



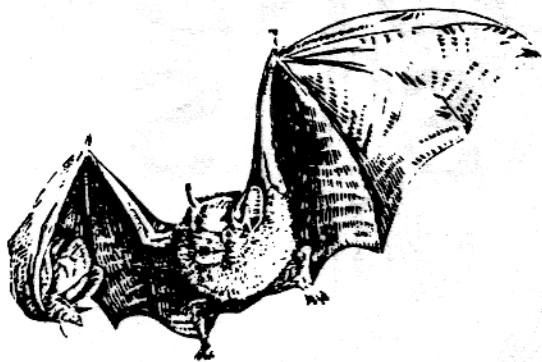
THE UNDERGROUND PRESS

SPECIAL
CARROLL
ISSUE

KANSAS CITY AREA GROTTO

LEFT YOUR
GROSS HERE

CALENDAR OF EVENTS



THIS ISSUE OF THE UNDERGROUND PRESS IS DEDICATED TO THE LATE CHARLIE CARROLL AND THE CARROLL FAMILY; WHOSE GOODWILL AND FRIENDSHIP HAVE MADE IT POSSIBLE FOR MISSOURI CAVERS TO ENJOY AND RESPECT CARROLL CAVE FOR OVER THIRTY-TWO YEARS!

CARROLL CAVE IS A VAST SYSTEM OF UNDERGROUND PASSAGEWAYS. ITS FEATURES ARE DIVERSE. THE CAVE IS UNIQUE IN MANY WAYS AND SO EXTENSIVE IT CAN EASILY DEplete THE PHYSICAL STAMINA OF EVEN THE MOST HARDENED CAVER. IT IS NEITHER COMPLETELY EXPLORED NOR COMPLETELY SURVEYED. ALTHOUGH IT IS ONE OF MISSOURI'S LARGEST AND MOST SIGNIFICANT CAVE SYSTEMS, IT IS ALSO ONE OF THE LEAST STUDIED. IT HOLDS MANY SECRETS IN ITS AWESOME AND MUDDY GRIP AND IT YIELDS ITS MYSTERIES SLOWLY.

THE UNDERGROUND PRESS IS PUBLISHED QUARTERLY BY THE KANSAS CITY AREA GROTTO OF THE NATIONAL SPELEOLOGICAL SOCIETY. SINGLE COPIES AVAILABLE ON REQUEST, SUBSCRIPTIONS ARE FREE TO GROTTO MEMBERS. ARTICLES ARE PUBLISHED FOR EDUCATIONAL PURPOSES AND DO NOT NECESSARILY REFLECT THE VIEWS OF THE ENTIRE GROTTO OR THE NATIONAL SPELEOLOGICAL SOCIETY.

CALENDAR OF UPCOMING EVENTS IN SPELEOLOGY FOR K.C.A.G. IN 1987.

MARCH 14-15: FITTON CAVE TRIP NEAR DOGFATCH, ARKANSAS. LIMITED TO EIGHT GROTTO MEMBERS ON EACH PERMIT FROM THE BUFFALO NATIONAL SCENIC RIVERWAY HEADQUARTERS. CONTACT RICHARD CINDRIC.

APRIL 25-26: SPRING 1987 M.V.O.R., BLUE RIVER CAMPGROUND, MILLTOWN, INDIANA. HORSEBACK RIDING, CAVING, CANOEING, HOT SHOWERS. BANQUET BY PRE-REGISTRATION. FURTHER INFORMATION AND PRE-REGISTRATION CONTACT: SCOTT FEE, 3630 WINGATE TERRACE, APT. C, INDIANAPOLIS, INDIANA 46236, (317) 897-1940.

MAY 30-31: SPRING M.S.S. MEETING IN ROLLA AT GEOLOGICAL SURVEY BUILDING. EVERYONE WELCOME! AFTER THE MEETING, THOSE INTERESTED WILL BE TRAVELING DOWN TO THE OZARK UNDERGROUND LABORATORY FOR A "CAVER'S TOUR" OF TOM AND CATHY ALEY'S GREAT FACILITIES. CONTACT BART RAPP FOR FURTHER INFORMATION.

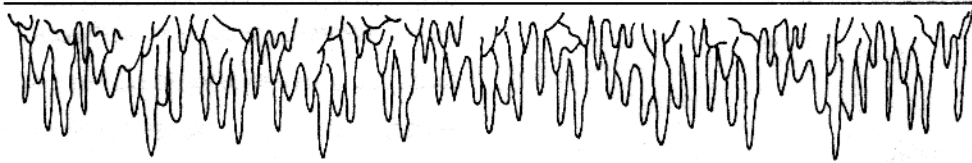
JUNE 15-19: CARLSBAD CAVERNS RESTORATION FIELD CAMP. SPONSORED BY N.P.S., C.R.F., U.S.S. LIMITED TO 30 PEOPLE. A CHARGE OF \$35.00 COVERS BED, BREAKFAST, AND DINNER. CONTACT: JOHN FRANCISCO, 7702 E. FAYETTE, TUCSON, ARIZONA 85730.

AUGUST 3-7: U.S.S. CONVENTION, SAULT STE. MARIE, MICHIGAN. CONTACT: DAVE LUCKINS, 428 FARNSWORTH, UNION LAKE, MICHIGAN 48085. (313) 698-4383 (H); (313) 683-4527 (W).



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SPECIAL CARROLL CAVE ISSUE :

CALENDAR OF EVENTS

A GROTTO IS BORN

CARROLL GATE PROJECT

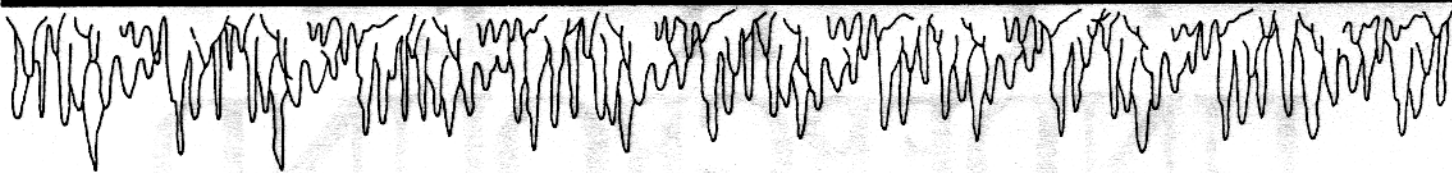
EARLY DAYS AT CARROLL CAVE

MINERALOGY OF CARROLL CAVE

GRAY BAT FACT SHEET



A GROTTO IS BORN



ON A COLD OCTOBER NIGHT 1967, MIKE AND BETTYANN LEONARD, DERRIL AND JUDY MENNIS, BILL AND JOANN BUSHAM, DAVE GRIFFITH, AND CHARLES WATTS MET IN CHARLIE'S BASEMENT AND STARTED THE WHEELS IN MOTION THAT WOULD SOMEDAY CARRY THEM TO THE REALIZATION OF AN N.S.S. GROTTO IN THE KANSAS CITY AREA.

AT THE FIRST MEETING THE GROUP DISCUSSED THE GOALS AND PURPOSES OF THE INVISIONED GROTTO AND PLANNED THE FIRST OFFICIAL CAVE TRIP OF THE GROUP TO CARROLL CAVE. THE DATE OF THE NEXT MEETINGS WAS SET FOR NOVEMBER.

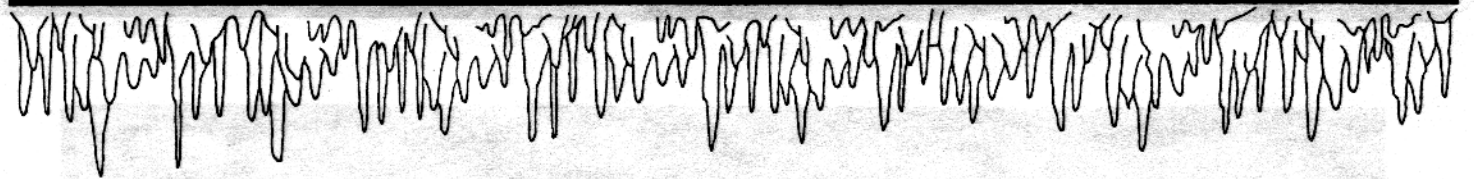
GATED FOR THE PRESERVATION OF THE CAVE. A GROUP WAS THEN DESIGNATED TO ATTEND THE UPCOMING MEETING OF THE M.S.S. TO PRESENT OUR PLAN TO GATE CARROLL CAVE ANOTHER MEETING OF THE GROUP WAS SCHEDULED FOR DECEMBER.

