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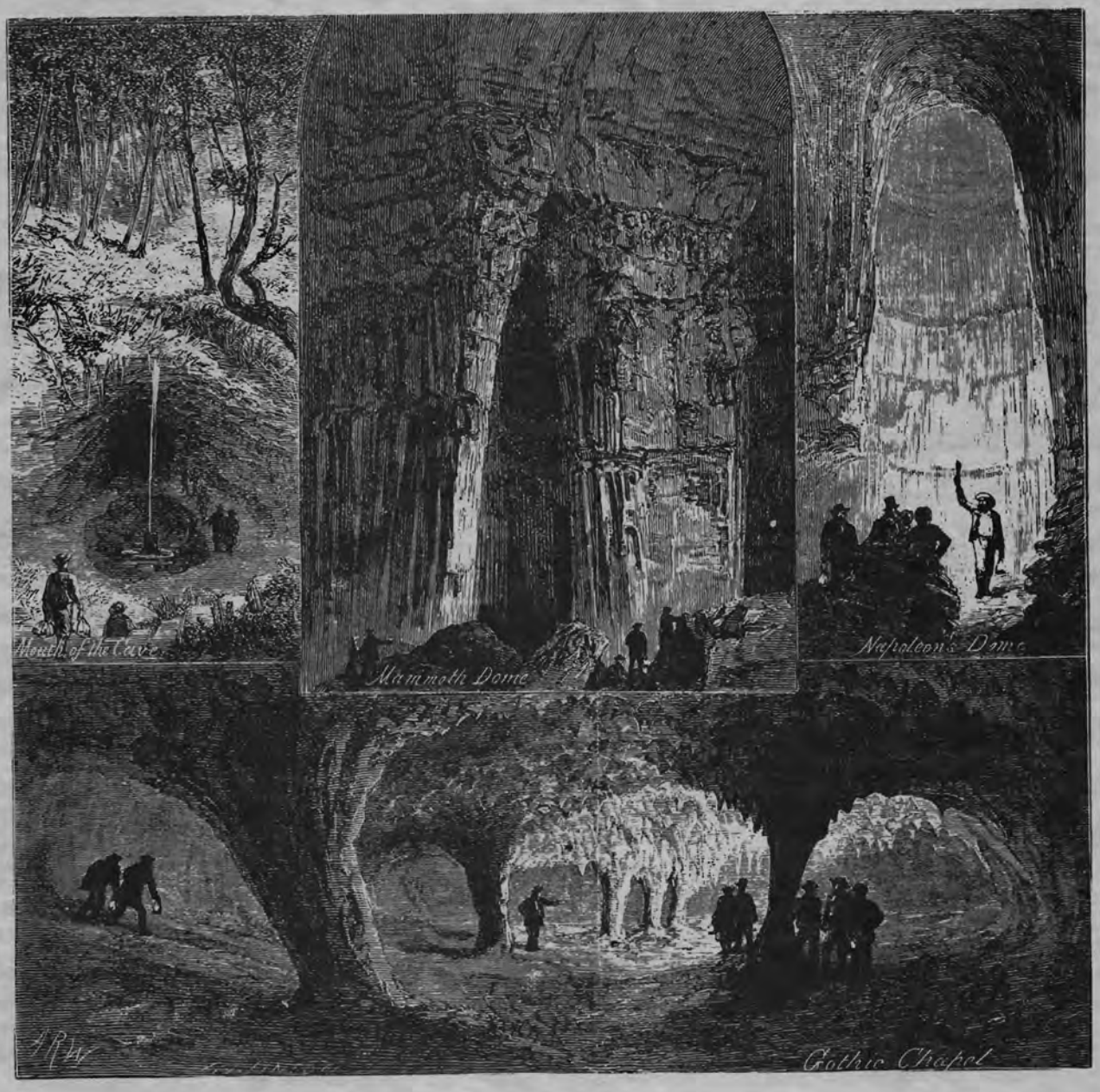

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THE ASSOCIATION

The American Spelean History Association is chartered as a non-profit corporation for the study, dissemination, and interpretation of spelean history and related purposes. All persons who are interested in those goals are cordially invited to become members. Annual membership is $5; family membership is $6; and library subscriptions are $4. ASHA is the official history section of the National Speleological Society.

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FRONT COVER

"Scenes in Mammoth Cave." Alfred R. Waud's print appeared in Picturesque America, 1872, on page 541.

THE JOURNAL

The Association publishes the Journal Of Spelean history on a quarterly basis. Pertinent articles or reprints are welcomed. Manuscripts should be typed and double-spaced. Submissions of rough drafts for preliminary editing is encouraged. Illustrations require special handling and arrangements should be made with the editor in advance. Photos and illustrations will be returned upon request.

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BACK ISSUES

All copies of back issues of the Journal are presently available. Early issues are photocopied. Indexes are also available for volumes 1, 2, 3, 4, and 5. All issues of volumes 1-7:2 are available on microfiche from Kraus Reprint Company, Route 100, Millwood, New York, 10546.

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ANOTHER LOOK AT SALTPETER ROCK MINING ACTIVITY IN DIXON CAVE

Warren C. Lewis, M. D.

The article on saltpeter rock mining in Dixon Cave by Angelo I. George was undoubtedly correct in its major thesis that limestone was being mined for saltpeter. He is to be commended for his careful observation and recording of detail in the cave; however, some of his historical data may be interpreted in another manner.

There is no good reason to doubt that the cave earth was first worked for saltpeter. It is most likely that the early leaching vats stood outside the cave as reported by Hovey. If no dependable water supply were present at the cave mouth during dry months it is likely the water would have been hauled from the Green River. It might have been easier at first to carry the peter dirt out of the cave than it would have been to haul the water into the cave and bring the leachate out. The spent peter dirt may well have been disposed of at the nearest out of the way place. The residue of the original cave soils may well have washed away by now or have been buried under later deposits. Wall stains indicating the original floor level as seen in Mammoth Cave may have been removed by subsequent mining activities.

It would seem to be beneficial to the miners to have dumped the earth back into the cave. When enough dirt had accumulated it would serve to ease the steep grade of the cave path. There was no problem in burying the rocks and dirt at the cave mouth since they contained no saltpeter. Eventually enough of the spent peter dirt did accumulate to form large earth aprons. These were leveled to provide platforms for ten leach vats on three levels. This allowed leach water to flow by gravity from one set of vats to the next to obtain the maximum concentration of crude calcium nitrate. Later when provision had been made for getting water into and out of the cave it became more profitable to process the peter dirt in the cave than it did to haul it out. It is unclear whether or not the spent earth of Dixon Cave was reprocessed for nitrate.

