

**BULLETIN OF THE
NATIONAL
SPELEOLOGICAL
SOCIETY**



MAY 1941

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S O C I E T Y - E M B L E M

The cover of this issue of the Bulletin bears the design which has been chosen as the emblem of the society. The emblem in the final form is a composite of several ideas submitted to the board of governors. The final design was done by Tom Cuverwell, who designed the cover of the June 1940 issue of the bulletin.

Two factors were kept in mind in the selection of the final design. They were: 1. simplicity, and 2. the portrayal of our activities. The basic parts of the emblem are: 1. the semi ellipse representing a yawning cave entrance or large passage way, and 2. the interposed initials of the society to represent the society as within a cave. Little imagination is needed to see that the initials also represent formations decorating the cave interior. The basic parts of the emblem are, therefore, merely the semi ellipse with the society's initials. The formal finished emblem, as portrayed in the cover, is further embellished by a hearty explorer pushing his way into a large cave room after a grueling crawl through the small passage partially blocked by stalactation deposits which have formed on the society's initials. The full name of the society has been surmounted over the cave outline. Space for the individual grotto's name has been provided under the cavern's floor.

The equipment committee hopes soon to be able to furnish these emblems to members in cloth and in metal. The cloth emblem can easily be made to closely approximate the formal emblem on the cover, while the metal emblem will probably be confined to merely the basic elements of the design. It is planned to make the metal emblem available for exploring parties to leave in the furthestmost points of caves reached in various exploration trips, and also to mark or identify caves which the society has explored. The metal emblem could also be used by members on their automobiles, etc. It is planned to make the cloth emblem in three basic colors--green, red, and blue. Members with ten hours underground to their credit will be entitled to wear or display the emblem in green. Those with one hundred hours in red, and those with over

one hundred hours, the emblem in blue. The chairman of the equipment committee will notify the members as soon as these emblems are available.

* * * * *

A D V A N C E D C A V E S A F E T Y Wm. J. Stephenson

Safety First should be the cardinal principle of every true Speleologist. Our society, as the name implies is devoted to the scientific study of caves. It must therefore, be our first aim to raise the haphazard exploring that has been done in the past to a truly scientific and worthwhile level that will be of benefit to mankind. Nothing would do more towards defeating this purpose than some accident to one of our members which the result of carelessness or lack of proper knowledge of exploring technique. Therefore, at the risk of repetition and it may be boring a small portion of our membership, it will be the established policy of the society to keep hammering at this point- - - Furthermore, since little has ever been written specifically on method, technique, and equipment for exploring, the bulletin will be glad to print any articles or notes that any member sends in bearing on these points.

This article is specifically directed to a discussion of some of the elemental safety precautions that should be taken in exploring caves containing pits or precipices that requires any considerable amount of rock climbing. If the principles of which are herein after set forth are strictly followed the changes of an accident which would reflect detrimentally on the society should be very slight.

Rock climbing underground is much more hazardous than on the surface. Two factors alone make this so, they being the lack of light and the usual presence of moisture and mud, which make the rocks extremely slippery. As rock climbing underground is a more dangerous feat than on the surface, the first principle of caution is obvious, "Make no attempts at underground rock climbing that you would not make on the surface." It would seem

that the statement of this principle would be entirely unnecessary but experience has shown that explorers (the author included) carried away by enthusiasm or due to other reasons unknown, are prone to attempting climbs underground which on the surface in the light of day they would declare extremely foolhardy.

From the above principle follows the fact that one should never attempt to explore a cave containing deep pits or high precipices without possessing a fair degree of rock climbing skill and experience previously acquired unless measures were available and had been taken to offset the lack of experience and skill. (These measures will be hereinafter discussed in some detail.) In view of this fact, the District of Columbia chapter of the Society has for the past year followed a strict policy of assigning the tasks of the initial exploration of "deep caves" (this term has been shown to designate caves requiring vertical descent or ascent in excess of 30') to parties composed solely of skilled rock climbers--Subsequently, exploration has been limited to parties lead by skilled members who took part in the initial exploration. It is highly recommended that this policy be adopted on a nation wide scale. At this point it seems fit to include a note of appreciation to the rock climbing group of the Potomac Appalachian Trail Club for the work they have done in teaching many of our members some of the elementary principles of rock climbing and also for their fine work and cooperation in exploring the deep caves of West Va. and helping work out methods of making entry into these deep caves relatively safe for the novice in rock climbing.

The next principle in order of importance applies primarily to the experienced rock climber or deep cave explorer--that is "In underground work the safety factor if possible should be increased to double that used on the surface". Surprisingly, this principle, experience shows, has in the past work of the Society been pretty well observed. This principle does not mean that instead of one safety rope, two should be used, but rather is more of a bond on unnecessary experimentation underground--Baker in his book on

"Caving" published in 1932 brings out the fact that underground, contrary to practice on the surface, any device which will add to the safety of the climb or descent is good and proper practice. This is the essence of this principle. Technical rocking as such for the sport of it should never be indulged in underground. If an accident occurs on the surface it is bad enough, but a broken leg or other injury deep underground in the narrow crevices and deep pits of a cave would be a tragedy. In the normal exploration of a deep cave there are enough instances where pure rock climbing must necessarily be resorted to without creating these conditions artificially. Where pure rock climbing is the only method of further progress, the most experienced climber should first make the climb and then the others should follow with the liberal use of ropes, ladders or other safety devices.

Any rock climbing in caves should be with the use of a safety rope, no matter how simple the climb seems. Safety ropes should be used for any rope ladder climbing. While rope ladder climbing sounds easy it in reality requires both experience and strength. A safety rope should prevent accidents due to slipping or falling from the ladder and from injury of the ladder due to rock chaffing. Where exploring in deep caves is done the use of a hard hat is always advisable as some member of the party is always apt to knock off a few small stones. These stones obtain tremendous velocity in even a 50 foot drop and at heights of 100 feet become like shot. While the hard hat is not under protection from a large falling rock or boulder, they do give a higher degree of protection from small matter. Needless to say, they also have the added advantage of protecting the head from hard knocks, while crawling through small passages with jagged ceilings.

Needless to say, any attempt to increase the factors of safety of any projection will fail unless that attempt is also reflected in equipment. It is not the purpose of this article to go into the proper equipment for exploring, as

separate articles on that subject are at present being prepared for release in following issues of this bulletin. However, a few brief notes are herein necessary to emphasize what should be regarded as safety equipment.

The equipment used in deep caves should be thoroughly tested and reliable. It should be of the best quality obtainable. Lights should be of simple and rugged construction. No trick lights should be solely relied upon in deep caves until thoroughly tested and found suitable for this work. Carbide and gasoline lanterns should not be used until they have been previously tried out in simple caves so as to become familiar with their individual peculiarities. Ropes should be of the highest quality and discarded upon the first sign of wear. The rock climbers of the Appalachian Trail Club have made it standard practice to thoroughly wash their ropes after each cave trip and discard them for cave use after 6 months. Shoes and other clothing should have been previously tried out so that each individual knows that his clothing is the most suitable for his individual requirements.

The next and last principle is "Do not rush your exploring." This is a principle which parallels somewhat the principle, "Always use caution", set forth in the previous article (June Bull. 1940) on Elementary Cave Safety. It has been noticed that even the normally cautious explorer is usually in a rush to get his cave exploring done. He often acts as though he was afraid that someone else would beat him to being the first man into some new passage. This attitude is shown in the tendency to plan a trip before sufficient equipment and experienced members are available, in the tendency to rush into a cave before the rest of the party and also a general scramble to be first down a particularly dangerous part. Although this tendency and attitude are explainable and somewhat understandable, they have no place in safe scientific cave exploration. The caves in most instances have existed for thousands of years and will usually wait for the individual explorer, so nothing will be lost by repairing for exploring any specific cave until such time when a completely

equipped party can be organized or until all members of a party are assembled and ready.

The principle of not smoking should also be carefully observed while in the cave. Members of a party have been known to get impatient with an advance crew making a difficult climb, descent or crawl, etc. Patience is not an outstanding American virtue, but is one that must be cultivated in cave exploration. A careless or hasty move may easily dislodge a rock from the ceiling, start a rock dropping in a pit on some party member below, cause a bad fall, or innumerable disasters. No one can be expected to do careful and safe exploration if members of the party behind are urging him to speed up. In like manner, safety courtesy demands that those who have safely made some particularly dangerous or tedious passage wait for and assist those who are still to come. Shouting, low and unnecessary talking are strictly taboo. They make for confusion and rushing, distract the ones attempting a dangerous passage and interfere with those assisting or operating safety ropes. Besides this, loud noises of any kind should be avoided or they may cause the dislocation of hanging formations or loose material on the ceiling. It is not necessary to whisper, but conversation is to be limited to essential matter. The voice should be no louder than is absolutely necessary for the one to whom the conversation is directed to hear with ease.

This article may sound more like a lecture or editorial than a technical monograph, however it is thought that the subject can stand a little in the line of preaching since the only way to obtain safety is to constantly preach it.

SAFETY FIRST

Within recent months it has been the good fortune of the Society to attract membership more and more from among responsible scientific workers.

In line with this trend, there has been suggested to the Editors the idea of confining to the Bulletin for publication those items of more current and general interest, fitting them into a flexible framework of "departments" such as is practiced by other journals. This would leave more detailed reports--containing geological, cartographical, hydrological, or other scientific aspects of speleology--to be pointed, at the leisure of the Society, in more ambitious form later on.

The Editors would appreciate membership reaction to this policy, referred to again elsewhere in this issue of the Bulletin.

TRAPPING FOR CAVE BEETLES by J. Manson Valentine

Quite aside from the fascination of capturing totally eyeless and depigmented organisms, whose presence deep underground may add considerable interest to a trip through some limestone cavern, there is always the intriguing possibility of an important biological discovery, especially among the specimens of the cave insects collected.

Even the more expected finds, however, are of value to science. The reason for this is twofold: in the first place, darkness-loving creatures exhibit, in their bodily modifications, remarkable concessions to a peculiarly stereotyped environment; hence they are ideal subjects for the study of adaptive evolution. In the second place, animals whose lives are confined to caves may supply important evidence for investigations into the problems surrounding the origin of species.

Faunas of small cave insects are capable of slow migration, one might say "percolation", through horizontal crevices in the limestone which connect the caves

of a given system. But when suitable breeding and feeding locations are found, or when gradual geologic shiftings have rendered underground travel virtually impossible even for insects, there is then a tendency for isolated colonies to become established. By a comparative study of such related yet geographically separated populations, not a little may be learned concerning the part played by segregation in the generation of new species and races. It is a noteworthy fact that even the imperfect barrier of a limestone ridge separating local drainage areas may be sufficient to set up several distinct races of the same species of cave beetle, each race being restricted to the shores of its own subterranean creek system.

With possibility of contact becoming more remote as one increases the distance between caves under consideration, endemic faunas reflect more and more clearly their age-old isolation in the uniqueness of their species. Hence, compared with an equal area aboveground, one may expect the cave-bearing strata to provide a tremendous number of species. This is indeed the case; but it must be borne in mind that the number of lines of cave evolution is negligible as compared with the thousands of lines of organisms which have no cavernicolous representatives.