IN DECEMBER THE CONSTITUTION WAS PRESENTED AND DISCUSSED AND SUGGESTIONS WERE MADE FOR REVISION. THE GROUP THEN DISCUSSED WHAT WENT ON AT THE M.S.S. MEETINGS. IN GENERAL THE GROUP LEARNED THAT MOST EVERYONE INVOLVED IN THE M.S.S. WAS VERY MUCH IN FAVOR OF THE GATE, BUT WERE VERY SKEPTICAL AS TO WHETHER WE COULD MANAGE SUCH A MONUMENTAL TASK SINCE ALL WHO HAD COME BEFORE FOR ABOUT 10 YEARS HAD FAILED. HOWEVER, WE PROVED THEIR SKEPTICISM WRONG, FOR IN APRIL THE CARROLL GATE WAS TO BECOME A REALITY!

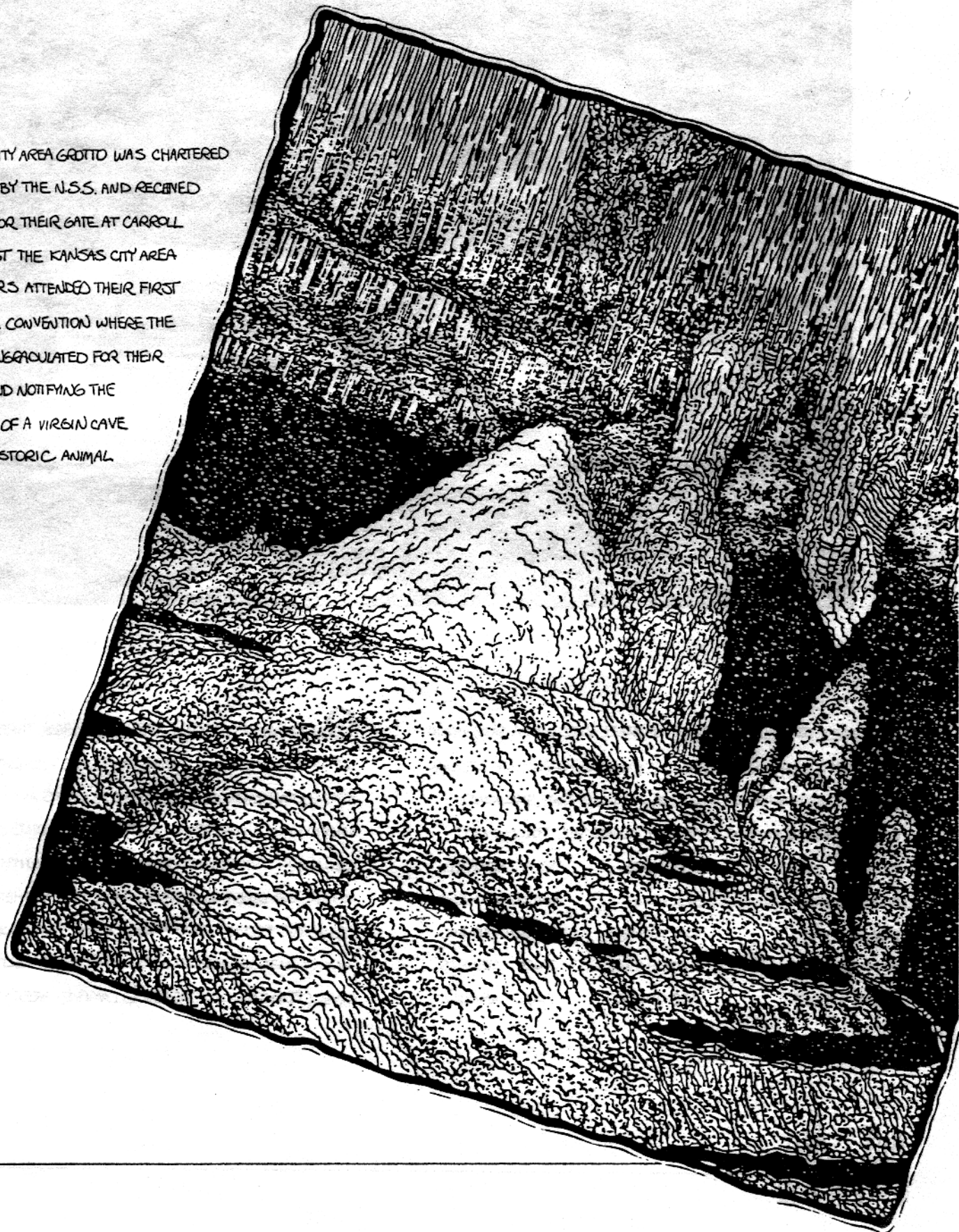
DURING THE INSUEING MONTHS THE GROUP MAPPED THE DEEPEST VERTICAL CAVE OF MISSOURI, MADE AN APPLICATION TO THE M.S.S. FOR MEMBERSHIP, AND ALSO INQUIRED ABOUT POSSIBLE N.S.S. MEMBERSHIP.

AT THE NEXT MEETING A CONSTITUTION COMMITTEE WAS ESTABLISHED AND PREAMBLES WERE READ AND DISCUSSED. THE PREAMBLE THAT WAS ULTIMATELY TO BE SELECTED WAS PRESENTED AND REVISED, SETTING FORTH THE FEELINGS OF THE GROUP TOWARD CAVING IN GENERAL AND THE KANSAS CITY AREA GROTTO IN PARTICULAR. AFTER THE BUSINESS OF THE NIGHT WAS COMPLETED THE GROUP DISCUSSED THE RECENT TRIP INTO CARROLL CAVE AND OF THE DEPLORABLE CONDITION OF THE CAVE. IT WAS SUGGESTED THAT THE CAVE BE

