

BULLETIN  
OF THE  
SPELEOLOGICAL SOCIETY  
OF THE DISTRICT OF COLUMBIA



VOL I  
JUNE 1940

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OFFICERS OF THE SOCIETY FOR THE YEAR 1940

|                     |                       |
|---------------------|-----------------------|
| President           | William J. Stephenson |
| Treasurer           | Dan J. Tyrrell        |
| Recording Sec't     | Jack J. Wilson        |
| Corresponding Sec't | Al Lewis              |

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| Thornton T. Perry     | Dr. Wm. W. Welsh           |

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|                  |                               |
|------------------|-------------------------------|
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Brief Synopsis of the History of  
The Speleological Society of the District of  
Columbia

This being the official report of The Speleological Society of the District of Columbia and occurring at the end of its first year's activities, it seems appropriate that the first article should be devoted to the organization and objectives of the Society.

The Society was officially organized in May, 1939. The purposes of the Society are to furnish a means by which those interested in any way in caves could contact others so interested and pool their experiences. Furthermore, it is hoped that the Society may form an official clearing house for all cave information and that one of the chief objectives will be the accumulation of a permanent library and provide for a permanent central depository for cave data. It is a further objective to publish a periodical which will become the country's official organ for the science of speleology, the present report being the first step in this direction.

The scope of cave study which the Society hopes to sponsor is unlimited. The term "Speleological" as used in the name of the Society is in no way limited to any particular phase of cave study. The Society has been organized so as to embrace the sportsman who wished to explore caves purely for the sport of it, the layman who wishes to make cave study a hobby, and the scientist who is making cave study his life work. The Society has initiated a novel mail order plan for its library so that all members may have equal access to the library, regardless of whether they are located in the Washington area or elsewhere.

The Society at present is still young and many problems are yet to be ironed out. The group in the District of Columbia is working as an active unit, planning field trips and indoor meetings on a definite schedule. Members of the Society not located in the District of Columbia have free access to the data collected by the Society. They are also encouraged to correspond with other members, especially with those who may be interested in their particular branch of cave study. It is hoped that active nuclei may be eventually formed to carry on organized activity in other sections of the country containing caves, and to become self-governing and eventually become affiliated with this society as one large national organization. However, until the time that other branches are formed, the majority of scheduled trips of the Society will necessarily be in the Washington area.

The constitution of the Society has been drawn up as flexibly as possible to allow for unhampered future growth. All changes in either the constitution or the by-laws may be ratified by the members by mail. In order that all the members or prospective members may become acquainted with the exact set up of the organization of the Society, a list of the first year's members, and a copy of the constitution and the by-laws as adopted upon the formation of the Society follows this article.

CONSTITUTION OF THE SPELEOLOGICAL SOCIETY  
OF THE DISTRICT OF COLUMBIA

1. The name of this organization shall be: "The Speleological Society" of the District of Columbia.
2. The purpose of this Society shall be to advance in any and all possible ways the Science of Speleology and to promote fellowship amongst those interested therein.
3. Government of this Society shall be by a Board of Governors whose membership shall be as prescribed by the By-Laws of the Society, except as hereinafter provided in paragraph 9, section B. The offices of the Society shall be chosen from the Board of Governors.
4. Membership in this Society shall be open to any person who shall have complied with all the conditions for membership as prescribed by the By-Laws of the Society and the Board of Governors.
5. The life of this Society shall be perpetual, or until terminated by a three-fourths vote of the Board of Governors, notice of which shall be sent to all members.
6. Conduct of all business of this Society shall be directed by the Board of Governors. The Board of Governors shall have the power to appoint any individual or group of individuals to conduct said business for them.
7. The By-Laws of this Society shall be drafted by the first Board of Governors and shall become effective immediately upon their adoption by said Board.
  - (a) Subsequent changes in the By-Laws shall be drafted as necessary by the Board of Governors.
  - (b) Notice of said proposed changes in the By-Laws shall be sent by mail to all voting members of this Society upon the same day. (1) The said notice must include a reply form for registering any objections to said proposed changes in the By-Laws. (2) Provision must be made in said reply form to permit objection to one or more portions as well as the whole of said proposed changes.
  - (c) Said proposed changes shall become part of the By-Laws thirty calendar days after said notices have been mailed, unless within that period objections thereto have been received from one-half of the voting members.
8. Amendments to the Constitution of this Society shall be made only after a two-thirds favorable vote of all voting members of this Society. Said vote may be taken by mail and must be completed within sixty calendar days after the registration of the first vote for or against said amendment.

9. Organization of this Society shall be completed in accordance with the following sections of this paragraph.

(a) This constitution shall become effective upon a two-thirds favorable vote of all present at a special meeting of prospective members called for the purpose of forming this Society.

(b) Upon the adoption of this Constitution, all persons present at the meeting who sign this Constitution shall automatically become charter members of this Society, which membership shall continue as long as said charter members comply with all provisions of the By-Laws relating to membership.

(c) At the meeting adopting this Constitution, the first Board of Governors shall be elected by the charter members. (1) Said first Board of Governors shall be comprised of five members chosen from the charter members. (2) Said first Board of Governors shall serve for twelve calendar months or until replaced by a Board of Governors elected in accordance with the By-Laws. (3) Said first Board of Governors shall elect a presiding officer and such other officers as it deems necessary. (4) Said first Board of Governors shall have the power to appoint additional members, not exceeding seven, from the membership of the Society. (5) Said first Board of Governors shall keep a permanent record of all its proceedings.

DATE:

By-Laws of The Speleological Society of the District  
of Columbia

1. Membership in this Society shall be obtained and held in accordance with the following regulations.

- (a) Membership shall be obtained by written application, sponsored by at least one Active member, and approved by the Board of Governors. All such applications for membership shall be accompanied by the fees for one year as set forth in By-Law no. 5. This section shall not apply to members created in accordance with Par. 9, Sec. (b) of the Constitution.

- (b) Membership in this Society shall be divided according to the following classification, defined in By-law No.2.

- (1) Junior
- (2) Associate
- (3) Active

2. Members of this Society shall be privileged in accordance with the following regulations.

- (a) Junior members shall have the privilege of attending the annual meeting as described in By-law No.4, Sec. (a) and shall have the privilege of use of the Society's equipment when on special society sponsored trips under approved leadership.

- (b) Associate members shall have the privilege of attending all club meetings and engaging in any Society sponsored trip or project. They may be assessed nominal fees for participation in club projects or for the use of club equipment.

- (c) Active members shall have all privileges extending to any other members of the Society and shall be exempt from assessment fees for participating in club activities or use of club equipment.

3. The Board of Governors shall be composed, elected and serve in accordance with the following regulations.

- (a) The Board of Governors shall be composed of twelve elected members.

- (b) The term of office of the Board of Governors shall be one year determined as follows:

- (1) The calendar year shall run from the first day of May next succeeding the assumption of office of the first Board of Governors elected in accordance with Paragraph 9, section (c) of the Constitution of this Society.

(By-Laws) -2-

(c) Election of the Board of Governors for the succeeding year shall be held at the annual meeting of the Society called in accordance with By-Law No. 4, section (a).

(d) The Board of Governors shall cause a permanent record of all meetings, correspondence, and activities in which it engages to be kept.

(e) Procedural matters concerning the meetings, records and activities of the Board of Governors shall be in accordance with regulations established by the first Board of Governors and recorded with the By-Laws of the Society.

4. Meetings of this Society shall be held in accordance with the following regulations.

(a) An annual business meeting of this Society shall be held during the fourth week of April of each year.

(b) The time and place shall be chosen by the Board of Governors.

(c) The Board of Governors shall cause notice of the meeting to be sent to each member of the Society at least three days before said annual business meeting.

(d) The annual reports of the Board of Governors as a whole, and the individual reports of the Officers shall be presented at said annual business meeting.

(e) Any active member of the Society may present as a matter of right a report of any work done or directed by him for the Society at said annual business meeting. Such report must be limited to fifteen minutes unless an extension in time shall have been granted in advance by the Board of Governors. Such report must be in writing, in proper form for insertion in the permanent records, and at least one copy thereof must be submitted to the Board of Governors at least ten calendar days before the annual meeting.

(f) A semi-annual meeting shall be held during the first week in October of each year at which progress reports of all the Society's activities shall be presented. Notice shall be given to the members in accordance with sections (b) and (c) of this By-Law.

(g) The Board of Governors shall have the power to call such special meetings of the members as it shall deem necessary and shall cause notice to be given to the members in accordance with sections (b) and (c) of this By-law.



(By-Laws) -3-

5. Annual fees paid by the members of this Society shall be as follows:

- (a) Junior..... \$ .50
- (b) Associate..... 1.00
- (c) Active ..... 3.00

6. The Officers of this Society shall be called the President, Vice-President, Secretary, and Treasurer. Their duties shall be those usually associated with those offices unless otherwise restricted by the By-Laws of this Society. The Secretary and Treasurer shall have the power to appoint as many assistants as they may deem necessary and shall designate the duties of each.

7. Committees of this Society shall be established in accordance with the following regulations.

(a) The following permanent committees shall be set up:

- (1) Records
- (2) Mapping
- (3) Photography
- (4) Equipment and safety
- (5) Exploration
- (6) Fauna
- (7) Paleontology
- (8) Formations
- (9) Publicity
- (10) Program and Activities
- (11) Membership
- (12) Junior Members
- (13) Bibliography

(b) The duties of each Committee shall be to study and promote interest in all matters pertaining to their fields of activity. Any question of conflicting jurisdiction of committees shall be decided by the President of the Society.

(c) The chairman of each Committee shall be appointed by the President of the Society and ratified by the Board of Governors. Each Chairman shall be solely responsible for the personal and function of his committee.

8. Publications: All material collected on field trips of the Society or sponsored by it shall become the permanent property of the Society.

9. Safety: The Board of Governors shall cause to be prepared a Safety Code which shall be strictly observed on all field trips of the Society or sponsored by it. Failure to comply with the Safety Code may be ground for expulsion from the Society. The Safety Code shall be recorded with the By-Laws at the end thereof.



10. Expulsion: For good cause and after an open hearing the Board of Governors may expel any member on the following grounds:

- (a) Willfull violation of the Safety Code.
- (b) Leading an unauthorized field trip.
- (c) Failure to turn in data taken on an authorized field expedition.
- (d) Conduct resulting in reflection on the Society.
- (e) Misuse of property of the Society.
- (f) Non-payment of dues.

11. Expense: The Society may pay the cost of photographic and other data becoming the property of the Society and traveling expenses of all members of the Society on field trips sponsored by the Society, provided such funds are available and offered by the Board of Governors. The Society may purchase property such as equipment, literature, etc., for general use of the Society. The society shall under no circumstances pay for any personal equipment of supplies.

12. Loss and Use of Equipment: The Board of Governors may establish regulations for the use of property of the Society. These regulations shall include penalty fees for retaining possession of the property by any borrower for a period longer than that authorized. The property shall be cared for by respective committees designated by the Board to have charge of the same and shall be loaned by them in accordance with any regulations established by the Board of Governors. The committees shall collect any overdue fees and shall turn them over to the Treasurer who shall keep them in a separate fund for the replacement of property. No member may be excepted from payment of over-due fees.

13. Publications: The Board of Governors may authorize publications by the Publicity Committee and may establish regulations governing the sale and distribution of such publications. Such publications shall be only upon express authorization of the Board of Governors and shall be approved by said Board before publication.

ATTENTION IS CALLED TO THE FACT THAT IT HAS BEEN NECESSARY TO HAVE THE MAJORITY OF WORK ON THIS BULLETIN PERFORMED BY VOLUNTEER HELP. AS THE SOCIETY'S TREASURY HAS NOT YET DEVELOPED TO THE POINT WHERE WE COULD AFFORD A PROFESSIONAL JOB IT IS, THEREFORE, REQUESTED THAT OUR READERS EXTEND TO US SYMPATHIC INSTEAD OF HARSH CRITICISM.

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OFFICERS 1939-1940

|           |                   |
|-----------|-------------------|
| President | Wm. J. Stephenson |
| Treasurer | Alden Snell       |
| Secretary | Elmer Harmon      |

Board of Governors

|                   |               |
|-------------------|---------------|
| Don Bloch         | Elmer Harmon  |
| Al Lewis          | Alden Snell   |
| James Lavelle     | Dan Tyrrell   |
| Charles Cooke     | Dr. Wm. Welsh |
| Wm. J. Stephenson |               |



After the Society's successful exploration of the Hell Hole on Nov. 11, 1939 (Reported in the Washington Star of Nov. 16, 1939) a group of experienced rock and mountain climbers under the leadership of Paul Bradt of the Appalachian Trail Club, made a descent in mid-winter under the most adverse conditions with the minimum of equipment.

This group kept such a detailed account of their equipment and experiences that it is thought that their notes should be included herein as an article, rather than to be placed in the section of "Activities" or under the detailed reports.

The notes are strictly a copy of the original, though in some instances editorial comment has been inserted, and some purely personal references omitted. (Ed. Note)

## DESCENT INTO HELL HOLE

William Schlecht

Onego, W. Va. quadrangle, U. S. Geological Survey

From Washington, D. C., across Memorial Bridge and go 1 mile, then 7 miles on Va. No. 338; 8.6 miles on U. S. No. 211; turn R to go 54.7 mi. on U.S. No. 50, to Winchester, Va; continue thru Winchester on U.S. No. 50; 45.6 mi. to Romney, and go 6.9 mi. further. Turn L on U.S. No. 220. Go 20.1 mi. to Moorefield, W. Va., and then 12.6 mi. to Petersburg, W. Va. Turn R on W. Va. Nos. 4 & 28; go 2.5 mi. to Mouth of Seneca Creek. Turn L on U.S. No. 33 and go 2.1 mi. to Harper's Gap Road (dirt). Turn L and go 0.9 mi. to High Rock Church. Take R fork (Harman Hill Road) and go 2.1 mi. to Cave School. Schoolhouse cave is about 200 feet N of the Schoolhouse.) Go 1.2 mi. further and park on L side of the road. The Hell Hole is about 500 feet down the hill (WNW) in a dry stream bed.  
Saturday, Dec. 30, 1939.

### Composition of Party

|                |                |
|----------------|----------------|
| Paul Bradt     | Tom Culverwell |
| Donald Hubbard | Sam Moore      |
| Bill Schlecht  |                |

We met for breakfast at 4 a.m. and then left Washington, D. C.,

It was snowing lightly; the highway was slippery but we didn't need chains.

----- Stopped to inflate Bill's R rear tire. Stalled bus driver said road bad ahead.

Stopped at Winchester, Va., to deflate Bill's R rear tire. Road no worse.

----- Stopped at Moorefield, W. Va., for lunch and carbide.-----

Stopped at Harper's store, Mouth of Seneca, to put on chains and tell Mr. Harper where we were going.\* Harpers son showed me a ppt. in heated spring water; looks like well clotted  $\text{CaCO}_3$  with trace of Fe.

----- Harper's Gap road covered with hard packed snow; easy to travel with chains.

Got to Hell Hole around 1 or 2 p.m., unloaded and carried packs and tackle to the hole.

\* A most important detail in cave exploration. (Ed. note)

Equipment

500 feet of 3/8" manila rope  
 5 steel sheave blocks  
 2 200 foot balls of Mason's cord  
 3 120 foot safety ropes  
 1 80 foot safety rope  
 1 80 foot lariat rope  
 Heavy rope for sling  
 14 pitons  
 3 Karabiners  
 1 ball heavy cord  
 Sleeping bags, blankets, extra clothes  
 Cameras (Bill and Sam), flash bulbs (Sam) Magnesium ribbon (Bill).  
 Groceries (including 12 eggs) Dishes (Metal)  
 Gasoline lantern; carbide lamps; flashlights; candles; 1 gal. gasoline.  
 Primus stove; 1 gal. kerosene; 1/2 pint alcohol; compass, plane table.  
 Filled canteens; 6 1 qt.  
 1 2 gal.  
 1 1 gal.  
 Total 4 1/2 gal. water

Put this notice on tree at Hell Hole.

NOTICE

Saturday, Dec. 31, 1939

Five men in Hell Hole; will come out about noon  
 Sunday, January 1, 1940.