Among the invertebrates, there are a number of widely divergent types which must be considered true cave-dwellers since they rarely, if ever, emerge from their equable abode into even the dim light and more inconstant temperature of the cave entrance. All agree in being sightless and in possessing tactile equipment which compensates, at least in part, for loss of vision. Perhaps subterranean evolution reaches its highest expression with certain carnivorous beetles known as anophthalmids, a group rich in species and illustrative of many remarkable specializations induced by an uninterrupted history of life underground probably as old as the entire Tertiary.

ary. In their connection, a most interesting problem of distribution presents itself. The beetles seem not to have extended their range further west than the caves of Kentucky; while across the Atlantic the numerous caverns of The Pyrenees, Alps, and Dalmatia contain a splendid anophthalmid fauna. Can this be evidence supporting the theory for continental drift?

It is such far-reaching considerations as the above which make the collecting (for study purposes) of these geologically antique forms so very important. They are no less than living fossils that have survived since remote times by virtue of a cloistered life below the earth's surface. Because of their great significance and value to future scientists every effort should be made not only

the existence of a cave fauna, let alone the equally important fact that these endemic organisms are more irreplaceable than the stalactites.

Concerning the hunting of cave beetles, much may be said. In order to simplify the technique, however, remarks will be confined to essentials. The best all-around results are obtained by baiting. Direct collecting, while often productive of minute and rarely-seen species which may not come to the traps, is extremely arduous and requires some experience. Unless the cave is simply crawling with beetles (occasionally one does strike it that rich), much time is saved for the beginner by sinking small jars or shallow, wide-mouthed bottles (about $2\frac{1}{2}$ " high x 2" wide at the mouth) flush with the surface of the cave floor in moist situations such as near a drip,

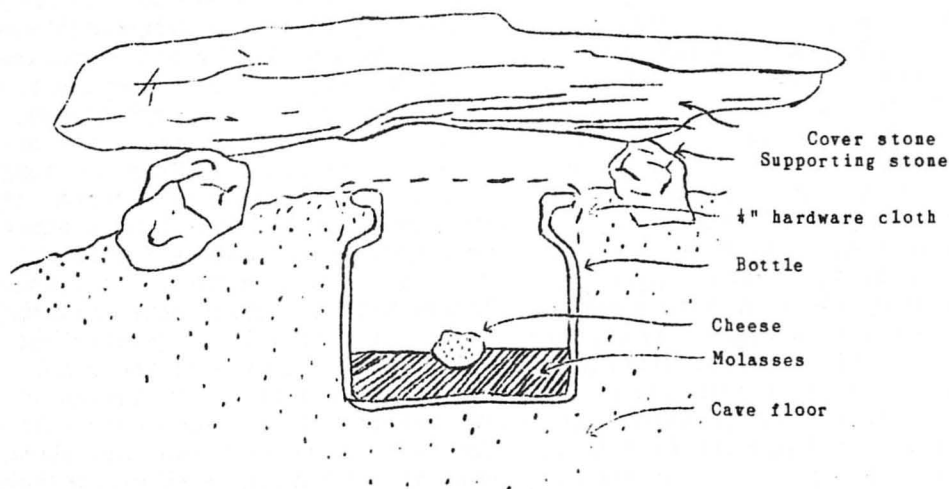


Fig. 1 Trap for Cave Beetles

to obtain samples from heretofore unworked caves, but to leave undisturbed those natural conditions of the floor of the cave which will insure the survival of an anophthalmid colony.

Too thorough a job of cleaning up a cave will discourage all forms of cavernicolous life and may cause the extinction of unique and important types! This has been one of the more regrettable results of over-development for commercial purposes. Few cave operators realize

a pool, or along clay or sandy banks of cave streams. A quarter to half-an-inch of thick, dark molasses should cover the bottom. On this is placed a small piece of evil-smelling cheese, such as roquefort. To repel cave crickets, a grating of $\frac{1}{4}$ " wire mesh should cover the mouth of the trap, care being taken to bend the corners of the hardware cloth down around the bottle lip, and to grade the earth or gravel so as to provide easy access to the trap's entrance. To repel rodents, and to foil

the inquisitive human species, a rather heavy, flat cover-stone, supported about an inch above the trap by small stones, protects the works and hides them from view. The theory behind the device is that the beetles, detecting the cheese from afar, diagnose it as carrion and come running in anticipation of a meal off cave-fly larvae. On entering the trap, they immediately bog down in the molasses where they soon die without doing any damage to each other, and are preserved by the sugar until picked up by the collector some days or even weeks hence. Of course the trap may have been washed out by a flood in the meantime, or dislodged by disrespectful mammals; but it is remarkable how long a well set trap will remain intact and functional in a cave. (Fig. 1)

It is perhaps the best policy to pool the contents of all the traps from a single cave into one container which may then be sent, complete with victims and molasses (but preferably minus the cheese) directly to Headquarters. If living specimens of cave beetles or other cave insects are taken by the more direct method of pursuit and capture, they should be dealt with by putting them into a small vial containing a scrap of paper or piece of cotton tape moistened with ethyl acetate. The use of alcohol or cyanide for the killing of small insects will stiffen appendages to the point of exasperation for the person who does the mounting and makes the dissections.

There is one thing, however, which is far more important than fancy technique: that is an accurate cave and location label with each vial or bottle!

Concerning the sort of things one might expect to find in the recovered traps, a word or two might not be amiss. The commonest creatures, and therefore bait-robbing pests, will probably be young cave crickets which have sneaked through the barrier. Their long hind legs and prodigious antennae unmistakably identify them. Next in order of abundance will be long, white, evenly-jointed fellows with many pairs of

small legs arranged in two pairs per segment. These would be the cave millipedes. A similar, but much longer, slightly yellowish animal with fewer legs and only one pair per segment, would be the much less ubiquitous cave centipede. The beetles will, of course, have only six legs like all other insects.

Although wanderers from the outside world may occasionally drop in, there are, in the Appalachian region, only two dominant categories of true cave beetles that are normally attracted by baiting. Both are pale reddish or yellowish brown, both are quite small (2 to 5 mm.) and both are highly desirable from a biological point of view. One group, mainly of the genus *Adelops*, is composed of tiny (2 to 3 mm.), convex, relatively slowly moving forms-the little scavengers (family Silphidae) which are frequently seen in the neighborhood of a bat's remains. The other group, staggering under the generic name of *Pseudanophthalmus*, belongs to a different family-the ground beetles (Carabidae). They are long-legged and very active, running like ants over the beaches of cave streams, over moist, bare, stony floors or among cave gravel near a drip. In dietary habits they are predaceous; although in captivity they will as readily eat fresh meat as they will their more usual food, the soft-bodied larvae of other insects. A hand-lens examination of the head of one of these cave savages will reveal strong, pincer-like jaws and well developed taste-organ-bearing palpi. Six long "flying" hairs, the main touch-sensitive equipment, will be found attached to the margins of the body, while the dorsal surface will be seen to be armed with the same number of long bristles.

It is sincerely hoped that this sketchy review will arouse further interest among cave explorers in the field of speleobiology. Perhaps those for whom the subject has an appeal will consider actively cooperating with the author in his survey of American anophthalmids. Such assistance would be greatly appreciated. Specimens from

any cave would be gratefully received, but the larger areas from which material is especially desired are the cavernous regions of Kentucky (exclusive of the Mammoth Cave complex), Tennessee, Ohio, and West Virginia. Vials, each with a supply of ethyl acetate suitable for a single cave's collecting, will be gladly furnished.

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M A R L I N T O N T R I P
(November 11, 1940)

(Ed. Note: Written by Jack Preble, and appearing in the Steubenville (O.) Herald-Star (November 27) this account of an expedition through Clyde Cochran's Sink Hole, just south of Marlinton, near Jacob, W. Va., is lifted bodily from the paper--with apologies, and permission.)

Members of the expedition:

Steubenville, O.

"Ducky" Thompson
Dick Galler
Nelson Armitage
Pat Miller
"Shy" Matchett
Schiller Martin
Jack Preble

Ravenna, O.

"Tenny" Jones

Washington, D. C.

Mr. and Mrs. William Stephenson
Alden Snell
Miles Pillows
Florence Whittley
William Schlichtig

Pittsburgh, Pa.

Joan Williams

Somerset, Va.

Dr. J. Manson Valentine

"We 1 the speleologists from Washington and proceeded to a spot where Spring run lost itself in the ground on Cochran's farm. The entrance was fairly easy to worm into but we soon found ourselves traveling on our stomachs for a hundred feet or more. All this time we were dragging in with us rope ladders, ropes, collection and specimen bags and bottles, first aid kits, extra flashlight batteries and carbide. We also packed into that hole two inflated inner tubes and two spruce planks (more about the inner tubes later).

"After quite a tiresome and painful crawl we came to a spot where the roof became a little higher, and we were able to advance in a half-crouching position. Then to a deep pit where the rope ladder was used for the first time for our descent. From this pit we found a passageway that led off to the right, winding and twisting downward. Then more work on stomach, elbows and knees until we came to the banks of a small river. Here's where we intended using the inner tubes. They were lashed to the two planks we had carried in to form a raft, and we mounted a large carbide lamp on the bow and set sail downstream into the unknown. This raft, or makeshift boat, was a honey, but we were afraid to put too much trust in the tricky thing. We tied a safety rope onto it in case we should encounter a miniature Niagara Falls deep in the heart of the earth. After all, we had hopes of getting out of that hole again.

"Well, this underground river glided peacefully along for about 100 feet, and then we discovered a rocky cascade or waterfall flowing into the river, and we could go no further. After collecting quite a number of cave crickets--look like they're made of nylon--and a blind salamander, we backtracked out of that place. The salamander, or lizard is now embalmed in a bottle of alcohol and is decorating one of the shelves of the National museum in Washington.

"Our next cave was one I ran across not far from the first one we explored. This was, in the words of Bill Stephenson, who is president of the society, a 15-minute cave--that is, 15 minutes between cave-ins and rock falls. Those fellows from Washington didn't fool around in my cave. They said it was too dangerous and said I could have it. They named it Preble's cave. Somehow or other I don't feel a bit proud to have a hole in the ground like that named for me.

"Then on to Sneedgar's cave. This cave has a beautiful entrance, and the first 500 feet inside looks to me like a high-class WPA job. The ceiling is 15 to 20 feet high, and the width was estimated at 30 to 50 feet. This cave kept going down and down into the very bowels of the earth. At one point we went so far toward the center of the earth that we could distinctly hear some Chinese soldiers squabbling over a bottle of shamshu. While Bill Stephenson and Shy Matchett were busy mapping the cave, Schiller Martin, Alden Snell and Thompson were snooping around various entries and galleries.

"They discovered an old pre-Civil war powder factory deep underground. Ranged side by side were several large hollowed-out logs where the early settlers would leach out their saltpeter to make gunpowder. Schiller wanted to take one of these troughs with him to present to some museum, but when he started to pick it up it crumbled in his hands. At this powder factory I backtracked out into the open again. I had had enough. The rest of the fellows kept on worming and twisting and burrowing their way through the mountain until they came out on the other side.

"It took only about five or six hours to complete this underground trip, and that includes collecting specimens and mapping. Snedgar's cave is a very interesting unexplored cavern and has quite a number of possibilities for tourist attraction. It has no formations whatever, no stalactites or stalagmites, no flowstone or other peculiar cave growths. We found plenty of bats, millions of those nylon cave crickets, and although Dr. Valentine looked high and low he could not find any blind beetles. Dr. Valentine has found blind cave beetles in the caves of West Virginia that are found nowhere else in the world except Spain. Just try to explain that--or laugh it off.