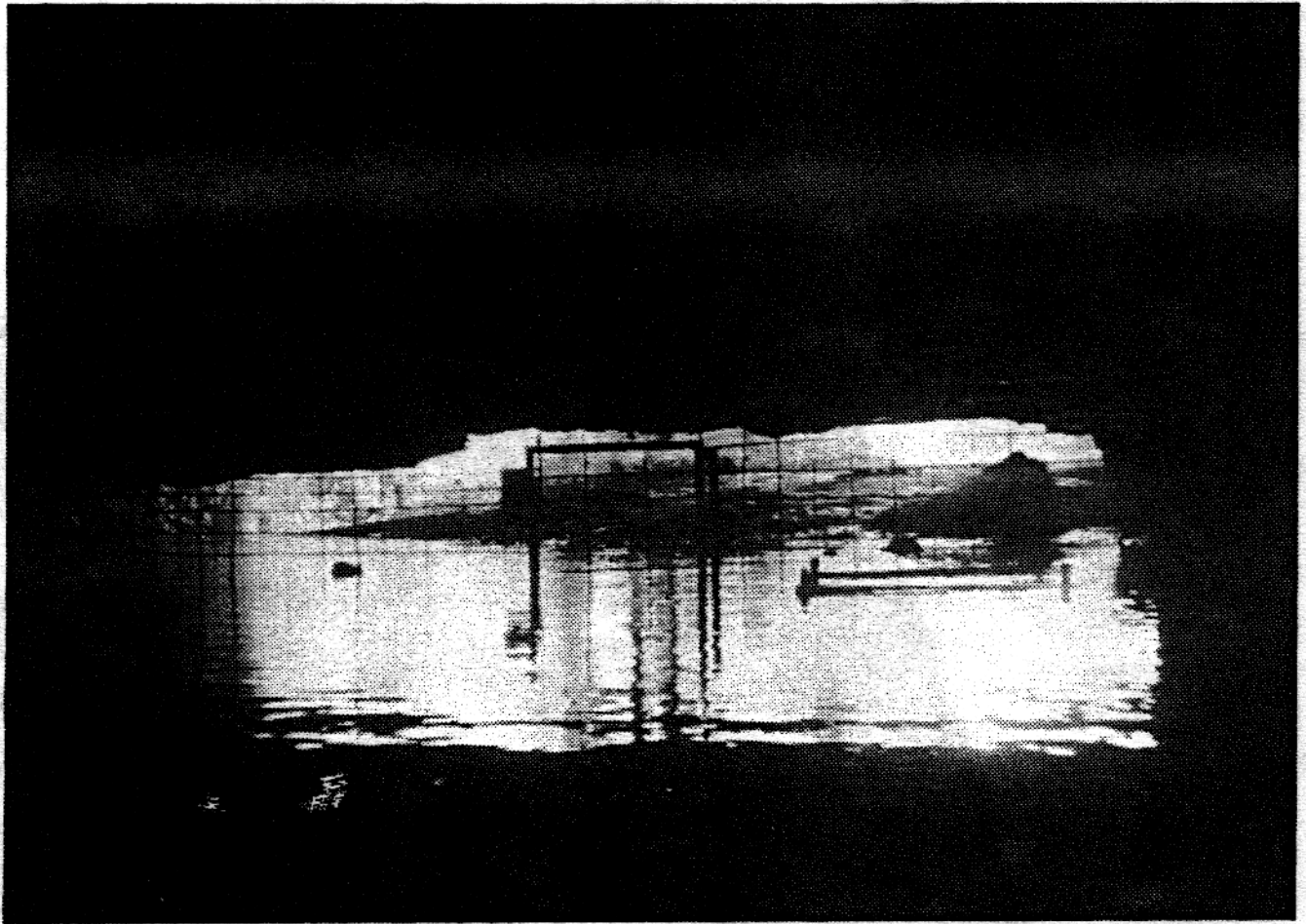




THE KANSAS CITY AREA GROTTO WAS CHARTERED IN SEPTEMBER BY THE N.S.S. AND RECEIVED RECOGNITION FOR THEIR GATE AT CARROLL CAVE. IN AUGUST THE KANSAS CITY AREA GROTTO MEMBERS ATTENDED THEIR FIRST NATIONAL N.S.S. CONVENTION WHERE THE GROUP WAS CONGRATULATED FOR THEIR DISCOVERING AND NOTIFYING THE PROPER PEOPLE OF A VIRGIN CAVE AND ITS PREHISTORIC ANIMAL DEPOSITS.



CARROLL GATE PROJECT



PURPOSE: TO PLACE A BARRIER OF STEEL BARS AND A GATE WITHIN THE ENTRANCE OF CARROLL CAVE. THE EXPRESS PURPOSE OF THE BARRIER IS TO STOP ANYMORE VANDALIZING OF THE CAVE. THE KANSAS CITY AREA GROTTO MEMBERS PRESENT WERE THE FOLLOWING:

CHARLES WATTS	BOB KORTE	BETTY LEONARD
MIKE LEONARD	BILL KLING	VIVIAN YOTHERS
JAY YOTHERS	TOM TUCKER	DERRIL MENNIS
BILL BINGHAM	MIKE BAUER	JUDY MENNIS
STEVE MOUNT	BOB TURNER	PAUL CARROLL

ON FRIDAY AFTERNOON, APRIL 26TH, 1968, THREE VEHICLES LEFT KANSAS CITY IN A RATHER OVERLOADED CONDITION, AND THEN HEADED FOR CARROLL CAVE. CHARLIE WATTS AND HIS JEEPSTER WAGON WITH A PORTABLE GAS DRIVEN WELDING OUTFIT IN TOW; BILL KLING WITH HIS TRUCK LOADED DOWN WITH ROD, CEMENT MIXER, AND OTHER ASSORTED GEAR; JAY YOTHERS WITH FOOD, GEAR, AND PEOPLE ABOARD HIS DODGE; AND FOR SOME REASON (UNKNOWN TO WE MORTALS) ALL ARRIVED SAFELY AT PERKINS CAVE. (PERKINS UNDERGROUND CAMPING AREA) I THINK THE

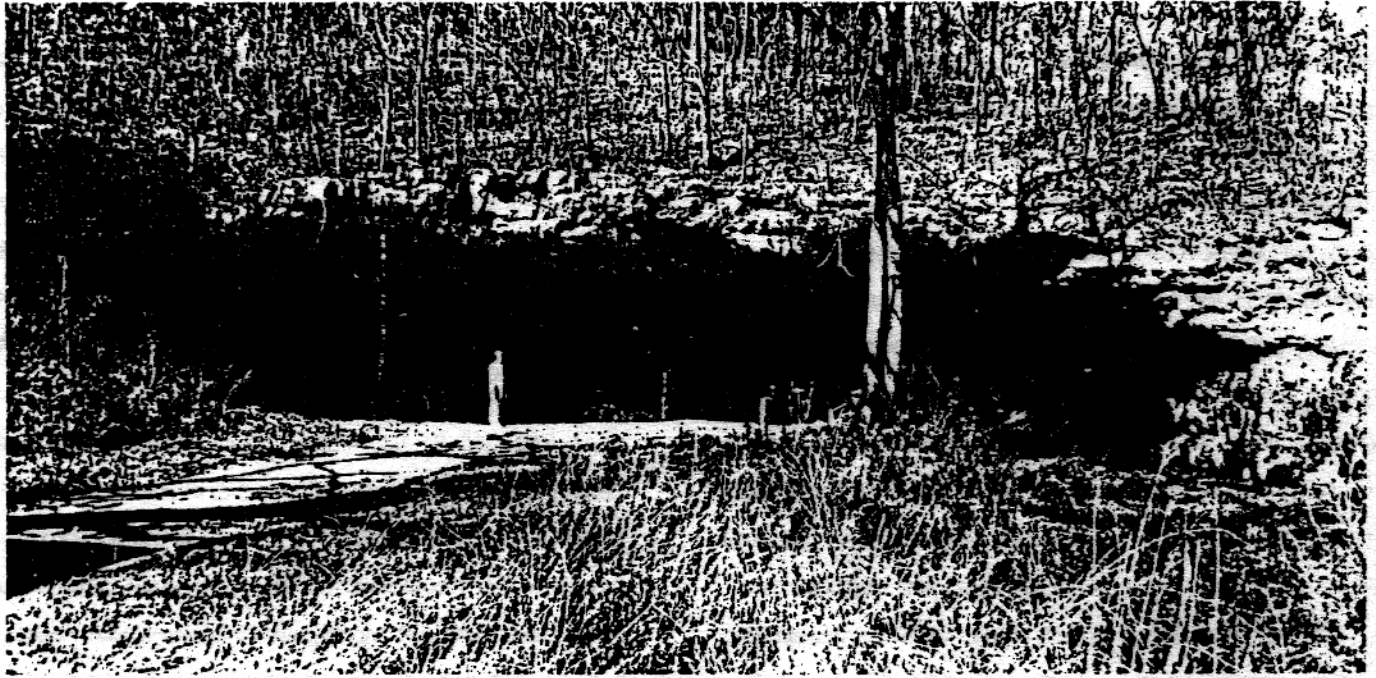


FIRST OF US TO ARRIVE PASSED THE ENTRANCE SEVERAL TIMES WHILE SOME OF US DROVE TO AND FRO IN AN AREA ALONG THE SAME ROAD, (BUT SOME DISTANCE REMOVED FROM PERKINS) SEARCHING IN VAIN FOR THE ENTRANCE FOR SOME TIME BEFORE DECIDING WE HADN'T COME FAR ENOUGH YET. AFTER A WHILE WE WERE ALL BUSCONCED IN OUR WARM SLEEPING BAGS FOR THE NIGHT. HOWEVER, AT AN UNEARTHLY HOUR (6:30AM) BILL KLING WOKE US. SO, AFTER DULY CONSIDERING THIS STRANGE OCCURENCE WE ALL AROSE, RESIGNED TO FACE AN UNCOMFORTABLE DAY IN CARROLL'S COLD WATER. SOMEHOW WE MANAGED TO GET THROUGH BREAKFAST AND HEADED DOWN THE ROAD TO CARROLL'S WITH ALL OUR EQUIPMENT IN THE WORLD AND IT SEEMED LIKE MUCH MORE MATERIAL THAN WE WOULD EVER NEED AND UNLOADED SAME. WE WERE MET AT CARROLL BY BOB KORTE WHO'D DRIVEN SEVERAL HOURS TO GET DOWN AND HELP WITH THE WORK. AFTER AWHILE WE DID MANAGE TO GET THE WELDER SET IN PLACE AND RUNNING, A LINE OF RODS DRIVEN INTO THE SEDIMENT ON A LINE ABOUT 4 FEET APART AND WERE ABLE TO BEGIN DRILLING IN THE CEILINGS AND THE WALLS. MORE ROD WAS WELDED ONTO THESE ALREADY DRIVEN INTO THE SEDIMENTS AND DRIVEN ON DOWN, UNTIL WE HAD RODS THAT WERE DRIVEN FROM SIX TO TEN FEET DEEP APPROXIMATELY FOUR FEET APART ALL THE WAY ACROSS THE ENTRYWAY ABOUT SIXTY FEET IN FROM THE DRAPLINE OF THE CAVE. THE WORK CONTINUED THRU THE DAY WITH HARDLY ANY BREAK FOR LUNCH AT ALL AND ABOUT 6 P.M. WE KNOCKED OFF FOR SUPPER. DURING THE DAY CHARLIE WATTS WELDED AND BILL BINGHAM CLAMPED RODS FOR HIM. MIKE LEONARD, JAY YOTHERS, AND BILL KLING HANDLED THIS BIG HEAVY DUTY A.C.-D.C. 1/2" DRILL BORING HOLES INTO THE DOLOMITE ARCH WITH A MASONRY BIT AND THEY WERE SOON "WELL-POWDERED" WITH ROCK DUST, AND BLOODY WELL BEAT TO DEATH! THAT ROCK IS EXTREMELY RESISTANT TO DRILLING WITH HAND AND SHOULDER-PRESSED TOOLS, IT TOOK MOST OF THE DAY TO ACHIEVE THE LINE OF HOLES ALL THE