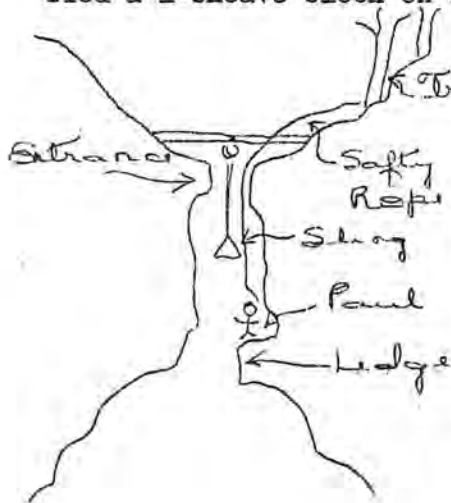
P. Bradt  
 T. Culverwell  
 D. Hubbard  
 S. Moore  
 W. Schlecht

(Washington, D. C.)

Please don't disturb our ropes.

Procedure of Descent

Put 120' safety rope around tree uphill (S) from the hole in the natural bridge. (Ed. note: Hell Hole consists of 2 large openings separated by a natural bridge.)  
 Doubled 80' lariat around trees, across pothole in natural bridge.  
 Tied a 1-sheave block on it, over the hole.



Tossed down wood and Donald's stocking cap.  
 Paul roped down the downstream face of the downstream opening on a 120' safety rope doubled around a tree West of the West hole, and worked upstream (East) to a ledge just below the pothole in the natural bridge, and fastened himself to the wall with a rope through two pitons driven into the wall. (He came up the W face once, snubbed by Tom, to try the means of emergency exit).



Didn't like the earth slope at top of rock. Took help here. This climb is too sporty to provide an ideal emergency exit. Accidentally sprung karabiner and dropped 3 pitons in hole.

500' of 3/8" manila rope tied to cross rope, threaded through a loose sheave block and through the hanging sheave block. Tied a sling of heavy rope on the bottom block.

Tied 80' safety rope and 120' safety rope together.

Let a mason's cord down to Paul, on ledge.

Sam got in sling; attached safety rope; tied top end of Paul's mason's cord to his foot. Put tree-surgeon's knot on loose end of hoist rope to let himself down; Tom snubbed safety rope. Stopped to rest on Paul's ledge. The tree-surgeon's knot made the ropes twist, making much trouble in dark going down.

When at bottom, Sam found about 6 feet of the loose end of the hoist rope left. He tied the mason's cord to the block. We tried to hoist it up by letting down drive rope, the ropes tangled several times. Paul tried to untangle them without success. We pulled the block up by the other two strands and untangled it.

Pulled up safety rope.

Tied end of mason's cord to a stick across the hole; pulled Paul's end of it up and let the lantern down to him on it. Paul lit lantern; we let it down to Sam.

Sam built fire. Ample wood available on floor of cavern.

Tried to let a big pack down on the block; it twisted several times; finally Paul couldn't untangle it. Pulled it back up on the twisted ropes; untangled and laid aside the hoist rope. Let baggage down on safety rope, snubbed on the stick across the hole. Used cask sling.

Let luggage down too fast at first; it bounced hard from the ledges. All told about 12 pieces were let down.

Pulled up safety rope.

Donald got in sling; (wore overcoat); put on safety rope; tied mason's cord on foot, other cord to Paul on ledge. Sam snubbed hoist rope from below, around a rock; Tom snubbed safety rope from above, on the cross stick. Don didn't twist, but says string on foot is irritating. Stopped at Paul's ledge on way down.

Very cold on bridge above; ice formed under foot. Ledge also cool.

Pulled up safety rope, string, block. Threaded drive rope through block. (Paul tied loose end of string to end of safety rope as we hoisted it up.)

Tom got in sling; put on safety rope; tied string to foot, Sam and Don snubbed hoist rope; Bill snubbed safety rope, Paul held string. No twisting. After Tom landed, Bill pulled up safety rope with loose end of string tied to it; pulled up block, untwisted hoist rope and threaded block through it, dropped safety rope to bottom.

Bill got in sling; no safety rope. Forgot to put string on foot; left it tied to cross stick. Stopped at Paul's ledge on way down. Donald, Sam, and Tom snubbed hoist rope; Bill kept it snubbed between feet. No twisting.

The big dome-shaped room below is an exciting sight when first seen thru the rift in its ceiling. I was let down the narrow hole in the dark and didn't see the room until I was below Paul's ledge and suddenly came through the rift in the ceiling. The floor looks about as big as a football field, and the men below, moving in the lantern and fire light, look about as big as insects.

Let Paul down from ledge in sling on block; no string on feet because Bill left one end of the string tied at tip. No safety rope. Paul kept from twisting as Bill did, snubbing hoist rope between feet. Bill tried to take picture of Paul coming down.

Last man (Paul) down about 11 p.m.

Paul has once found knot connecting the two safety ropes loose. Tied hoist ropes to a log.

5 eggs left.

Had dinner; slept.

Tom slept on rock near fire; Don laid on talus slope; the rest slept on a pile of dried oak leaves near the landing spot, but far enough up the slope to be out of danger of any rocks that might fall into Hell Hole.

Very cold. 0°C \_

Sunday, Dec. 31, 1939

When we woke, snow was falling thru the holes above.

There are two main passages out of the central room, one about north and the other about east, at the foot of a talus slope which is piled against the southwest walls.

Donald found the room 110 paces long, 52 paces wide. (1 pace=3ft)<sup>3</sup>

Large boulders near the landing place, and where we cooked. Cave almost entirely dry, but there is some water dripping near the E passage.

We went thru the E passage ( a fine big arch) into another big room, nearly as big as the central one. The floor is a dry sandy stream bed. We went on up a talus slope of big boulders, into a narrower passage containing heaps of bat dung, and millions of bats. The bats cluster together on the roof, and make a lot of noise, squeaking when disturbed. In the places containing bats and dung, the air is warm and stuffy. We followed a string left by the previous party of the Speleological Society through passages narrowed by rock slides. Somewhat damper here. Went up muddy passage to two chimneys.

Few formations; ample water here for laundry, etc.

Stream bed in places.

(Ed. note: here the east passage ends in a rock fall barring further progress in this direction)

Came back down; took pictures with magnesium ribbon (2 feet) and with flash bulbs.

3

ED. note Previous tape measurements gave dimensions of room as 305' x 157'.

Bill not feeling well, the others made preliminary exploration in the N passage. Tom went up a ledge and came to a high vaulted passage. Sam found instruments dropped on sand by Speleological Society. They left a rope on the ledge on the W side near beginning of N passage, where Stephenson had a previous narrow escape from falling. It is not difficult to imagine him living or dying after a fall from saig ledge.

Stream bed was followed beyond windows and crawled through the sand to place where water apparently had sunk through debris. Sam, Donald, and Paul moved some short logs trying to open passage following watercourse. This passage proved too tight for Paul so others didn't try it. (Ed. note: this point was further point in this lower north passage reached by the first party.)

Main room still cold.

After lunch we went down the N passage; first went thru a window (Ed. note: shown on map prepared after first exploration) on its E wall, down to a fork. The R fork goes to a small chimney, the L fork to a cliff. Paul went past way down the cliff on a rope and returned, at the chimney. The doubled and knotted 120' rope didn't reach bottom.

Some stalactites, bats. Sam took pictures.

Back thru the window into the main N passage, we went on. On L side is a passage to a chimney going N, we came to the ledge Tom had climbed. (Ed. note: Bloch was stuck on this ledge on first trip) tied ourselves along the safety rope and went over it to Tom's room.

Warn; biggest deposits of dung. Streaks of nitrate crystals leached down in dung piles. Bats. Some stalactites.

The lower passage, a stream bed, is covered by rock falls except in 3 places. We finally went up a thick dung slope to a chimney, closed with rocks and clay; couldn't go further. Sam took pictures.

Paul and Bill made traverse back to main room. The last 3 directions seem wrong; we think they are 200° not 100°.

Still cold in central room. After dinner looked into a small blind passage W of the N opening.

Slept in same places as last night. Cold.

Traverse from Tom's Room back to Hell Hole

| <u>Station</u> | <u>Direction</u> | <u>Feet</u> | <u>Station</u>   | <u>Direction</u>     | <u>Feet</u>     |
|----------------|------------------|-------------|------------------|----------------------|-----------------|
| Chimney        | SW               | 42.5        | Hump             | 210°                 | 42.5            |
| at top of      | S                | 42.5        |                  | 270°                 | 42.5            |
| bat-dung       | SSE              | 42.5        | Chimney 310°     | 215°                 | 42.5            |
| slope          | SSE              | 42.5        |                  | 160°                 | 42.5            |
|                | S                | 42.5        |                  | 160°                 | 42.5            |
|                | SSW              | 42.5        | Window 100°      | 205°                 | 42.5            |
|                | 240°(E of H)     | 42.5        |                  | 195°                 | 42.5            |
|                | 220°             | 42.5        | Up into entrance | 200°                 | 42.5            |
|                | 180°             | 42.5        |                  | 100°                 | 42.5            |
|                | 180°             | 42.5        |                  | 100°                 | 42.5            |
|                |                  |             |                  |                      | <u>850 feet</u> |
|                |                  |             | Portal           | 100° to hanging rope |                 |
|                |                  |             |                  | about 75.0           |                 |
|                |                  |             |                  |                      | <u>900 feet</u> |



Monday, January 1, 1940

After breakfast we packed, leaving a cache of food, etc, on the talus slope above the fireplace. Sam made an inventory of the cache. Piled luggage at foot of hoist rope. Started up about 9 a.m.

Paul recovered the Speleological Society's rope from Stephenson Ledge.

Put a sheave block on a boulder N of the landing spot.

Paul got a sling, tied a karabiner to right foot, put hoist rope through karabiner. Ball of mason's cord in pocket. We put the hoist rope through the block on the boulder, and hauled Paul up to the ledge by walking along the ground. Snubbed rope on another boulder.

Paul fastened himself on the ledge and let the block down; it twisted and stopped. He hauled it back up and threaded rope enough through it, then let it down on the two ropes. It was easily untwisted from below. Hung ropes clear of landing place.

Paul dropped an end of mason's cord and hauled up safety rope.

Tom got in sling; put on safety rope; karabiner tied to foot, hoist rope thru it. Paul held safety rope while we put hoist rope thru anchored block and hauled Tom to Paul's ledge.

Hauled Tom to top from ledge, without safety rope. Tom tied himself to the safety rope left on the slope, tied to the tree above. He threaded the hoist rope thru the block and let it down, where we wove a marker into it at the bottom position of the block. It was easily untwisted from below. Tom let the safety rope down.

Donald got in sling, put on safety rope, karabiner around hoist rope tied to right foot, stood on rock above anchored block. Bill and Sam threaded hoist rope thru anchored block; they and Paul hauled Don up. Tom sat on S side of hole (in ice) with feet on cross stick, and snubbed safety rope on the stick.

Don and Tom threaded hoist rope thru block to mark; laid it on ground. Let safety rope down. Paul dropped mason's twine. Bill and Sam slung baggage on safety rope and guided it up across ledges and thru hole by holding mason's twine taut and standing in appropriate places, while at top of bank Don and Tom, (at opening in bridge) pulled it up. (Paul helped.) Don hauled baggage up slope off the bridge.

Sent up about 10 pieces. (Ed. note: What happened to the other 2 of the original 12 pieces?)

Sent up lantern. Mason's twine returned to Paul.

When rope is let down, small rocks fall. By pulling rope down with cord this is avoided, because rope then can be kept clear of rock covered ledges.

Don and Tom let block and hoist rope down; let safety rope down. Sam and Bill untwisted rope on block.

Bill got in sling, stood on rock above anchored block. Karabiner around hoist rope tied to right foot; put on safety rope. Sam threaded hoist rope through anchored block; he and Paul helped Bill up and Don also pulled at the block at the surface. Tom snubbed safety rope as before.

Pulled up hoist rope; Sam had tied the extra block to it.

Don and Tom threaded hoist rope thru block to mark, let down to Sam; Sam untwisted it, and got in sling. Bill and Don took rope up slope and around a tree; didn't put the extra block on the tree.

This made hauling Sam and Paul up much harder. Tom let safety rope down; Sam tied it around himself. Paul let mason's twine down; Sam tied it to his right foot.

Mr. Nelson and a neighbor were at top; they had built a big fire.

Bill, Don, and a neighbor hauled Sam up; Tom snubbed safety rope as before. Paul kept mason's twine taut. He didn't twist it.

Pulled up cord.

Let safety rope down to Paul.

Threaded hoist rope thru block and let sling down to Paul. Paul put on safety rope (snubbed by Tom), untied himself from pitons, and removed pitons.

Didn't need string or karabiner on foot.

Sam and Don hauled Paul up by walking along hillside, snubbing the hoist rope around the tree.

Last man (Paul) up about 4 p.m.

Pulled the safety rope up from the W cliff Paul had gone down. Removed lariat rope from trees, across hole.

Packed ropes. Hauled tackle and equipment; neighbors helped.

Very little snow had fallen while we were below, so no trouble getting cars onto road. Had to push Tom's car to get it running right.

Snow and evergreens on ridge uphill looked swell. Very gorgeous sunset; blue and green sky, red clouds.

Stopped at schoolhouse cave to look at entrance; walked down to water trough and back.

Road to highway as before except for some snowdrifts on river bottom (being plowed off). No snow on highway.

Stopped at Harper's store.; (Ed. note: checking out at store not only a cautious, but important act.) removed chains, ate. Mr. Harper says Kraus wrote an article about his trip in Hell Hole for the Pendleton Chronicle.-----

Stopped at Romney for dinner. (Tom and Sam went on)

Got gas and oil.-----

Not much ice or snow on mountain highways; perhaps less than Saturday. Changed driver at Winchester.

Moonrise, red

Gave men 1 gal. gas

Drove to Paul's car

Home 3 a.m. Tuesday, asleep 4 a.m., up 7:30 a.m.

Wed. January 3, 1940

Gave A.J.Clark instruments, rope, and list of things cached in Hell Hole, for delivery to Speleological Society.

Monday, January 8, 1940

Met at Bill's house to compare notes. (Ed. note: This procedure of immediately meeting after the trip to work up and prepare data while it is fresh in the memory is quite important and should be adopted without exception by all explorint parties of the Society.)

Total cost of trip including gas and oil and 500 feet of rope was \$3.68 each.

## NOTES ON CERTAIN CAVE DEPOSITS

Dr. R. J. Holden  
(Head of Department of Geology at V.P.I.)

These notes were prepared originally for the use of the members of the Speleological Society on the occasion of their visit to Luray in January 1940 and incorporated in a letter to President Stephenson. They were intended as a substitute for some of the things which I should have liked telling to the Society on that occasion. They were written primarily for the Luray visit but were later revised to make them of more general application.

Luray is outstanding in its wealth of formations. Stalactites and stalagmites in various forms and shapes are developed on a tremendous scale. Their ubiquity is such that one does not look for more in number but for differences in type. However, if one studies Luray critically, there is a varied interest. In 1886 helictites were reported from Luray\*. Just what conception of helictites was in the mind of the writer of this article is not entirely certain. Webster's New International Dictionary (1925) says, "A curious twisted form of stalactite". The derivation of the word would lay emphasis on the twisted form but at the time the Luray helictites were first described an additional idea seemed to be dominant. This was that their long axes were not perpendicular but stood at angles oblique to the vertical. The dripstone character of stalactites and stalagmites was understood and the contrasting attitudes of helictites called for an explanation other than that given for dripstone. Noting spider webs between stalactites and seeing drops of water on the webs, it was but a step in reasoning to the idea that precipitation along the webs accounted for the oblique angles. Just what supporting evidence these authors had, is not known. In light of fuller information, the spider web theory of the origin of helictites seems quite inadequate.