An immense problem was posed by the amount of loose limestone rock in this cave. Angelo I. George estimated that 30,000 tons of breakdown were found in about 200 meters of passage. Undoubtedly at first the blocks were merely put aside in piles to get to the dirt. As the floor was progressively lowered these piles not only covered valuable dirt but also became unstable if they were undermined. No doubt the rocks were moved to the nearest permanent spot. It is likely that any loose crust or debris would have been brushed off for processing since this was high in nitrate. No doubt the underlying earth was quite rich to reward such herculean labor.

From the beginning the miners seem to have been aware that the rock walls were a future source of saltpeter. The breakdown was piled in huge transverse heaps in the center of the passage away from the walls. The rock walls at the edge of the bays were probably added from recently loosened rock as the mining progressed.

The method or producing saltpeter by chipping rock from the walls had been followed for many years in the caves of Ceylon. Not only limestone

caves but also those in talc and feldspar were successfully mined for nitrates in this way. The salts were found only in the surface layers but the walls renewed themselves each year. The same method was followed in the open air chalk quarries in France. The surface rock was chipped off for extraction of calcium nitrate. The spent rock from this process was piled in walls to renew itself. In more recent times in the Mexican caves the workers removed not only the loose dirt but the native rock on the lower side and floor of the passage. This was included in the fertilizer.

The rock bearing the nitrates is not solid bedrock. It has deteriorated under the corrosive action of acid. As each one knows who has tried to drill a hole in a cave there is likely to be a superficial layer of rotten rock. Usually this is done by carbonic acid. In saltpeter caves the rock is attacked by nitric acid. It is this irregular layer of weak rock that was sought by the later saltpeter miners in Dixon Cave. At floor level the wall could be scoured with a mattock or pick. It appears from Angelo I. George's observation that ladders were used to reach the upper walls. A small hand held pick or even a hoe may have been used for scaling the upper wall. Flakes and blocks or rock especially in the fractured zone were dislodged and allowed to fall to the floor.

On the floor the detritus was gathered into piles. The larger pieces were stacked on the side and the remainder taken to the leaching vats. The seven gravel piles observed by Angelo George may have been the sites of this sorting process. Because of the friable nature of the desirable stone it is unlikely that further crushing was necessary. The marks of a blunt instrument on the wall suggest that the flakes could be dislodged by use of a hammer or maul.

The term "working bay" is a good term to denote a discrete section of the working face. The bays were bounded by dry walls. Recession of the face suggests that the nitrate layer was very thick or that it was worked several times. It is possible that the walls renewed themselves. If so there is a question as to how long this process took in Dixon Cave. This also raises pertinent questions as to its origin. Since the bedrock is low in nitrate the niter may have formed on the surface of the rock itself. It is logical to presume that these are formed by nitrogen fixing bacteria. These aerobic bacteria must live close to the rock surface.

The mining of saltpeter from rock shelters in sandstone posed a different set of problems. The rock which contained true saltpeter was very hard. It needed to be blasted and broken up by hand. The pieces were placed in boiling water to aid in the disintegration of the sandstone. This situation was the reverse of that in limestone in which the calcium nitrate made the stone weak and fragile.

In France the quarry walls faced south. In Kentucky the shelter walls faced south and west. Is it possible that the mode of formation of nitrate was the same in these widely separated locations?

In the future all saltpeter sites should be inspected for evidence of rock mining. The composition of the leached earth should be determined. Angelo I. George has made a significant contribution by recognizing and documenting this type of saltpeter mining in this country.

Reference:

George, Angelo I., Saltpeter Rock Mining Activity in Dixon Cave, Edmonson County, Kentucky, Journal of Spelean History, Volume 20, Number 4, 1986, pages 92-103.

RECOLLECTIONS OF NORTHERN NEW ENGLAND CAVING HISTORY

Robert W. Carroll, Jr.

INTRODUCTION

This is a personal recollection of the history of caving in Vermont, New Hampshire, and Maine since 1964. This era saw exciting, though modest by world standards, advances in the western Vermont marble belts, and then more impressive discoveries in the talus regions further east. The era closes with older efforts in decline but with surprising new developments that may eventually herald a new generation of discoveries.

DEDICATION

This paper is dedicated to all those whose time and efforts under difficult circumstances made the New England speleological statistical picture what it is today. These include Ronald Morris, Brian Pease, Joel Fearon, Peter Quick, Robert Piper, and many others- both local inhabitants and "outsiders"- who contributed to this aspect of New England history and science. And we must not forget those whose earlier but less successful efforts laid the groundwork for subsequent impressive discoveries- Clay Perry and the people in his book, Underground New England; Dr. Harold B. Hitchcock, the bat expert; and especially Roy Webster, who rightfully deserves the title, "Father of Vermont Caving in the Twentieth Century."

OVERVIEW OF EARLIER EFFORTS

Clay Perry's book, Underground New England, leaves one with a mixed impression of New England caving before the 1940's, namely of colorful eccentrics, modest actual caves, exaggerated reports, and, yet, still a possibility of more impressive finds awaiting those few willing to search and dig for them. Most tantalizing was the geologist Hitchcock's reference to very deep sinkholes and domepits south of Mt. Equinox. Less plausible were stories of the Aeolus Bat Cave and Skinner Hollow Cave "going clear thru" their respective mountains. John Scott's Caves of Vermont helped set the record straight by 1960- no confirmed northern New England cave had over 600 feet of passage- but left open the possibility of much larger systems, which was soon to prove true.

During the 1950's and early 1960's, a handful of little-known efforts began uncovering the secrets of the US-7 Valley marble belts. Roy Webster, a lifelong resident of the Danby area and both a Vermont Marble Company foreman and avid çave hunter, knew more than anyone else what the Dorset Range had in terms of speleological potential. Quarrying operations actually uncovered a few caves such as Quarry Cave and Webster's Bonus Cave (the latter renamed Cote Cave in later works). Webster was also one of the first to descend the 80-foot Purgatory Pit, though the technique of having a quarry crew lower and raise him manually by rope is not overly recommended today. He also tried digging open sinkholes, and his core-drilling crews reported hitting natural "voids" some 320 feet underground- a level yet to be reached in Vermont today.