WAY ACROSS AND DOWN THE WALLS, PLUS SOME BRAS FOR FRONT BRACING. ALL OF THE POINTS WERE WELDED WHERE THE RODS CROSSED AND IT WILL SUFFICE TO SAY THAT THIS BARRIER OF GRILL WORK WILL NOT BE REMOVED EASILY. HOWEVER, WE DO RUN OUT OF STEEL BEFORE WE WERE FINISHED SO CHARLIE WATTS AND BINGHAM MADE A RETURN TRIP TO FINISH THE JOB THREE WEEKS LATER! ON SATURDAY EVENING CHARLIE WATTS SHOWED SLIDES TO A GOOD PERCENTAGE OF THE LOCAL FOLKS AT THE RESIDENCE OF PAUL CARROLL, (MRS. CARROLL'S SON) AND WERE WELL RECEIVED BY ALL PRESENT. BILL BINGHAM STAYED IN THE SACK AND BEGAN FEELING THE EFFECTS OF AN OVERDOSE OF ELECTRIC ARCS AT CLOSE PROXIMITY AND SPENT AN UNCOMFORTABLE SATURDAY NIGHT AND SUNDAY. AROUND MIDNIGHT SATURDAY WE WERE TUCKED INTO OUR SACKS, ONLY TO BE AWAKENED AGAIN (AT FOUR A.M. THIS TIME) BY THE UNEARTHLY HOWLING OF THE INHUMAN SGT. BILL KLING; (KLING SHOULD MAKE AN EXCELLENT D.I. AT PARIS ISLAND.) BREAKFAST WAS HAD, SUCH WORK AS COULD BE DONE ON THE BARRIER GRILL WAS RESUMED, THEN EQUIPMENT AND TOOLS WERE HASTILY PICKED UP AND THE CAMPING AREA AT PERKINS WAS (NOT SO HASTILY) CLEANED UP, AND WE ALL MADE OUR WEARY WAYS BACK TO KANSAS CITY. IT WAS THE END OF LONG WEEKEND!

THIS ARTICLE WAS TAKEN FROM AN 'OLD' K.C.A.G. NEWSLETTER ENTITLED "MISSOURI UNDERGROUND" AND WAS WRITTEN BY ONE OF K.C.A.G.'S ORIGINAL MEMBERS, BILL BINGHAM. BOB KORTE FURNISHED THE PHOTOGRAPH OF CARROLL CAVE'S ENTRANCE TAKEN FROM INSIDE THE ENTRANCE PASSAGE LOOKING OUT INTO DAYLIGHT. THIS 'FREEZING' VIEWPOINT WAS TAKEN IN THE LATE 60'S SOMETIME AND SHOWS A HIGHER WATER LEVEL AND THE OLD DOCK BUT WAS BEFORE THE BAIT BOX WAS INSTALLED IN THE ENTRANCE AREA.





FOR MISSOURI CAVERS IT ALL BEGAN LATE IN 1955. DESCRIBING THOSE MOMENTS ON THE THRESHOLD OF DISCOVERY, DR. OSCAR HAWKESLEY WROTE IN 1966 "SOMETIME IN 1954 OR EARLY 1955, DR. JAMES KEZER, THEN OF THE UNIVERSITY OF MISSOURI DEPARTMENT OF ZOOLOGY, MENTIONED A CAVE NEAR WET GLAIZE WHICH HE HAD INVESTIGATED SLIGHTLY IN LOOKING FOR SALAMANDERS. HE THOUGHT THAT IT SHOULD BE CHECKED MORE THOROUGHLY AND TOLD US WHO TO CONTACT TO USE THE OLD WOODEN BOAT IN THE ENTRANCE. OUR FIRST OPPORTUNITY TO EXPLORE THIS CAVE CAME ON NOVEMBER 19, 1955 WHEN A JOINT CLUB OF THE WESTERN MISSOURI CHAPTER (OF M.S.S.) AND THE CENTRAL MISSOURI CUTTING CLUB MEMBERS MET AT CARROLL FOR A TRIP. ON THE FIRST TRIP IN, THE BOAT DUNK AND LEFT SEVERAL PEOPLE STRANDED ON A NARROW SHELF WHILE OTHERS WENT BACK FOR REINFORCEMENTS. AFTER THIS FAKE START, THE GROUP DID FINALLY GET INTO THE CAVE AND IT CERTAINLY WAS WORTH CHECKING OUT, FOR THIS WAS

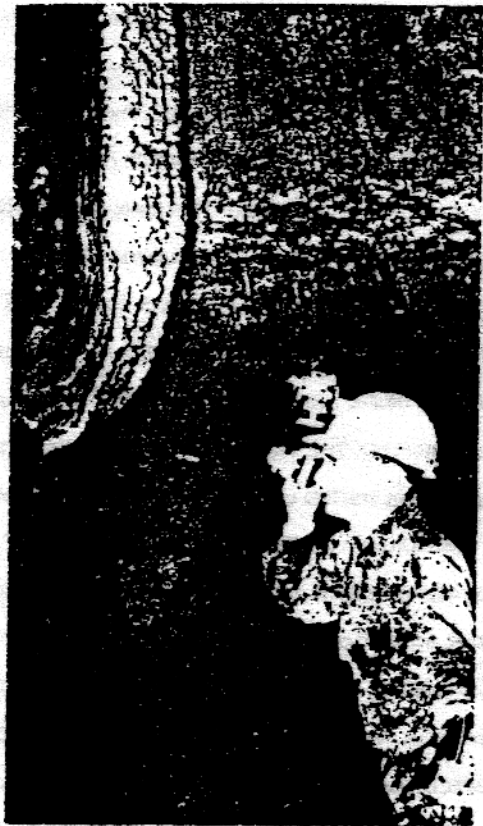
CARROLL CAVE!" OBVIOUSLY, THE CAVE HAS BEEN ENTERED BY OTHERS. WHO? WHEN? HOW FAR DID THEY GET? THERE ARE NO RECORDS PREDATING 1955. MISSOURI CAVING WAS NOT AS SOPHISTICATED IN 1955 AS IT IS TODAY. IT WAS QUITE A RISK TO VENTURE INTO THE CAVE IN A LEAKING OLD WOODEN BOAT. BUT MISSOURI CAVING HAD A LOT OF GROWING PAINS TO ENDURE YET. THERE WERE THIRTEEN PARTICIPANTS ON THE FIRST WMO-CMSC TRIP INTO CARROLL CAVE. THIS EXPEDITION RESULTED IN WHAT MAY BE THE FIRST NEWS RELEASE ON THE CAVE ALSO. IN DESCRIPTION, THE ARTICLE STATED: "ENTRANCE INTO THE CAVE WAS MADE BY BOAT FOR NEARLY 200 YARDS. SOME OF THIS WATER PASSAGE HAD SUCH A LOW CEILING (THE KNECKBREAKERS) THAT IT WAS NECESSARY TO LIE DOWN IN THE BOAT AND PROPEL IT BY PUSHING AGAINST THE CEILING." THE WATER PASSAGE OPENED INTO AN ENORMOUS ROOM APPROXIMATELY 600 FEET ACROSS AND 80 FEET HIGH. GIANT STALACTITES OF A



