual)
   A. Protective headgear.
   B. One primary and two backup light sources.
   C. Litter depository (for spent carbide et al).
   D. Suitable clothing and sturdy footwear.
   E. Suitable technical edquipment as required.

NOTES:

1. All protective headgear shall:
   A. Give full protection to the head above the ears.
   B. Have secure connections between suspension, webbing, head band, and the hard portion.
   C. If light brackets are present, they shall be secure and servicable.
   D. Have a properly functioning chin strap.
2. Each primary light source shall:
   A. Be properly functioning.
   B. Be accompanied by a reserve energy source (carbide, battery(s) et al) capable of producing eight hours of light beyond the projected length of the trip or accompanied by a second source which serves the same function.

My comments are two:

(1) In this country, I prefer a minimum of four persons rather than three for extended trips since rescues do not come as easily as "outside".
(2) Where the backup light sources are battery powered, be well aware of the expected life of the batteries used. I have had just-bought "disposable" flashlights fail in half an hour. The best plan is to remember that when your primary light source fails, your backup light source becomes your primary one. Also remember that battery life is longer when the batteries are warm, so keep them in your pocket when weather is below 0°C.

Jay Rockwell

CAVES IN THE IMURUK LAKE AREA

Bendeleben Quadrangle on the Seward Peninsula in Northwestern Alaska probably has a unique grouping of karst and psuedo-karst in Alaska. Four different types of karst and pseudo-karst features are mentioned in USGS Bulletin 1141-C. "Geology of the Imuruk Lake Area, Seward Peninsula, Alaska" (Hopkins, 1963). There are solution caves, deep thaw sinks, lava tubes, and sublava fluvial caves. Most of the information in this article is taken from Hopkins' report .

The Imuruk Lake area, 1100 square miles, 100 miles northeast of Nome, is a highly varied, treeless, and inaccessible area. As of 1963 it had no permanent residents or roads. To the west of Imuruk Lake by 35 miles lies a dirt road to Nome and 15 miles to the north of Imuruk Lake (el. 1021) lies a dirt road to Deering (35 miles away); the two roads are not connected to each other except by a tractor trail and neither is connected to the road system which connects Fairbanks and Anchorage to Canada and the rest of the United States. These two roads serve old placer mining regions mostly now abandoned.

The terrain consists of rolling hills of schist, limestone, and marble (refered to by Hopkins as metalimestone) sometimes overlain by relatively flat lava flows with silt deposits over top of them. The Bendeleben Mountains, to the south of Imuruk Lake and the Imuruk Lake area lava flows, rise to over 3000 feet and consist mostly of gneiss but include some limestone and other rocks. To the north of Imuruk Lake as well as in scattered locations throughout the Seward Peninsula beds of limestone, marble, and schist are exposed. Hopkins, while cautioning that current research contradicted this previously believed age of the metalimestone north of Imuruk Lake (Hopkins, 1963, p 12), refered to it as Paleozoic; however, in a later work (Hudson, 1977) Travis Hudson refers to some of the rocks as Paleozoic marble and others as Precambrian limestone. Hudson also identified Mississippian and Silurian limestone elsewhere on the peninsula. Much of Hudson's work is from Sainsbury, 1974 which gives descriptions and locations of the many formations in Bendeleben Quadrangle. The upper map on page 5 shows the location of Quaternary basalt flows and calcareous rocks of all ages on the Seward Peninsula; these two categories each contain several formations as discussed in various places throughout this paper. The geologic data on the map is based on USGS Open File Report 77-796A.

During the Nome River (Illinoin) Glaciation much of the southern half of the Seward Peninsula was glaciated and windblown silt, ground by the glaciers, covered the rest of it. Most of the northern half of the peninsula, including much of the Imuruk Lake area, is still covered with at least five feet of this silt. Other glaciations have deposited additional layers of silt so that, where it has not washed away, deep deposits have accumulated. The lava flows, mostly of Quaternary age, cover the center of the Bendeleben Quadrangle and have been attributed to four flow periods distinguishable in part by the amount of silt covering the flow. The lower map on page 5 shows the extent of glaciation and windblown silt on the Seward Peninsula. It is based on Plate 3 of USGS Bulletin 1141-C.