The full story of Vermont caving before I entered the effort in 1965 may never be known. At about the time John Scott published his work, he and others explored a 1000-plus-foot cave near Weybridge but kept it a secret for several years to protect its formations. Having seen it and the first signs of vandalism in 1966, and having heard by 1976 accounts of far worse damage and even of cavers' ropes being cut and stolen, I fully sympathize with him. The early 1960's saw Ronald Morris uncover Vermont's largest known cave by digging out a sand filled passage that a lime quarry near Danby had earlier intercepted. Morris Cave had some 1200 feet of passage by 1966 when I first saw it, later reaching 1655 feet (when Ron and others found the "lost waterfall" passage in 1968) and finally perhaps 1800 feet during scuba expeditions a decade later.

Less knowable are the reported earlier efforts (in the 1950's) of Yale University and other Connecticut cavers at Purgatory Pit and the Red Mountain Pit. Did someone descend the Red Mountain Pit over a decade before the 1967 expedition? In 1967, we did find the opening covered with brush and a fishline plumb bob snagged on wall projections below the 20-foot level. Did a Yale group get a very thin vertical caver through the Purgatory Room #4 narrows and to the minus 205-foot level 15 years before the 1974 expedition? In those days, gear was primitive, but this possibility can't be fully dismissed.

THE HEYDAY OF VERMONT MARBLE CAVING: 1965 TO 1974

In 1965, I began investigating caves in southwestern Vermont. Tantalized by the two notable works on the region, I was determined to make important discoveries in the northern Taconics, and "the key to the mountain" became like the Holy Grail. However, the facts of insoluble strata and Ice Age damage soon turned this into hard work and many disappointments. With the help of Roy Webster, I became familiar with Dorset Peak and its known caves. My first exposure to vertical caving, with the help of Gerry Clagett (a University of Hew Hampshire rockclimber), was at Purgatory Pit, and the view of Room #4 through the narrows gave me determination to continue efforts there. By year's end, I had made my first discovery- the 150-foot Bruised Rib Cave near North Dorset- and begun mastering the search for sinkholes along schist-marble contact zones.

The year 1966 saw more well-known caves visited, modest finds, and the start of joint efforts with Brian Pease, Ron Morris, and Bob Piper. This was a year of digging projects with mediocre results, a peak year for Roy

Webster's contributions to Vermont caving. Using spade, winch, and (reputedly) his white Samoyed dog, he single handedly dug through a sink into Deer Cave, an intricate blue-marble cave with deer bones (for which it was named) and over 300 feet of passage. Webster also took part in the exploration of Beldon Falls Cave near Middlebury, a nice 400-foot channel system that an ill-advised dam and leaking reservoir had turned into a treacherous underground rapids. Some 400 feet from Deer Cave on Dorset Peak was Hunter Cave, a dangerous loose rock-and-sand system that he also picked at, with less luck, but nevertheless laying the groundwork for a major find in 1968.

In 1967, efforts shifted away from the Dorset Range to the Equinox and West Mountain sectors. Primary objective was the legendary Red Mountain Pit- find it, get string and weight depth measurement, and do a vertical expedition. Several inquiries and reconnaissance trips finally located it that April- the hole covered with brush crusted with refrozen snow- and later determined the first major drop to be 75 feet. A May 13 expedition was repulsed by snow melt runoff and hypothermia hazards. On June 10, Brian Pease, Ron Morris, Allan Budreau, and I reached its bottom, 177 feet underground, then had severe hypothermia problems from water running down the rope and making the prusik knots stick. Disappointing, though maybe fortunate for us, was its vertical termination at less than a third of the 600-plus-foot karst relief potential for that slope.

Other 1967 efforts included reconnaissance of West Mountain and a search for a reputed 700-foot pit in that range- the report since then believed to be false- and more footwork and digging in the two other ranges. An abandoned quarry near Mt. Aeolus yielded a stone blocked passage that, when excavated, yielded 220 feet of passages of a cave we named Cliff Hole. Explorations of wet passages along Sweeney Brook near North Dorset yielded two 200-footers. Late 1967 saw a Northeastern Regional Organization caving convention at Dorset Peak, and an expedition into Tallow Cave by Brian Pease and Ron Morris that negotiated a narrow crawl, descended a 35-foot pit, and doubled its length to 200 feet.

The year 1968 began with extensive personal reconnaissances of the three Taconic ranges which yielded hundreds of sinks but only minor caves. Ron Morris and Brian Pease discovered a way into the hidden waterfalls passage of Morris Cave, adding some 400 feet to its length. I renewed efforts to get an expedition to widen and enter Purgatory Room #4, but others began to lose interest in Vermont. Prospects for a major discovery now seemed very limited, but on July 19, a thunderstorm forced me to seek shelter in Hunter Cave- and discover the unexplained disappearance of its stream, which had deterred probing below the 40-foot level where Webster had earlier reached.

On July 20, careful digging and squeezing enabled me to probe into the lower part of Hunter Cave, which I aptly named "The Mangler". Unlike the Purgatory system a quarter mile to the southeast, this system's vertical extent is broken up into drops of less than 30 feet, none requiring rope, finally becoming a horizontal bedding plane system below 140 feet. The variety of strata and mixture of passage types make it scientifically the most interesting cave in the area, but the loose rock upper part made it by far the most dangerous. Only two others, Brian Pease and Mike Flores, were brave (or foolhardy) enough to see the lower part and reach the -175-foot

level. "The Mangler" eventually produced 900 feet of passage and 185 feet of relief- though a fraction of the karst relief potential for that sector (the resurgence believed to be 700 feet downhill and a mile to the northeast). My last descent was on October 10, 1969. The next year, wet weather and maybe a shift in the upper fill brought the upper stream back. It remained in existence and deterred further exploration until 1976, when a hurricane hit the region and soaked the mountainside with six inches of rain in a few hours, inducing a collapse of the upper unstable section, leaving the lower 800 feet of passage and 165 feet of relief perhaps lost forever.

A personal relocation to Potsdam, New York, and diversion of efforts elsewhere coincided with a decline in Vermont marble efforts. Sporadic reconnaissance and digging trips from 1969 to 1973 accomplished little. The main thrust of New England caving turned toward the talus systems that soon would rival and surpass the Vermont marble caves. But I kept alive hopes for a Purgatory Room #4 expedition, and this became a reality in June, 1974.