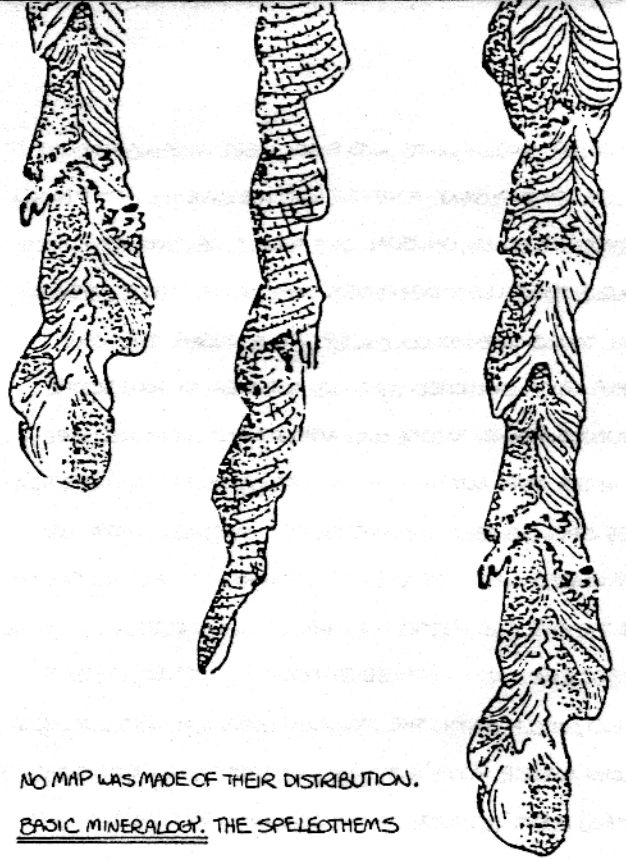
RUSTY COLOR, SNOWY WHITE, AND BLACK WERE HANGING THROUGHOUT THE ROOM. BY EXPLORING FURTHER INTO THE CAVE THE GROUP FOUND RARE LIMSTONE POOLS, UNUSUAL CAVE PEARLS, DELICATE HELECTITES, AND LARGE TRANSLUCENT DRAPERIES. SOME OF THE LATTER GAVE CLEAR, MUSICAL TONES WHEN STRUCK GENTLY WITH A FINGER. THE GROUP HAD BEEN EXPLORING UNTOUCHED TERRITORY FOR OVER AN HOUR BEFORE THEY TURNED AROUND TO COME OUT. APPROXIMATELY SIX HOURS WERE SPENT IN THE CAVE, BUT THE POINT OF FURTHER PENETRATION WAS IN A PASSAGE STILL 50 FEET IN DIAMETER AND NUMEROUS PROMISING SIDE PASSAGES WERE NOT EVEN CHECKED. AN INTERESTING SKETCH MAP OF THE EXPLORED PORTION OF CARROLL WAS CREATED DURING THE NOVEMBER EXPEDITION, DETAILED BY OSCAR HAWKSLEY, CHARLES HOUX AND LUCILLE SMITH. THE MOUNTAIN ROOM WAS INITIALLY CALLED THE "SCHOOLHOUSE ROOM" BUT THIS WAS LATER CHANGED TO THE "MOUNTAIN ROOM" BECAUSE OF THE CHAMBERS SIZE AND THE HUGE MOUNTAIN-LIKE PILES OF BREAKDOWN AND CLAY IT CONTAINS. EXPLORING BEYOND THE MOUNTAIN ROOM FOR 2000 FEET, A RIGHT-HAND PASSAGE WAS INVESTIGATED WHEREIN THE EXPLORERS FOUND MANY FORMATIONS AND A DANGEROUS LOOKING HOLE 40 FEET DEEP. ANOTHER LEFT HAND PASSAGE FURTHER UP THE CAVE'S MAIN CORRIDOR YIELDED A FIND OF CAVE PEARLS. THE NEXT LEFT HAND PASSAGE 1800 FEET AWAY PRODUCED LIMSTONE POOLS WITH FLOATING CALCITE. THIS PASSAGE IS DOWNSTREAM FROM THE "SNAKE SKIN". LESS THAN 1200 FEET FROM THE "SNAKE SKIN" LAY THE ENTRANCE TO LEFT FORK, THE MOST INTERESTING LEFT HAND PASSAGE ALONG CARROLL RIVER PASSAGE. BUT IN NOVEMBER OF 1955 THE EXPLORERS HAD NO INKLING AS TO WHAT WONDERS SHIMMERED IN TRAGUL BEAUTY NEAR ITS END. ENJOYING THE FIRST FEW HUNDRED FEET OF LEFT FORK, THE EXPEDITION MEMBERS FOUND A SMALL WINDOW AMONG THE FORMATIONS AND THIS LED TO THE "TOTEM POLE" AND THE GREAT BARREN STRETCHES BEYOND. IT WAS AT THIS POINT THAT

EXPLORATION WAS TERMINATED. THE "PARADISE ROOM" AND "AZURE POOL" WAITED IN SILENCE. THEIR TIME HAD NOT COME YET, BUT WAS SOON TO BE!

THIS ARTICLE WAS WRITTEN BY DWIGHT WEAVER OF THE LAKE OF THE OZARKS GROTTO FOR THE 1983 FALL MNOR AT CARROLL CAVE. THE PHOTOGRAPH TO THE LEFT IS OF CARROLL'S ENTRANCE TAKEN BY PAUL JOHNSON IN 1979. THE PHOTOGRAPH BELOW IS OF A YOUNG JERRY VINEYARD TAKING A SHOT OF THE "SNAKE SKIN".



MINERALOGY OF CARROLL CAVE



CARROLL CAVE IS LOCATED IN CAMDEN COUNTY, MISSOURI IN THE GENTLY DIPPING GASCONADE DOLOMITE OF THE OZARK DOME. THE PORTION OF THE CAVE UNDER CONSIDERATION IS ABOUT TWO MILES LONG AND CONSISTS FOR THE MOST PART OF A SIMPLE WINDING RIVER SYSTEM PASSAGE. THE CROSS-SECTION VARIES, BUT AVERAGES 20 TO 30 FEET WIDE AND FROM 6 TO 20 FEET HIGH. MASSIVE BLOCK BREAK-DOWN IS PRESENT BUT IS NOT PARTICULARLY COMMON. THE GALLERY IS FLOORED WITH A THICK SILT WITH SOME CLAY. A SMALL STREAM, THE CARROLL RIVER, FLOWS ALONG THE FLOOR. NEAR THE ENTRANCE, PONDING OF THIS STREAM COMBINED WITH A LOW CEILING MAKES AN EFFECTIVE BARRIER TO ACCESS TO THE CAVE. THE SPELEOTHEMIC SECTION DESCRIBED IN THIS PAPER COMPRISES ABOUT ONE HALF MILE OF GALLERY BEGINNING WITH THE APPEARANCE OF THE FIRST SPELEOTHEMS BEYOND THE MOUNTAIN ROOM AND CONTINUES TO THE LUNCH ROOM. ADDITIONAL SPELEOTHEMIC SECTIONS OCCUR NEAR THE "WATER BARRIER" AND BEYOND NEAR THE INTERSECTION OF THE THUNDER RIVER PASSAGE. THESE WERE EXAMINED BRIEFLY BUT WERE NOT EXTENSIVELY SAMPLED. THE FIELD WORK ON THIS PAPER WAS VERY BRIEF. CARROLL WAS VISITED ON APRIL 1, 1959 BY THE AUTHORS, JOHN STELLMACK AND WILLIAM WHITE ACCOMPANIED BY HERBERT BLACK, MR. AND MRS. GEORGE DEIKE AND BETTY WHITE. THE VISIT BEGAN WITH A SIMPLE TOUR AS PART OF THE U.S.S. PRE-CONVENTION FIELD TRIPS. HOWEVER, NOTING THE UNUSUAL NATURE OF THE SPELEOTHEMS, A LITTLE TIME WAS SPENT IN MAKING SOME DETAILED OBSERVATIONS. CAREFULLY SELECTED SPECIMENS OF BROKEN SPELEOTHEMS WERE COLLECTED FOR LATER ANALYSIS. THE TYPES OF SPELEOTHEMS WERE NOTED BUT

NO MAP WAS MADE OF THEIR DISTRIBUTION.