Another explanation of their origin is that they are due to the effect of varying air currents. In no occurrence which I have seen does there seem to be any evidence supporting this theory. I have studied many helictites with this theory in mind. My imagination is not sufficiently vivid to conceive of air currents of a versatility such as to produce these results. Helictites do occur and seem to be now growing in places where there may be some air movement but they are not forming on any considerable scale. On the other hand it seems probable that they form chiefly in places where the air has little circulation or is quite stagnant. In those extraordinary showings of helictites in the Skyline Caverns near Front Royal, Virginia, it seems quite certain that they were formed in small rooms which were quite closed and in which the air was stagnant and the atmosphere saturated with water vapor. I was present when these helictites were discovered and saw the rooms opened. My first but very limited view of them was through a two inch opening between the rock roof of the cave and the mud floor. This opening appeared to be due to the settling of the mud.

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\* Dolley C. S. On the Helictites of Luray Cave, Virginia:  
Acad. Nat. Sci., Philadelphia Proc. 1886 pp 351-352



The helictites were confined to dome-like cavities in the roof. It seems very probable that these domes were completely sealed below by mud and water and contained stagnant air saturated with water vapor at the time of the formation of the helictites.

Before one can discuss satisfactorily the origin, it is necessary to define the term helictite. I am not yet prepared to give a final definition. My argument therefore loses something of its value. I am inclined to consider a helictite to be a cave deposit of carbonate mineral formed in an atmosphere saturated with water vapor under the force of crystallization and generally in stagnant or quiet air. Like most definitions this one does not set sufficiently exact limits. Under it there must be included structures which mineralogically are composed of aragonite, of dolomite and of calcite. The dolomite helictites which I have seen have been stalactitic in character but definitely twisted. It seems not improbably that the term was originally applied to these dolomite structures. The aragonite helictites on the other hand are branching, with their needle-like and columnar members standing at all random angles to the vertical with no direction dominant. They are horizontal. They are inclined obliquely downward. They are pitched obliquely upward. They may even point directly downward or upward or stand at minor angles to the vertical. They may be a network of interpenetrating needles. An outstanding feature is their complete defiance of gravity. It may seem a far cry to include calcite helictites here, but under the suggested definition it is necessary. Calcite does form in caves under the conditions described and produces forms which are independent of gravity. There is a calcite helictite about which there may be but little question as to its appropriate inclusion here. A very definite aragonite helictite may become uniformly coated with calcite till the foundation aragonite is completely hidden. The mass has the helictite characteristic but the greater portion of the material is calcite.

There is another structure which has been included under helictites but which under this definition is excluded. No satisfactory name has been suggested. In the absence of anything better the term knob is used. These are common structures in caves. They occur on stalactites and on stalagmites. They are formed as pendants from the roof and as projections from sides and floors. They are knob like or hemispherical or almost globular, the latter being supported by a short thin stalk. Clearly, they are not dripstone. The only characteristic of helictites which they have is that of standing out from their support. They are solid and in this feature are wholly unlike the branching and reticulated forms of helictites. Clearly they are independent of gravity. The explanation seems to be that they result from the action of capillarity in a moist atmosphere spreading lime bicarbonate solutions over surfaces where a gentle circulation of air permits the escape of carbon dioxide and some evaporation.

There is another type of deposit of which I have seen only a trace in the caves of eastern United States. It is the oulopholite, the so-called cave flower. Where strongly developed, they are said to resemble the spreading leaves of certain herbaceous plants. Mineralogically, they are gypsum. They are formed at or just below the surface of the coating of the cave by material which crystallizes and squeezes through a small opening, causing it to be twisted and curved resembling

leaves. In the Skyline cavern the gypsum has formed under a coating of crystals of dolomite and disrupted the coating. The following chemistry is suggested. Pyrite is oxidized to ferrous sulphate. This latter reacts with the lime carbonate and water, forming gypsum. This gives an increase in volume which finds release through small openings.

These four types of cave deposits may be classified as follows:

|             | <u>Force</u>    | <u>Mineral Composition</u>   |
|-------------|-----------------|------------------------------|
| Dripstone   | Gravity         | Calcite (rarely aragonite)   |
| Helicite    | Crystallization | Aragonite, dolomite, calcite |
| Knob        | Capillarity     | Calcite                      |
| Oulophilite | Crystallization | Gypsum                       |

In the developed portions of Luray there are scattered showings of helictites on stalactites. They may be recognized by their needle shaped habit and their non-vertical orientation. In a small room below the main exhibition portion of the caverns there are helictites which are particularly interesting. They are branching and interlacing forms whose interior is aragonite but whose exterior is calcite. Quite clearly they were originally regular aragonite helictites which have become thickly coated with calcite. Here then are helictites which have both aragonite and calcite in the same structure.

Various factors determine whether calcite or aragonite will form. In the laboratory a hot solution will precipitate aragonite, while the same solution cold will yield calcite. A strongly alkaline solution of calcium hydroxide will give aragonite to carbon dioxide while a less alkaline solution will throw down calcite. The presence of certain ions is sometimes a determining factor. Temperature, Ph values and ions present and probably other factors are determinants.

At one point in Luray where water is dripping freely, there are a dozen small stalactites, pencil size, hanging close together. Most of these are typical calcite stalactites. Now comes the strange thing. A few of these are tipped with needles of aragonite. There is also one pencil sized atalagmite tipped with needles of aragonite, pointing vertically upward. This seems to show that sometimes the limiting conditions between the formation of calcite and of aragonite may overlap. It seems to be a pretty well settled mineralogical notion that minerals are stable under the environment in which they are formed. In this Luray occurrence it was not determined whether calcite or aragonite or both are now forming. Clearly both are stable under present conditions. It seems not improbable that here under borderline conditions, calcite and aragonite each has the power to precipitate calcium carbonate from solution in its own space lattice.

## CAVES AND CAVE LIFE

Veronon Bailey\*

(Reprint of talk given before the Speological Society  
February 15, 1940)

Cave study covers a broad field of interests. It is something more than following a loquacious guide down an electrically lighted trail while he points out the elephant's head, the cooing doves, the frozen Niagara and the fat man's misery.

### Kinds of Caves

In the first place there are many types of caves, limestone caves, gypsum caves, salt caves, hot-spring caves, lava caves, river caves, ocean caves, and probably more that I am not familiar with.

Most of our eastern caves are in limestone formation, merely underground water courses where rain water that has picked up acids from the leaves and soil has dissolved the rock as it percolates through the lower levels and then out in larger streams to still lower levels, having miles of deep channels or tunnels below the surface. Mammoth Cave in Kentucky boasts 150 miles of known subterranean extent and no one knows how much farther it extends. Most of the caves in Virginia, Maryland, Pennsylvania and New York are in limestone formation.

Some of the caves in New Mexico are in limestone and others in gypsum formations, and it has been suggested that some are the result of dissolved salt deposits. There seems to be some explanation other than erosion necessary to explain the enormous size of the Carlsbad Cavern. It is only one of fifty or more caves in that general region, but the largest one that has been explored.

In Nevada and Yellowstone Park are many caves that are old hot spring or geyser channels where the water has dried up or found other outlets and left empty chambers with calcite walls. Some are still warm with steam or poisonous gasses coming out.

Lava caves are common in some volcanic regions, generally where long streams of lava have hardened over the outside and then broken out below and the inside run out, leaving long tunnels with arched roof and level floor like a subway. In many of the lava caves the roof has broken through in places and the snow filled in so deep in winter that it remains all summer as permanent ice and these are called ice caves. This may happen in any open caves that are not very deep, but is most frequent in lava caves.

Caves under the ocean are too wet to interest anyone but mermaids, starfish, and squids, but in places along the shores the tides and waves have cut out under the rocks and made chimney holes through which the waves shoot up like geysers. When the land rises above the ocean level some of these water worn caves become of real interest.

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\* Author of Cave Life of Kentucky and Animal Life of the Carlsbad Cavern.



River caves may be found in sandstone, limestone or heavy clay that have been cut out by the water at higher levels than at present. The Painted Caves along the Rio Grande of West Texas are gouged out of old sandstone walls in great shelter caves now fifty feet above the river. Some are open fronted rooms that I should guess at 100 feet wide, 75 feet deep, and 50 feet high, but filled half way up with refuse from human occupation. The name comes from crude paintings on the back walls by prehistoric men.

Other river caves are numerous along the canyons of the Colorado and San Juan Rivers in Arizona, southern Utah, and Western New Mexico. Many have been lived in by ancient people and others used for storage or burial places. They present a rich field of study for the ethnologists.

### Why Caves are Interesting

The real interest of caves is not just a dark hole underground with a scary feeling. The first appeal is how it happened, and here we must turn to the geologist and chemist.

Caves have been here for a long time and many have been lived in since the days of the Cave Man and Cave Woman and contain important records of human life and culture. There can be no greater sacrilege or vandalism than to disturb any of the traces of the early life of man or animals thus preserved until they can be carefully studied in place by the most skillful archeologists, paleontologists or ethnologists.

In many caves we find the most perfect remains of animals, many of them now extinct, which, if properly removed, will always throw new light on problems of evolution and relationship of past and present life. Just a few years ago in a cave in southern Nevada were found the remains of a giant sloth, long extinct but so well preserved that some of the hide and hair still clung to the skeletons and its food plants could be identified from the accumulation of dung in the cave. The cave also showed traces of human occupation.

### Animals Living In Caves

Of the animals found living in caves there are so many different kinds we can mention them only by groups. Of mammals the bats are most numerous and important. Millions of them, including many species, spend their winters in caves, and a considerable number insist on caves for a year-long residence, coming out at night for food and water. All of our bats are harmless and they are probably as useful insect destroyers as the birds. A few other mammals are permanent residents and many species go out and in at will.

A few birds live and breed in the entrance of caves, among them the great horned owl, white throated swift, says phoebe and canyon wren, and there must be others.

Snakes and lizards go into caves to spend the winter and sometimes fall in where they can not get out, but they are rarely found in caves. In crawling into a low cave entrance on my belly I have often waved a stick back and forth in front of me to keep from crawling onto a snake. There is not danger if you are careful.

Blind fish, almost white, and of very primitive types, inhabit many deep caves where there is permanent water. They are very ancient types that have been there for millions of years, I guess. I don't remember just how long. They are different in different caves all around the world south of the waters that froze solid during the Glacial Period.

White crawfish are found in some of the caves and they too are blind.

Insects are the most abundant cave life, both in species and individuals. Blind crickets, nearly white, with long antennae that keep touching the ground ahead of them, are often abundant and conspicuous. Different species are found in almost every cave and several different species in some caves.

Spiders of many kinds live permanently in caves and daddy-long-legs are often so numerous back at the edge of twilight that the walls look like coarse hair of some animal.

Tiny pseudoscorpions and multipedes are regular cave dwellers but no one would ever notice them without getting down on their knees and looking closely with a strong light.

Then there are cave worms, cave snails, and many other low-down groups that most of us would not recognize, and there are probably many more that have never been recorded. It is a rich and fascinating field of study. Every new cave that is carefully explored adds much to our knowledge of underworld life.

Plant life in total darkness is limited to fungus and parasitic plants without chlorophyll, but where there is a trace of daylight or even near electric lights we often see a wash of green. The microscopic spores of mosses and algae, always floating in the air and lodging everywhere, will grow in very dim daylight or close to artificial lights and make green spots that always puzzle the visitors. Mushrooms grow well in caves and at one time were raised commercially back in the dark part of Mammoth Cave.

But what really interests us most is the human occupation and use of caves. In this country it has been less general or else is less known than in Old World countries, but there are many known caves with evidence of prehistoric occupation, fire-smoked ceilings, ashes, and human refuse; storage caves where food and utensils were hidden and sealed with clay and stones from outside intruders; burial caves where the dead with their equipment for the Next World were laid away in niches or in niches or in earth under the floor surface; paintings and rude sketches on the cave walls, and often remains of outer walls or barracks of stone built up to conceal and protect the entrances. Many small caves have been used as merely temporary shelters or camps but even in such limited use there is often abundant evidence in flint chips and broken arrow points and bits of pottery over the ground near-by.

In Old World caves the early history of mankind is written in stone, bone and indelible paints. Southern Europe, France, Spain, Switzerland, Austria, Italy and Greece have caves that tell a thrilling tale of the home life of our ancestors, the Neanderthal and Cromagnon men of whom we ought to be proud, sturdy beings who, armed with oily stone hammers and stone spears, entered deep caves and killed the huge cave bears in fair fights, hunted the mammoth, rhinoceros, musk-ox and bison without the advantage of long range and high power rifles.

They left skulls and bones and ivory marked with their prowess and volumes of pictographs of the animal life around them, the beginning of recorded history.

In African caves, on Mt. Elon near the equator, people are still living in Neanderthal manner among elephants and rhinoceres.

#### LIBRARY NOTICE

The following is a list of books and pamphlets received since February:

#### BOOKS

10. The Mammals and Life Zones of Oregon. Vernon Bailey-416 pgs.
11. Animal Life of the Carlsbad Cavern. Vernon Bailey-195 pgs.
12. Cave Life of Kentucky. Vernon Bailey-256 pgs.
13. Ground Waters in the Paleozoic Rocks of Northern Alabama.  
Wm. Drumm Johnston -  
414 pgs.
14. Engineer Field Manual. U.S. Army Eng. Corps -  
541 pgs.
15. Report of the U.S. National Museum, 1939. Smithsonian Institution -  
128 pgs.
16. Ground Water in the Paleozoic Rocks of Northern Alabama.  
Wm. Drumm Johnston -  
54 pgs.
17. How Nature Makes a Cave. T. C. Northcott
18. Cave Number of the Tennessee Academy of Science. July 1930 issue.
19. Pennsylvania's Historic Indian Cave. Franklinville, Pa.
20. The Lure of Cave Lore. Thomas Allen Missaeus
21. Cave Fishes of North America. Ulysses O. Cox,  
U. S. Bureau of Fisheries
22. Classification of the Genus Pseudanophthalmus Jeannel with  
Descriptions of New Species and notes on distribution. J.M. Valentin
23. The Beautiful Caverns of Luray.
24. The Beautiful Caverns of Luray. (Selected Views)
25. Gold Mining near Washington, D.C. Rocks & Minerals, Oct. 1939

Oct. 1939



## CAVING SAFETY

Wm. J. Stephenson  
President of the Speological Society

With the Speological Society yet in its first year and with interest in caves growing apace, it seems appropriate that one of the first problems that should be dealt with is that of safety. Since the Society, up to the present, has been unable to find any articles dealing specifically on this question to which its members can refer to for instruction and tips on safety, the following article has been prepared. The principles of safety herein set forth are mainly those which have been learned as a result of our first years' hard and sometimes sad experiences, added to what little has been found on the subject. It is hoped that this article will serve both as a guide for the new members and as a basis of further study for those who are already experienced in this field.

It is a well known fact that in all walks of life what is safe for one person to do is very often quite dangerous for another. For example, a skilled airplane pilot, acrobat, or swimmer may perform feats which are merely elementary routine to them in perfect safety, while one lacking their skill could attempt to duplicate them only with great personal risk. When the elements of common safety are carefully observed by those skilled in any art, the hazards attending most all professions become far less than those accompanying normal recreation.

In spite of common belief, caving is not an essentially dangerous pursuit. If a few elemental rules of safety, are observed, the study of caves should be as safe as one's morning ride to work. The principles should be observed with equal care by these who consider themselves experienced and those who are totally inexperienced in caving. It does not seem amiss to call to the attention of those who consider themselves experienced the well-known saying "It is the good swimmer who always gets drowned."

The principles underlying cave safety are few and general and have been for the purpose of this article grouped in four headings, as follows:

### 1. Never Go in a Cave Alone

This is a principle that while apparently obviously basic, is perhaps more apt to be violated than any other, especially by those who call themselves experienced in caving. The chances of a broken bone due to an accidental fall on a wet and slippery rock or a foot being caught in a crevice, as well as the occurrence of numerous other minor accidents are always present in caving, just as they are in hiking and other recreations. Although they usually result in little more than an inconvenience to one accompanied by a companion, the consequence to one in a cave alone might be dire if not fatal. Accidents may happen to one, no matter how careful he may be. By their very definitions they are unavoidable, but to be caught in a cave alone as a result of an accident is something that can be avoided if the principle of never exploring alone is strictly adhered to. Enthusiasm or impatience is no excuse for violating this rule. The most efficient party for cave exploring or mapping or other work is believed to be three or four, while probably two or three could make more rapid progress on the study of any specific work or collection of data. More than these in a party

may result in slowing it down but this is clearly an insufficient reason to leave the party and attempt cave work alone. When in a cave with a party, never leave the party, for to get out of earshot is the full equivalent of being in the cave alone.