The June 1974 Purgatory effort coincided with the Spring NRO Convention in Vermont that year. Most of the "Vermont Crew" of the 1960s took part, along with New Hampshire, Massachusetts, and Connecticut cavers. The preparations the earlier week, which involved a narrows widening attempt that merely sooted up the passage, offered little encouragement. An unwise choice of food left me with insufficient stamina to make more than two descents into the pit, the second one merely proving my inability to squeeze through the barely widened narrows. It took Miles Drake and David Allured, who had smaller bone structures, to enter Room #4 and do its 80-foot rappel to the mud filled floor. The cave reached -205 feet but failed to go into the long sought "key to the mountain" we had believed existed there.

The early 1970s also saw the formation of the Addison County Caving Association (or ACCA). My knowledge of their activities is secondhand, but they accurately mapped many caves in west-central Vermont, including over 1000 feet in Horse Farm Road Cave, a water crawl system. Together with Peter Quick of Boston Grotto, they would revive the Vermont marble effort later that decade.

VERMONT MARBLE REGION: EFFORTS AFTER 1974

Fully involved with talus and other efforts, I have only secondhand knowledge of Vermont marble efforts after 1974. Many involved vertical and scuba expertise that is "out of my league". David and Viloya Allured, Bob Jeffrys, and Peter Quick led the more technical expeditions.

In 1978, vertical experts bolt climbed Room #1 of Purgatory Pit while a second group proceeded to the "rat hole" at the lowest part of the Back Door Cave, upstream in the series. The first group found 100 feet of horizontal passage and eventually reached the "rat hole" and shook hands through it with the second crew. Net relief of the Purgatory System stood at 262 feet, by far the most in New England, and passage was estimated at 580 feet, excluding the 80-foot rappels.

A vertical expedition into Red Mountain Pit reached "hanging" leads across the main dome pit, adding a modest amount of passage. Brian Pease measured the net relief at 177 feet. The Allureds also took part in this

expedition.

Boston and Connecticut Grotto scuba cavers made several tries at extending the underwater parts of Morris Cave. They reportedly dove to depths of 45 feet in the main siphon, which ended in fill. The lesser waterfalls passage siphon ended in tenuous silt which the divers called "Royal Jelly" and expressed no desire to push further.

The most impressive find of the early 1980s was a new 380-foot extension of Weybridge Cave. The ACCA excavation crew encountered very nasty "mud-down-the-neck" conditions when digging into the new section. Resulting passage was typical of rooms and crawlways seen elsewhere in the cave. Net passage may be around 1500 feet, with relief at least 140 feet.

Unfortunately, along with the major finds and increased activity in western Vermont has come deteriorating caver-landowner relations. Acts of vandalism, changes in ownership, rising crime rates, and the liability-insurance crisis have combined to create a less friendly local attitude toward cave investigations. Those visiting these areas should be mindful of the problem and take steps to avoid worsening it.

BEGINNINGS OF THE TALUS REVOLUTION AND THE MBDATHS EFFORT

Talus systems, those caves formed by fracturing of rock or piling up of rock fragments, have never been overly popular to investigate. However, large parts of the Northeast have only talus caves (as an alternative to driving hundreds of miles elsewhere to cave), and some of them proved to be far larger than the typical "maximum-sized-300-footer" New England supposedly had. My interest in talus systems dates back into the 1950's, but it took a handful of major talus finds and disenchantment with solution areas and their man-caused problems to encourage a full probe of how large these oft-maligned systems actually get.

Before 1973, I had occasion to explore an occasional Adirondack or New England talus cave, usually while enroute to a marble cave area in Vermont. Notable examples included the Pittsford Ice Cave and Deer Leap Caves in Rutland County, assorted small granitic talus caves in New Hampshire, and the Greenwood Ice Caves and Saddleback Mountain Caves of western Maine. In 1967, I investigated the 270-foot Widened-Fault Cave, an impressive quartzite-fissure system just east of Danby, Vermont. In 1968, I explored 350 feet of passages in Cow Hill Cave in Caledonia County, Vermont, an impressive granite-fault cave that yielded another 100 feet of passage when the water table it intercepted was ten feet lower in 1973. But it took the verifying of two Adirondack systems- 700 feet for "W Mtn." and over 500 feet (eventually 1850 feet) at Eagle Cave (a project of Roger Bartholomew) to make talus a serious contender in the Northeast.

By the late 1960s and early 1970s, Miles Drake and others were probing large talus systems in northern New Hampshire and Vermont. The Kinsman Notch area of New Hampshire had a large talus fan as well as the better known Lost River, a boulder-bridged pothole gorge. The talus fan yielded several complex talus mazes. Late in 1973, Miles and I investigated the 90-foot-deep Ice Pit at Dixville Notch (a dangerous, loose shist fissure rappel), Cow Hill Cave in Vermont, Maidstone Lake Cave (alias Stans-Drake Cave) in

Vermont, and the Kinsman site. We managed to verify 1000 feet for Scott's Cave and 900 feet at the linked Barn door and the Hole at the latter. Eventually, Stans-Drake was to yield 900 feet of passage and 110 feet of relief. Other sites produced trivial caves, and the Kinsman site drew our full attention.

The year 1974 saw an important linkup at the Kinsman site between Scott's Cave and the Barn Door-Hole complex, raising the estimate to some 2600 feet and displacing Morris Cave as New England's largest cave. A complex lower part of Scott's and a shallow east part of The Hole made this connection possible. In 1975, a connection was found between Barn Door and Merrill's Cave, and we named the resulting 4000-foot monstrosity MBDATHS for its component parts. Unexplored extensions promised an even greater length, but Miles Drake and the Allureds would soon relocate in other parts of the nation, and this magnificent system would soon be all but abandoned to the brush.

During my September 1976 vacation, I returned alone to MBDATHS and succeeded in finding more passages at the east end, raising the total to 5300 feet, the world's first known talus "miler". Combined relief was 140 feet. Intricate and extremely grueling to traverse, unpleasant to Grade 5 map, forsaken by its founders who moved to Colorado and Virginia, ignored by me in favor of other talus sites, and even surpased thereafter by an Adirondack anorthosite system called TSOD that yielded 13,050 feet of passage, MBDATHS soon was all but forgotten. But it inspired a worldwide crop of major talus finds, including a 5560-footer in North Carolina and 5000-plus-foot systems in California and Sweden.