BASIC MINERALOGY. THE SPELEOTHEMS

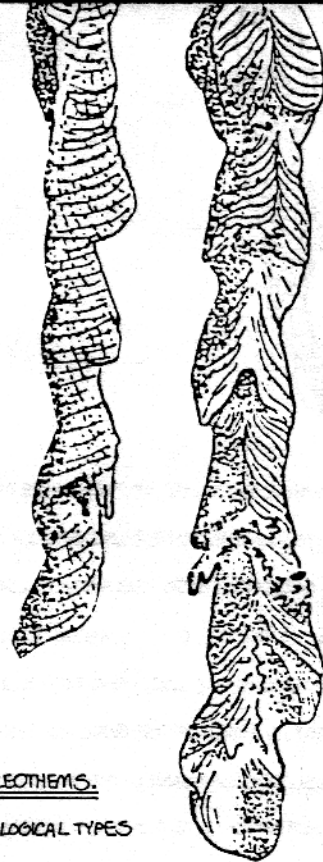
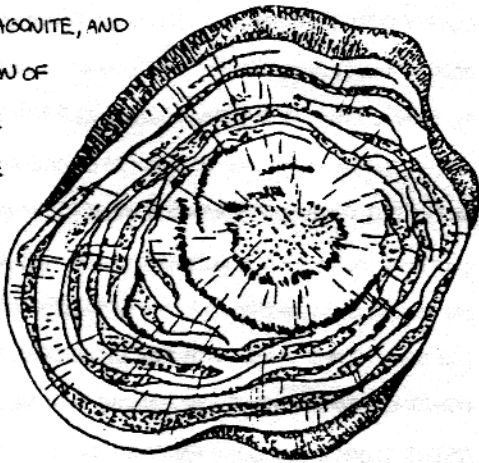
OF CARROLL CAVE ARE COMPOSED OF CALCITE AND ARAGONITE. CHEMICALLY, THESE ARE BOTH CALCIUM CARBONATE. CALCITE CRYSTALLIZES IN THE RHOMBOHEDRAL BRANCH OF THE HEXAGONAL SYSTEM AND ARAGONITE CRYSTALLIZES IN THE ORTHORHOMBIC SYSTEM. CALCITE OCCURS IN THE CAVE EITHER AS MASSIVE CALCITE WITH GOOD RHOMBOHEDRAL CLEAVAGE OR AS TUFTS OF SCALEHEDRONS SHOWING GOOD CRYSTAL DEVELOPMENT. THE LATTER OFTEN OCCURS AS POOL DEPOSITS WHILE THE FORMER MAKES UP THE BULK OF SUBAERIALY DEPOSITED DRIPSTONE AND FLOWSTONE. THE CALCITE WHEN FRESH SHOWS A SMOOTH POLISHED SURFACE WITH NEARLY A VITREOUS LUSTER. WHEN FRACTURED, THE CALCITE SPELEOTHEMS SHOW THE CLEAVAGE FACES OF MANY SMALL CRYSTALS ACROSS THE FRACTURE PLANE, GIVING IT A BLOCKY, STEPPED APPEARANCE. ARAGONITE CAN OCCUR EITHER MASSIVELY OR AS TUFTS OF CRYSTALS KNOWN AS ANTHODITES. ALTHOUGH THE MASSIVE ARAGONITE IS RATHER RARE IN MOST CAVES, IT IS EXCEEDINGLY COMMON THROUGHOUT CARROLL CAVE.



ANTHODITES WERE NOT OBSERVED ALTHOUGH CONDITIONS

APPEARED TO BE CORRECT FOR THEIR OCCURENCE. ARAGONITE HAS A GOOD 100 AND 010 CLEAVAGE. IT TENDS TO OCCUR AS LONG ACICULAR PRISMS OR NEEDLES. BECAUSE OF THIS DIFFERENT CRYSTAL ORIENTATION, THE SURFACE OF A FRESH ARAGONITE SPELEOTHEM HAS A WHITE COLOR AND A SILKY LUSTER WITH A "WHITWASHED" APPEARANCE. A BROKEN SECTION OF AN ARAGONITE SPELEOTHEM WILL ALSO SHOW THE SILKY LUSTER AND HAS A FIBROUS APPEARANCE DUE TO THE MATTING OF THE ACICULAR CRYSTALS.

METHODS OF ANALYSIS. SEVERAL OF THE LARGER SPECIMENS WERE SAWED INTO SLICES TO SHOW THE STRUCTURE OF THE CRYSTALS WITHIN THE SPELEOTHEM. CALCITE WAS DISTINGUISHED FROM THE ARAGONITE BY X-RAY DIFFRACTION. THE SAMPLE WAS POWDERED IN A MORTAR, MOUNTED ON A GLASS SLIDE, AND SCANNED FROM 20 TO 30 DEGREES 2-THETA WITH COPPER K-ALPHA RADIATION IN A GEIGER COUNTER DIFFRACTOMETER. THE INTENSITY OF THE 26.1° AND 27.1° REFLECTIONS OF ARAGONITE, AND THE 29.3° REFLECTION OF CALCITE SHOWED THE PROPORTIONS OF THE TWO MINERALS PRESENT.



DESCRIPTION OF SPELEOTHEMS.

THE KNOWN MORPHOLOGICAL TYPES OF SPELEOTHEMS FROM CARROLL

CAVE DIFFER FROM THOSE IN OTHER CAVES ONLY IN THE PROPORTION OF MASSIVE ARAGONITE THAT OCCURS IN IT. THE KNOWN FORMS WILL BE CATALOGUED AND DESCRIBED IN THIS SECTION. MASSIVE STALAGMITES, MOSTLY OF PARABOLIC CROSS-SECTION OCCUR THROUGHOUT THE AREA. THEY RANGE FROM A FEW INCHES TO 8 FEET IN HEIGHT AND UP TO SEVERAL FEET IN DIAMETER. BOTH ARAGONITE AND CALCITE STALAGMITES OCCUR. IF THE ARAGONITE STALAGMITES ARE INDEED ENTIRELY ARAGONITE, THEY ARE THE MOST MASSIVE SINGLE SPECIMENS YET REPORTED. MANY OF THE LARGE ONES COULD NOT BE ANALYSED AND THE PRESENCE OF ARAGONITE WAS MERELY SUPPOSED FROM THE "WHITWASHED" SURFACE. A STALAGMITE FROM THE CARROLL RIVER PASSAGE WAS SAWED SO THAT THE CROSS-SECTION COULD BE EXAMINED IN DETAIL. THE ORIGINAL SPECIMEN WAS 8 INCHES LONG AND TWO INCHES IN DIAMETER. GROWTH RINGS ARE CLEARLY VISIBLE AS A SERIES OF TWO DARK BANDS SEPERATED BY WHITE SILKY LAYERS. THE DARK





BANDS

PROVED TO BE

MOSTLY CALCITE WHILE THE WHITE LAYERS WERE MOSTLY ARAGONITE. A 3/4" DIAMETER LAYER IN THE CENTER WAS SPONGY ARAGONITE. THE OUTSIDE OF THIS SPECIMEN ALSO HAD A SILKY LUSTER. SINCE THE ARAGONITE GROWS WITH THE C-AXIS RADIAL TO THE GROWTH CENTER, AND SINCE THE C-AXIS IS THE LONG AXIS OF THE CRYSTAL, THE SURFACE OF THE SPELEOTHEM IS A MAT OF THE ENDS OF THE ARAGONITE CRYSTALS. BECAUSE ONE OBSERVES THE ENDS OF THE ARAGONITE FIBERS, THE SPELEOTHEMS HAVE A SILKY APPEARANCE. THIS IS IN CONTRAST TO CALCITE IN WHICH CLEAVAGE PLANES ARE PARALLEL TO THE SURFACE AND THUS THE SPELEOTHEM HAS A SMOOTH VITREOUS LUSTER. THIS SPECIMEN IS OF INTEREST IN THAT IT SHOWS THAT DEPOSITION HAS ALTERNATED BETWEEN CALCITE AND ARAGONITE DURING THE PERIOD OF THE STALAGMITES GROWTH. NUMEROUS STALACTITES OF THE CONICAL, CYLINDRICAL, AND CARROT SHAPES OCCUR. THEY ARE USUALLY SMALL, SELDOM BEING MORE THAN A FOOT LONG AND A FEW INCHES IN DIAMETER, ALTHOUGH SEVERAL GROWING CLOSE ENOUGH TO THE WALL TO BE CALLED CASCADES ARE MUCH LARGER. SOME FRAGMENTS OF STREAM ERODED STALACTITES FROM THE "WATER BARRIER" SHOW A CENTRAL CORE OF CALCITE AND A THIN OUTER LAYER OF ARAGONITE. ONE SPECIMEN IS SIX INCHES LONG AND ABOUT ONE INCH IN DIAMETER. THE ENTIRE LOWER PART OF THIS STALACTITE IS WHITE CALCITE. FOR ABOUT TWO INCHES ALONG ITS BASE, IT IS COATED WITH A 1/8 INCH LAYER OF FIBROUS ARAGONITE. THUS, CONDITIONS AT ONE TIME PERMITTED THE DEPOSITION OF



CALCITE AND ONLY NEAR THE END OF THE GROWTH PERIOD OF THIS SPECIMEN WAS ARAGONITE DEPOSITED. A LOOSE STALACTITE FROM THE "WATER BARRIER" AREA IS EIGHT INCHES LONG AND TWO INCHES IN DIAMETER.