## 2. Always Check In and Out of Cave

Whenever anyone enters a cave, someone on the outside should be acquainted with such fact. In spite of all precautions, it is always conceivable that something may happen to a party in a cave. For example, they may, in spite of everything, become lost or some accident may occur. If proper notice has been left on the outside of the cave, too prolonged a stay will bring help. If there is no one available to advise concerning the trip into the cave, a note given the time of entry, names of the members of the party, and expected time of return should be left on an automobile, at camp, at the cave entrance, or in some other spot that will attract attention. That the ones advised of the cave entry should also be told of the exit is merely elementary courtesy and needs no discussion. All notes left should obviously be destroyed upon the return from the cave.

## 3. Observe Minimum Equipment Rules

Always have proper and sufficient equipment before entering a cave. What is proper equipment is of course a controversial question. One must necessarily distinguish between equipment necessary for proper safety and that which is used merely for comfort and efficiency. It is with the former, solely, that this principle is concerned. An article on the latter will follow at a later date. This principle is not directed toward any technical question but refers merely to the barest necessities for insuring safe return from the cave: To wit (a) Proper and sufficient lights and (b) Adequate means to prevent one becoming lost.

Concerning lights, it is a good and safe rule that a short trip or small party should have, and maintain, a reserve of lights equal to that which is expected to be used on the trip. Larger parties or longer trips can relax this standard slightly as members of a party can always double up on lights in a pinch, also the return may usually be accomplished in only a small per cent of the time consumed in advancing into the cave. For small parties on short trips, if flashlights are used, each member of the party should have an extra complete light, or a change of battery and an extra bulb. If there are only two in the party, the extra light is much more preferable than a change of battery and bulb. If the size of the party is increased, say to five or more, complete change of batteries all around and a few extra bulbs should be sufficient. If carbide or gasoline lamps are used, standard flash lights should always be carried as supplemental equipment. It is highly recommended that regardless of the size of the party, the length of the trip, and the lighting equipment carried, each member of the party should have a box of dry matches and a few candles. All extra lighting equipment should always be figured independently of the refills that will normally be used with the main or standard lights.

As means to prevent getting lost, several good methods are available. The simplest and most commonly used are: (1) The use of a trail such as string or confetti; (2) the use of marks or arrows placed on the cavern walls or suitable cairns; (3) the leaving of lighted candles at all junction points. Other methods are also known, such as the use of a compass, and tape with all directions and distance carefully recorded in a notebook, but the above three are probably the best suited to the average caver. The proper use of any one or any combination of the three should give complete assurance against ever becoming lost in a cave.

A few words of elaboration concerning the above methods appear to be necessary since each of the methods possess certain disadvantages which should be known to those using them. In connection with the string trail, the two most usual difficulties are (1) the trail may become broken (2) the string may become crossed during the wandering through various passages and the trail thus become confused. Neither of those difficulties are serious if proper precautions are taken. A careful playing out of the string goes a long way to avoid possibility of breads. At no time should the string be stretched or pulled tight. If the string is not stretched, normal friction with the cavern walls or floors will usually prevent much displacement of the string even if it by chance should become broken. Under these conditions the loose ends can usually be found after a short search (caution: a loose end of a string should never be left to look for another loose end without first attaching an additional piece of string to the end being left.) This procedure will prevent one ever loosing both ends of a string trail.) If the foremost person in a party is charged with the laying of the string trail and the last person made responsible for checking the condition of the played out string, breaks of the trail should be entirely prevented. To prevent crossing of string trails, the following hints may be helpful. When the main line is crossed, or a return is made from a side passage, the string should be disconnected from the crossing or side passage, the end knotted and placed within a foot of the main string line. Thus the following back along a string trail may avoid unnecessary ramblings in side passages. It is neither necessary or desirable to remove the string upon returning from a side passage since the disconnected string in that passage remains as an indication that the passage has been explored. Should a new party or the original party again traverse that passage the string should be reconnected to the main trail string while any members of the party are up in said passage. By following this system other parties starting at the mouth of the cave may go directly to parties within the cave without being forced to make any unnecessary trips up side passages or to recross their tracks.

The use of a confetti trail has not been tried out extensively by the Society. It is reported to be a favorite method of the French Speleologists. This method should not be used where the path leads across or adjacent running water. Such a trail should be laid by the last member of the party in order to avoid having it ground into the mud by following members. Our experience indicates that the trail may be followed safely though more slowly than a string trail. The speed of following this type of trail may be increased by a generous use of the confetti when the trail is laid.

The main objection found to the use of arrows or other markings is that they tend to deface the cave and may easily overlooked even



when properly placed. The overlooking of a single marking in an intricate cave system might result in them becoming entirely lost. If markings are used they should point back towards the entrance in all instances, and should be positioned so that one returning along the passage will see them without any trouble. Further the placings of proper marking is a time-consuming job and slows down the general work of exploring.

The leaving of lighted candles at crucial junction points is a good practice to follow even where other trails are used. The physiological affect especially on an inexperienced caver to return along a lighted or semi-lighted trail cannot be overestimated. A good candle will usually burn as long as the average party is in the average cave. If the candles burn out, a pool of wax remains which is usually as easy to locate as other more elaborate types of markings and moreover such a pool of wax will not remain as a permanent defacement to the cave. Care must obviously be used in the placing of the candles. They should not be placed in too great a draft or where if the candle fell over it would possibly roll behind boulders or into crevices. Upon the return the candles should be blown out to indicate that no one remains in the passage. If Pack rats are known to be present in the cave it is best to add some traps ever so often since the rats have been known to steal both candles and string.

#### 4. Always Use Caution

Even though caves are for the most part safe, they possess many factors that call for the exercise of a certain degree of elemental caution. The mouths of caves form an ideal place for the hibernation of snakes and other small and sometimes vicious animals. A sharp lookout should therefore be maintained for such animals until one is well within the cave. Loose rock is the next greatest danger. All footings should be carefully testing as the majority of cave floors contain large quantities of loose rock which may easily shift if at all disurbed. However, the danger from this source is no greater than that present on a mountainside possessing large quantities of loose rock. No opening however tempting should be entered if it appears that it might be blocked by falling stone. The great majority of cave passages are dissolved from solid limestone and should cause no trouble. It is only in the larger rooms where loose rock occurs generally on the floors and at the junction of intersecting passages and the intersection of passage ways and rooms where it occurs in conditions likely to block the passage. If in doubt as to the safety of a rock formation, it is best to leave the passageway entirely alone. Muddy floors are probably more hazardous than loose rock. Cave mud is an especially slippery and slidey variety. The lack of caution when walking on muddy floors or ledges may result in a bad fall which is probably the greatest danger which the average cave explorer has to face. The use of spike shoes, guide ropes, and stoves are all useful means for overcoming this hazard. Climbing on ledges and other species of rock climbing is always dangerous and doubly so in a cave where the lighting is probably poor and the ledges or rocks muddy and slippery. All safety rules known to the art of rockclimbing should be adopted when ever cave work involves the slightest bit of rockclimbing, no matter how simple the climb might appear. Poisonous gasses are not a usual condition in limestone caverns, however, small passages filled with carbondioxide

become fatal. Swimming in cave pools and streams is extremely hazardous because of the coldness of the water and the chances of losing ones light. This practice should be avoided wherever possible. Last but not least, members of the party should avoid injuring themselves on projecting rocks and jutting formations. It is not at all uncommon for a cave explorer to receive bad cracks on the head by raising his head too suddenly on his emergence from a passageway or to receive other injuries by running into unobserved rocks and formations. Care should be taken in all movements. Haste should be avoided. Any injury to the head may in a great measure be guarded against by the use of the conentional hard hats of the mining industry.

As a summary, let every Speleologist and Caver observe the above rules which for convenience of memory are listed as follows:

- 1-Never "cave" alone
- 2-Always check in and out
- 3-Observe sound principles for minimum equipment
- 4-Be ever cautious

#### PHOTOGRAPH COLLECTION

A collection of Cave photos has been started by the Society. Any and all pictures are welcome. If possible, information should be furnished concerning the cave and place in the cave in which the picture was taken. Date, photographer, type of film, lenses stop, and source of lighting. Also, if the negative is available it would be appreciated.

This collection has already been enlarged by Mr. Bailey's donation of two volumes of pictures taken by Mr. William Lee of Kentucky Caverns in the early part of the present century. One volume concerning the activities of the Society during the last year has already been collected.

The Executive Committee is busy working on a plan similar to the one used for the Library so as to make this photo collection available to all the members.

#### Caution

Members are asked to not empty used carbide into cave streams or pools. The alkali present in this used carbide will kill all life that may be present in the water of the cave. Used carbide may be safely left on dry ledges and other spots where it will not wash into cave waters.

## REPORTS OF TRIPS AND ACTIVITIES

The following reports are directed solely to accounts of some of the various trips taken by the Society during the first year. They are reproduced practically as submitted by the leader of the trips. While some of the material presented in these accounts will of necessity be duplicated in the final detail reports of individual caves, it is thought that the many specific happenings set forth, combined with the reference to the various members participation on the trips warrants the reproduction of these reports.

Comments on this policy and the reports themselves is solicited.

January 15, 1950

On this date, the Society conducted the first of its proposed annual trips to Luray Caverns, Va.

In spite of the fact that these are the largest and probably best known caverns on the Eastern Seaboard, one of the outstanding caves of decoration in the whole United States if not the world, and the subject of writings which, if assembled would fill many volumes, still the Society was shown and by itself discovered some features of interest which it is believed had not been heretofore recorded.

On a conventional trip along the route which tourists are regularly conducted, deviations were made at some places to see particular points of interest. Among these were some blood-red splotches which have recently been observed to be growing on a large deposit of brown flowstone. These splotches were stated by the cavern management to have originated within the last eighteen months. The red coloring was believed to be caused by hemitite, and was tentatively identified at the time as such by Dr. Alfred C. Hawkins. Previously Hawkins had identified a similiar deposit of hemitite in a small cavern (Baldwin's Cave) near Front Royal, Va. In this latter cave the hemitite occurs as veins of deep red in stalactites, rather than as splotches on the floor as found in Luray. It is believed that deposits of hemitite are extremely rare in the caves of this section of the East, and these deposits in Luray should be watched with interest.

Near these of hemitite were seen other deposits of pure calcite which had recently formed over moss. The green moss could be clearly seen through the transparent calcite deposits which are conservatively estimated as at least one quarter of an inch in thickness. This moss is plentiful in Luray, and forms readil, in locations where the lights used for illumination furnish sufficient heat and light to support growth. This present deposit is of particular interest as it has not only been recently formed over the live moss, but the green of the moss affects the white transparency of the calcite so as to produce a very interesting color effect rarely found in cave formations.

The Society was also conducted through a number of the undeveloped passages and passages not at present open to the public. In a room immediately above the main ball room there was observed a large pillar on the right side of the room. This pillar had a maximum thickness of nearly three feet, and had a crack extending about two-thirds of the way through the pillar. Cracked pillars are quite common in Luray



and have been generally supposed to be the result of some pre-historic earth tremor. This pillar, however, presents a crack which appears to be quite recent, and which may be actually growing. As the crack continues through the pillar, its point of disappearance is almost impossible to ascertain. It would be possible, however, to place a reference mark on the pillar and to so check any growth of this crack. If it is found to be actually slowly growing, it will surely serve as evidence that a cracked pillar alone can't be regarded as positive proof of some previous earth tremor in a cave. This pillar will be kept track of and a further report on the condition of the crack will be made by the Society at future dates.

At one point the party descended a shaft about 15<sup>o</sup> deep and was shown a room in which a multitude of crystalline formations formed as appendices to existing stalactites. It is not known whether or not these crystalline formations can be classified as true helictites. In most instances it seemed as if large masses of elongated crystals had started to grow from the bottom of existing stalactites. In some cases the individual crystals approached an inch in length, but one of them appeared to be over 1/16 of an inch in diameter. All grew as clusters, and generally pointed down even though many stood out from the main body of the stalactite with at least a forty-five degree angle. The room in which these crystals were found was generally enclosed except for the entrance shaft, and was quite damp. The humidity of the room appeared to be high enough to have been a factor in the formation of these crystals, but whether it was or not is at present only a matter of conjecture. The cavern management stated that this room had not been entered since 1921. It is believed that the formations in this room are of sufficient interest to warrant a series of systematic periodic visitations.

A short distance from the shaft leading to the above-mentioned room, the party was shown a small lake whose beauty is believed to be unsurpassed by any other in the cave. The lake was all the more striking since it was still in its natural state with no other illumination than that furnished by the individual party members. This lake was entirely surrounded by a series of columns and pillars and open floor space. As the party traversed the boundary of the lake, their lights sparkling in the water produced an effect so gorgeous as to make one wonder if artificial illumination did not after all detract rather than add to the beauty of a cavern. Between the lake and the aforementioned pit two shield formations were noted. This is thought to be of particular interest since the presence of this type of formation in Luray has never before been recorded.

Mr. Legan, cavern manager, showed the party a number of peculiar formations which occurred directly under "Swiss Cottage". While the "Swiss Cottage" is one of the outstanding showpieces of the cave, the general public for obvious reasons cannot examine closely the numerous small formations occurring directly underneath the overhanging ridge which constitutes this feature. Among these formations were noted especially a great number which nearly resembled a rose or a cabbage held upside down. These formations contained a central rounded core with a plurality of petal-like formations surrounding the core. Mention is made of these formations since none of this specific type have ever been previously known. Their composition appears to be similar to other formations in the immediate vicinity, furthermore, a removal of any of them for analysis would be inadvisable due to their prominent position in the cave. No explanation is here offered for these peculiar growths.

Towards the end of the trip the Society was shown some of the passages leading in the direction of the old Ruffner's Cave. Some of these passages were quite muddy and cramped and reminded our membership more of the smaller type cave prominent generally in the Shenandoah Valley, rather than the gorgeous and spacious cavern from which we had just come. Mention is made of these small passages merely because they tend to show clearly that even the large caverns must have their corresponding networks of smaller unimportant passages.

In one of these passages, however, was observed what was at first thought to be a root of some surface plant, but distance of the passage under the surface of the ground precluded this possibility. Close examination also showed that the supposed root branched upward rather than downward. specimens of these roots were pried from the wall and carefully preserved for future analysis. None of them were over 1/8" in thickness, but all extended several feet and possessed a reddish brown color. Our attempts to analyze these specimens were defeated, for they disintegrated into a fine powder before they had been identified. It is believed that these roots may have been in reality small vines which might have started growth either from seeds dropped unintentionally by workman, or from seeds washed into the cave.\* Other similar instances, especially in connection with "Skyline Caverns" (near Front Royal, Va.), have been known to occur when workman brought common field seeds into the caves in the cuffs of their overalls. In these instances, however, the seeds quickly sprouted and grew to considerable height without color and with a small increase in the usual diameter of the plant, then quickly died due to lack of light. In the specimen found at Luray, however, it is noted that if a plant, it possessed color, was of considerable length, and quite thin, thus in this manner it did not resemble any of the previous known instances where seeds were accidentally sprouted in a cave.

\* Explanation offered by Dr. Robert Coates:

Temporary small streams of acidulated water charged with mud which was deposited in a thin film with travertine and left as a hollow shell with subsidence of the tiny stream. The water crept along by capillary attraction; following inequalities of the surface which gave the root like appearance. To be seen at Mammoth Cave, Howe Caverns and Weller's Cave, generally on a smooth travertine base. This phenomenon appears to be worth following up and be particularly looked for in subsequent visits to Luray.

February 25, 1940

The main party of the Society met in Charles Town, W. Va. at 10:30 and was let first on an inspection trip of the old George Washington Cave, just to the south of Charles Town.

At one time commercialized, the cave is now completely deserted, and the developed portion fallen into a state of disrepair. It is quite small, probably not over 150 to 200' in extent, containing practically no formations or any large passages.