THE NEW ENGLAND TALUS REVOLUTION: 1977 TO 1985

As impressive as MBDATHS and TSOD were, the real "revolution" in New England talus caving occurred when sites with 1000-plus-foot examples ceased to be an extreme rarity and became wore widespread. Within ten years, the number of Northeastern 1000-plus-foot talus caves rose from three to twenty, of which New Hampshire had six, Maine five, and Vermont three. Scores of lesser but interesting systems were found from the Green Mountains to Baxter Park and even Acadia National Park in Maine. A sampling of the more significant finds, in approximate chronological order, follows.

The second confirmed New England talus 1000-plus-footer was found in late 1977 at 4100 feet elevation in Huntington Ravine on Mt. Washington in New Hampshire. Named Mt. Washington Snow Talus Maze, this intricate, compact system yielded 1250 feet of passage by 1979, plus assorted trash and even human feces left by thoughtless hikers. Huntington Ravine also produced a 300-footer and a score of lesser gneiss talus caves, and the nearby Tuckerman Ravine yielded even more caves, including the 750-foot Lion's Head Cave which James Hedges and I investigated in August of 1982. All these cirque talus systems tended to be shallow but intricate amid impressive boulders and some of the most spectacular alpine backdrops east of Colorado.

August of 1978 saw important solo finds at the base of Cannon Mountain at Franconia Notch after several years of minor talus finds in that impressive granite area. These included the 1200-foot Franconia Notch Slabs Cave and 1150-foot Franconia Notch Coral Cave, both very shallow but having

extremely wided exfoliation-slab rooms and some curious "coral" speleothems. Following these was the discovery in August 1981 of 750-foot Franconia Notch Ponor Cave, an intricate compact maze with the sound of a stream beneath its back section.

Initially very frustrating, Maine yielded its first "big one" in September 1978. Trips from 1975 to 1978 to western Maine had produced only exercise and minor caves at Tumbledown Mountain and several other sites dominated by huge cliffs but schisty rock. The granite talus at Saddleback Mountain Cave near Rangeley was 1100 feet long with assorted crawlways and wide slab-ceilinged rooms. From a distance, the rugged Bigelow Range to the northeast looked even more promising, but its schist was good for merely a few 50-footers in 1979 and a 250-footer in 1980.

In September 1979, areas near Randolph, New Hampshire, yielded two more large talus caves. I had known of the talus potential at King Ravine since 1964, but this spectacular cirque yielded its secrets slowly because of its size and mostly one level limited spread gneiss caves. It has more 200-plus-footers than the other Presidential Range sites combined. By 1978, I had noted the existence of a 400-footer and a 700-footer there. The larger of these, Mt. Adams Ravine Cave, at last yielded extensions raising its total passage to 1150 feet. The same 1979 vacation also saw the discovery of a 1050-foot granite talus cave at Ice Gulch several miles to the north. This confusing intricate maze has few exits and may be New Hampshire's worst cave to get lost in, except possibly for "The Hole" in MBDATHS.

Vermont proved a formidable challenge to find a 1000-foot talus cave in, but the results proved impressive. The schist talus at Smugglers Notch yielded 620 feet at Graffiti Cave in 1978, a third of what may have been if the rock were solid granite instead of splintery schist beneath the huge fragments. A similar situation existed at Deer Leap Cave east of Rutland, but the fractured-ledge nature of the upper part enabled me to find 750 feet of passage and 120 feet of relief in 1984 after visits in 1978 and 1979. The huge granite cliffs near Lake Willoughby did little better in 1978 and 1979- the paucity of talus at Mt. Pisgah yielding a mere 100-footer and the larger but scattered talus ramparts of Wheeler Mountain yielding two 200-footers, though Haystack to the east revealed a 450-footer in 1985. But the September 1979 vacation uncovered a first-rate talus slope on Mt. Horrid at Brandon Gap.

This spectacular gneiss site, like Chimney Mountain in the Adirondack region further west, looks like a cataclysm hit it, is treacherous to traverse, and has some of the East's most impressive talus caves. The 1980-84 peak of activity included solo trips and visits with other cavers such as the Allureds, Peter Quick, and Roger Bartholomew. Its largest cave- and Vermont's second largest cave- is Chiller, with 1650 feet of passages, 80 feet of relief, and an intricate layout of belly-crawls, multiple levels, ice rooms, treacherous fissures, and large and high chambers. A mere 50 feet to the northeast but not connectable is the 1050-foot Gargantua, its huge rooms making the name self-explanatory, drops and loose fragments making it dangerous for the careless. Ice Cave, at the contact between cliff and upper talus rampart has 650 feet of passage and a room 40 feet wide. Late in 1984, Roger Bartholomew and I explored 400 feet of passage and a house-sized room at Substitute Cave further southwest, the name inspired by our inability to

relocate a cave I had found in 1983.

In 1981, a brief August trip to Groton State Park yielded Vermont's third largest talus cave, the 100-foot Abenaki granite system. The modest 400-foot relief of its host mountain, the huge rocks and varied layout despite the small ledge size, and its site barely on the Winooski side of the watershed divide are distinctive features. I found it within minutes in 1981 on a mere hunch about the odd looking ledge, but wasted an hour relocating it in 1982 when showing it to James Hedges. Other ledges such as Owls Head were far more impressive but produced at best 200-footers and 100-footers. It should be noted that Devils Hill to the east, despite old reports and much talus, yielded at best a 250-footer in 1978.

Maine, vast and full of impressive but usually disappointing talus sites, and feasible for me to visit only once a year, proved a formidable but rewarding challenge after the 1978 Saddleback Mountain find. An earlier visit in 1965 to Baxter Park left me impressed with the 1000-foot granite cliffs and led to trips there in 1980, 1981, and 1983. In 1980, I found Pathfinder Cave north of the Northwest Basin, a shallow but intricate 1000-foot mixture of crawls and small rooms in a talus fan a mere four miles south of the 46th parallel. It is the Northeast's worst cave of its size to reach- a ten mile hike each way or about eight miles each way with over a mile of climbing. The North Basin yielded a 300-footer and a 400-footer, the other east side ledges lesser caves. The remote Northwest Basin may have other large talus caves, perhaps by the dozen, for those willing to expend the energy and time.

The year 1981 saw mixed but interesting results. The September vacation began at the northeastern part of Baxter Park, where huge cliffs turned out to consist of rhyolite, a more brittle igneous rock than granite, and offer scores of acres of bowling ball sized talus with very few caves. However, one near Billfish Mountain had 200 feet of intricate passage and remains the area's largest rhyolite cave. The vacation proceeded to Acadia National Park, where Dorr Notch on Cadillac Mountain yielded a 350-foot granite talus maze. Unfortunately, I had to leave for home before I could check all the leads on a 250-foot long cave at Champlain Mountain.