IT SHOWS MUCH ETCHING FROM LYING IN THE WATER OF THE CARROLL RIVER. ANALYSIS SHOWS IT TO CONSIST ENTIRELY OF ARAGONITE AS A MAT OF FINE RADIATING CRYSTALS. THE INDIVIDUAL CRYSTALS ARE ABOUT 1/4 INCH LONG AND LESS THAN 0.01 INCH IN DIAMETER.

THE C-AXIS OF THE CRYSTALS ARE ARRANGED RADIALY FROM THE TUBES WHICH APPEAR TO BE THE GROWTH CENTERS. THE SPECIMEN CONTAINS A NUMBER OF CAVITIES AND VOIDS AND IS QUITE POROUS. SEVERAL GROWTH CENTERS ARE PRESENT WHICH RESULT IN SOME CROSS-MATTING OF THE CRYSTALS. SODA STRAW STALACTITES ARE THE MOST COMMON SPELEOTHEMS IN THE AREA. THEY ARE NEARLY UNIFORM IN SIZE, AVERAGING SIX TO TEN INCHES IN LENGTH AND ABOUT 1/4 INCH IN DIAMETER. SOME CONSIST ENTIRELY OF ARAGONITE AS SMALL FIBROUS CRYSTALS GROWING RADIALY FROM THE HOLE IN THE CENTER. SOME ARE ENTIRELY OF CALCITE AND THUS ARE NO DIFFERENT FROM SODA STRAWS IN MANY OTHER CAVES. A THIRD TYPE CONTAINS BOTH CALCITE AND ARAGONITE. THE ARAGONITE IS USUALLY ON THE OUTSIDE. INSIDE IS A THIN LAYER OF CALCITE CRYSTALS. FINALLY THE HOLE IS ENCRUSTED WITH SCALEHOEDRAL CRYSTALS OF CALCITE POINTING TOWARD THE CENTER. CALCITE AND ARAGONITE STALACTITES APPEAR TO GROW IN A QUITE RANDOM FASHION IN THE CLUSTERS. THERE

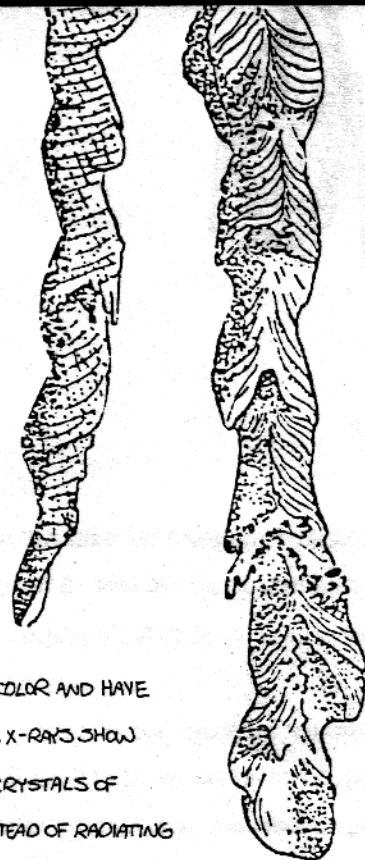




WAS NO OBVIOUS SEPERATE FEEDING OF GROUND WATER TO THE TWO FORMS. SEVERAL HANDFULS OF SMALL FRAGMENTS WERE COLLECTED FROM THE FLOOR ALONG THE ENTIRE AREA. OF THESE, APPROXIMATELY 75% WERE ARAGONITE AND THE REMAINING 25% WERE OF CALCITE. TWO UNUSUAL SPELEOTHEMS WERE NOTED IN CARROLL CAVE. BOTH ARE OF THE DRIPSTONE CLASS. BOTH ARE DUE TO THE HIGH PREVALENCY OF ARAGONITE IN THE CAVE. ONE IS A SMALL SPELEOTHEM THAT HAS THE APPEARANCE OF A PETAL HANGING FROM A SODA STRAW. THE AUTHORS BELIEVE THESE TO BE A NEW SPELEOTHEM AND PROPOSE THE NAME OF "SPATHITE". THE NAME IS DERIVED FROM THE BOTANICAL TERM "SPATHE" MEANING AN ENCLOSING PETAL. THE SPATHITES CONSIST OF A FLATTISH, PETAL-LIKE ARRAY OF CRYSTALS. THE CRYSTALS ARE ENTIRELY ARAGONITE AND IT IS APPARENTLY THE DIFFERENT NATURE OF THE ARAGONITE THAT IS RESPONSIBLE FOR THEIR FORM. THE LONG FIBERS OF ARAGONITE RADIATE FROM THE CENTER TO THE EDGE OF THE PETAL. MANY ARE VERY ACTIVE WITH LARGE DROPS OF WATER HANGING FROM THE BOTTOM. MULTI-STAGE SPECIMENS ARE COMMON, WHERE AS MANY AS A DOZEN PETALS ARE SUPERIMPOSED ON TOP OF EACH OTHER. AN AVERAGE SIZE FOR THE MULTI-STAGED SPATHITES IS PERHAPS 1/2 INCH BY 3 INCHES. THE SINGLE PETALS ARE USUALLY ABOUT 1/2 INCHES LONG. THE SECOND TYPE OF UNUSUAL SPELEOTHEMS ARE CAVE FILAMENTS THAT RESEMBLE SMALL HELECTITES. THEY ARE LESS THAN 1/10 INCH IN DIAMETER AND ARE SELDOM MORE THAN ONE INCH LONG. HOWEVER, UNLIKE THE HELECTITE, THE FILAMENT IS UNUSUALLY SPIKY IN ITS APPEARANCE. MANY JUT STRAIGHT OUT FROM THEIR BASE. OTHERS HAVE KINKS AND BENDS, BUT THESE USUALLY OCCUR AT SHARP ANGLES

INSTEAD OF IN SMOOTH CURVES AS IN THE CASE OF HELECTITES. THE FILAMENTS GROW ON THE SIDES OF STALACTITES AND OTHER SPELEOTHEMS.

THEY ARE SILKY WHITE IN COLOR AND HAVE AN ACICULAR APPEARANCE. X-RAYS SHOW THAT THE FILAMENTS ARE CRYSTALS OF ARAGONITE. HOWEVER, INSTEAD OF RADIATING IN TUFTS AS IN ANTHODITES, THESE CRYSTALS HAVE GROWN AS SINGLE SPIKES. THEY ARE NOT SINGLE CRYSTALS BUT RATHER CLUMPS OF VERY SMALL CRYSTALS WITH ALIGNED CRYSTAL AXES. THEY RESEMBLE BUT DO NOT APPEAR TO BE IDENTICAL WITH THE PICTURE OF "CRYSTALLIZED COBWEBS" PUBLISHED BY MURRAY. GEZE HAS PUBLISHED PICTURES OF A SIMILAR APPEARING SPELEOTHEM FROM THE CAVE OF MOULIS. SINCE THIS CAVE CONTAINS BOTH HELECTITES AND ANTHODITES IN GREAT PROFUSION, IT IS DIFFICULT TO TELL THE THREE FORMS OF SPELEOTHEMS APART FROM PHOTOGRAPHS. GEZE DOES NOT IDENTIFY THE FILAMENT AS A SEPERATE SPELEOTHEM.



THIS ARTICLE WAS WRITTEN IN 1959 BY WILLIAM B. WHITE AND JOHN A. STELLMACK, EXPERIENCED CAVE MINERALOGISTS THAT VISITED MISSOURI FOR THE 1959 N.S.S. CONVENTION. IT WAS LAST PUBLISHED BY THE M.S.S. IN "MISSOURI SPELEOLOGY, VOLUME I, NUMBER 3." FINIS.