Several bats were noticed, but they all appeared to be either the Eptesicus or Pipistrellus. A specimen of each was collected for the National Museum.

The main interest in this cave lies in the fact that George Washington is reputed to have signed his initials on the wall, however, they can not now be seen if, in fact, they ever were there. In the early days, it is stated, the local Masons used this cave for initiation purposes, and George Washington attended such meetings.

After leaving the George Washington Cave, the party proceeded to a newly discovered sink near Clip, W. Va. Local residents, Thornton T. Perry and William Jones had previously tried to reach the bottom of this sink, but failed for lack of equipment. This time, however, Jones, in company with Wilson, (another local man) and Dr. Wm. Welsh, succeeded in reaching the bottom. They reported the sink comes to a dead end within fifteen minutes after entering.

The sink itself slopes at an initial angle of 45° which gradually increases until the last 30' are practically vertical. The total distance from the opening to the bottom of the sink is about 30 feet. At no point is the shaft of the sink more than 8 feet wide or over 3 feet high.

The bones of a cow which a farmer had lost in the sink were found about 40 feet from the opening. Dr. Welsh reported its thigh bone to have been completely fractured.

The bottom of the sink is filled with a conventional silt and debris. It seems very unlikely that this particular sink is any more than a very small seepage opening for water, and the chances for reaching any main cave that might exist in this area appear to be slim at this point.

Following this work, the party investigated an extensive cave which T. T. Perry had located the previous summer. So far as could be determined it has no official name; but since it is located on property previously owned by a Mr. Silers and has been referred to by the natives as "Siler's" cave, this name will be herein adopted.

Located a short distance from the town of Tommyhawk, W. Va., Silers Cave is about nine miles S.W. of Martinsburgh, W. Va. Its entrance also is almost at the exact tip of a small hill, and is an opening five or six feet in diameter and about twenty feet deep. The remains of an old ladder were found in the opening, but did not appear to be trustworthy. Rope ladders were resorted to effect entrance.

At the bottom of the opening is a good sized passage about six feet high by four feet wide. A short way in this passage connects with a multitude of cross passages, making a general plan of the cave appear like a perfect grill.

In the three of four hours which the party spent in the cave, it was impossible to trace down all of the branching passages of this grill system, although rough data were taken, sufficient for the drawing of a preliminary map of the major portion of the cave investigated on this



trip.

One particularly good room was discovered lying practically straight back from the entrance hole, well decorated, it is approximately 20 feet in diameter, and at the time of exploration was filled with water of undetermined depth.

The cave was generally wet and muddy, and the bottoms of all passages appeared to be deposited mud rather than native rock. Many passages contained dips in excess of 10 feet in depth and 15 or 20 feet in length. Some passages showed evidence of having been cut from the original mud, but had been since consolidated to a rock-like nature by an apparent dripstone saturation rather than deposit.

A great number of cave crickets were noted in passages immediately adjacent to the entrance. All parts of the cave contained bats of the Peperisilus family which, though not present in any great numbers, were generally plentiful. No other type of bat was seen, nor was any evidence present showing use of this cave in the past by large numbers of bats of other species.

Further study of this cave in detail is planned. The farmer who owns the land immediately adjacent has invited the Society to camp near his spring which apparently flows from the cave.

March 30, 1940

On this date, Madden's Cave, Read's Cave, and Jennings Cave were explored. The following people were in the group: Jerry Garland, Alden Snell, Herman Vallmer, and Al Lewis. Wm. C. Good, a local boy acted as the guide and took the party to Read's and Jennings Caves. He also described a cave on the edge of the mountains in which he said there were blue formations. His address, as well as Miller's (owner of Madden's Cave) is New Market, Virginia.

To reach Madden's Cave at New Market, Va. go west across the railroad tracks at station (station is about 1-1/4 miles from the town) and make sharp right turn after crossing narrow bridge. Make sharp left turn and come to house of C. H. Prophett, 1/2 mile from railroad station. Second house belongs to Wm. C. Good. Third house is Ed Miller's, who now owns Madden's Cave. Secure Miller's permission to visit cave. Go up hill from Prophett house across overgrown field. Sink hole is easily seen near top of hill.

Extreme care should be exercised in this cave, as tons of roof have fallen and there is much loose rock overhead. The cave has been badly treated. Madden claims to have sold about \$2,000 worth of the formations and local boys have raised havoc with the rest. There is one room where tiny white, hair-like crystals grow according to specimens seen at Miller's house--but it could not be located. Nothing worthwhile is left in the cave. The entrance is very wet and muddy, and there is considerable danger of further falls. I got a couple of pictures in the cave which I hope will show the extent to which the roof has fallen in.

To locate Jennings Cave, go 7 miles south of New Market and turn left on state route 259. Go 2.4 miles of Jennings' house. Cave is

almost due east up the hill be a large oak tree about 300 feet from the road. The entrance is small and very steep so a ladder was necessary. The entrance is almost straight down, full of sharp and jagged edges. At the bottom there is a good-sized room where the roof is about 40 or 50 feet high. A passage goes east about 350 feet, and 150 feet west from the bottom of the chimney. A fault in the north wall gives access to a small opening that leads to the west but soon peters out. There are a few formations but all the good ones have been broken out. Took two pictures in the cave and collected two bats. There seems no reason for making another trip.

To reach Read's Cave go south from main street traffic light 7 miles, turn left on state route 259, 2.2 miles to white bungalow on left. Park here by large cherry tree near gate into plowed field, just east of house. The cave is at tip of a nearby hill in a large sink hole about 500 feet from road.

No formations of any sort, were seen except for a large chunk of calcite at the entrance.

The cave goes straight down and there are passages to the north, northeast, and to the east, but of no extent. The cave shows evidence of many fires as the walls are pretty thoroughly smoked in many places. Trips to the end of all the passages discovered nothing of interest. The floor and walls were damp to wet, but there was not much mud and no pools.

April 6, 1940  
(Geology)

On Saturday, April 6, 1940 the following people explored Spring Cave: Mr. and Mrs. Alden Snell, Don Bloch, Tony Eno, and guest Volkmar Wentzel, Jack Wilson, Al Lewis, and Dr. and Mrs. Bill Welsh.

We entered the cave at about 8 and left at about 1. Dr. Welsh was guide and leader.

The cave, known to us and to the local residents as Spring Cave and to the geology department of Washington and Lee University as Geology cave, is one mile from Lexington, on Route 60 to Clifton Forge. Go 1 mile from the underpass at Lexington to the first small group of cabins and gas stations on the right. Park, and walk about 1/2 mile or less at 55° to the only small wooded hill in that direction. The portal is in a small sink hole in a clearing on the presenting brow of this hill.

By walking around the base of the hill to the south, Cave Spring, a large tubular spring, said to drain the cave system, can be found at the base of the cliff and very close to North River. This spring is 116 feet below the portal.

Through the courtesy of Dr. M. H. Stow, Morningside Heights, Lexington, the probable source of Cave Stream was located. One mile from the Railroad Station in Lexington, on the road to Colliersville and a few hundred yards beyond the reservoir on the right of the road, is a very large, rocky sink hole. Within a few feet of the road a piped spring feeds a horsetrough which overflows to form a small stream.

The stream flows at 50 degrees for a hundred yards into the sink hole and disappears. It was followed 150 feet down channel to a pool whose ceiling is rock and the junction of rock and water closely examined. Although there is a very small passage visible, it was considered impossible to go through. It might be worth exploring at low water.

This stream disappears about a mile and a half from the portal of the cave and presumably about 3/4 mile from the point at which it can be relocated in the cave system. The presumed course of the unknown portion is marked by a series of sink holes, some of which can be seen as the cave is approached on route 60. The line of these sink holes is about 40 degrees.

The portal of the cave itself is about 3 by 7 feet and horizontal to the ground. The channel slopes down in an East northeast direction at an angle of 35. After about 20 feet of residual clay the first section - the maze - is reached. This maze offers moderately difficult and wet climbing for 400 feet. It is characterized by cleft formation and interlocking criss-cross clefts. For a portion of the route, travel is done on a shelf and, at this portion, the cleft is probably 80 feet from top to bottom. Ceilings are unusually high and there are several dangerous crossings with 25 foot falls.

After the shelf climb the second portion - the subway - can be entered in two different ways. Map shows the usual continuation down a mud slide to a lake. Lewis, Wilson and I took the route suggested by Dr. Stows map. We climbed the shelf across a passage to the left to a flat rock room and entered a cleft which brought us through a narrow squeeze (should not be attempted without a rope) to the subway's elbow. Bloch came back this way. The route is preferable because it avoids the lake (Eno's Bath Tub) and because a thirty foot vertical climb down from its exit will bring you directly to Stream's end.

To the left (facing away from this exit) is a mud bank which should not be attempted alone as a slip would bring you to Stream's end. To the right is a shelf down which the usual route comes from the lake. Under the shelf is a newly discovered passage (Bloch's Onyx Alley) which passes under and around the mud bank. From top of the shelf is a good view of the caves only beautiful formation, a white, glittering flowstone waterfall about 15 feet high and 10 feet wide.

The usual route follows a large passage (the Subway) to a 15 foot crevice which is easily climbed (life line here) to the stream. There are three other passages to the stream. The Bloch and Welsh climb to Stream's end (newly discovered), a climb from the base of the flowstone formation (low water, belly climb) and a dangerous forty-foot almost perpendicular climb from flat rock room to a point 8 feet above the stream (Fool's Short Cut). This last route is the only known one which avoids the subway, but there is at least one other route and probably more, judging from the passages leading from the stream cleft.

The stream cleft is rather easily waded. Because of assurances of Ben Morriss now of Rich Creek, Virginia, that he swam under water from stream end to the river - not the cave, - Bloch and Welsh examined this portion carefully. There is no apparent flow there though the rest of the stream flows briskly. The pool is 3-5 feet deep and the wall cannot be entirely examined with the feet. Due to the position of the leads at Subways elbow it is judged that such a swim is impossible but this needs checking at low water and from the outside.



Dye in the stream does not appear in the spring. They waited an hour and a half.

The upper stream was not explored on this trip. There is at least one unmapped passage, sloping up to the left (going upstream) in the direction of the sink hole line and floored with residual clay.

Colonel Steidtmann's booklet (1) says - "The cave system follows joints striking N 50 - 70 E and N 5-20 W. These joint systems are plainly exposed south of the portal, where the surface shows more or less rectangular rock outcrops bordered by narrow strips of sod. The sod strips have the same general trend as the chambers of the cave system.

"The strata in which the caverns are cut include the basal beds of the Whitesburg formation and a part of the underlying Holston Limestone. They strike N 50 E and dip about 10 SE. Local dislocations due to subsidence are common"

- (1) Edward Steidtmann, (410 VMI Parade) Lexington, Va.  
"Humidity and Waters of a Limestone Cavern near Lexington, Virginia". Virginia Geological Survey, Bulletin 46 E. 1936.

April 7, 1940

On this date, the following people entered Withero Cave: Alden and Fran Snell, Jack Wilson, Bill and Virginia Welsh, Al Lewis, Don Bloch, Volkmar Wentzel, and Milo Sonen.

Bloch led the party to the main entrance where we split into two groups - Sonen Wentzel, Welsh wandering around free together. The small group ended up in the flat room and later were joined by the large group.

A later expedition was started through the large entrance. One of Stephenson's old blue prints was found on a rock, by which the party located, with surprising ease, the main entrance room. We felt there was not time to see the entire cave, but had no difficulty following the passage to the danger room with the aid of the chart and the compass. The new chart, not with us on this trip, shows battaley, which had us confused for a time. We think there are a few interlocking passages which were missed in mapping. Virginia went through the port hole and climbed what she believes to have been the corkscrew into a large room. The map does not show such a route, but we were too tired to follow up this lead. I think it improbable that she discovered a new room.

The owl formation shown on the map is the finest animal formation I have ever seen.

April 14, 1940

A party consisting of Thornton Perry, Jr., Bushrod Hopkins, Mr. and Mrs. Alden Snell, Dr. and Mrs. William Welsh, Jerry Garland, Al Lewis, and William Jones met at a hotel in Charleston, W. Va.. They proceeded directly to Mohler's Cave, which lies a short distance south east of Shepherds Town, West Virginia.

After picking up a few young natives who claimed to have been in the cave before, the party started the serious work of exploration.

For the purpose two separate groups were formed; one went with the native boys in advance to scout the various side passages; the other followed behind mapping.

After about one hour's work, the native boys turned back and left the advance party when the group had gone beyond the part of the cave known to these boys. A short distance further, the mapping party overtook the exploring party which had been slowed down by the time consumed in vain attempts to find a way to avoid several large ponds and running streams in the lower passages. All exploration was stopped when the cave terminated in a series of lakes of unknown depth, too wide to be traversed other than by swimming or boat.

Due to the fact that air outside was extremely cold and blowy and all the members of the party did not possess dry clothes, exploration past the lakes was postponed until warmer weather.

After leaving Mohler's Cave, the party proceeded to Shepherds Town and viewed two openings in the face of a cliff on the river about two miles below the town. These openings do not look as if they enter into caves of any extent. As all the members of the party had taken off their cave clothes, no attempt was made to explore these openings thoroughly. From Shepherds Town the party proceeded to Boomesboro, Maryland, and there contacted the management of Crystal Caverns, a small commercial cave. Through the courtesy of these people the party was shown through the cavern, and was allowed to take notes for the drawing of a map of this cave. It seems as if this cave has not been thoroughly explored, and tentative arrangements were made to do some exploring work here sometime next winter.

On this trip several snail shells were collected from Mohler's Cave and also a few bats. Several bones were observed in the lowest level of the cave but appear to be bones of domestic animals washed in, so none were collected. While bats in this cave were not plentiful and the cave contained no colonies or evidences of such, individual bats were by no means rare.

April 7,8,9, 1939  
(by Gus Hortman)

The party consisting of Bill and Merle Stephenson, Louise Shaw, and Gus Hortman, left Stephenson's at about 6:45 on this date and proceeded to Withero's Cave via Charlottesville, Va.. We stopped in Charlottesville to see Assistant State Geologist McGill, at the University of Virginia, in reference to the cave and to see if he would furnish us with information as to other caves in this area. While at Charlottesville, we picked up food for the trip and a few flashbulbs for pictures within the cave.

After Steve returned with McGill, we put the numerous booklets donated by him in the car and proceeded, stopping to eat lunch at Buffalo Gap. We arrived at Shaw Ray's place after stopping and getting the key to the old unused house on his farm in which we were going to stay.

We unloaded the car and set up the cots and started a fire, and then Steve and I went over to the cave and spent the rest of the afternoon mapping the exterior contours, but did not get into the cave that day. After supper dishes were washed, we sat and talked a while,

and then to bed early. After a night during which, in spite of about eight blankets apiece, the girls were cold, Bill and I got breakfast, and then the whole party migrated to the cave to show the girls through and to take some pictures. We led a string trail through the patch of pine woods that we had to go through, so that the girls would have no trouble in returning to camp. After going in to the cave a short distance, Louise developed a case of claustrophobia, came back out and waited at the entrance while the three of us continued on to take some photoflash pictures.

Upon coming to the entrance to porthole passage, it looked as if there had been a cave in since our first visit, but when we looked at it from the direction from which we usually approach it, we saw that it was just the angle of approach which had fooled us. After returning outside, the girls took the camera and other excess equipment and returned to camp while Steve and I remained to continue mapping the cave.

The newer, or first entrance, seems to be still undergoing a settling process, although proceeding very slowly. Some one has been doing some excavating around the main entrance, and has uncovered a fourth entrance a short distance from the main entrance toward the big entrance which apparently leads onto an upper level of the cave. Steve went just inside the entrance and reported quite a bit of dripstone formation but we did not have time to explore at this time.

We went on into the main entrance and continued mapping and checking on the parts already mapped as we came to them. We discovered some new rooms and passages and mapped them as we came to them. I had never seen the Danger Room and Steve took me to it. As we came into the room itself, Steve thought that more of the ceiling had fallen in, but then we saw the string laid last November leading across the top of the pile and knew that nothing had fallen. None of the string in the cave had weathered at all during the time it had been in there, and we found no evidence that there had any amount of water in the cave in that time.