The September 1983 vacation started at Acadia National Park and ended at Baxter Park. At Acadia, I checked lesser caves first, then returned to Champlain Cave, which yielded 1150 feet of passage and 65 feet of relief in a fragment-filled gulch at base elevation of only 300 feet. Its crawls and rooms are interesting, but hikers' trash spoils parts of this unique offshore cave. At Baxter Park, Witherle-ET Cave west of Baxter Peak produced 1350 feet of passages and compact mazework, setting a Maine record. The hike to this gem is five miles each way and involves over 4000 feet of climbing, and its 3800-foot elevation one and a half airline miles from Baxter Peak makes a trip to both objectives feasible the same day. This vacation also yielded a 200-footer at 4400 feet elevation in the same part of the range.

Latest of the Maine "big ones" was Mahoosuc Ice Cave, a complex gneiss 1200-footer that I found at Mahoosuc Notch in September 1985. The pass vaguely resembles Indian Pass in the Adirondacks, the cliffs lower but the trail even more treacherous with holes underfoot and snow and ice lasting well into summer. Ironically, I had in 1976 reached the east end, but weighed down with 40 pounds of gear and short of both time and energy,

turned back toward Old Speck Mountain too soon- with a mediocre impression of its talus caves. The 11 and a half mile access road from Berlin, New Hampshire, is rough on cars, but by 1985, the Notch was being heavily used, and car vandals were smashing in car windows at the remote trailhead, which discouraged further trips.

THE LEGACIES OF WINTER AND OTHER CHALLENGES

Had I been aware of the existence of snow melt "caves" in the Northeast in 1971 and 1978, the cave relief statistics of New England may be quite different today. These two years must have left record sized snowdrifts at Tuckerman Ravine and elsewhere in New Hampshire and possibly Maine. Meltwater streams in gullies can melt negotiable passages through any large snowdrifts in the way, and some of those gullies cover two or three times the 280-foot relief of McFails Cave, the Northeast's deepest cave. Purists may object to the seasonal and short-lived nature of these snowtubes, but they have begun to rival some Vermont marble caves and are pitch dark over four feet below the surface and 100 feet in from the nearest exit. More serious problems are hazards like hypothermia and slab avalanches and the necessity to monitor sites or be lucky at guessing the few days (usually late June or sometimes early July) when they reach optimum size. Recent mild winters and hints of permanent warming of the climate do not boost morale for snowtube hunters.

On Memorial Day of 1978, the abnormal snowpack at Smugglers Notch in Vermont yielded a gully with a 70-foot snowtube and a nearby 40-footer. A few weeks earlier, a 200-footer with 100 feet of relief may have existed there. On August 2, 1982, James Hedges and I found 750 feet of passage and 70 feet of relief at a Tuckerman Ravine snowtube; parts of the main 240-foot passage could accomodate a car. In June 1984, Tuckerman Ravine had a 550-footer with 120 feet of relief at this site- and a nearby 350-footer with 145 feet of relief. The wait continues for the next really "snowy" winter.

As the "talus era" began declining in New England, I began an attempt to tie together all my favorite caving areas with a series of hikes. This had begun in 1980 in the Adirondacks, and by 1984 I had my Potsdam, New York home "hike-linked" to all twelve Adirondack Counties and had reached Lake Champlain, crossed it on the ice, and was crossing Vermont. I also visited numerous White Mountain summits and caves. In 1985, a network of interconnecting walks stretched from the western Adirondacks to Grafton Notch in Maine. Besides the exercise of occasional of 30-plus-mile days, this effort produced dozens of lesser caves.

One result was an increase in interest in lake-ice hiking. For those who can't afford a boat or don't wish to tangle with cliffs and five-foot waves on lakes such as Champlain, it it the only way to investigate caves on islands and lakeside cliffs. Lake Champlain has many ledges and rugged islands, plus limestone areas. So far, speleological results have been mediocre- two 30-footers on Valcour Island and two 15-footers on the Grand Isle side being the best so far for their respective states, but the quest goes on. Even without caves, an ice hike reveals a lot of fascinating lakeshore geology and physical ridging-rifting phenomena on the lake itself.

THE CHALLENGE AHEAD AND POSSIBLE HOPE FOR THE FUTURE

The western Vermont marble belts have karst relief potentials of up to 800 feet. Talus fans in Vermont, New Hampshire, and Maine sometimes exceed 500 feet in relief. Hew Hampshire and Maine mountainside slides potentially capable of accumulating deep snowdrifts commonly have reliefs exceeding 1000 feet. Ridges and cliffs in fault zones, including eastern Vermont where strata are sometimes vertical and occasionally have a thin limestone layer, often have over 500 feet of relief. The potential is there for dwarfing the 262-foot New England cave relief record, but the problems are formidable, as even the recent trend of mild winters have joined the unfavorable geological history in a seeming conspiracy against further advances. Yet, New England WILL have deeper and larger caves, even if we have to wait for another geological era to leave New England with glaciers or thicker limestone and larger caves than can now be imagined.

A new generation, not "burned out" over recent failures or man-caused hassles, has already begun the next era of New England cave exploration. The recent 380-foot Weybridge extension, geologically anticipated but logistically unexpected, is a good omen. Addison County Caving Association continues to quietly make discoveries and map caves in western Vermont. Recent years have seen evidence of other talus caves, so far anonymous, in New Hampshire and Maine- Ice Gulch Nightmare Maze and Witherle-ET definitely had prior deep explorations despite remote sites and difficult mazes. In Maine, a new National Speleological Society Grotto formed in 1986 and was conducting studies of Enchanted Lake Cave, a system obviously of significance but which I had never before heard of. The potential is great and the quest will continue.