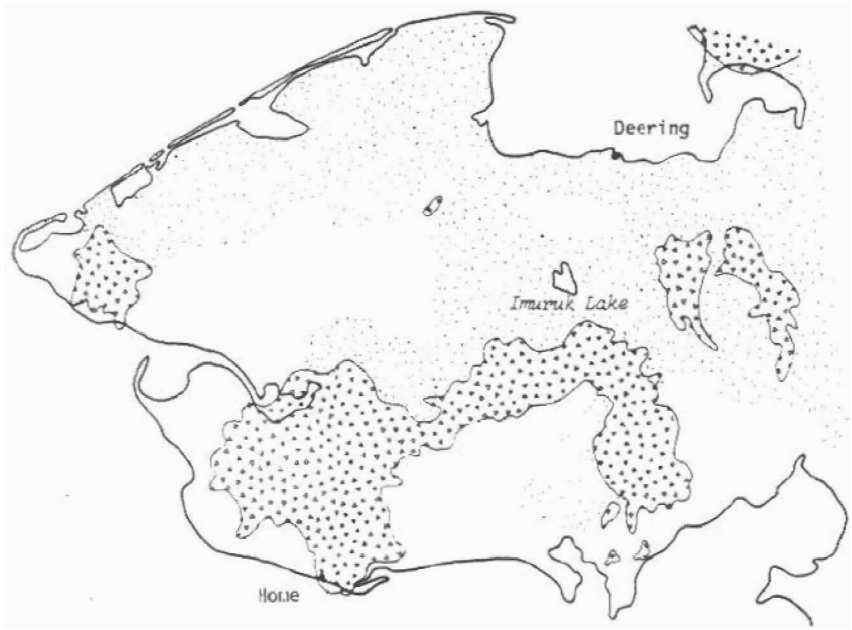
Limestone Caves

The only limestone cave mentioned by Hopkins is a small marble cave on Trail Creek which contains archeological remains ranging from a few hundred to 6000 years ago (Hopkins, 1963, p 7, from American Antiquity 1950, Notes and News: v.15 p 264-265, 1951, v.16 p285). Volume II Number 2 of The Alaskan Caver refers to three other articles which talk about nine caves in the area with one being 21 meters in length and about two meters in width at the entrance.

As additional evidence of karstification, Hopkins says that in the Seward Peninsula Uplands north, east, and west of Imuruk Lake, "segments of streams underlain by metalimestone bedrock generally are dry except during flood stages" (Hopkins, 1963, p 11). Although beds of massive and interbedded metalimestone up to a few feet thick are found in the schists in the area, "metalimestone underlies most of the highest hills in the area and forms outcrops more commonly than any other rock of pre-Quaternary age." "The metalimestone in broad belts is generally light gray, contrasting sharply with the darker gray and blue-gray tones of metalimestone interbedded with schist and mapped with the schist unit", and "is generally pure" (ibid. p 16). Reportedly, neither bedding nor cleavage are discernable in the rock. In a letter to William Halliday in 1961, Hopkins lists several other places on the Seward Peninsula where karst sinkholes and some "very small" caves exist. These include Boulder Creek off the Sinak River, Willow Creek in the Nome River valley, in the Port Clarence limestone in the York Mountains, and near Cape Wolley. Another source reports caves in the limestone cliffs at Bluff. These locations are noted on the maps on page 5.

"Large springs emerge from metalimestone in many places on Seward Peninsula; they are especially common near the downstream ends of valley reaches that cross metalimestone belts. An example in the Imuruk Lake area is found on the upper Inmachuk River, where springs yielding 8 or 9 second-feet emerge from the steep west wall of the valley about 30 feet above stream grade. Much of the discharge emerges from a single open fracture about 1 foot in diameter, but smaller springs are distributed over an area of about 2,000 square feet. The temperature was not measured but is estimated to be about 50° F" (ibid. p 91). There is a picture of this spring in USGS Bulletin 247 (Moffit, 1905, plate IX,B) but the accompanying article talks about placer gold mining nearby rather than caves.