After lunch, we went over to Warm Springs and had a swim in the warm sulfur springs. We returned to camp about 5:30 and while the girls were preparing supper, Steve and I went over to the cave and surveyed the stream bed, which had apparently caused the three rooms to cave in and leave the present three entrances.

After dinner we sat around the fire a while, and then went to bed about 9:00. There was a little excitement due to a bat in the house, but we caught it and put it in a specimen bag.

Steve and I again prepared breakfast on Sunday morning, and after getting the girls up and fed, we packed up ready to leave right after lunch. After packing, Steve and I went to the cave to get some bats for the museum. In one bag, we put several individual specimens, and in the other we managed an entire group that were clinging to the ceiling. We kept this group separate so that the scientist could determine if all the bats in a group belonged to the same species. As we were leaving the cave, we met the owner, Mr. J. N. McLaughlin who gave us permission to return any time we desired. We told him of the new entrance and gave him a candle so that he could look into it. He had never seen a bat, so we showed him the ones we had in the bag.

We went up the Valley Pike to Newmarket, crossed Skyline drive at Panorama and continued on to town on Route 311. Arrived in town about 10. No casualties.



REPORT OF CAVES SURVEYED BY SPELEOLOGICAL SOCIETY  
OF THE DISTRICT OF COLUMBIA

The following is the initial report on individual caves. One of the main purposes of the Society is to make surveys of all known caves both large and small, and to collect and publish all data which these surveys produce. The object of these reports is to set forth clearly all known data concerning any caves on which information may be gathered from any available source. It is obvious that no report of any one cave will ever be complete, for it is always possible to gather new facts concerning any individual cave. As such new facts become available, they will be released in the form of a supplementary report for that cave.

This work even when confined to one small area of the country, will no doubt take years for its completion. Its progress will therefore be marked by a continuing series of reports directed to individual caves as these are visited and as additional data about them is collected by the Society. Obviously, these first reports may be incomplete as to many details and perhaps not drawn up with the degree of perfection as it is hoped will be attained later when both the technique of gathering the data, and the method of reporting the same, will have greatly improved as a result of experience.

It is expected and hoped that these reports will be freely criticized both as to style and context, or in any other manner that might strike the fancy of the individual critic. Since these reports will probably be read only by those in sympathy with the work which is being herein attempted, it is therefore believed and hoped that most of such criticism will be purely constructive. The Society as a whole, and the authors of each of the individual reports, hope that all criticism or suggestions will be immediately passed on to the Society so that all additional work may be done with such suggestions and criticisms in view, to the end that the reports on this phase of the work of the Society will constantly improve both as to content and as to readability.

The main efforts of this Society under present plans, are being directed primarily towards the little-known and undeveloped caves, since this field appears to present the greatest need at present. The major part of our first work, it is believed, will be directed to cataloguing, surveying, and collecting data on known portions of existing undeveloped caves rather than to the attempted discovery of new caves or to further exploration of known ones. However, in an effort to present a well-balanced program, a certain amount of the work of the Society will be devoted to developed caves and to exploration. However, none of the reports included in this issue are on either developed or on caves which were heretofore totally unexplored.

The work of the Speleological Society of the District of Columbia will of necessity be confined more or less to the local area adjacent to the District of Columbia. It is hoped that, eventually, groups in other sections of the country will also engage in this work and will make available their results for either this or similar publications.

In collecting the data represented in the following report it was necessary to develop new technique for cave-surveying and also for reducing the data to map form. Both of these problems will be fully discussed in articles scheduled to appear in this bulletin in the near future. Specific directions for locating any cave studied are all on file with the Society, but have been in many instances omitted for sake of usefulness and to prevent the caves from becoming sources of danger for the inexperienced or, annoyance to the local farmers. All original data and other information is filed in the records of the Society under the name of the cave to which it pertains. These records will of course be available to all members of the Society and will also be open to the general public for the purpose of cave study only.

Where maps are not included with the reports, but are referred to, copies may be obtained by writing to the editor.

#### REPORT -1- "BLOWING CAVE"

This cave is located on the Highway running between Goshen and Warm Springs, Va. (State Rt. 501). The entrance to the cave is about 50 ft. off the highway about  $\frac{1}{2}$  mile West of Millboro Springs, Va.

The present entrance of the cave is in the face of a rock quarry which was used by the state for local road building but which is now abandoned.

The cave is of interest primarily because of the fact that prior to the establishment of the quarry the cave was entered through a very small entrance in a small cliff beside the road, through which entrance air would blow with considerable force. It is from this phenomenon that the cave obtained its name. Since it is on the side of a well-traveled highway, this cave early attracted considerable attention, and is referred to in many old documents relating to this section of the State of Virginia. The mouth of the cave used to be a regular stopping point for the old stage coaches where the women folk were amazed by the ability of air drafts to suspend their handkerchiefs in mid-air. The quarrying operations have now so enlarged the entrance that that this blowing phenomenon is no longer noticeably present.

The cave is still of interest because it is adjacent to the road, with ample parking space provided by the old quarrying operations. The broad Cow-Pasture River adjacent to the road and paralleling the other side of the highway makes the cave entrance an ideal parking place. A State highway sign further serves to point out this cave and to attract the attention of the traveling public, many of whom stop and roam through the cave at will.

A spring of reputedly good water, about 125 feet in from the mouth of the cave, serves as a water supply for campers and also for some of the local residents. Beyond the above facts the cave is small and generally lacking in features of interest to the Speleologist.

The cave is described below in detail, reference being made to the accompanying map.

## DETAILED DESCRIPTION

The cliff, wherein this cave is located is of Heldeberg limestone with a dip of approximately 30 degrees. At the entrance the passage of the cave is approximately 6 ft. wide and about  $4\frac{1}{2}$  ft. high. This passage heightens slightly a short distance in the cave with the width of the passage remaining constant. The entrance passage runs practically due North. The floor of this passage has been covered to a slight extent by deposits of mud, sand and broken rock.

Following the passage back about 75 feet, one comes to a branch sharply to the right. This branch to the right extends only for about 50 feet, before it gets too small for passage. There is a small connecting passage about 50 feet in from the entrance of the cave. In the main passage between the entrance and said branch passage, occur two fissures which cross the main passage. These fissures do not appear to be passable excepting the last one to the right, which constitutes a connecting passage between the main and the branch passage above referred to. The main passage bears left slightly at the aforementioned junction, continues for about 75 feet and then the main passage takes a sharp turn to the left with a smaller passage continuing directly forward. About 30 feet before the sharp left turn a fissure extends across the main passage and on the right at the base of the fissure is the spring above mentioned. The run-off from the spring crosses the main passage and disappears down a fissure on the left. Neither the fissure in back of the spring nor the one down which the run-off flows are wide enough to be passable. The floor of the main passage is practically solid rock with only a slight covering of clay in as far as the spring. Between the spring and the sharp turn to the left there exists a considerable pile of rocks on the floor of the cavern. This pile also extends down the main passage after the sharp turn for a distance of about 25 feet, and is at the maximum about 4 feet high.

The small passage continuing forward from the sharp left turn runs for about 50 feet and gradually peters out. The floor of this passage is covered with rock and silt. A small passage, easily passable extends between a point about 25 feet up this passage and the main passage to the left, as clearly shown by the map.

The main passage to the left continues for about 100 feet and this part of the main passage is probably the highest and widest part of the cave. The floor is generally of relatively smooth rock. In this section of the main passage there is one cross fissure which can be followed to the right for about 50 feet, until it reenters a main passage about 12 feet above its floor. This feature is illustrated in section of the map. The fissure to the left is too small for passage. The said main passage now abruptly enters another main passage crossing the first passage at nearly right angles. This passage is passable to the left for about 50 feet and to the right for about 200 feet, petering out in both directions because of the ceiling and floor apparently meeting. While the previous passages of the cave were generally half elliptical in shape, this passage is formed nearly triangular with the walls slanting steeply to the right along the dip of the rock, with only a small portion acting as a real



floor of the passage. The floor contains little deposited material, except at the lowest point of its cross section, where this material forms a compacted clay path. The part of the passage to the right makes a right and then a left bend each about 55 feet long.

As gathered from the above detailed description, the main passages appear to follow generally the seams of the rock with the small fissures crossing the main passages at right angles apparently along small faults or fractures. The map shows the cave in perhaps better detail than can any description. The section taken along both main passages are horizontal projections of the same. They show well the slope of the floor and general contour of the ceiling. The side sketches appear to be self-explanatory; side sketch A being used particularly to illustrate the differences between the two main sections of the cave. The term C.H. as used on the map, means ceiling height. The limestone is shown merely for purpose of illustration and does not represent the true dip of the stone.

It is not believed that this individual cave extends much farther than indicated by the map and the above description, though other larger caves probably may be semi-connected with this, by cracks and fissures too small to be followed by human beings. There are no formations present in the cave. Rumors that local boys have found pools of water 10' or more deep where they have swum in the summertime, appear to be unfounded. The way this cave has apparently developed along seams of the rock indicates a probable absence of any large rooms in the near vicinity.

#### REPORT -2- "RHEA'S CAVE"

This is a small cave located on the property of Mr. S. A. Rhea. in Milboro, Bath County, Virginia.

To reach the cave one turns right at the junction of State Rts. 501 and 42, on the west side of Milboro Springs on a dirt road, State Rt. 633 if one is proceeding to the west through the town of Milboro Springs. Proceeding up State Route 633 the entrance to the "Rhea" property is on the left hand side of the road, 2 8/10 miles from said junction. Incidentally, the Rhea property is the second farmhouse of the left from said junction. This farmhouse is at the present deserted. Permission to enter the property can be obtained from Mr. Rhea who lives on the left of Route 501, about one mile west of Milboro Springs.

From the farmhouse one travels down an old wagon road proceeding generally to the north from the rear of the house. Specifically, starting at a point where a stream from a spring crosses this road about fifty feet from the northwest corner of the house one proceeds 215 ft. up the road to a point where the road divides near the crest of a saddle between two hills. From this point one goes 130 ft. up the road to the right which slants generally up the hill. This point (130 ft. from the junction) is directly beneath the mouth of the cave, which is 88 ft. up the slope of the hill. The location of the cave from this point is also easily ascertained by reference to the map of Fig. 1.

## Description of Cave

The mouth of the cave is small, being about 2 ft. wide and not over 2 ft. high. The cave runs almost directly back into the hill at a dip initially of ten degrees which increases to about 30 degrees. At one point approximately 30 ft. from the entrance of the cave, one encounters a shaft 35 ft. deep. The distance across the top of the shaft is 26 ft. and the width about 5 ft. A small shelf surrounds the shaft and is easily wide enough to traverse the right hand side of the shaft. When the entrance passage has reached this shaft it has gradually widened until it has become about 4 ft. wide and 3 ft. high. Past the shaft, the cave continues for about 45 ft. up a passage varying in width from about 8 ft. to 0 ft. and in height from about 5 ft. to 0. This passage rises from the shaft at an angle of 18 degrees. The original entrance passage is bone dry, and has a tendency to be dusty in spite of the downward slope in from the side of the hill. Small animals have used this passage for their habitat. When this cave was first explored, a family of large cave rats was encountered in this portion of the passage and their nest had to be removed before proceeding with the exploration. It is also of interest to note that a rope ladder, left in the cave over night, had one strand completely severed by the rodents.

The portion of the cave extending upward on the other side of the shaft gradually gets quite muddy, even though at the time the cave was visited the mud did not extend as far as the mouth of the shaft. This portion of the passage gradually petered out about 45 ft. from the mouth of the shaft. There was no evidence of any formation in this part of the passage.

Access to the lower portion of the cave may be obtained only by the use of a rope ladder, the 35 ft. drop not only being a little great for traverse by means of but a single rope, but the walls also contain a number of loose rocks which would likely be dislodged by one scaling them with the aid of but a single rope. Care should be taken by all descending to the lower portions of this cave, to stand in some protected point while any others are negotiating the descent or ascent of the shaft. One of the mapping party, who did not take such precautions, narrowly escaped serious injury by the falling of a rock dislodged by another of the party who was descending.

As shown by the map (Fig.1), the shaft ends in a mass of debris which covers the floor to an estimated depth of about ten feet. The mass of debris is greatest directly under the hillside end of the shaft. This mass of debris slopes at an angle of about 28 degrees back into the hill. If there is a passage extending from the shaft into the hill, the accumulated debris into the shaft has apparently effectively clogged said passage. From the base of the shaft the cave extends back into the hill only about 20 ft., at this point the passage narrows to a crevice which continues back into the hill but which is only 4 or 5 in. wide. This lower part of the cave is practically dry except for localized spots of moisture.

From the base of the shaft a passage 4 ft. wide and about 6 ft. high leads toward the face of the hill. This passage gradually narrows both in height and width and after about 35 ft. is approximately 2 ft. wide and 4 ft. high. At this point another shaft

approximately  $1\frac{1}{2}$  ft. in diameter drops 8 ft. into another passage directly below. This passage extends about 4 to 5 ft. past this shaft before it peters out. While this second shaft may be further explored by lowering a thin person down into it, such exploration has not been made as it did not appear to be worth the time and effort, for as shown by the map the passage would necessarily be limited in the direction that it could extend toward the face of the hill unless it dropped another 25 or 30 ft. which it showed no indication of doing. The passage was also limited in its direction into the hilly by the mass of debris which blocks the base of the shaft. There appears to be very little circulation of air in this lower part of the cave which is another fact that argues against the second shaft opening into any extensive passageway. As shown on the map, this passage leading toward the face of the hill contains quite a little drip stone in the form of small to medium sized stalagmites and stalagmites.

#### "Summary and Recommendations"

This cave is of very small extent and would hardly be worth the extensive write-up above given, excepting for the below mentioned feature of interest. Unless one is particularly interested in digging for the recovery of bones of animals, etc., they are advised against attempting further exploration of this cave since the chances of making further discoveries of any physical extent do not appear to be worth the trouble and danger involved. It is however noted that from the slope of the upper passage, from the steepness of the sides of the main shaft, and from the great amount of debris accumulated at its base that probably the base of this shaft would form a fertile field for digging for animal remains or perchance even human remains. This cave is probably of great age and is probably one element of a large system of caves known to exist in surrounding country. See for example The Weatherow's Cave located about 1500 ft. to the North West, also caves are known to exist directly across the valley to the South. The spring from whose stream the direction to reach this cave were started apparently flows from a cave system less than 100 yds. to the south. The entrance to this cave was probably opened when the saddle on whose side this cave is located was first formed. The entrance crevice before the lowering saddle left it high and dry, may have been the original crevice through which water originally entered to form this cavern, however, if this cave was formed by solution the water may in all probability have been the same which may have filled all of the caves in the vicinity. The upper part of this cave appears to exhibit more characteristics expected from formation by stream action than solution, in spite of the propone theory that this cave may be but a small element of a large inter-connected system.

The cave is located in a Helderberg limestone formation which directly overlies a shale outcropping which occurs less than one hundred feet below the entrance to this cave. The main stream draining this area "Pig Run", lies about 200 ft. below, and one quarter of a mile to the east of the saddle where the entrance to this cave was found. Another small stream, a branch of Steuart Run, is found about 1000 yds. to the west and about 200 ft. lower than the mouth of the



cave. The main stream to the east has cut its valley deep in the underlying Romney shale. The character of the stream-bed to the west was not ascertained. It appears clear that the whole of this cave lies well above the water table of the surrounding country.