VERMONT CAVES WITH AT LEAST 500 FEET OF PASSAGE AS OF 1987

1800 ft. - Morris, Rutland Co., marble (counting scuba leads)
1650 ft. - Chiller, Windsor Co., gneiss talus
1500 ft. - Weybridge, Addison Co., marble (estimate from reports)
1050 ft. - Gargantua, Windsor Co., gneiss talus
1000 ft. - Horse Farm Rd., Addison Co., marble (minimum estimate)
1000 ft. - Abenaki, Caledonia Co., granite talus
900 ft. - Hunter, Rutland Co., marble (800 ft. lost in 1976)
900 ft. - Stans-Drake, Essex Co., gneiss fault (visible link)
750 ft. - Deer Leap, Rutland Co., schist talus (visible link)
650 ft. - Nickwackett Bat, Rutland Co., marble
650 ft. - Mt. Horrid Ice, Windsor Co., gneiss talus
620 ft. - Smugglers Norch Graffiti, Lamoille Co., schist talus
580 ft. - Purgatory, Rutland Co., marble (handshake link)
500 ft. - Aeolus Bat, Bennington Co., marble (maximum estimate)
500 ft. - Skinner Hollow, Bennington Co., marble (maximum estimate)

NEW HAMPSHIRE CAVES WITH AT LEAST 500 FEET OF PASSAGE AS OF 1987

5300 ft. - MBDATHS, Grafton Co., granite talus (visible links; estimate)
1250 ft. - Mt. Washington STM, Coos Co., gneiss talus (visible links)

1200 ft. - Franconia Notch Slabs, Grafton Co., granite talus
1150 ft. - Franconia Notch Coral, Grafton Co., granite talus
1150 ft. - Mt. Adams Ravine, Coos Co., gneiss talus (visible links)
1050 ft. - Ice Gulch Nightmare, Coos Co., granite talus
750 ft. - Franconia Notch Ponor, Grafton Co., granite talus
750 ft. - Lions Head, Coos Co., gneiss talus
750 ft. - Tuckerman 8/2/82, Coos Co., seasonal snowtube
>500 ft. - Lost River, Grafton Co., granite talus (restricted access)

MAINE CAVES WITH AT LEAST 400 FEET OF PASSAGE AS OF 1987

1350 ft. - Witherle-ET, Piscataquis Co., granite talus
1200 ft. - Mahoosuc Ice, Oxford Co., granitic gneiss talus (visible link)
1150 ft. - Champlain, Hancock Co., granite talus
1100 ft. - Saddleback Mtn., Franklin Co., granite talus (visible link)
1000 ft. - Pathfinder, Piscataquis Co., granite talus
>400 ft. - North Basin-G, Piscataquis Co., granite talus

VERMONT AND NEW HAMPSHIRE CAVES WITH AT LEAST 90 FEET OF RELIEF

262 ft. - Purgatory, Rutland VT, marble (handshake link)
185 ft. - Hunter, Rutland VT, marble (165 ft. lost in 1976)
177 ft. - Red Mountain Pit, Bennington VT, marble
>160 ft. - Sicos, Rutland VT, marble (200 ft. by some reports)
>150 ft. - Morris, Rutland VT, marble (including scuba lead)
145 ft. - Tuckerman S-6/23/84, Coos NH, seasonal snowtube
140 ft. - Weybridge, Addison VT, marble (minimum estimate)
140 ft. - MBDATHS, Grafton NH, granite talus (visible links; estimate)
>130 ft. - Tri-State, Bennington VT, schist fault (possibly 150 ft.)
120 ft. - Deer Leap, Rutland VT, schist talus (visible links)
120 ft. - Tuckerman N-6/23/84, Coos NH, seasonal snowtube
110 ft. - Stans-Drake, Essex VT, gneiss fault (visible links)
90 ft. - Dixville Ice Pit, Coos NH, schist vertical fissure
90 ft. - Cow Hill, Caledonia VT, granite fault (excluding lowest pool)
90 ft. - Interstate, Chittenden VT, schist fault (ACCA report)
90 ft. - Old Nickwackett Bat, Rutland VT, marble (possible)

Note: This list is doubtlessly incomplete. The Kent marble cave and Anthony's marble cave in Bennington County, Vermont, and some badly documented or unchecked fissure caves, may have 90 feet or more of relief. The highest estimate for any Maine cave I have seen to date is 65 feet for the Champlain talus system of Hancock County.

ELEVATION-RECORD LIST FOR NEW HAMPSHIRE AND MAINE TALUS CAVES

6150 ft. - 20-footer on Mt. Washington, Coos Co., NH
5650 ft. - 30-footer on Mt. Adams, Coos Co., NH
4750 ft. - 100-footer on Mt. Lafayette, Grafton Co., NH
4500 ft. - 150-footer at Tuckerman Ravine, Coos Co., NH
4400 ft. - 200-footer on Mt. Katahdin, Piscataquis Co., ME
4250 ft. - Lions Head Cave, Coos Co., NH (750 ft. length)
4100 ft. - Mt. Washington STM, Coos Co., NH (1250 ft. length)

3800 ft. - Witherle-ET, Piscataquis Co., ME (1350 ft. length)

Note: The Tuckerman Ravine snowtubes occur above 4350 feet elevation. Chiller Cave in Vermont is at 2450 feet elevation, the Aeolus Bat Cave is at 2400 feet elevation, MBDATHS is at about 2100 feet elevation, Purgatory is around 1600 feet elevation, and Morris Cave is at 800 feet elevation.

THE PURCHASE OF THE JOHN GUILDAY CAVE PRESERVE

Fred Grady

Sometime during April of 1981, the owners of the property containing Trout, New Trout, and Hamilton Caves in Pendleton County, West Virginia decided to enforce the closure of the three caves. New "No Trespassing" signs were put in place and the sheriff was requested to arrest anyone on the property. The August 1981 D.C. Speleograph noted the change in status of the three caves in the closed cave list. Prior to this time Ray Garton and Fred Grady had been doing paleontological work on the property for about two years with the permission of Harlan Moyers, one of the owners. Members of D.C. Grotto and the Potomac Speleological Club had been surveying Trout and Hamilton Caves. All these operations ceased.

The property, said to be 55 acres, had been listed for sale at $65,000 by Wilson Smith, a realtor in Franklin, West Virginia. The price subsequently dropped to $55,000. Fred Grady and Ray Garton informally discussed the possibility of purchasing the property over a period of several months. Fred agreed initially to put up $10,000 for the purchase. Word of the proposed purchase gradually spread through the caving community. Rob Stitt, then President of the National Speleological Society, indicated that there was support on the part of the NSS.[1] Local caving clubs in the D.C. area also expressed considerable interest.