Cave Related Geology of the Seward Peninsula, Alaska



Bedrock

Limestone, Dolomite and Marble

Quaternary Basalt

Ice Age Modifications

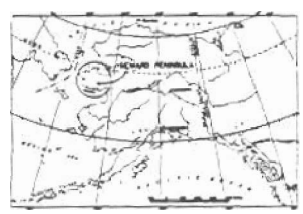
Areas covered by ice during None River (Illinoin) glaciation

Areas blanketed by windblown silt 5 feet or more in thickness

Roads

25 0 25 50 75 100 miles

25 0 25 50 75 100 kilometers



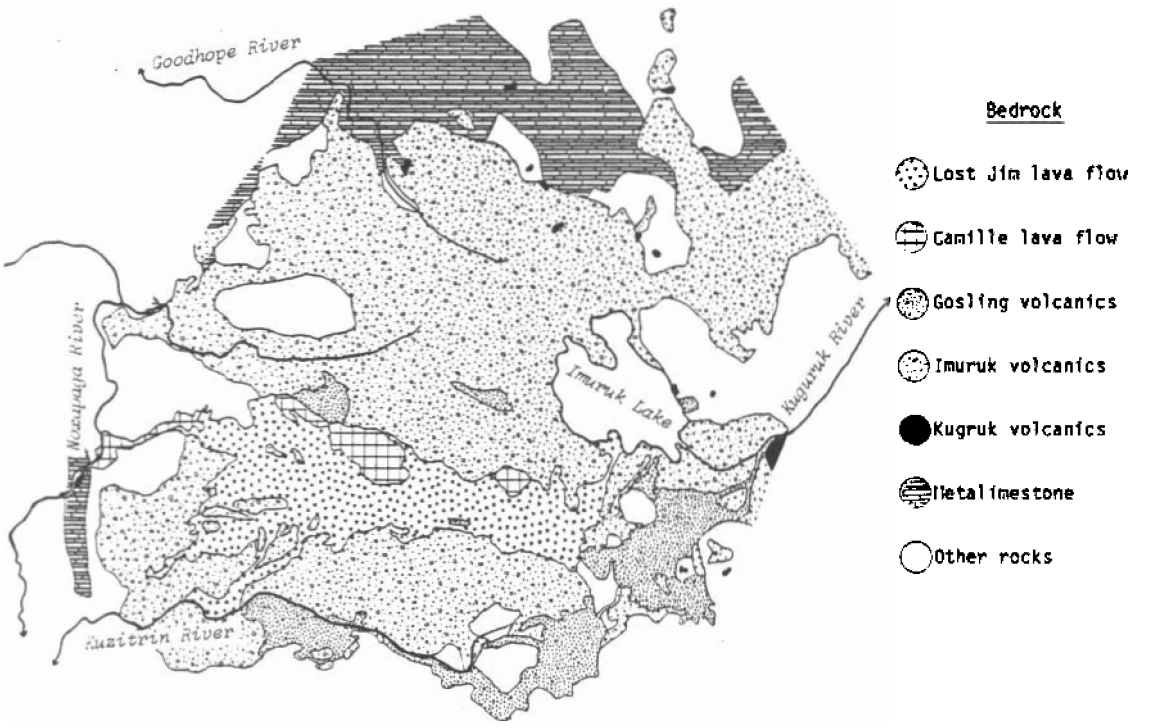
location

Volcanic Caves and Related Pseudokarst

Hopkins defines five volcanic formations; in decreasing age they are the Kugruk volcanics, the Imuruk volcanics, the Gosling volcanics, the Camille lava flow and the Lost Jim lava flow, illustrated on the map on this page. Each are distinguished by their relative degree of weathering and the amount of windblown silt on top of the flows. He believes the eruptions have been spaced over at least the last 100,000 years. The Kugruk volcanics only appear where streams have eroded away the overlying Imuruk rocks and is separated from them by a layer of weathered rocks which were at one time the top of the stratum. The Imuruk volcanics also show a great deal of weathering and "their surfaces have been thoroughly brecciated by frost action and mantled by a layer of windblown silt 3 to 20 feet thick" (ibid. p 54). They are the most extensive layer with a general thickness up to 200 feet. Their silt covering ranges from "a few to several tens of feet." The Gosling volcanics are 10 to 50 feet thick in most places and up to 300 feet thick near some source vents, have been brecciated by frost to at least 10 feet deep, and are covered by a thinner layer of silt (which has accumulated more in low-lying areas on the rocks) than the Imuruk. The Camille lava flow, in contrast to the older rocks shows very little frost riving, has only a few inches of silt, and lies over the Gosling and/or Imuruk volcanics. The Lost Jim lava flow lies over the Camille lava flow and at times directly over the Imuruk or Camille, is relatively undisturbed by frost action, and has no silt over it. It covers about 88 square miles and has more pseudo-karst features than the underlying volcanics.

Thaw Sinks and Thaw Caves. On all lavas which are covered with silt, especially the Imuruk volcanics because the mantle of silt is thicker there, thaw sinks are evident. They can occur wherever the permafrost layer is breached, sometimes because the vegetation has been stripped. The silt then washes down through the volcanic rocks. "In many cases marshes and streams drain down through these thaw sinks where they percolate into the underlying volcanic rocks" (ibid. p 56).

Geology of the Imuruk Lake Area



Based on "Geologic Map of the Imuruk Lake Area, Alaska", USGS Bulletin 1141-C Plate 1.