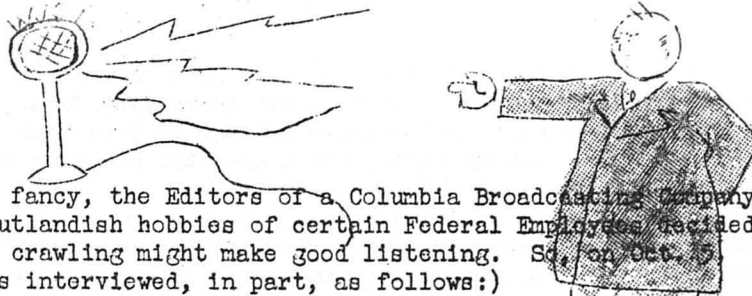
"The next day, in a pouring rain, the remainder of the party (several members had left early for Washington) proceeded further south and, under the guidance of Dr. Valentine, mapped Higginbotham's Cave. This latter is described in some detail in the West Virginia Geological Survey volume on the geology of Greenbrier County. Like Snodgrass Cave, it was entirely through the mountain, making possible a continuous journey without much backtracking.

"Dr. Valentine made quite a catch of cave beetles, and showed the party how to track down and catch these little insects. He also dug out and carted away a great quantity of cave earth which he uses for a home for a number of beetles that he is raising in captivity.

"After leaving the cave, the party split up and headed for home. Some of the members stopped off at Warm Springs, Va., long enough to soak off a two-day accumulation of cave mud.

"All in all, the trip was a huge success. Special thanks should go to Clyde Cochran, Mr. Snedgar and John Hill, who assisted us in every way possible. Also to Mrs. Cochran, who fed us until we were unable to squeeze through any more passageways. Those folks below the Smith & Wesson line--or is it the Mason-Dixon line? --are jewels if we ever saw any. We were strangers and they took us in; fed us, and invited us back. Cal Price furnished us with maps and told us whom to call on for help or guide service. They're mighty fine people. God love 'em."

Bloch In Interview



(Ed. Note: By some fancy, the Editors of a Columbia Broadcasting Company program which airs the outlandish hobbies of certain Federal Employees decided my predilection for cave crawling might make good listening. So, on Oct. 5, 1940, over W J S V, I was interviewed, in part, as follows:)

ANNOUNCER: "You wouldn't ever expect to run into a speleologist - there are not too many of them - unless you happened to be crawling along a stuffy, pitch dark, rock lined passage anywhere from 15 to 1500 feet underground. And if you were, there's a good chance of your running into Don Bloch - our guest - who has wormed his way into nearly every cave and crevice that you can think of offhand.

But Mr. Bloch does not think of caves offhand - he takes them seriously. So let's take him seriously. Mr. Bloch, what is, first, a speleologist?

BLOCH: A speleologist, Mr. Blake, is a person devoted to studying caves - new caves, old caves, caves not fully known - and with studying their plant and animal life, their geological history, their formations, and their complete history.

ANNOUNCER: I see. You study them, then, not entirely for the kick you get out of the adventure and danger that lies in underground exploration but for real scientific information.

BLOCH: Yes, and for that reason in May of last year the Speleological Society of the District of Columbia was organized. We now number almost 100 members made up of men from several nationally known museums, of naturalists, geologists, professional mountain climbers, students of natural science, and laymen like myself. The Society is quite well organized. We have a Bibliography and Library Committee and a Library of books on caves and cave exploration numbering well over 300 titles. In addition we have a Bulletin and Publications Committee, and Equipment and Safety Committee - an Exploration and Location Committee - a Formation Committee - a Geological Committee, a Hydrographical Committee - a Paleontological Committee - a Photography Committee - a Publicity Committee - and there are others.

ANNOUNCER: Well, Mr. Bloch, let's get down to caves - and I think down is the proper word. You speak of yourself as a layman, but I have it from expert sources that you are one of the most experienced explorers. How long have you been delving around underground - and how many caves have you been in?

BLOCH: I think I got the cave bug in 1922 - and since that time I've been in about 113 caves in a dozen different states.

ANNOUNCER: And no doubt you've experienced some walloping adventures in some of them. Can you think of any thrillers this evening?

(There followed several minutes of give-and-take on safety rules and more or less basic cave knowledge. I was asked to ad lib an experience which gave me a particular thrill, and happened to remember a little forced stay I made in a 22-foot

pit in an unnamed cave across the river from Knoxville, Tenn., in 1933. I wore out patience, hand and leg skin, and every muscle in my five-hour struggle to get out. I went in alone - that was my error, and I used the story to point out this "don't" in cave-exploration rules. D. B.)

Undoubtedly many other members of the Society have experienced similar "thrillers" in their caving. If you, as members, would like to have us include individual accounts of this kind as a regular feature of the Bulletin, give us some comment. Better yet, write up your experience and send it in to me. Walter Amos (See "Sixth Sense of Togo", below) already turned us in a good one.

* * * * *

SIXTH SENSE OF TOGO

While exploring a cave in Pendleton County, West Virginia, in 1930, my friends and myself decided to explore a lead beyond a deep well-like pit. As usual Togo wanted to follow but we decided that it was best to proceed without him.

We closed all places that we thought he could get through and after we had crawled through the small opening, we closed it from the inside and left Togo coaxing to get in.

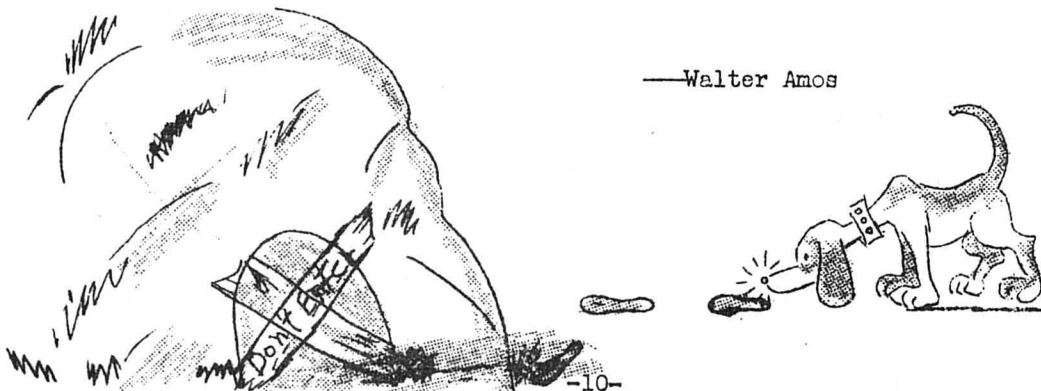
By climbing, crawling, and twisting, we came to the pit that one of the men said was the jumping off place. We found the opening to be a funnel shaped one and too thick to proceed around the rim so we made our way across by holding to formations. If we could have seen in daylight what we were doing I doubt if any of us would have been foolish enough to attempt such a thing. However, with the aid of flashlights we landed safely on the other side and proceeded to explore the lead for several hundred feet.

We were engaged in speculating in the beauty of the room we had found and you can imagine how I felt when something rubbed against my leg. I flashed my light to see what unearthly thing it could be that was about to get us. How relieved we all were to find it was just our little dog, Togo.

We spent the rest of the evening in trying to figure out just how Togo got across that awful hole. We could find no other place he could have used to get into the room where he found us. It was a weird happening and to us such a great mystery.

We carried him across on our return trip and after getting safely on the outside, we searched and found that he had dug a new opening near where we entered.

I will always wonder how Togo made that trip.



THE USE OF COLOR PHOTOGRAPHY IN CAVES

John F. Meenehan

Rich red and brown colors, contrasted against sparkling white calcium crystals; these are present in almost every cave we enter but our eyes are so accustomed to the shades of clay that the delicately pigmented walls might just as well be invisible. Fortunately for us, however, color film provides a medium for the comprehensive recording of speleological work, that never becomes satiated with color and shows every subtle variation of the color. Furthermore, it is as easy to work with as black and white film and the expense is not excessive.

In my experience with cave color photography I have noted a number of items that might be helpful to those who wish to enter this almost virgin field. Color pictures are, of course, subject to all the laws of black and white photography and in addition, have a few rules of their own. Exact treatment is required in lighting and exposure. This cannot be emphasized too strongly. It is the basis of success in color work. The simplest method of achieving this result is by standardizing your photographic technique. In my own case, I resolved to stick to Kodachrome color film, a Victor Pocket Flash Gun and General Electric #5 flashbulbs. The results have been highly satisfactory.

The Victor Pocket Gun is cheap and it has a rugged construction. Although the flash gun is very simple, it has a positive action and gives a beam light that will enable you to take color pictures at 25 feet with an opening f4.5. The camera I chose, was the Kodak f4.5 Bantam. It has many attributes that are valuable to the speleologist. Its width and height is the same as a package of cigarettes and its length is half again as long. It focuses by means of a scale on the front element of the lens and the short focal length of the lens (47 m m.) insures a great depth of focus and a wide angle picture. In addition, all loading and film winding can be done by sense of touch. By using the above equipment all items can be slipped into the pockets of my coveralls, leaving my hands free for climbing and crawling.

The proper exposure of the pictures is arrived at very easily. The General Electric Company has assigned a guide number of 100 to No. 5 flashbulbs used with Kodachrome. By dividing this number 100 by the distance, in feet, from the light to the subject the correct lens opening is found. For instance, if the subject is 10 feet from the light, we find $100/10 = f.10$. As a matter of practice we would use nearest f setting on our camera; in this case f.11. We then set the shutter for Bulb, use an opening of f.11, open the shutter, flash the bulb, and close the shutter. Always do your thinking before you shoot. After the picture is taken it is too late. Make sure no lights are shining directly into the lens, that your picture tells a story and that your lens has no mud or moisture on it. This last hazard may be avoided by keeping your camera in a rubber-lined cosmetic bag, which you can buy at any dime store.

Do not throw your discarded flashbulbs away in the cave. Either place them out of harm's way or put them back in your pocket for disposal later. Broken glass of this type can cause a nasty wound. Visualize the picture before you take it. When you find a particularly beautiful formation you would like to picture, be sure to include a figure in the scene. Not only will it serve as a valuable index as to size but it is useful to lead the eye into the picture. Suitably handled, it will catch your attention and make you look beyond it. A silhouetted figure will give depth to the scene, and be sure to keep your figures about six feet from the background, otherwise you may have trouble with borrowed color from the reflected light. By observing these few precautions, you will have no trouble in taking beautiful pictures.

If you take or have already taken color pictures in caves, I would appreciate if you would get in touch with me at 1222 Euclid St. N. W. Washington, D. C. as the Society is anxious to have duplicates made for its files.

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INTERESTING ITEM FROM THE CORRESPONDENCE FILES

(Ed. Note: It has been suggested that the membership as a whole might be interested in the correspondence conducted by the Society. The editor has therefore selected a few letters for publication by way of experiment. As much public interest has been aroused over the possible use of caves in our national defense system, the first of the letters chosen were from the files on that subject. The other letters are taken at random but should prove of equal interest.)

August 22, 1940
4912 43rd Place, N. W.
Washington, D. C.

The Advisory Committee to the
Council of National Defense.
Edw. R. Slettinius, Jr.
Chairman, Raw Material Division.

Dear Sir:

The Speleological Society is the only organization in the United States which is devoted to the study of caves and the collection of data thereon.

We are not sure what, if any, the exact military value of caves may be. However, we can vision several possible military uses and aspects upon which they might have a bearing. We therefore offer to your committee and the U. S. Government all information which our Society possesses which may be in any way useful National Defense and the full cooperation of our Society on any National Defense projects where we may be of use.