### REPORT -3- "MADDEN'S CAVE"

Madden's Cave is located just West of New Market, Va. The cave lies on the west side of the North Branch of the Shenadoah River in Conoccocheague limestone of the Ozarkian age. This cave is reached by taking the road from the main street of New Market that leads to the R. R. Station. The road is followed directly across the railroad heading due West. This road continues up a small valley and one-half mile from the railroad station, bears left forming a fork with a very unimproved road that continues forward and bears to the right. Cars must be parked at this point. The cave lies over the hill almost directly in back of Mr. Prophet's house. It can be reached by either of two ways, the first and most direct is to follow directly along the fence in back of Prophet's house leading up the hill at about 75 degrees for about 800 ft. and then cutting to the right across the field at 140 degrees for 120 ft. directly to the mouth of the cave. This trip up the fence involves rough going with considerable undergrowth. The easier way therefore is to take the old, very unimproved road directly in front of the farm house through the gate at about 70 degrees for 400 ft. to a gate; through this gate at 70 degrees for 130 ft., then 80 ft. at 120 degrees and 365 ft. at 65 degrees, all on the road. Cutting across at this point 120 ft. at 120 degrees, one comes to the point of the fence from which as before mentioned a course 140 degrees for 120 ft. should be taken to the cave entrance. The mouth of the cave is in a small sink lying about 150 ft. from the crest of the hill in an open field and being about 10 ft. vertically below the elevation of the top of the crest. In the following specific direction of the cave, reference is made to the map of this cave prepared by the Society, a reduced copy of which is appended to this description. In this map an attempt has been made to illustrate the cave isometrically. The isometric projection is drawn to scale as nearly as possible, and should give a better visual picture of the relation of the various rooms of the cave than do the plan and cross section. However, this isometric view has been made for experimental purposes only, and all references to the map will hereinafter be confined to the plan and sectional views.

As clearly shown in the cross-section, the entrance consists of a funnel-shaped opening nearly straight down, however, the walls of the entrance afford good footing and the use of a rope is unnecessary. The start of the course in a horizontal direction occurs exactly 17 ft. below the surface of the ground at this point. The first horizontal passages are low and muddy. The cave generally consists of a series of flat rooms each lying at respectively lower levels. There is an abrupt drop between each room as one progresses downward, and each becomes larger in area and in height. The first two rooms can only

be traversed by crawling. From there on, one may stand with difficulty in the next three rooms but must crawl over the connecting ledges. The going in the last three rooms is relatively easy, ample height being available for standing and walking. It is believed that reference to the map will show at a glance the salient features of this cave. Particular attention is called to the "skating rink", the largest room of this cave, the floor of this room is smooth solid limestone with no accumulation of dirt or other deposits. The floor is so smooth that it is believed that one could skate over its surface with ease with a pair of roller skates. This condition in a cave is believed to be a rarity. Apparently the floor of this room was formed by a block averaging approximately 6 ft. or more in thickness dropping from the top of a previous room. In the southeast corner of the room the stone of the floor is bent up and merges gradually into the ceiling showing clearly how the present floor of this room parted from the present ceiling. Investigation disclosed that this present floor is suspended by means of dripstone formations approximately 3 to 4 ft. above what was believed to be the original floor of this room. As clearly illustrated in this section, it is highly probable that the original floor of this room and the next room, along which the lines K-L-M are taken, at one time coincided, but that when this section of roof split off, these two rooms at different levels were formed. Between the two rooms, a cliff of broken rock almost touches the ceiling of the room K-L-M. The thickness of the floor of the skating rink corresponds approximately to the height of this room.

One can see on the map how easily this block constituting the present floor, can be fitted against the present ceiling to form one large room. Examination of the present ceiling disclosed a still present tendency towards scaling. The least disturbance was sometimes sufficient to bring down large slabs an inch or more in thickness. These slabs apparently represent a line of crystallization which must have taken place when this room was filled with water saturated with the usual salts. The examination of the higher rooms showed crystallization on the walls up as far as the second room from the entrance. The room designated as the crystal room and the two rooms adjacent showed particularly striking crystal deposits. In the crystal room all drip-stone and flow-stone deposits had a coating of later deposited crystals, and ruptured pieces of dripstone showed evidences of the material having been converted to large crystals after its initial deposition.

From this evidence it would appear that at one time practically the entire cave was filled with water saturated with the usual calcium and magnesia salts. The water in the room which at that time constituted the skating rink had a head of pressure equalling at least 50 ft. The relatively great hydrostatic pressure enabled the water to thoroughly penetrate every crack and seam of the adjacent limestone, and apparently as the water withdrew from this cave, crystal deposits were formed in the cracks above the skating rink room. The tremendous splitting action of these crystals, together with the weight of dripstone formations previously deposited on the ceiling apparently resulted in the bodily splitting off of this large section of stone which now constitutes the floor of the room. Pieces of the ceiling

which apauled off at the time of our visit possessed a crystalline deposit on all faces of fracture. Those on the top face being almost like the frosting on a cake. The stone itself had become thoroughly impregnated with crystals so that the usual dull gray limestone sparkled along its factured faces, and resembled fresh broken quartzite.

It is probable that the water which first filled this cave was not by any means in a saturated condition and that as pressure forced it into the adjacent crevices of the surrounding rock, the water also ate and enlarged these crevices and even had a tendency to dissolve and render the adjacent stone somewhat porous. This fact is believed to be substantiated by the finding of the minute deposits of crystals above referred to throughout the structure of the stone itself. The surrounding limestone may have been sufficiently fractured to allow penetration of water along the fractures without being aided by any dissolving action of originally unsaturated water.

The production of porosity in the stone sufficient to support the formation of the observed crystals, can apparently not be accounted for by any theory other than that the cave must have been filled for considerable time with unsaturated water under a considerable head, and that later for a practically equal time the same head of water must have been either saturated or withdrawn from the cave so slowly, as to allow a zone of saturated water at the surface to form the observed deposits of crystal. The cave was apparently fully formed before its period of inundation as evidenced by the crystal deposits on all dripstone and flowstone found in the lower portions of the cave. It is not believed that this cave possesses any large connection with any adjacent cavern, since a large connection would have precluded the standing of water under such a large head of pressure as was here developed for any considerable time. There is also no evidence of the water having left this cave in any rush, so apparently merely small channels were developed which eventually drained the water out of the cave. This is further evidence that would indicate lack of connection with any adjacent cavern. The present owners of the land are reputed to have spent considerable money and energy in digging in an attempt to discover what they believe is a main cave. However, the existence of any main cave directly adjacent to this is seriously doubted for reasons above set forth. Springs in the valley in front of the house of Mr. Proffit would indicate the presence of a large cave system in the S.W. at least 200 to 300 yds. distant and many breathing holes occur in the hills in this area. If this cave is at all connected with any general cave system in this neighborhood, it would appear to be more likely a small off-spring of a system at least 100 yds. to the S.W.

There is no great quantity of either flow or dripstone present in this cave but the rooms above the "skating rink" have their walls covered with great quantities of calcite crystals, these crystals being in some instances three or four inches in thickness. Some peculiar and interesting specimens of crystal and dripstone have been found, one large shattered stalagmite showed the entire cross-section to be crystalline. The crystallines generally radiating from the center axis is the stalactite. The stalactite itself was completely covered with small crystal deposits of calcit. This is believed to



be further evidence that the cave was filled with water for a considerable period of time. Apparently the majority of the dripstone and like formations were deposited before the cave was subjected to its immersion. It is believed that the period of immersion was sufficiently long to completely change the usual ring like cross-section of the stalacmite into a body of crystalline material. A portion of this stalacmite has been brought back from the cave and is now the property of the society. A few small stalactites are present in the extreme upper rooms. These stalactites show no crystalline alterations and were probably deposited after the water had been withdrawn at least from this part of the cave.

Dr. H. S. Barber of the National Museum, has placed his beetle traps in the upper levels of this cave and made several very interesting catches. There is no evidence that the cave has been used extensively by bats, even though a few pipistrilus were observed in June, when the mapping party went through this cave.

A later trip to this cave--(see report of trip) found the floor of the "skating rink" to be covered by a foot or more of talus. The roof of this cave is probably falling faster than at first realized. The cave should be carefully approached by mere sightseers.

#### REPORT -4- "John Brown's Cave"

John Brown's Cave is a small cave lying just west of Harper's Ferry, West Virginia, in a cliff overlooking the Potomac River.

This cave is of historical interest because of the fact that it is rumored that John Brown hid guns in here prior to his historical raid on Harper's Ferry. The present entrance of the cave is in a railroad cut, apparently made long after the Civil War, but the entrance used by John Brown was supposed to have been very close to the Potomac River, and accessible mainly by boat. The local residents state this cave extends entirely through the mountain separating the Potomac from the Shenandoah Rivers, a distance of about  $2\frac{1}{2}$  miles, and some claim to have gone back into the cave at least a mile, but the survey of the Society does not bear out this claim. It may be, and is highly probable that the cave system continues much further through the mountain than is at present known, for the stream which runs through this cave enters through an impassable syphon. However, the existence of no part of the cave other than shown in the accompanying map has yet been properly verified.

The cave entrance is situated adjacent the Baltimore & Ohio railroad tracks about one and one-half miles above Harper's Ferry.

This cave occurs in one of the oldest known sedimentary rock formations, the Tomstown dolomite of Lower Cambrian age. These beds of rock have been greatly folded, the dip at the mouth of the cave being approximately 23 degrees. The entrance is semi-circular, about 5' high and 5' wide. A short distance in, however, the height increases until after about fifty feet its height exceeds 10'. The cross-sectional outline follows the dip of the rock and the walls of the main passage slant in accordance with this dip. The slant of this main passage generally is shown by section x-x of the map.

About 100 feet from the entrance the floor of the cave, which has been approximately level to this point, dips slightly as clearly shown by the section A-B-C-D-E-F. Over this slope the ceiling has a tendency to rise, thus increasing the overall height of the passage to something in excess of 25'. The slope contains some fallen rock but not to any great extent. At the bottom of the slope are small twisting passages on the right which lead nearly straight down. These passages are not generally passable, but at least one has been forced to what is believed to be the level of the Potomac River.

Proceeding along the main passage, the floor rises slightly and the ceiling descends and then the floor takes another dip with a corresponding rise of the ceiling. At the low point in the dip crevices lead down as before. Following this dip the floor slightly rises and becomes covered with slippery mud and after about 50' ends in a passage too small to be further traversed. Over the floor at this point is a chimney which ascends for about 60' and branches off in passages too small for further travel. The angle of the chimney is about 60 degrees to the vertical, its axis paralleling the dip of the rock.

In the main passage in the dip, above referred to, just before reaching the chimney is a small crevice on the left hand side of the passage, opening into a series of rooms which apparently form the main part of the cave. These rooms are separated from the passage just described, by a thin wall of rock, apparently connecting only at this crevice. The side walls of this crevice are practically perpendicular, and it is with difficulty that one can squeeze through, for besides getting through the crevice it is necessary to make about a 12' ascent. A cross-section through this crevice is shown on the map at section marked through E-12. When entering the main room from this crevice one finds himself on a small slippery rock shelf covered with a thin coating of typical cave mud. The shelf slants down to the floor of the room, along which runs a small stream which disappears in dry weather. The stream itself disappears from the cave by dropping down through an opening in the North end of the room. In dry weather when the stream is not actively flowing this opening can be followed down until one comes to standing water which is believed to be close to the river level. The location of the stream with regard to the room is believed to be clearly shown in the plan view of the map and in the section marked H-I-J-K. At the far end of this room, which has been called the main room, is a considerable pile of fallen rock, which approaches to within about 3' of the ceiling. On the other side of the rockpile, are two rooms each decreasing in size as compared to that of the main room. The floor of all of these rooms including the main room appears to be of solid rock with a thin coating of clay and sand apparently recently deposited by the stream. It has been observed that the course of the stream across the floor of the room is subject to change as it moves the deposited clay and sand on the floor. The said deposits are not believed to be over 2 or 3" in thickness, and the floors of the last two rooms of this system appears to be perfectly flat. In each of the rooms after leaving the rock pile occur chimneys leading straight up to the ceiling. They are apparently impossible any great distance

though the chimney in the first room does connect about thirty feet above the floor with a passage later to be described. In the right hand wall of the second room occur a few small passages as best shown in the plan view of the map. However, these passages do not appear to lead anywhere, but stop within about 25' at the most. In the last of this series of rooms occurs a spring which acts as a source for the stream. In dry weather the level of the spring drops and one is able to slide down a muddy chute approximately 8 or 9' to a small series of rooms. In the last room is a small opening so clogged that it cannot be traversed. Only once has the water in this spring been reported to stand at such a low level as to disclose this last opening. Normally in dry weather the water stands about at the level of the two little rooms at the base of the chute.

At the south end of the shelf upon which one enters the main room is a small passage, with an average diameter of about 2'. This passage follows a serpentine course and eventually comes out at the top of the chimney at the first room past the rock pile.

In addition to the above remarks, special reference is made to the accompanying map. A box of symbols in the right hand corner is believed to be self-explanatory. Use of the limestone hatching in the sectional views is diagrammatic and does not attempt to show the true condition of strike and dip of the rock. Upon the plan of the map has been imposed contours which give some idea of the character of the hill immediately over the cave. The hill continues throughout the entire length of the cave, but with decreasing slope. The rock pile between the main and second rooms has been shown diagrammatically only. It is possible to crawl through the pile of rocks immediately above the course of the stream. This passage has not been shown on the map. Abundant notes have been used to try to make the map more self-explanatory. The use of a system of dots in the plan is to illustrate portions of the cave lying at 10 or more feet above the main level is an experimental expedient. A survey of surface connections into the various chimneys of the cave utterly fail, but a large sink was discovered at a point approximately midway between the term 10' in the notation "10' contours" and the term 8 through 10' in the notation "stream may be followed down 8' to 10' in dry weather" as shown on the plan view of the map.

There are no pronounced formations found within this cave. However, some flowstone is beginning to form at the south end of the shelf in the main room and on the west walls of the main passage over the dips in the floor. It is believed that this cave is of relatively recent origin, in spite of the great age of the rocks wherein it is located. The stream appears to be actively cutting down the floor level where it flows through the room. However, the level of the floor of the rooms and the general level of the main passage does not appear to be greatly different, but the main passage, due to its irregularity shows no evidence of having possessed a flowing stream, while the floor level of the room all occur along a general sloping line as clearly shown by the sectional view. It may be that this cave at present is changing at a speed great enough so that observation years later may show differences in the amount of flowstone and like deposits and in the course of the stream.



### Siler's Cave

The entrance to Siler's Cave is a pit about 5 feet in diameter and fifteen feet deep, which is at an altitude of 720 feet, one quarter mile north of a county road, one and one-fourth miles southwest of the village of Tomahawk, which is in the Hancock quadrangle, W. Va.

The cave is developed either in the Denovian Helderburg limestone or the underlying Silurian Tonoloway limestone. It seems to be located on or near the crest of a large anticline, which trends about N 30 degrees E.

The passages of the cave are mostly rather narrow. They have been developed by solution along three predominant sets of joints. One of these trends about N. 56°E. The second trends at right angles to the first. The third set is approximately parallel to the trend of the rock structures, that is, about N. 30°E. Nearly all the passages are approximately in one plane. Except where collapse of part of the roof has occurred, the roof appears to be a single limestone stratum, which dips gently. The floor is chiefly of clay, and is rather uneven, because removal of the clay filling of the passages has not proceeded uniformly. It is probable also that the most passages were never completely filled. Locally some passages were found, which are slightly below the general level. There are some unexplored solution pits which extend downward to still deeper levels. Passages in these levels may be quite extensive, as the crest of the hill is underlain by about 400 feet of limestone, and the entrance to the cave is considerably above the local water table.

Very little flow- or drip-stone was observed.

The map prepared of this cave shows the general pattern of the passages but is still somewhat incomplete and may be considerably enlarged when further exploration is done, with the map as a basis for reference.

### Mohler's Cave

Specific directions for reaching this cave are as follows: Starting at the hotel in Charleston, proceed east on Washington Street out U. S. 340, 4 miles to Hall Town, at Hall Town turn left on the road to Shepherdstown; 4.1 miles on toward Sherdstown, turn right on narrow macadem road; 1.6 miles further, turn left where the road ends abruptly in a cross road; 1 mile further on turn right at the church, follow this road for 1 mile. Park just past the farm house on the left. The cave lies across field to the left about 200 yards at a direction of about 45 degrees. The cave is easily visible as one crosses the field, being situated in a small clump of wood at the bottom of a bluff that rises from the far side of the field.

The entrance of this cave is in a small wash somewhat below the main level of the field, however, from the cliff side in which the direct entrance is located the wash spreads out fan-wise so as to give the conventional appearance of a sink. The field gives some evidence that after a hard rain quite a bit of drainage is even now

deflected directly into the cave. However, at the time of making the map, there was no direct drainage into the cave apparently, even though the stream running through the cave appeared quite active, and the weather had been generally quite damp for the past few weeks.