A very thorough article by Hopkins (1949) talks about thaw lakes and thaw sinks in this area. He defined thaw sinks as "closed depressions with subteranean drainage; believed to have originated as thaw lakes" (Hopkins, 1949, p 119). These sinks exist mainly to the fact that 50 to 80 percent of perenially frozen silts consist of ice while the normal porosity of the silt when not frozen is only 20 to 30 percent (ibid. p 122). Thaw lakes often occur on these surfaces because the water cannot sink through the soil when it is frozen and there is very poor drainage. These lakes thaw the ice wedges where most of the ice is stored; then, with successive summers, melt ice wedges adjacent to the lake and gradually expand the lake. "In places the banks are undercut by cavernous openings at water level, extending 10-15 feet horizontally beneath the banks" (ibid. p 125). Maybe we should call them 'Thaw Caves'. As the lakes expand they may invade an area where the ice wedges reach all the way through the silt to rubble below. When these ice wedges melt, the water drains through the new hole into the rubble and permeable basalt below. "The watershed of some of the sinks is limited by the walls of the sinks themselves, but other sinks receive the drainage of one or more streams having discharges of several second-feet" (ibid. p 129).

Lava tubes and collapse depressions. The Lost Jim lava flow, the Gosling volcanics, and occasionally the Camille lava flow, have collapse depressions where lava tubes underneath have caved in. An oblique photograph of the Lost Jim flow in Hopkins' report (Hopkins, 1963, p 69) shows a distinct line of collapse sinks visible in the picture for at least two miles. Hopkins refers to it as the "great lava tube" and says its total length was originally at least twelve miles (ibid, p 70). There are many other collapse sinks on the Lost Jim flow, some of which have caves up to a hundred feet long . These caves are all in the Lost Jim flow because the intense frost action has closed any entrances in older flows (Hopkins, 1961).

Drainage and sub-lava caves. The drainage of the younger lava flows is quite interesting; there is very little surface water and the only major streams are usually those that cross narrow portions of the flows. "Except for the Noxapaga River, the Camille flow contains no surface streams; drainage is entirely subsurface. Small streams emerge from the base of the flow in several places, indicating that subsurface drainage is concentrated chiefly in minor buried valleys in the silt mantle on the overlying Imuruk volcanics" (Hopkins, 1963 p 68). "The younger volcanic rocks evidently contain considerable ground water perched on the silt mantle that covers the underlying Imuruk volcanics; the ground water seems to move rather freely in courses determined by the buried topography on the silt, it reappears at the surface as small clear streams in the places where the buried valleys emerge from beneath the younger lava flows" (ibid. p 93). Some of this water could have come from thaw sinks as described above.