Some of the defense values of caves which have been suggested may be briefly outlined as follows. (1) Their use as storage places for strategic materials, especially gasoline. (2) Their use as air-raid and permanent shelters for evacuated civilian population. (3) Their possible use as factories for highly specialized or important military implements. (4) Their use as possible prisons in case of actual war. (5) The location of caves may possess a military value where heavy equipment is to be operated in a cavernous region. These suggestions may or may not have any value whatsoever at present as regards National Defense. However this obviously is a question which cannot be determined by our Society. They are merely offered for what they may be worth.

Though our Society has for some time been actively engaged in the study of caves, the surface of this subject has been barely scratched. If it should be decided that caves possess any defense value whatsoever, their study should be conducted upon a much more active scale than our Society is at present able to do. For example, it would take several full-time field parties to even finish in a reasonable time the mere job of cataloguing various cave locations in this area. The Society has made fairly accurate maps of all caves very briefly so as to avoid any unnecessary consumption of time should this subject possess no immediate interest. If, at any time the subject of caves may be able to play any part in our National Defense, the Society and all of its members stands ready to assist in any way possible and

hopes it will be called upon for this purpose.

Most sincerely,

President

THE ADVISORY COMMISSION TO THE COUNCIL OF NATIONAL DEFENSE
Federal Reserve Building
Washington, D. C.

August 28, 1940

Mr. Wm. J. Stephenson, President
The Speleological Society of the
District of Columbia
4912 - 43rd Place, N. W.
Washington, D. C.

Dear Mr. Stephenson:

Thank you for your letter of August 22 and the patriotic offer of assistance of the Speleological Society.

The actual planning for national defense falls under the jurisdiction of the Planning Branch of the War Department and, therefore, I would suggest that you write to Colonel Harry K. Rutherford in the Assistant Secretary of War's Office, advising of the facilities of your organization in case that at some future time a complete study of the advantages of caves should be given further consideration.

I shall, of course, bear the matter in mind and mention it to the various members of my division of this Commission.

Sincerely yours,

E. R. Stettinius, Jr.

INTERNATIONAL AFFILIATION

Many members have inquired to what extent the National Speleological Society is cooperating with the British Speleological Society and other Speleological Societies. Our secretary has made several attempts to contact the British Speleological Society but has received no answer to such attempts. It is probable that due to war conditions his attempt at contact has been miscarried or the society has suspended operation for the duration of the war.

WAR DEPARTMENT
Office of the Assistant Secretary
Washington, D. C.

September 24, 1940

Mr. William J. Stephenson,
President, The Speleological Society
of the District of Columbia,
4912 - 43rd Place, N. W.,
Washington, D. C.

Dear Mr. Stephenson:

Your letter of September 4, 1940, was duly received but the pressure of other work has prevented its proper acknowledgment.

The outline which you have furnished regarding the work of your Society is very interesting, but of course it is impossible to say at the moment where the information you have collected may be applied specifically. However, I am making copies of your letter and will distribute them in the War Department so that the information you submitted may be available in the event that the subject is discussed.

Thank you very much for bringing this matter to my attention.

Sincerely yours,

H. K. RUTHERFORD
Colonel, U. S. A.
Director, Planning Branch

WAR DEPARTMENT
Office of the Chief of Engineers
Washington

September 20, 1940

The Speleological Society of the District of Columbia,
51 Star Building,
Washington, D. C.

ATTENTION: MR. A. C. LEWIS, SECRETARY

Dear Mr. Lewis:

This office has received a copy of the letter written by the president of your society to Mr. Stettinius relative to the military use of caves and the offer of the services of your society in this matter.

As the letter suggests, there may be military uses for caves, and plans for their employment when their location makes them usable, will

be desirable. The offer of cooperation and assistance is deeply appreciated. The services of your society will be requested should the occasion demand.

For the Chief of Engineers:

Very truly yours,

George Mayo,
Lt. Col., Corps of Engineers,
Chief, Construction Section.

Fish & Wildlife Service
105 Anderson Hall
University of Washington
Seattle

April 14, 1941

Mr. Don Bloch
Fish & Wildlife Service
South Agriculture Building
Washington, D.C.

Dear Don:

You will recall the peculiar white crystals that we found in Withero Cave, Bath County, Virginia, on March 23. They had the general appearance of a mold but were actually slender, needle-shaped crystals radiating from a center.

I diagnosed them as saltpeter but find that I was mistaken. Dr. Rex Robinson of the University of Washington Department of Chemistry says that they are magnesium sulfate (Epsom salt) with traces of impurities such as carbonate, silicate, and iron.

I thought that you might like to have this information and perhaps pass it along to Mr. Stephenson.

Regards,

Victor B. Scheffer,
Assistant Biologist,
Division of Wildlife Research

Letters from out-of-town members:

December 25, 1940

I have been working on Mr. Gallaher to write up our local caves but I haven't had any luck to date. I thank you for your compliment about

my cave time but I am really a decided novice. Clark Gallaher is the only really cavitist in our group. He has spent at least a thousand hours underground; chiefly in the Ozarks but also a goodly amount in other sections.

All of our caves around Lexington are small mild affairs but I do hope that some one or ones in our group will write up a short article about local caving. Speaking from my own experience they have aroused an interest in caving, developed all those muscles I never knew I had, and developed some technique. We have a score of caves within a score of miles although no one has even a good mile of passageways.

We have just finished an interesting trip. Three of us went down to Floyd Collin's Crystal Cave, near Mammoth Cave, and took two of the toughest day trips exploring a new route. Dr. E. R. Pohl made the arrangements for us and was exceedingly kind and helpful. These added on twenty hours to my time underground, and about ninety percent of it was crawling.

W. Scott Hall
(Lexington, Ky.)

News from New England:

Minutes of Meeting of
New England Grotto No. 1,
National Speleological Society

On Sunday morning, December 1st, 1940, there were gathered in the waiting room of the Union Depot at Pittsfield, Mass., a crowd of 24 persons (19 males and 5 females). About 10:45, they set out for Pettibone Falls cave, under the leadership of Mr. Clay Perry of Pittsfield. This cave is located at Farnams, Mass., about 12 miles north of Pittsfield in the town of Cheshire. The party proceeded by car to a spot about 3/4 of a mile from the cave entrance, the balance of the trip being made on foot through heavy snow.

Within a short time the entire party had entered the cave, and were busily engaged in looking around. Later lunch was enjoyed by all inside the cave, and then the actual process of forming the grotto was started. Mr. Perry began the formalities of organization by reading the proposed by-laws of the National Speleological Society. He was requested to appoint a nominating committee and named to this committee, -Fred S. Best of Westfield, N. J., Robert M. Hambidge of Springfield, Mass., Edgar Swanson and Robert C. Hudson, both of Meriden, Conn. This Committee was asked to meet and report their nominations later in the day. A motion was then made and seconded that the constitution of the National Society be adopted. It was so voted.

The group at this point adjourned to the Baker Quarry cave, located in the "Disappearing Brook" section of the town of Lanesboro. During their visit to this section, the nominating committee recommended the election of the following:-

President- Clay Perry of Pittsfield, Mass.

Vice-President- Ned K. Anderson of Sherman, Conn.

Secretary-Treasurer- Leo. L. Lincoln of Pittsfield, Mass.

It was moved and seconded that the nominating committee cast one ballot and these three were declared elected.

The group then adjourned to the starting point where the final good-byes were said. Many expressions of delight over the trip were made as well as suggestions for another in the near future.

The following took part in the first trip of the New England Grotto #1, of the National Speleological Society.

Ned K. Anderson,	Sherman, Conn.	
Ted Anderson,	"	"
E. G. Crowell,	Meriden,	"
J. W. Mitman,	"	"
J. B. Cook,	"	"
Peter L. Henreus,	"	"
Dorothy L. Henreus,	"	"
Edgar Swanson,	"	"
Harold F. Lorenz,	"	"
Robert C. Hudson,	"	"
Arthur McCarthy,	"	"
Horace Turner,	"	"
Dorothy Greenbacker,	"	"
Natalie Salamander,	"	"
Elaine Evans,	"	"

Fred S. Best, Mountainside, Westfield, N. J.
George E. Helmke, Mansfield Ave., Nyack, N. J.
Joseph T. Ruddley, 91 Mountain Way, Rutherford, N. J.
Robert M. Hambidge, 108 Northampton Ave., Springfield, Mass.
Robert M. Hambidge, Jr. 108 " " " "
Thomas R. Huckins, 35 Hanover St., West Springfield, Mass.
George F. Dillman, Otis, Mass.
Clay Perry, East Acres, Pittsfield, Mass.
Leo L. Lincoln, 14 Kenwood St., Pittsfield, Mass.

Leo. L. Lincoln
Secretary-treasurer.
12/1/40

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CONTRIBUTIONS TO THE SOCIETY

The society has received word from the U. S. Department of Internal Revenue that gifts and dues to the society (dues of the members) are deductible from their income tax. If anybody wishes to make any donations to the society perhaps this may encourage them to do so.

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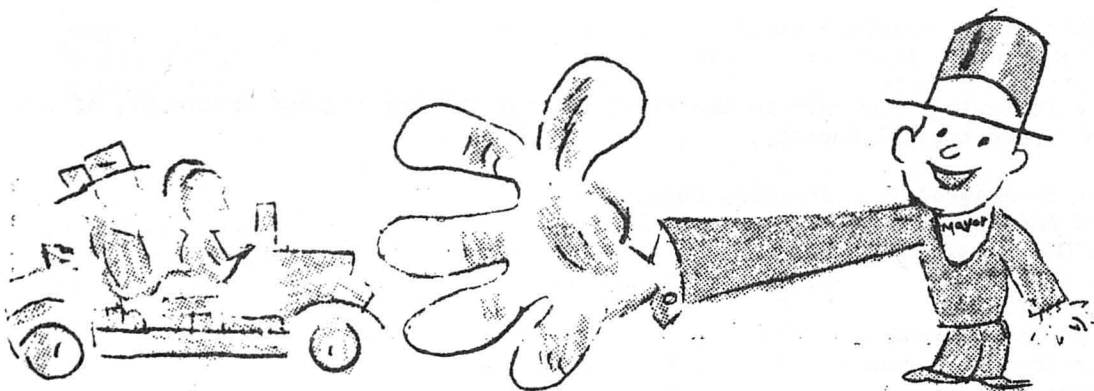
LIBRARY CATALOGUE

It is hoped within the next two months to complete a new catalogue of material now in the library. Robert Braid, the new librarian, is working on this catalogue and it will be released as soon as it is available.

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IF A CAVE IS WORTH VISITING IT IS WORTH COMPLETELY RECORDING!
In other words a visit to a cave which is not completely recorded turns out to be a mere fancy trip and accordingly a waste of time to the Speleologist.

* * * * *



LAKE LURE CAVE TRIP
(July 19-21, 1940)
Reported by Jack Schultz

An exchange of letters and an interview with Miss Ruth Levi, of Rutherfordton, N. C., resulted in twelve members of the Society leaving Washington to explore and report on the advisability of commercializing a cave at Lake Lure.

The party consisted of William Stephenson, Jack Schultz, Alden Snell, Gus Hartman, Tony Eno, Walter Amos, Mr. and Mrs. Elmer Harmon, Arthur Lembeck, Louis Lembeck, Charles Daniels, and Leo Scott.

Nothing spectacular in caves was expected, as geological charts showed a definite granite vein through the Lake Lure section. Miss Levi was given no reason for optimism regarding future findings of the cave, and as Miss Levi kindly financed the major portion of the trip, we felt there was nothing to lose in making the exploration. There was also the prospect of visiting several other caverns en route.