GREY BAT FACT SHEET



THROUGHOUT ITS RANGE THE GREY BAT HAS DECLINED IN NUMBERS MORE THAN 74% WITHIN THE LAST 15 YEARS. IN MANY AREAS THE DECLINE IS WELL OVER 80%. (BRADY, 1982.)

HISTORICALLY, MISSOURI HAD AT LEAST 41 MATERNITY CAVES, WITH A POPULATION OF APPROXIMATELY 1.8 MILLION BATS. IT PRESENTLY HAS ONLY 11 MATERNITY CAVES, WITH A POPULATION OF 343,000 BATS. THE TOTAL PAST SUMMER POPULATION OF GREY BATS WAS 2.37 MILLION; THE PRESENT POPULATION IS ONLY 570,000. (LAVAL, 1980)

IF THE DECLINE IN THE GREY BAT IS NOT REVERSED, THEY WILL LIKELY BE EXTINCT BY THE YEAR 2000. (BRADY, 1982)

THE SINGLE GREATEST FACTOR IN THE DECLINE OF THE GREY BAT IS DISTURBANCE BY MAN, SPELUNKERS AND RESEARCH SCIENTISTS INCLUDED. THE FUTURE OF GREY BATS DEPENDS ON FUTURE ACTIONS BY MANKIND. (CLARK, 1983)

ALDRIN, A PESTICIDE USED BY FARMERS UNTIL ITS BAN IN 1974, ACCOUNTED FOR THE DEATH OF MANY GREY BATS. NOW HEPTACHLOR, ALDRIN'S REPLACEMENT, IS RAISING A SIMILAR CONCERN. (CLARK, 1983)

95% OF ALL GREY BATS HIBERNATE IN ONLY 9 CAVES. (BRADY, 1982)

IN A CASE WHERE STRICT ACTION WAS TAKEN, A POPULATION HAS RECOVERED FROM 9000 TO 19,000 IN TWO YEARS. THIS EXAMPLE OFFERS HOPE IF IMMEDIATE ACTION IS TAKEN. (BRADY, 1982)

THE GREY BAT BECAME LISTED AS AN ENDANGERED SPECIES ON APRIL 28, 1976. SINCE THEN SOME PROGRESS HAS BEEN MADE IN SECURING HIBERNACULUM AND MATERNITY CAVES. (RABINOWITZ, 1980)

EDUCATING THE PUBLIC ON THE VALUE OF BATS AND THEIR NEED FOR PROTECTION IS CRITICAL TO THEIR SURVIVAL. (MOHR, 1977.)

THE MAXIMUM LIFE EXPECTANCY OF A GREY BAT IS ESTIMATED AS THIRTY-NINE YEARS. (STEVENSON AND TUTTLE)

GREY BATS LIVE IN CAVES ALL YEAR LONG AND ARE DEPENDANT ON CAVES FOR THEIR SURVIVAL. (MYERS, 1964)

GREY BATS NORMALLY CHOOSE LARGE CAVES BECAUSE THEY ALLOW THEM ENOUGH VARIETY IN MICROHABITATS TO FIND ONE THAT IS SUITABLE FOR THEM. ONLY 5% OF ALL CAVES MEET THE BAT'S EXACTING REQUIREMENTS OF TEMPERATURE AND HUMIDITY. (TUTTLE, 79)

IN MISSOURI, GREY BATS ARE THE ONLY CAVE DWELLING BATS THAT LEAVE LARGE GUANO PILES ON THE FLOOR. THIS MAKES CONFIRMING THEIR PRESENCE VERY EASY AND EASIER TO AVOID THEM WHILE CAVING. (GARDNER, PERSONNEL COMMUNICATION.)

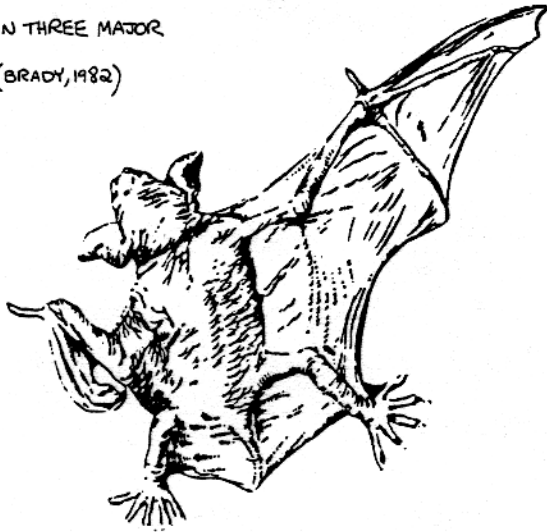




IN A SINGLE NIGHT, A GREY BAT MAY EAT 3000 OR MORE INSECTS; A SMALL COLONY MAY EAT MILLIONS, AND A LARGE COLONY MAY EAT UP TO A TON.

IN 38 YEARS SINCE RECORDS HAVE BEEN KEPT IN THE UNITED STATES ONLY TEN PEOPLE ARE BELIEVED TO HAVE DIED OF RABIES CONTRACTED BY BATS. BY COMPARISON, IN AN AVERAGE YEAR TEN OR MORE AMERICANS DIE OF DOG ATTACKS. (TUTTLE, 1979)

IN MISSOURI, APPROXIMATELY 20% OR 300,000 OF THE REMAINING GRAY BATS HIBERNATE FROM AUGUST 15 TO MAY 15 IN THREE MAJOR CAVES. (BRADY, 1982)



A GREY BAT COLONY CAN BE AWAKENED FROM HIBERNATION SIMPLY BY QUIETLY PASSING NEARBY. A BAT MERELY NEEDS TO BE AWAKENED, NOT NECESSARILY FLY, TO SERIOUSLY JEOPARDIZE ITS SURVIVAL DURING ITS TIME OF HIBERNATION. (MOHR, 1977)



AN AVERAGE GRAY BAT STORES 3 GRAMS OF FAT TO SURVIVE HIBERNATION FOR MORE THAN SIX MONTHS. WHEREAS HIBERNATION PER SE IS VERY ENERGY EFFICIENT, USING ONLY 10% OF THE STORED FAT, AROUSAL FROM HIBERNATION IS EXPENSIVE, ACCOUNTING FOR THE OTHER 90%. A COUPLE OF ADDITIONAL DISTURBANCES DURING HIBERNATION MAY LEAD TO STARVATION AND DEATH IN EARLY SPRING. EACH AROUSAL CAUSES A GREY BAT TO EXPEND 10 TO 30 DAYS WORTH OF ENERGY.

THE REPRODUCTIVE RATE OF GREY BATS IS LOW, ONE OFFSPRING PER FEMALE PER YEAR. (GUTHRIE AND JEFFERS, 1980)

AS THE MATERNITY PERIOD BEGINS AROUND JUNE 4, THE MALE AND FEMALE BATS SEGREGATE AND OCCUPY DIFFERENT CAVES.

MATERNITY CAVES SHOULD NOT BE VISITED BETWEEN APRIL 15 AND SEPTEMBER 30. DISTURBANCE CAN LEAD TO ABORTING THE YOUNG. HIBERNACULA SHOULD NOT BE VISITED FROM AUGUST 15 TO MAY 15. FAILURE TO FOLLOW THESE GUIDELINES WILL RESULT IN THE DEATH OF GREY BATS. (BRADY, 1982)

EACH YEAR IN MISSOURI 500,000 GRAY BATS EAT 400 TONS OF INSECTS, MANY OF THEM AGRICULTURAL PESTS. (LAVAL, 1980.)

THE PENALTY FOR HARMING AN ANIMAL ON THE ENDANGERED SPECIES LIST IS A FINE UP TO \$20,000 AND IMPRISONMENT OF UP TO A YEAR IN JAIL. (CURRIE, 1980.)



THE UNDERGROUND PRESS

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90 BART RAPP, K.C.A.G. DIRECTOR

"AS YOU ENTER AND EXPLORE THIS AMAZING CAVE, AS IT REACHES OUT TO SURROUND AND OVERWHELM ALL YOUR SENSES OF UNDERGROUND REALITY, TRY TO SLOW YOUR PACE NOW AND THEN AND TRULY GET AQUAINTED WITH CARROLL CAVE. YOU'LL BE GLAD YOU DID!"

DWIGHT WEAVER, 1983.