The Noxapaga River crosses the Camille lava flow in a series of rapids while large streams percolate through the Lost Jim lava flow in several places without ponding on the upstream side. Hopkins suggests that the rapids may be a later stage of the underground flow where frost action due to the large volume of water has broken down the rock where the water once flowed through or under it. Like the Camille, all drainage in the Lost Jim is sub-surface. "Minor tributaries of the Kuzitrin River, whose valleys have been invaded by tongues of the Lost Jim flow, meander 'through' the lava in several places. Small lakes are dammed at the upstream margins of the lava tongue in a few places, but more commonly the streams percolate through the flow without ponding" (ibid. p 71).

In some places pseudo-karst windows exist such as the one three miles east of Gosling Cone where an area of silt covered Imuruk volcanics is surrounded by Gosling volcanics. A stream runs out from under the Gosling at one end of the window and runs under it again at the other end (ibid. p 62). Likewise, "Small clear streams flowing across 'islands' of Imuruk volcanics within the Lost Jim flow and similar streams heading in areas of Imuruk volcanics and disappearing beneath the margins of the Lost Jim flow suggest, again, that subsurface drainage is concentrated chiefly in buried valleys in the silt mantle on the Imuruk volcanics" (ibid. p 71). Whether any places where this occurs are enterable (and can thence be termed caves) or not is unclear although some of the streams are evidently of fair size.

Does all of this mean there are caves under the more recent lava flows where the silt has been washed away? Are there many lava tubes in the Lost Jim Lava Flow? Are there extensive limestone or marble caves in the area? It's hard to say without checking.

Hopkins, D. M., 1949, "Thaw Lakes and Thaw Sinks in the Imuruk Lake Area, Seward Peninsula, Alaska" in Journal of Geology, V. 57 p 119-131.

Hopkins, D. M., 1961, Personal letter to William R. Halliday.

Hopkins, D. M., 1963, Geology of the Imuruk Lake area, Seward Peninsula, Alaska: U.S. Geol. Survey Bull. 1141-C, 101p.

Hudson, T., 1977, Geologic map of Seward Peninsula, Alaska: U.S. Geol. Survey Open File Report 77-796A.

Ififf, Alice, 1975, "The Trail Creek Caves - A Short Look" in The Alaskan Caver, Vol 2, No 2, p 12.

Moffit, F. H., 1905, The Fairhaven gold placers, Seward Peninsula, Alaska: U.S. Geol. Survey Bull. 247, 79p.

Sainsbury, C. L., 1974, Geologic Map of the Bendeleben 1:250,000 Quadrangle, Seward Peninsula, Alaska, The Mapmakers, Anchorage, AK, 3lp.

CALL FOR ALASKA CAVE INFORMATION

Since I have promised to present a talk on Caves of Alaska at the NSS Convention in Bend Oregon next summer (see the Call for Papers on the cover), I need some help in collecting material. I will mostly have to talk about cave potential meaning limestone deposits, lava flows, and places to look for caves because not all that many caves are known. What I would like to be able to say is how many caves are known and where they are.

I need everyone's help to collect this information. Please send me a list of every cave you know in Alaska (address below). Don't assume I know of them or where they are. I need to know whether its a rumor or known cave, its location, size, and any other particulars you feel are important. Limestone, glacier, lava tube, seacave, or talus caves are all acceptable, even frost pockets if they are large enough. The more people that respond means a longer, more complete list.

I'm also interested if you have any good cave slides or prints. Caves are hard enough to find in Alaska, but pictures of them are even rarer. Tell me what you have and I'll contact you if I feel I may need them.

Rich Hall

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NEWS - DATED MATERIAL