The wonderful mountain scenery, and cave yarns as spun by Walter Amos made the trip down anything but monotonous. Arriving in Rutherfordton, we met the sponsor of the trip, Miss Levi. From there we proceeded to Lake Lure, a half hour's drive. At this attractive mountain resort we were cordially received by the citizens and the town fathers. Bill Stephenson, Alden Snell, Jack Schultz and Tony Eno went to the mayor's home; Doctor Washburn. Marian and Elmer Harmon stayed at the Rocky Broad Inn; and Walter Amos and Gus Hartman bunked down at the Lake Lure Inn. The other members of the party

did not arrive until the following morning.

Rumbling Bald Mountain is the site of this cave. On the way we picked up two guides and many of the local residents, who were very helpful in toting equipment up the mountain. On arriving at the mountain, we hiked up the side for almost a mile. As we expected on preliminary investigation, the cave was of that type known as a rock fissure, in granite, and formed by contraction, expansion, and perhaps earth movements. Although not an unusual cave as a type, it is perhaps one of the largest of its size. The cave extends about 300 ft. into the mountain, the largest room being about 84 long, 18 wide, and 35 ft. high. Various fissures ran in several directions from this room. Some were explored which ran vertical, and opened at the top of the mountain. The complete exploration of this cave was somewhat made hazardous because of tons of loose rock, much of which was overhead in the ceiling. This was one of the reasons given for not encouraging development of the cave. The removal of these hazards would have to be supervised by a person well versed in mining and the effective use of explosives.

Two other caves were explored in the immediate vicinity, one a cave from which emanated a blast of cold air. The natives stated that an equally hot blast of air blew out in the winter. A little east of this is another cave of medium size. At the end of a 75 or 100 foot room was a spring of clear cold water, fit for drinking. This stream

was unusual, since the cave was very near the mountain top.

The following morning, Bill Stephenson, Alden Snell, Jack Schultz, Walter Amos and Gus Hartman started for Washington after breakfast. Arthur and Louis Lembeck, Charles Daniels and Leo Scott stayed at Chimney Rock, and climbed the cliff adjacent to the rock itself. This gave the natives a big thrill and earned themselves much publicity thereby. They later explored Bald Cave 8 miles away and reported it merely a small duplicate of Rumbling Bald Cave. Marian and Elmer Harmon headed south for a vacation.

On the way back to Washington, stops were made at the Linville Caverns, Linville, N. C., the party being cordially received. This cave is only recently developed, and is situated in an isolated area of limestone, probably the only limestone in N. C. Walter Amos, after making a visual survey of the terrain, stated it was his belief that the major portion of the cave was as yet undiscovered, and lay directly above the present developed rooms. The owners were very enthusiastic about further exploration and development, and promised to inform the society of any further findings.

Our last cave stop was Salem, where the Dixie Caverns are located. We were shown through by one of the original explorers of the cave, who spun tales of the original opening and developing of the cave. After almost an hour of listening to this character, we dubbed him the "unreconstructed caveman".

All parties arrived home without further incidents.

There follows a copy of the report on this cave as prepared for Miss Levi.

Report

RUMBLING BALD MOUNTAIN CAVES

Rumbling Bald Mountain lies in the

southeast portion of the state of North Carolina, about 40 miles southeast of Asheville, 30 northeast of Hendersonville, and 16 miles west of Rutherfordton. The nearest town is Lake Lure on U. S. Route 74. For many years this mountain has from time to time alarmed the natives by emitting loud rumbling heard for many miles across the county to the southeast, but in no other direction. Large caves were reported to exist in the face of the mountain in which Tories were supposed to have hidden their treasure during the Revolution. It was after this that the rumbling was supposed to have occurred. The treasures are supposed never to have been recovered. The last rumbling that could be positively verified occurred in June of 1932 and others were reported in 1928.

Due to the presence of caves in this mountain the Speleological Society was invited by Miss Ruth Levi, the owner of the mountain, to make an exploration of the caves and also see if they could determine the cause of the rumbling. Accordingly, on July 20, 1940, a party, composed of Mr. Walter Amos, Mr. Leo Scott, Mr. Charles Daniels, Mr. Tony Eno, Mr. & Mrs. Elmer Harmon, Mr. Wm. Hartman, Jr., Mr. Arthur Lembeck, Mr. Jack Schultz, Mr. Alden Snell, Mr. Wm. Stephenson, made an exploration of the caves of this mountain. This party was joined by Miss Ruth Levi, owner of the cave. Mr. Charlie Dobson would act as guide.

The following is a report of the finding of this party.

To reach these caves, proceed west from Lake Lure $\frac{1}{2}$ mile across concrete bridge over head water of the lake. Take side road right after crossing bridge $\frac{1}{2}$ mile and take dirt road to left at farm house on left. Follow dirt road 2 miles up mountain, and park in clearing on right where used to stand an old house. Walk back down road about 100 yards to bend in road. A path leads from this point on the right up the mountain to the cave. The distance up the path is about $\frac{3}{4}$ mile, and the path peters out as it ap-

proaches the face of the mountain in which the caves are located. However, upon this point the caves themselves become visible.

These caves were found to be what are known as fissure caves. That is, the caves have been formed by the cracking of rock due to expansion and contraction or some earth movement rather than by the action of water. While this type of cave is not uncommon, they are by no means as numerous and no where near as large as those formed in limestone. Rumbling Bald Mountain appears to be a solid block of granite. The face of this mountain is exposed along the South East side and it is here that the caves are located. These caves occur about two-thirds of the way up the mountain and slightly above the bottom of the exposed portion of the face. Measurement discloses that these caves are probably the largest of this type on record in the Eastern United States. They are also unusual in that a portion of them have been formed parallel to the face of the mountain as well as extending into the mountain.

Three separate caves of considerable size were found and explored. There may possibly be others which were missed due to our limited time which precluded a close inspection of the entire exposed face of the mountain. The largest cave, hereinafter referred to as the main cave, extended into the mountain nearly 300' with the largest room being about 84' long, 18' wide and 35' high. The entrance of the main cave is slightly to the East and about one-fifth of the way up from the center of the exposed face of the mountain. The other two caves lie slightly to the East and will be later discussed in detail.

The main cave, as before stated, is formed by fissures running both parallel to the face of the cliff and into the cliff. There are openings at each end of the main fissure running parallel to the cliff. Numerous small passages and crevices extend from the main fissures of the cave. Most of these contain loose rock and they are extremely dangerous. Some members of our party were able by means of these

fissures to ~~work their way~~ from the opening almost at the base of the cliff up until they emerged from a small opening in the extreme top of the mountain. No doubt other such passages exist but they are dangerous and should be avoided. The rock on the cliff side is integrally joined to the rest of the mountain except where the openings occur. Entering the main cave at the opening on the extreme right (facing the cliff) one passes through an opening roughly 2' wide and 5' high and enters an elongated chamber extending parallel to the face of the mountain approximately 12' wide and 30' high, the floor of which with the exception of some loose stones is practically level for about 50'. After 50' the room continues up a hill of fallen rock for approximately 40' and narrows as it goes up. At the top of this hill is a small opening out through the face of the cliff through which a commanding view of the valley may be seen. On the other side of this hill of rock is a yawning pit approximately 15' in diameter and 25' deep with an opening in the bottom which also leads through the face of the cliff. From the top of this rock pile almost due North on the right of said pit, the cave continues directly back into the mountain. Here the fissure reaches a width approaching 20' and a ceiling height approximately 35'. The floor of this portion is somewhat broken by rocks and other fallen material. This is the largest room in the cave. At the end of about 100', this room ends in a cliff 20' high. Over this cliff the room continues for a short distance but soon peters out in a narrowing fissure blocked by rock-falls. To the left of this cliff lies another cliff of similar height, and has a passage which extends for approximately 50' to still another cliff of about 15' from whence the passage continues to an end in about another 30'. Each of the passages over each cliff has several other passages which peter out in closing fissures and rock-fall. It was from the middle passage of the top cliff that the members of our party, before mentioned, were able to work themselves up to the top of the mountain. The distance from this point to the top of the mountain was between

100' and 150'. All passages, over the top of all the cliffs appeared to be dangerous and unstable. They are subjected to rock-falls and probably change from year to year as rock-falls block one passage and open another. With the exception of the portion of the cave over the cliffs, it is believed that any loose or dangerous rocks could be easily removed so that the average person could go through this cave safely.

As before stated, the other two caves are found in the cliff to the East of the main cave. The first cave, well named the 'refrigerator', lies about 200' to the East about 40' below the entrance to the main cave. A strong blast of cold air comes from this opening of this cave. We were told that in Winter, an equally strong blast of heated air comes from the opening about 20' above. A small person can crawl into either of these openings a short distance and come out the other. Each opening extends further back into the cliff than one is able to crawl. This cave probably acts merely as a large heat exchanger. In summer the warm air is drawn into the top opening, is chilled, and drops down to the lower level and out the lower opening. In winter, this process is reversed and the air in the lower opening is heated, rises, and is expelled from the upper opening.

About 100' to the East of the refrigerator is another medium large cave extending directly into the rocks between 75' and 100' averaging about 8' to 10' wide and dropping down for about 25'. At the bottom and far end of this cave is a running stream of water which issues from a spring in the remote part of the cave and drops down through the floor after a gravel of about 25'. The water appears to be quite soft and fit for drinking. A spring of this type is quite unusual, especially in this type of cave. It is not believed however that this stream in any way influenced the original formation of this cave. It probably is composed merely of water coming from the top of the mountain which has found its way down into the cave through previously formed crevices. In size and general formation this cave seems to be quite similar to the Moonshiners Cave on Chimney Rock. (Chimney Rock is a commercial development about 2 miles

S. W. of Rumbling Bald Caves).

Two explanations are offered for the rumblings reputed to this mountain. The first is that heat of the Sun in midsummer and the extreme colds, of mid-winter, acting on the exposed face of this mountain may be causing the fissures of these caves to be constantly extending and enlarging due to the forces of contraction and expansion. The other is that the main room of the big cave which runs parallel to the face of the cliff may cause that part of the face of the cliff opposite this room to act as a drum or a gigantic sounding board. Any rock fall which would strike this portion of the cliff either from within the cave or without may cause it to vibrate as would a large drum. This is easily understandable since the average rock thickness between this room and the face of the cliff probably does not exceed 10'. Also, it may be that a rock fall in the more remote portions of the cave might even set up waves which would cause the face of the cliff to resonate and give off the rumbling sound.

A positive explanation of these rumblings cannot be made until further and more accurate data is collected. The first need is a reliable list of the rumblings with their exact dates and weather conditions. This data will be collected by the Society if any exact information will be sent in, and if further rumblings are reported.

The commercial value of these caves is problematical as a cave per se. They possess neither the size nor the beautiful formations which would normally attract visitors, however, as this region is highly developed as a tourist resort, the caves may probably possess enough size, history, and scenic attraction to perhaps warrant their development. The view from the entrance of these caves is superb. As before stated, they are probably the largest caves of their type in Eastern America and the history of their rumblings and legends of buried treasure should give a romance to them which would be an asset hard to estimate. If these caves could be developed in a simple manner without excessive expenditures on a plan similar to that followed

at Chimney Rock, they might be made into a paying attraction. However, attention is called to the fact that the success of development depends upon the skill of the manager, and publicity agents. Our Society is not in a position to analyze the economics which might be involved in the development of these caves. One attempting to develop any cave should carefully weigh all factors and then rely upon his ~~their~~ own judgment. It does appear to me personally that with proper development they might well be made into a commercial success.