The cave generally is composed of two levels, one lies about 20 feet above the other. In the first hundred feet the floor is filled with broken boulders so as to constitute a single level. At a 112 foot distance from the entrance there is a 12 foot shelf or cliff on the left which constitutes the clear beginning of the upper level. To the right, the passage drops over a boulder floor for the next 50 or 60 feet to where a stream appears, thus forming the lower level ruffly 20 feet below the upper and generally 35 feet to the right of the same. Both levels run almost perfectly straight, lead directly back into the hill. The passage constituting the main part of the upper level is generally wider than that of the lower level, in some places reaching a width of about 25 feet ceiling height in the upper level valley from 6 to 12 feet until the upper level becomes completely clogged with a clay deposit about 400 feet from the entrance. The floor of the upper level is generally solid rock with portions of deposited clay which is generally quite dry.

After leaving the shelf or cliff before mentioned, there are several other connecting passages between the upper and lower level. Each of these becomes more narrow and intricate as one progresses inwardly from the cave.

The parts of the lower level nearest the entrance are small passages which necessitates crawling and possesses a floor stream with some boulders. The best way of approaching the lower level is believed to be from the last passage between the upper and the lower levels. At the point where this passage enters, the lower level is completely occupied by a running stream. The passage constituting the lower level at this point is about 2 or 3 feet wide and about 6 feet high. The passage continues straight for 200 ft. leading into a room having a diameter of about 20 feet and a ceiling height of about 20 feet. The far right hand corner of this room contained an active water falls which flows over flowing stone cascade, the main cave continues under this cascade, the stream disappears at this point in a passage slightly to the left of the cascade which appears to be at this season of the year utterly impassable.

Following the passage under the flow-stone cascade a stream of water which is probably the same stream, crosses the passage about 50 ft. further on. From here on the passage appears to be alternately nearly blocked by mud banks over which it is necessary to crawl sometimes for as far as a hundred feet, or to be a full passage at stream level and in some instances to be recorsed by the stream. In the next 400 feet two such recrossings take place and one crawl of at least 150 feet is encountered. The lower level finally ends in a series of three lakes, the first of which appears to completely block the passage and to be of about 15 feet in diameter, all of these lakes appear to have a depth of 15 feet and would require swimming to be crossed. The size of the next two lakes was not accurately determined due to the fact that the first was not crossed. The passage way appears to continue on the far side of the lake. The

lakes occur approximately 12 hundred feet from the cave entrance.

The cave itself is located in Elbrooke limestone. The strata appears to be nearly level with a strike running generally north, northeast. The thickness of the limestone above the entrance of the cave is at least 20 feet and increases to at least 40 feet, a hundred feet at the entrance. The cave runs directly back across a field and the lakes end approximately under the center of a small hill which at the far side of the field generally rises. The direction which the stream in the lower level flows is almost directly towards the Potomac River, which is about a mile from the cave's entrance. The surface water generally drains toward the Potomac River through a series of valleys which wind indirectly down to the river bed.

Very few formations were observed in this cave, the best being in the room where the water flows occurred. No fossils of any sort were observed and probably none will be found on the lower level due to the activity of the present stream. It seems as if the upper level should continue to parallel the lower, should one be able to pass the mud fall which blocks progress along the upper level. There appeared to be no connections leading to the upper level after the point used to enter the lowest. There were practically no side passages in this cave, though one does occur within 50 feet of the end of the upper level but that also ends in a mud bank. A small side passage also occurs in the lowest level about 20 feet after the entrance of the last passage to the upper level. However, this side passage reenters the main passage after about 30 feet. Another side passage by-passes the cliff to the left on the way in and has also a total length of about 30 feet. These were the only side passages observed. Many isolated bats were observed, but no large colonies or evidence of the use of this cave by bats for large scale hibernation was found.

Data for the above report was collected April 14, 1940. The map of this cave has been drawn in the rough and awaits only

#### WITHEROS CAVE

The Society has done more extensive work at Witheros Cave during the past year than perhaps any other one cave. Witheros Cave will always be close to the hearts of the early members of the Society since most of the members here received their first real training and experiences in cave exploring and mapping.

The cave itself is quite extensive. It is located in Bath County Virginia, about three miles north of Millboro Springs on the property of Mr. James McLoughlin. It occurs in an outcropping of Held-erberg limestone and has three large openings, all in a practically straight line extending almost from East to West. For future reference, the openings may be referred to as the West opening, The East opening and the Central or Main opening. It is a peculiar fact that the Main opening is the smallest of the three, however, it affords the best and easiest access into the cave. The general plan and characteristics of the cave may be best understood by reference to the map which has been prepared by the Society. The map was prepared



in three separate stages, each one being more detailed than the other, as the cave was further explored.

Starting with the West opening, one enters a large arched room through a portal nearly 60 feet wide and 20 feet high. About 60 to 70 feet in from the opening, the room is partially blocked by a rock fall through which there are two floor openings which are passable by crawling. Each of these openings emerges upon the opposite side of what has been called the "Horse Shoe Room". This room is unusual in that a previous rock fall from the ceiling has filled the center of the room throughout its length with a large practically solid block of stone so that a cross-section across the room to any point in its length would appear to be almost a perfect horse shoe. The prongs of the horse-shoe vary generally from 3 to 4 feet in width while the room itself, which constitutes the width of the horse-shoe has a total width approximating that portal of the West opening. The height immediately above the rock fall to the ceiling varies between 6 and 10 feet while the height of the passages constituting the legs of the horse-shoe are each close to 30 feet. A little past the midway of the length of the room, the rock fall is split so as to form a tunnel or archway connecting the two legs. Opposite this split is a cross passage which leads into a series of rooms to the West of, and parallel with the Horse-Shoe Room. These rooms are of small extent, being about 15 to 20 feet average diameter, are quite wet, and contain few formations. Leads extend from these rooms both North and South, generally parallel to the Horse-Shoe Room. These leads in each direction appear to peter out, the lead extending South being clogged as it approaches the line of entrances of the cave, the one extending North apparently becoming too small for passage, but air current are still felt at its extreme end.

It is appropriate at this point to note, as is evident from the map, that the cave system appears to be in the West portion generally formed along joints leading North and South from the larger rooms with other connecting passages running generally East and West.

Returning to the Horse-Shoe Room a small tortuous passage extends to the East from the above referred to split. This passage has numerous small connecting rooms and small passages as shown on the map. It eventually leads into what has been called the Main room which is directly North of the Main opening. The Main Room is reached from the Main opening by an easy grade down a rift averaging 2 to 3 feet wide, which leads directly into the room from the opening. This room is outstanding in that its floor appears to be formed in two distinct levels. The first level appears to have been the original floor of the room and seems to have been later cut and cross-cut along the seams and joints of the floor, so that now a series of criss-cross deep canyons, varying from 13 to 15 feet in depth have been formed throughout the entire floor area. In the northeast corner of the room, the main floor area itself has become disintegrated into a pile of small broken stones by which one is enabled to make his way down to the level of the equivalent to the bottom of the cross-cutting canyons. Examination of the floor fails to reveal any evidence that the main floor might have been formed by blocks fallen from the ceiling. It is hard to account for the sharp angularity

and the sharp intersection of the canyons in the floor, if they were formed solely by water wash.

The Southeast portion of the floor adjacent to the passage leading in from the entrance, after close examination, appears clearly to be a basic stone integral with the remainder of the cave, and to show absolutely no evidence of fall, while the other parts of the floor of the room are so broken as to make it impossible to tell whether the stone fell from the ceiling or toppled over from the floor as the canyon was cut. This Main room is about 55 feet in the North and South direction and about 35 feet along the East and West line. To the West, the ceiling of the main room extends over a series of broken rooms, the floors of which are boulder strewn, and also over a deep pit, all clearly shown on the map. These rooms connect with the passage previously described which leads East from the Horse-Shoe Room.

A passage leads North from the Main Room and gradually becomes narrower until one is barely able to walk with comfort. After about 100 feet, this passage joins another similar passage leading in the same direction, and which lines up generally with the East opening. Shortly past the junction of these passages there occurs on the left an opening which has been called the Flat room. This room is over 100 feet in length and averages between 25 and 40 feet in width with a ceiling height of approximately 3 feet. The floor of this room is marked by water courses which have been cut as much as three to four feet deep at places. By following in these water crosses one is able to stand upright at one point. At the far end of the flat room, a small passage or tunnel leads downward and is apparently the only means of escape for water entering this room. After a devious course this tunnel ends in a mud sink, which bars further progress. There is no evidence on the surface of any opening or crevice which might indicate an exit of water to the surface from this point. Air currents observed in this passage give evidence that a connection exists with the passages immediately to the west of the Horse-Shoe Room.

Leaving the main room by the East corner, a sheer drop of 13 or 14 feet is encountered, which gives access to the level formed generally by the canyons in the main room. From here on, this appears to be the main level of the cave. All the passages in this part of the cave contain broad shelves at points 13 or 14 feet above the floor, which apparently lie on the level of the floor of the main room. A short distance on the passage leading from the East entrance back to the flat room is crossed. At this point a small opening, which may be easily overlooked, near the floor gives the only access to the eastern portions of the cave. Passing through this small opening the passages become generally wider and have a tendency to form more of a labyrinth, which apparently is less affected by the natural joints and seams of the rock. The cave from here on seems to be definitely older than the part previously described. The walls all show evidence of water flow. As the general plan is most easily understood by reference to the map, detail thereof will be omitted, and only points of interest particularly referred to.

About 25 feet after passing into the older portions of the cave, one comes into a small passage named the Tunnel, which is about 4 feet wide and 2 feet high and bars further progress except by crawling. At this point, a passage also bears to the right and leads to the Throne Room. Over the tunnel is a wide opening about 15 feet off the ground which apparently is a continuation of the level of the main floor of the main room. This opening constitutes a shelf over the tunnel, which is co-extensive with it and much broader. In this part of the cave many of the passages appear to be much wider at a height 14 feet or more above the floor and serve as evidence of the prior existence of a previous stage when the cave existed only at the higher level.

Down the passage to the right from the tunnel towards the Throne room there is found a natural porthole about 2 feet in diameter and about 2 feet of the floor in the side wall, through which one may pass into a parallel passage. This porthole seems to be natural, and must have been formed by some peculiar water action. At other places between these two passages similar smaller portholes exist. These passages both end in a series of medium sized rooms named respectively, the Hidden Room, Middle Room, and Throne Room. All these rooms appear to be practically on a line with the openings of the cave.

The Throne Room is notable since it contains the largest collection of stalactites found in the cave. High up on the walls of the passage leading into the Throne Room are a beautiful collection of pure black and white stalactites, side by side. The black formations are probably due to the presence of manganese and form a most interesting contrast with the pure white crystals of the adjacent stalactites.

Passing through the tunnel, the cave passages become quite wide and high, and are easily traversed from here as far as the Danger Room, which constitutes the end of the cave so far as is at present known. The Danger Room is so-named since the room exhibits evidence of recent extensive falls from the ceiling. Along the passage leading into the Danger Room are numerous small formations. The Danger Room constitutes the most eastwardly point of the cave thus far found.

Between the Danger Room and the Throne Room are a series of large rooms named respectively, Bat Alley, Don's Room and the Big Room. The Big Room appears to be on a line generally with the Danger Room and the Throne Room and the entrances of the cave. In Don's Room large round pockets of rotting chert are found in the walls and disintegrated pieces of chert are to be found on the floor. This room is very wet and appears to be at present in the process of being actively enlarged by solution.

To the North of Don's Room, between there and Bat Alley are several holes in the floor which lead down to a lower level, not yet explored. However, it isn't believed that this lower level will prove to be extensive since it probably runs immediately under Bat Alley. It is noted that the elevation of Bat Alley will correspond generally to the elevation of the floor of the Main Room and that the floor of this lower level appears to be on a plane of the lowest level of the cave.

In Bat Alley the bats have accumulated a deposit of droppings estimated to be between one and two feet in depth.



On the West side of Bat Alley are a group of dripstone columns, which are now quite dead and so indicate an apparent absence of moisture from this particular room for a great number of years. Numerous small rooms exist off the western side of the main passage leading into the Danger Room as shown by the map. These rooms all are very wet and appear to be in an active process of solution or disintegration. Small channels to the East of the passage into the Danger Room give evidence that the cave system may continue further in this direction, but as yet no passable passages have been found.

After the exploring of this cave had been well under way, a small new entrance was found mid-way between the main entrance and the West entrance, which leads into a well decorated room, not more than 15 or 20 feet below the surface. This room probably connects with the main cave by a series of passages too thin to permit a human to crawl through, immediately to the West of the Main Room, as shown by the dotted lines on the map.

It is believed that the main parts of this cave have been now well charted, but numerous small passages still remain to be explored, any one of which may lead into rooms and passages bigger than any found to the present. The country to the East and South of this cave is full of numerous sinks and sink holes. In fact an examination of the country would lead one to believe that a still larger cave system should exist to the East and South of this present cave.

#### REPORT OF SOCIETY'S FINANCES

(While an exact report was not available from the Treasurer at the time the editor found he had this blank space, the Treasurer gave this approximate information:)

|                                |              |                     |
|--------------------------------|--------------|---------------------|
| <u>Income</u>                  |              |                     |
| Dues                           | \$76.00      |                     |
| Profit<br>(from trips)         | 7.50         |                     |
| Contributions                  | <u>50.00</u> |                     |
| Total Income for 1939-40       |              | \$133.50            |
| <br><u>Expenditures</u>        |              |                     |
| Stationery                     | \$10.00      |                     |
| General Supplies               | 6.50         |                     |
| Mailing                        | 20.00        |                     |
| Equipment                      | 40.00        |                     |
| Bulletin                       | <u>50.00</u> |                     |
| Total Expenditures for 1939-40 |              | <u>\$126.50</u>     |
| <br><u>Balance in Treasury</u> |              | <br><u>\$260.00</u> |
| <br>Dues Outstanding           | <br>\$45.00  |                     |

## ACKNOWLEDGMENT

No report of our Society's first year activities would be complete which did not include an acknowledgment of the valuable assistance that the Society in its first year of life has received from many and varied sources.

Perhaps the first acknowledgment should be extended to the Smithsonian Institute, whose advice and encouragement has been largely responsible for the placing of the scientific side of the work of this Society on a firm footing. Not only has this institution aided in the identifying of specimens, the supplying of collecting equipment, and furnishing a variety of general information for the instruction of our members in various fields of science, but many of its staff have taken out membership in the Society and thus contributed materially to our growth.

Our second acknowledgment must be extended to the management of the many commercial caverns who have in the last year cooperated with the Society. It must be here stated that never has the Society made any request of the management of any commercial cavern which was not granted. Though the Society wishes to avoid going on record as favoring one cavern over another, special attention must be called to Skyline Caverns, at Front Royal, Virginia, who have loaned their cave as an experimenting grounds for the development of mapping techniques to Luray Caves, Luray, Virginia, for use of their cave for general instruction and study; and to Senaca Caves, Riverton, West Virginia, and the Smoke Hole Caverns, Petersburg, West Virginia, for their co-operation in various of our projects of exploration. Acknowledgment is also given to the management of Crystal Caves, Boonesboro, Maryland, Lincoln Caves, New York, Horse Cave Cavern, Horse Cave, Kentucky, and Grand Caverns, Grotes, Virginia, for their cooperation during the past year.

Last but not least, the following companies and institutions are acknowledged and thanks are extended to them for their help in the following varied fields. To the Chesapeake and Potomac Telephone Company for its loan of telephone equipment which contributed not only to the ease and accuracy of exploration and mapping projects, but also materially to their safety. To the Bowen Instrument Company, of Bethesda, Md., for its help in the designing and construction of instruments and equipment. To the Dupont Company for the gift of a quantity of a newly developed light-weight waterproof insulated wire which greatly facilitated the use of the telephone. To the Talon Fastener Company for the gift of zipper fasteners used in the manufacture of our specially designed cave knapsacks. To the Y.M.C.A. and George Washington University for the use of their properties for meeting purposes.

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