In December of 1981 the NSS Trout Rock Conservation Task Force was formed with Ray Garton as Chairman.[2] Fred Grady was subsequently made co-Chairman. Ray had already approached the Western Pennsylvania Conservancy about funding for the purchase.[3]

Independently, John Wilson, representing the Richmond Area Speleological Society (RASS) made a $25,000 offer for the property.[4] This offer was refused but is significant in that the reply indicated the asking price for the property was now $40,000.[5] This letter also indicated that if the property was not sold in 30 days, the owners would sell the timber on it and save the caverns for a future investment, and that the caverns would be closed to everyone.

John Wilson provided copies of his correspondence to Paul Stevens, then NSS Executive Vice President and also to Rob Stitt. Paul wrote to Ray Garton indicating support and suggesting the Trout Rock CTF and RASS get together.[6] Steve Callen, a caver and certified public accountant, was asked by Ray Garton to negotiate with the owners. In a letter to Wilson Smith, Callen suggested a fair price for the property would be $35,000.[7]

A few days later, John Wilson wrote to Ray Garton indicating that three Richmond based organizations would contribute up to $15,000 to the purchase of the cave property, but demanded several conditions including joint management proportionate to the amount donated.[8] Fred Grady was in particular put off by such demands. The Nature Conservancy was also approached about the possibility of assisting with the purchase.[9] Ray Garton sent a detailed proposal to the NSS Board of Governors meeting at Indianapolis, Indiana, on March 20, 1982.

By May of 1982 an account for the Trout Rock Conservation Task Force had been opened in Franklin. A title search was also completed.[10] There was concern about tax deductions for donations to the CTF as Paul Stevens indicated to Dave Irving, then NSS Secretary-Treasurer.[11] A major fund raising brochure was in the works and letters of support were received from three paleontologists.[12] Ray also received in June a pledge of $5,000 from the American Youth Hostels which was conditional on the purchase price being less than $30,000.[13] Unfortunately none of the outside, non-caving organizations contributed in the long run.

The major fund raising brochure of 28 pages was produced in time to be distributed at the NSS Convention in Bend Oregon, from June 27 to July 3, 1982. This brochure listed Fred Grady and Ray Garton as co-Chairmen of the Trout Rock CTF. By late August of 1982 more than $25,000 had been raised or pledged.[14] More was raised during Old Timers Reunion at Alpine Shores, West Virginia, on Labor Day Weekend. Negotiations had bogged down, and in an effort to get them moving, Ray Garton wrote directly to George Sponagle II, an attorney representing the Moyers family.[15] Fred Grady was becoming increasingly frustrated at the progress and asked Ed Ricketts to join the Trout Rock CTF.

On October 30, 1982, Fred Grady, Ray Garton, and Ed Ricketts got together at the NSS Board of Governors meeting in Morgantown, West Virginia. Here the Ad Hoc Committee for the purchase of the Trout Rock Caves was formed with Fred Grady as Chairman. Ed Ricketts assumed the role of coordinating the purchase.[16] It is evident that feelings were a bit strained among the three members of the Ad Hoc Committee.[17] Over Thanksgiving Weekend of 1982 Ed Ricketts and Fred Grady met with Harlan Moyers to discuss the purchase. Mr. Moyers was not in the best of humor and made repeated threats to timber the property and blow the caves shut. Ed then went ahead and had the county surveyor, Tom Firor, survey the property in January of 1983. This resulted in a total area of 41.63 acres for the property, considerably smaller than advertised. However, according to the owners, size of the property was not a negotiable point. At Fred Grady's urging, Ed Ricketts contacted George Sponagle II and arranged for a meeting on January 17, 1983.

Fred Grady, Ray Garton, and Ed Ricketts were at the meeting with George Sponagle II and made an offer of $34,000. After consultation with Harlan Moyers, Sponagle made a counter offer of $40,000 with the Moyers retaining

an option on the timber on the western half of the property, well beyond the western-most cave entrance. The three members of the Ad Hoc Committee accepted this offer and insisted that contracts be prepared on the spot and a down payment was made at this time. Two days later, the contracts were signed in Birmingham, Alabama at the NSS Officer's Meeting.

Since $30,120 had already been raised, it was necessary to get loans from four cavers and the NSS "Save the Caves Fund" to cover the difference. All loans were interest free. An appeal was sent out to get these loans paid off as soon as possible.[18] Fred Grady wrote a brief announcement of the purchase in the February, 1983 D.C. Speleograph. The purchase was officially completed on March 15, 1983 when the deeds changed hands. There were two separate deeds, on which one the Moyers retained the timber rights and the other containing the three cave entrances.

Also in March, the property was officially designated the John Guilday Cave Preserve after John Guilday, NSS 911, a research paleontologist for the Carnegie Museum of Natural History who had died in November of 1982. Active fund raising continued for about 13 months. During the Virginia Region meeting at Thorn Spring Park, April 28 and 29, 1984, Ron Morton of RASS announced that his organization would pay off the remaining $6,000 of loans.[19] In about three years what had initially been wishful thinking was reality.

Footnotes

1 Letter from Rob Stitt to Fred Grady, Oct. 31, 1981.
2 Letter from Tim Shafstall to Ray Garton, Jan. 18, 1982.
3 Letter from Ray Garton to Josh White, Dec. 10, 1981.
4 Letter from John Wilson to Wilson Smith, Dec. 22, 1981.
5 Letter from Wilson Smith to John Wilson, Jan. 5, 1982.
6 Letter from Paul Stevens to Ray Garton, Jan. 19, 1982.
7 Letter from Steve Callen to Wison Smith, Feb. 5, 1982.
8 Letter from John Wilson to Ray Garton, Feb. 9, 1982.
9 Letter from Paul Stevens to S. Rodman, March 18, 1982.
10 Letter from George Sponagle II to Steve Callen, May 3, 1982.
11 Letter from Paul Stevens to David Irving, May 5, 1982.
12 Letters from Frank Whitmore to Fred Grady, May 21, 1982; from Ralph Eshelman to Fred Grady, June 2, 1982; from John Guilday to Ray Garton, June 9, 1982.
13 Letter from Edward Honton to Ray Garton, June 14, 1982.
14 Letter from Ray Garton to David Irving Aug. 26, 1982.
15 Letter from Ray Garton to George Sponagle II, Sept. 1, 1982.
16 Letter from Ed Ricketts to George Sponagle II, Nov. 10, 1982.
17 Letter from Ed Ricketts to Ray Garton, Nov. 17, 1982.
18 Letter from the Trout Rock CTF to all grottos and IOs, Jan. 27, 1983.
19 D.C. Speleograph, July, 1984.