DEAD DOG CAVE

This cave is located nine miles west of Charlestown, Jefferson County, West Virginia, near Leetown. See the Harpers-ferry Quadrangle. Specific directions to reach any of these specific caves are in the Society's files. The owner of the cave is at present unknown.

The cave lacked a name so it was named on the spot in view of the quantity of dead dogs and other dead animals that had been thrown into the entrance of the cave from time to time, and which were there and much in evidence at the time the cave was surveyed by the Society. The West Virginia health authorities have been notified of this condition and it is understood that these decaying animals have been removed. (A recent visit to this cave by members of the Society shows the animals to have decayed to a state where their removal is no longer necessary. They were apparently not removed as reported to have been done by the West Virginia health authorities.) As any water entering this cave through the entrance passes through these putrifying remains and then later comes to the surface through a nearby spring, this condition was believed to be a very serious health menace.

Entrance to the cave is through a vertical shaft two feet in diameter and fifteen feet deep. At the bottom of this

shaft is the pile of dead animals, chiefly dogs, thrown in by the county dog catchers. (After our party had finished their explorations they were told by a farmer that a few years previous a local farmer had thrown into this hole 120 hogs that had died of hog cholera.) However, at this time, a year later, all members of the party are still alive and show no evidence of catching the cholera, even though some of them probably spent many anxious moments.

While the stench at the entrance of the cave was terrific, a strong draft out kept the air in the cave fairly sweet after the mass of dogs had been passed. The exploration trip was made in March when the outside temperature was nearly freezing. It is doubted if one could have remained in the cave at any length of time in the summer when the warm outside air would have probably caused the air current in the cave to be reversed and thus fill the cave with the fumes of the decaying canines.

The exploration trip would not have been undertaken had the members of the party known in advance what they were to face. After gathering several local guides, and a party of onlookers, (The cave was reputed to have been unexplored. We were not told why, but the reason is now evident.) we were shown the hole and had to plunge in to save our faces and the good name of the Society.

Our first man down was a real hero- Jerry Garland- who first fortified himself with a big jug of West Virginia mountain dew (This is not recommended as good practice, but was probably justified in this case) and reported by phone that once past the dogs everything was okay. Our next man down, Alden Snell, assumed a position at the bottom of the shaft to receive equipment and pass it to Garland. He hollered up to work fast for the smell was unbearable, but he could not find the source of it. When the work of passing the equipment in was about two-thirds complete, Snell rose out of the entrance shaft as if shot from a cannon. The party at the entrance scattered as if a live and kicking wood pussy had suddenly appeared. Snell ran for the stream. He threw himself in, clothes and all. After

stripping and washing, he redressed and burned his old clothes. The story came out that Garland had finally hollered to Snell to quit griping about the dogs if he intended to keep sitting deep in the mass of it. Apparently, when Snell reached the bottom of the shaft, he had unknowingly set himself down into the midst of the decaying animals. At least he had a soft seat.

Profiting by Snell's experience, the rest of the party was able to quickly and easily make their way in past this loathsome hazard.

The cave itself extends both north and south from the entrance. To the north, the cave is primarily a single room of medium size, having a 16' maximum ceiling height, and much fallen rock on the floor. A stream flows across the extreme north end of the room. Little time was spent in this room due to its proximity to the entrance. Al Lewis, who seemed to have a less highly developed sense of smell than the rest of the party, reported that it may be possible to force one's way either up or down the said stream for a considerable distance. It is into this stream that water running through the cave from the entrance drains. The stream emerges as a spring about 100 yards north of the entrance of the cave.

To the south the cave extends as a narrow passage, and then opens up into a series of runs with two levels. The upper level is fairly flat with an average of four feet clearance to the ceiling. Many passages lead from the upper level to the lower level, approximately 30' down. Forty feet from the start of the upper level a lead extends two to three hundred feet almost due south. This lead has also two distinct levels which gradually approach each other, and gradually become mud-filled as they rise to the plane of the upper level. At the point where the upper level and lower level converge, the whole passage appears to be filled by mud. Survey and measurement shows it to approach the surface. This probably constituted an older, and may be the main entrance of the cave. To the west of the junction of the south passage, the upper level floor disappears into a single room of 30 to 35 feet ceiling

height. It continues 50 feet or more and narrows down to such a point that further progress is apparently impossible. Directly to the north of the junction of the south and west passages is a small room containing a lake and a considerable quantity of fairly beautiful formations. One other interesting feature of this cave is the fact that the main passage some 50' from the main entrance became mud-filled to the point that digging had to be resorted to get the largest members of the party through. The mud fill at this point was apparently due to the fact that a small passage to the surface washed silt into the cave at this point. A party returning to the cave recently reports that during the year this passage is not appeared to have been noticeably silted. This would appear to indicate that the rate of silting in these caves may not be as great as believed, for it was fully expected that the year would have silted this passage to such an extent that it would have to be again dug out to permit large members to enter the back portion of the cave. The original exploration of this cave was done under adverse circumstances. It is believed that further studies and explorations, when the dogs had been removed, would be warranted.

* * * * *

BERRYVILLE-CHARLESTOWN ROAD CAVE

In the latter part of the week of January 9, 1941 workmen widening the Berryville-Charlestown section of U. S. 340, broke into a small cave about 1.7 miles from Charleston, West Virginia. The Society was asked to examine this cave and ascertain the possibilities of its extending under the highway. Warm air blew out of the entrance with considerable force and thus a large cave system was suspected. Accordingly an exploration party was sent up on Sunday, January 12, 1941.

Figure one gives a diagrammatic view of conditions at the spot where the cave was broken into.

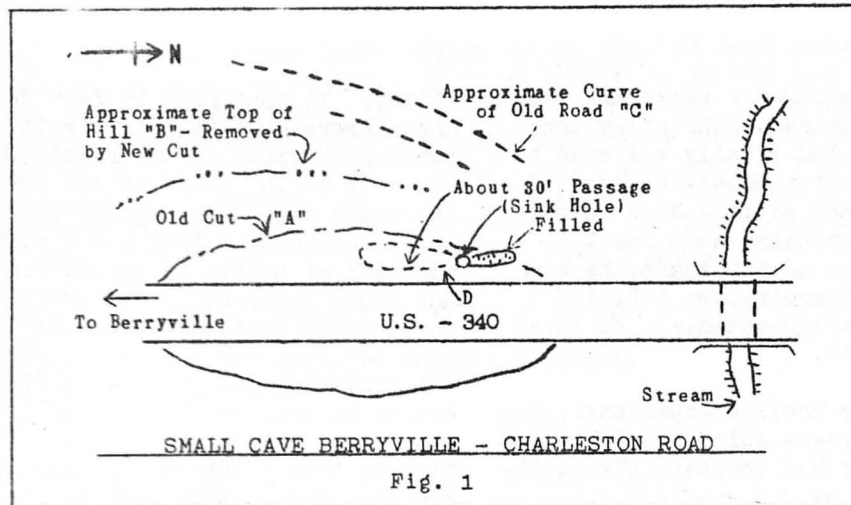


Fig. 1

The road crosses a bridge over a small stream and goes up a gentle hill through a small cut. The old road 'C' follows around the edge of the hill as indicated. The slope of the side of cut 'A' is being reduced and the small hill 'B' is being completely removed. At no point is hill 'B' over 10 ft. higher than the road. The top of cut 'A' is from 10 to 15 ft. above the road. Point 'D' indicates the spot where the cave was discovered. Entrance was effected when hill 'B' was reduced at this point practically to road level. This point is not over 25 ft. above the level of the stream shown in the diagram. The rock is solid and has a 40° dip in an east--north-easterly direction. The cave itself turned out to have a south portion about 30' long and 10' wide roughly 6' below the level of the road. White flowstone was observed on the west wall. The ceiling was 4' high and still solid despite recent blasting overhead that had reduced its thickness to less than 6'. This fact is of interest as it shows what punishment a cave in solid rock can take and still remain apparently safe and sound. The floor of the cave was apparently covered with solid flowstone. However, rocks had already been thrown into the cave to such an extent that a thorough examination of the floor was impossible. The north of the cave had been entirely unroofed and filled with rock by the time our party arrived, however indications are that it extended less than 15'.

There are some indications that the cave extends toward the east down the dip of the rock. A 2' crevice extending along

the entire east wall was carefully examined. It appeared to extend for 4 or 5' and to be mud filled. The cave if it does extend down this crevice to the east does go under the highway, but it would be 10 to 15' below it with solid rock overhead and would in all probability be also mud filled so it is not believed to constitute any menace to the road at this point.

The surface at this point is flat with numerous surface streams less than 40' below the tops of any small hill. While many small caves and sinks occur in the immediate vicinity no large cave system has been found in this exact locality. Under the conditions here presented most caves and sinks in the vicinity appear to be practically all mud filled. With the surface drainage at the site of this cave lying at a level only 20' below the cave's mouth, coupled with the fact that no large cave system is known to exist near here, the presence of any extensive cave under the road is most remote even though small open crevices may exist for a considerable distance in all directions. A careful search along the edges of the hill to the south of the cave exposes several small crevices with a slight in-draft which would apparently account for the observed blowing action. As all such crevices were higher than the cave entrance, a local heat exchange unit could have been established in the cut alone without the need of any assistance except in cave systems. This theory is further substantiated by the fact that the blowing action at this cave was reported to be greater Saturday

night, when the air temperature was twenty, than it was Sunday morning, when the air temperature was 40. The Highway Department has now blasted the entire top off the cave and filled it with broken rods. It is not believed that this cave should in any way constitute a further hazard to the road at this point. Due to the smallness of the cave, no official map of it was prepared.

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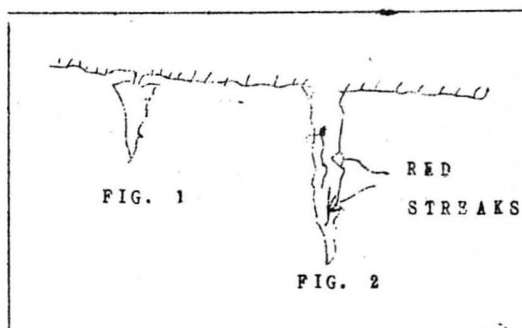
BALDWIN CAVES

These caves are located about $2\frac{1}{2}$ miles south of Front Royal, Va., about 200 yards to the east of State Route 12, running from Front Royal to Luray. The caves are on the crest of a small ridge about a quarter mile to the east of the Shenandoah River, and one mile west of the foot of the Blue Ridge Mts. They can be best reached by parking one's car 7 miles south of the entrance to Skyline Cavern, and then following up an old road up to the crest of the hill. There are 4 known caves in this series. They lie in a practically straight line along the crest of the ridge and can be found with almost no searching.

For further reference to these caves, they will be by numbers, from one on the north and four on the south.

All four caves are quite small and only numbers 2 and 3 have been mapped--No. 1 because it was the largest, and No. 3 because it was the most interesting. Both caves have been shown on the same map in proper relationship. Cave 1 is a narrow shaft working its way down about 50 ft. to water. Cave 2 has one good sized room and a 150 ft. branch passage. This cave extends about 200 ft. in from its entrance and has a small upper level room at its far end. All passages of this cave are finally blocked by mud fills. Cave No. 3 is quite small. This cave is composed of 2 small rooms, both of which are reached only by a crawl and a wiggle. The far room of this cave is extremely well decorated and it contains stalagmites having blood-red veins and splotches. The red streaks have been identified as hematite, but exactly how they were formed is still to be fully explained. A specimen of these formations has been collected for

purpose of record. In this room are also many perfect carrot-shaped stalagmites which hang from but a small stem. This formation is sketched in Fig. 1. The red streak formation is sketched in Fig. 2. All the red streaks occurred on the more or less conventional type of stalagmite. The floor of this room is of dripstone and is apparently hollow.



Cave No. 4 is small and very much like No. 3 except that it lacks the interesting formations.

It is probable that each of these caves is but a disconnected part of the upper levels of a larger cave system. Quite a bit of work has been done by the owner digging out mud filled leads in the hope of finding that one of these caves might lead into the expected larger cave system. But so far these efforts have been without result.

The hill in which these caves are located is part of the same ridge in which Skyline Caverns are found. A stream cuts midway between these caves and Skyline, so that any present interconnection of the Baldwin Cave through Skyline is very improbable. The rock in which these caves are found is Beckmantown limestone dolomite. No specimens of cave life are known to have been found in any of the Baldwin Caves.

In connection with these caverns, reference should also be made to the reports on Allen's and Horseshoe Caves.

ALLEN'S CAVE

Allen's Cave is one of the older (from point of view of discovery) and more well known caves in Virginia. It is located two miles south of Front Royal, Va. This cave was supposed to have been used as a hide-out by the famous Confederate spy, Belle Boyd. According to rumor, Stonewall Jackson himself visited her in this cave. The walls of the cave, especially near the mouth, have been darkened by the soot deposits of the torches of the early explorers and sightseers. There is, however, a great amount of black formation in this cave due to the presence of manganese. However, it is impossible to tell what proportion of the black is due to the manganese coloration and what is due to soot. The entrance to Allen's Cave is less than 300 yards to the west of the entrance to Skyline Caverns (a commercially developed cave). This cave and Horseshoe Cave (entrance 300 yards to the north of Skyline Caverns) are all owned by the Skyline Cavern Corporation and may someday be added to the developed portion of the Skyline Cavern itself. Obviously Horseshoe and Skyline itself have been carefully surveyed by the Skyline Cavern management. Skyline Cavern at one point is reported to be not more than 13' from the Allen's Cave. In view of this fact, the mapping of this cave by the Society has been deemed unnecessary.

This cave is situated in rocks of the Beeckmantown group. These rocks crop out along the east banks of the south branch of the Shenandoah and form a ridge or plateau rising to an elevation of 100 to 150 feet above the river. About a half mile or more to the east they disappear at the foot of the Blue Ridge. For two or three miles along the foot of the Blue Ridge and parallel to the river numerous small caves have been found. (See the accompanying report on Baldwin's Cave). Whether these various caves are all a part of one larger cave system which has not yet been found or whether they are the remains of a larger older system, or whether they are separate and disconnected, smaller caves, is yet to be discovered. These questions, however, serve as a spur to further study. A fairly complete study has been made by Dr. R. J. Holden, who was employed by Skyline Caverns as it was being developed commercially, and should be consulted by one attempting any study of the above problems.

Allen's Cave consists primarily of a well developed passage system, three to five feet wide and ten to twenty feet high running generally northeast for three-hundred feet or more. Here the passage branches into several small passage ways and into an upper and lower well-defined level. The upper level must be followed to reach the further parts of the cave. A short way along this upper level are 3 large lakes formed from rimstone that has reached to the height of 3 to 4 feet forming, of course, pools of corresponding depth. The largest of these pools is over twelve feet in diameter. The majority of all branch passages soon peter out. By following the southernmost passage one finally comes to what is called the ballroom, a room 70' in length and 35' wide. The ceiling of this room is 35' high, and the floor is of soft mud, of unknown depth, estimated to be at least 10' deep. The mud itself, while apparently firm, is so soft that a tripod sank of its own weight enough during a 3 second exposure so that the picture was blurred. No specimens of cave life have so far been collected by the Society from this cave. Cave rats are known to live here and a wild cat is said to have a den up one of the very small side passages near the cave mouth.

This cave is referred to extensively in Allen Mousseause' book, The Lure of Cave Lore.

HORSE SHOE CAVE

This cave is merely a large opening in the limestone cleft directly overlooking the Shenandoah River about 300 yards north of the entrance to Skyline Caverns. The entrance of this cave is approximately 40' wide and 30' high, but the cave peters out in fallen rock a little over 60' in from its mouth. The mouth of this cave is about 50' above the level of the Shenandoah River and an equal distance below the top of the cliff. This cave is probably the remnants of a large room of a cave which has now been completely destroyed by the river. Originally this cave probably connected with both Skyline and Allen, but any such connecting passages are now completely blocked at the Horseshoe end by the rock fall. The cave itself takes its name from the fact that its mouth was supposed to have been used as a place for shoeing horses in the early days of the settlement of the valley. No specimens of life have been collected from this cave. No map has been prepared due to its extreme smallness.

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TRIP TO "HELL-HOLE" AND "SCHOOL HOUSE CAVES" by Jean R. Williams

Date: July 3, 4, 5, 6, and 7th, 1940.

Party: Stephenson (leader, Hell Hole Exploration), J. Preble, S. Martin, J. R. Williams, Tony Eno, Dr. William Welsh, George Hall, Henry James, George Dare, Shy Matchett, and Casey Schught.

Over the Fourth of July week-end, 1940, the Society's second expedition (the first trip Nov. 11, 1939, main parts of cave were mapped, but no report issued as the trip was reported accurately in the Evening Star newspaper, Thursday, Nov. 15, 1939. See also article by Schelecht, June 1941., 1940, on the trip of rock climbers to this cave) to the Hell Hole spent approximately 170 man-hours time below ground. The time was about equally divided between casual rambling and serious exploration. Much time was also spent in picture taking with disappointing results.

A rough platform was built around over the small central entrance. The hand bench belonging to Dr. A. E. Krause was borrowed and set up on Thursday morning, July 4. Two guide ropes were lowered down and were anchored in place at the bottom of the pit by Dr. Wm. Welsh, the first man to descend. The telephone wires were then put down and a station was established at each end of the cableway. The phone was a great convenience in operating the cableway and in maintaining contact between those above and those below ground. The distance is too great for the voice to car-

ry well, though it is measured as only 165' 6" from the ground level to the talus slope directly below. The shape of the opening is such that one's voice ceases to become audible to the one on the surface after he has descended, 60 feet or so. The lower end of guide cables were later anchored still farther down the slope, perhaps 40-50 ft., offset from the entrance opening. The lower station was thus displaced to avoid falling rocks (and there were some) and to give a slope to the guide ropes so that in holding on to them one would be pulled off to the side and thereby prevented from spinning or swinging, to better aid in clearing a shelf 50 feet below the entrance.

On Thursday nine descents and ascents were made. Those who entered the cavern spent their time in sightseeing and in casual exploration. A cache of food, fuel, and candles which was left in January by the Rock Climbers Group of the PATC was discovered in the cave near the lower station. It was found that the average time of descent was 5 minutes, of ascent 10 minutes, and that 5

men are required for best operation of the cableway--2 on the phones, 2 on the crank, and one on the brake and reel. Also, in making a descent, it was found to be smoother and safer to lay out the cable by back cranking than by snubbing with the brake. In ascending, 2 men are required on the crank for division of effort and for maintaining a steady rate of lift. It is rather discomforting to the passenger to be moved in a jerky fashion or worse yet to be stopped entirely while someone above rests.

On Friday July 5, a party of 4 (Stephenson, Williams, and two local boys) went into the cave to explore and map some new passages. The route led up the north passage to the "Porthole". We went through this and into the adjoining parallel passage. Due to the nature of the exploration, the phone was taken along instead of being left at the foot of the hoist. To the right, the passage goes a short distance and then ends. To the left, it goes on for some distance through a series of small rooms and passages. About 250' along this passage one catches a glimpse of a room off to the left, which turned out to be the main part of the north passage. As the climb is difficult, the Porthole entry was consistently used in place of this possible entrance.

About 38 feet from the Porthole the passage ends abruptly at a pit. This was the limit of previous exploration. Before continuing farther it was decided to have lunch. Accordingly, we telephoned our orders to the cook and then sent two men back to the lower cable station to receive the food that was lowered down. After the loss of much precious time, the food was carried back to the pit and then eaten.

After the luncheon we prepared to descend into the pit and were about ready to send the first man over when word came in over the phone that an expected group of rock climbers from PATC, who had spent the previous day climbing Champ Rocks, had arrived in camp. It was then decided to delay our descent until this second group of troglodytes could join us.

It was a long wait and for those of us who hadn't the forethought to bring

along an extra jacket or sweater, it was a chilly wait. To while away the time we talked among ourselves, talked to the people above ground, or else sat silent and let the utter stillness of the cave bear down upon us. Incidentally, our ears became so acute, when relieved of their usual oppression of sound, that we could hear over the phone even the very faint sounds of birds twittering in the trees near the topside phone station.

Our party was enlarged by the arrival of Paul Brodt, Tom Cuverwell, Don Hubbard, Leo Scott, Charlie Daniels, Arthur Lembeck, and Ed Siggars. We were then ready to resume our mapping and exploring. A telephone station was established at the edge of the pit and 2 men stayed here attending phones and safety ropes. After a few minutes preparation, we went over the edge and down a 57 foot precipice via rope ladders to the bottom of the pit. From here a large passage led off to the left. This, and the adjoining passages at this lower level, bore a marked resemblance to sewers. They were quite large and open and tended to be circular in shape. Observations of the silt and trash present also indicated that these passages performed the functions of storm sewers which probably collect all flood waters coming into this cave. This was substantiated by the finding of a surface type salamander probably washed in with yesterday's flood.

A short distance from the pit the passage forked. One prong led down at about 10° to a sand filled sink through which water carried by this passage probably filters down to a still lower level. The other prong led on for a distance of about 100', and terminated in a chimney which was climbed for 40' and was seen to extend for at least 50' more. For the last 80-100' of this passage, the going is a bit rough. The floor is muddy, a small stream flows through, and the ceiling is very low, at places less than 12 inches.

This was the apparent end of the cave. The party now started out. On the way out much time was spent in looking in to smaller leads and observing the cave structure in detail. The last of the party did not reach the surface until well after 8 p. m.

The next day the hoist and guide ropes were dismounted, the phone removed, and the hoist left at Seneca Cavern for delivery to Dr. Krause. After this, Stephenson and Williams joined the rock climbers at School House Cave, and were shown through the parts of this cave that this group had so far been able to explore. The Rockclimbers' main purpose on this trip besides showing what had been discovered to date were the assisting of Lowell Bennett in photographing the cave (those, like our picture of Hell Hole, turned out to be disappointing) and to climb the back wall to ascertain if the cave continued in that direction.

Brodts and Daniels had succeeded in making this climb far enough to believe (this was later proven to be wrong) that there were no passages at this point leading on. When we came out at 9 p. m., however, the ascent was so arduous that it was not until 1 a. m. that the last rock climber left this cave. The next day a small party under the leadership of Arthur Lembeck left to make a cursory exploration of Limestone Mountain Cave at Parson's, West Virginia on their way home. A party under the leadership of D. K. Harmon, visited Ruddle's Cave and partially mapped the same after that. Preble, Martin, Stephenson and Williams dropped by to pay their regards to O. B. Harmon at Smoke Hole Cavern and thank him for making arrangements to borrow the hoist, and the remainder of the party departed for home.

This report would be incomplete if it did not mention the help given this party by the management of Seneca Cavern. They furnished the lumber for the platform, transported it to the Hole's entrance and also furnished transportation for the members. Further, they spent considerable time tending the upper phone and helping with the hoist.

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WHITING'S NECK CAVE

This cave is located in Berkeley County, West Virginia. To reach cave go to Scrabble (Scrabble is a very small town to the northwest of Shepherdstown, W. Va.). Follow the dirt road through the center of Scrabble for a mile and a half to where a small stream crosses the road. Turn in at

the gate and follow the meandering stream through pasture for approximately half a mile. The cave entrance is over the hill through which stream runs as a sink.

This cave has two entrances. The first is the one which one sees when coming over the hill and leads in a short distance not over 15 ft. and then encounters a 15' deep pit, roughly 12 ft. in diameter. One must go down to the bottom of the pit and then scale the wall at the far side. At the top of the wall on the far side, a flat tortuous passage leads 50' until the cave opens out. Where the cave opens out, the passage may be generally referred to as the main cave. Following down the main passage one hundred and some feet, one comes to the jumping off place. This is a shelf 45' down. It is possible to scale this shelf without the aid of a ladder, but this is not advised. With the aid of a rope or a ladder the scaling is comparatively easy. At the bottom of the shelf a beautiful flowstone cascade is found on the right. Passing this cascade the cave floor ascends on a mud bank which is composed of a considerable amount of Bat guano. From the top of this mud bank the cave follows for about 200 ft. thru several small passages until it eventually comes to an end. The passages average about 5' in height and 3-4' in diameter. All of them have floors composed of silt. There are no formations in the back portion of the cave. Returning to the jumping off place, a small opening is found directly to the left which leads to a well decorated room in the form of terraces. It is possible to climb these terraces and come out onto a shelf which is midway down the jumping off place. The formations in this room are as good as encountered in any cave in this area. Returning to the main cave a short distance after it has been entered from the small tortuous passage from the pit, a lead is found to the left which leads down generally to a lower level. It is possible to worm one's way perhaps twenty feet in depth and sixty or seventy feet lengthwise along the passages of the lower level. No formations have been found along these passages and all of them appear to peter out. Directly to the left of the entrances to the lower level is a small cliff which can be

scaled into an upper passage which leads 100' to the other opening of the cave. This other opening is roughly 150' almost due north of the original opening. It is at the bottom of a sink and enters into a fairly large room, roughly speaking 30' wide and 50' long, with a dirt slope of approximately 20 degrees, which as before stated, leads into the passage which enters the main passage of the cave at the top of the cliff directly above the point where one takes off for the lower level.

The society has made four trips to this cave. The first was primarily exploration. The second was led by Arthur Lembeck, and the cave thoroughly explored. The third, on December 1, 1940, for the purpose of taking pictures. The pictures were taken for International News Service by Walter Bordas. On this same trip James Fowler made a survey of the fauna of this cave. The last was conducted by John Meenehan for the purpose of taking colored pictures.

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JOHN'S CAVE

Directions for reaching: John's Cave is located 10 miles northeast of John's Texaco Service Station at Ninevah, Virginia, Warren County. Ninevah is on the Winchester Front Royal Road about 3 miles from Front Royal. To reach this cave, turn in at gate one-tenth of a mile northeast of John's Station, on side of road where church is. Go past church and follow down half way to the creek. Turn right directly across the field and head on tree far side of field. Cave is at sink hole at base of this tree. Tree is almost a quarter of a mile across the field. There is also another small cave at junction of fence corner directly in back of the church. This cave is not over 50 feet from the stream and is usually filled with water.

This cave itself is a small, rather uninteresting cave. Its entrance is a large sink-hole about 50 feet in diameter, and roughly 20 feet deep. The cave leads from this sink in two general directions. The main passage runs practically south. A small passage leads to the north, that is, the passage extends a small distance to the north, but is almost fifty feet wide.

It ends in a small sink in the floor. This passage may be considered really an alcove from the main sink. Following back the main passage one makes a short climb after about 70 feet. From here the passage greatly narrows. At the end of 250 feet, it entirely peters out. One interesting feature was that at the far end of the cave a number of oil cans were found. These oil cans had either been brought into the cave or had washed into the back part of the passage from some surface sink. A check on the surface disclosed a sink fully fifty from the point in the cave where the oil cans were found, tending to show that the oil cans had come down through the sink, washed some 50 feet into the cave, even though there was no visible passage. About two-thirds of the way down the main passage are the remains of old bins where it is said natives attempted to raise mushrooms. This attempt was apparently a failure. Where the main passage enters the entrance sink, a small shaft leads down under a pile of rubbish, and into a small room where there is standing water. This room is not over 2 or 3 feet high, and twenty feet in diameter. Mr. Fowler collected several specimens of life from this water. They were, however, all of surface type.

Two types of bats: *Pipisillus*, and *Eptesicus fuscus fuscus* were observed in December, 1940, neither being in any great quantity.

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ARKANSAS' UNSUNG WONDER

By George L. Connell

One of Arkansas' greatest natural masterpieces lies practically unknown. Filton's Cave, hidden beneath Gaither Mountain in the wilds of northern Newton County, is the largest one known in the state, possibly in all the Ozark region.

Filton's Cave, so named for the owner of the land under which it lies, is located some eight miles west of the Harrison-to-Jasper road, under Gaither mountain, where this hill comes to an end at Cecil Creek. From it the Buffalo River is only about one mile distant

overland. Its passages appear to run north and perhaps west from this entrance, but the length of its underground routes is unknown. One group of young men have traversed an estimated twenty miles along its various levels, and believe they have only begun to explore its depths.

To reach the cave, drive south out of Harrison on Highway No. 9. Ten miles from town, at Marble City, a graveled country road turns sharply to the right, and begins to climb its way into the hills. About eight miles up this picturesque mountain lane lies Villines Chapel, a white, one-room church situated in a valley near Buffalo River. Leave cars here on one side of the Creek or the other, depending upon the season of the year, and walk up Cecil Creek, searching all the while for signs of the wagon trail which the natives call "the highway".

On this trail it is about two miles to Gaither. Once at the foot of the right hill--and there are no signs to direct you--a stranger still needs a guide, even though the cave entrance is but one hundred and fifty yards away, is a "hole" concealed beneath a ledge of overhanging slate.

Prior to 1938, few people had ventured over two hundred yards beyond the entrance to Filton's Cave. Natives of the region have from time to time entered the entrance room and the first passage. Beyond here, signs of exploration are few. In many parts of the extensive passagework, no signs may be found of earlier visitors. During 1938-39, however, a group of Harrison men, under the direction of Clark Gallaher, covered an estimated twenty miles of tunnels in the cavern.

Once arrived at the entrance, one scoots feet first through the small opening and drops a few feet to an earthen mound which slopes steeply downward some forty feet. This leads to an immense room which measures about one-half a city block in size. Everywhere there are beautiful stalagmites and stalactites, some extending from floor to roof, and thirty or forty feet high. In places the ceiling is one hundred feet above. The floor of this great room is uneven, with pretty lakes being formed in the lower strata. Here natural terraces have formed, so that the

water stands at different levels up the sloping sides.

Far over to one side of this hall, so as to escape notice on first visit, is a large lead. Four feet within this, one finds a passage-way leading farther back into the mountain. This passage is thirty feet wide, with the ceiling varying from three to thirty feet high. Except for perhaps fifty yards, however, this passage can be traversed rapidly. At one place along here a gigantic column of lime carbonate comes down out of a hole in the ceiling to disappear through another hole in the floor. This pillar is forty feet in height and twelve feet around at the base. From its base, ten feet below the level of the first passage, another route leads off, following the course of a small stream of water. Several other tunnels lead off from the main passage, some of them being only blind alleys.

Approximately three-fourths of a mile from the entrance, passage number one comes to an end in a mass of fallen rock. Off to one side, however, about one-half mile from the entrance, is a hole through which one can drop twenty feet straight down into still another level, or floor, of the cave. From here starts a second passage even larger than the first. With a little work an admirable one-way automobile drive could be made here.

This latter lead may be the main artery of the cave, although about two miles from its beginning it is closed up by fallen rock. A short detour seems to lead back into the same tunnel a little distance on, making it possible to continue one-half to one mile further to a huge "dry" room measuring, on the average, 600 X 90 YDS feet. This room is so dusty and dry and is considered dangerous by cave experts. From it extend two or three unexplored passages.

A short distance from this second lead, not far from the detour mentioned above, is the "Mosaic Room", so named because of its floor, composed of perforated flowstone. Underneath this hard, inch-thick floor, is six

inches of space and a slight amount of water. The room, which measures 60 X 20 feet, is open only at one end. Its walls are lined with "chimes", stalactites which give out clear, bell-like tones when struck with a hard object.

Back up passage two, about one mile from its beginning, a fairly large tunnel leads off to the south. Out of here comes the sound of running water. A few hundred feet along this way lies the "River", a stream of water averaging five feet across and three feet deep. With the passing years this stream has eaten its way down through the earth until the ceiling of its passage is one hundred and fifty feet overhead. Downstream, the banks allow fast and comparatively easy walking. This way has been followed four or five miles without finding signs of its ending. Upstream, after about a mile, the walls close in, forcing the explorer to enter the cold water for further progress. In the spring of 1939, a Mr. Gallaher and Glenn Martin, of Harrison, faced this cold march for a great distance, to be rewarded in the end with the discovery of "Victoria Falls" which, as far as can be learned, is the largest known underground waterfall in North America.

This journey, and magnificent waterfall can best be described as one member of their small party saw it.

"We set out for the "River", loaded with a good supply of candles and electric torches, photographic supplies, and a change of clothing. Going up the river for nearly a mile from where we struck it, we came to a large, bell-shaped room with a floor of dust, and a ceiling one hundred and fifty feet over our heads. Here we prepared to "take to the river", for the grueling march ahead. We placed photographic supplies and dry matches in coffee cans sealed with candle tallow. These were carried in a leather pack-bag by different members of the party. A few of the members undertook the water-trip barefoot, clothed only in shorts. The rest, fearful of the cold, wore shoes, trousers, and shirts.

"We plunged into the cold, clear stream. The walking was easy most of the way, with the water waist-deep, and flow-

ing slowly. At times the stream widened out to become only ankle-deep. At other times the walls closed in to make it four to seven feet deep. In these places the water flowed swiftly, but the walls were so close together as to allow us to make progress only by placing our backs to one wall and our feet to the other. In one chute, thirty feet long and three feet wide, the level dropped six or eight feet. Down this the water rushed with tremendous force, making progress extremely difficult

"After more than an hour's wading, the roar of falling water ahead began to grow. Suddenly we burst into a room to view the grandest sight of our lives. There, from far above our heads, fell a great sheet of water measuring fifteen feet across and one foot thick. Its height was estimated at from fifty to eighty feet. The party finally agreed on sixty-five feet. The roar was so loud that we could make ourselves heard only by shouting. The smallness of the chamber, the flying spray, as well as the intense cold, make satisfactory photography impossible. Of the pictures taken by the three camera addicts, none came near doing justice to the magnificence of Victoria.

"We were unable to reach the head of the falls. It is rumored that some one has since done so, and, by following passages leading on from there, discovered another entrance to the cave. We did find routes leading away from the falls room, but explored only one, and that for but a mile."

TRIP TO PEACOCK CAVE by Jack Preble

Starting out Saturday morning for Peacock Cave we drove for several miles until we reached the summit of a high mountain. Leaving the cars we proceeded on foot toward the cave. Our path led us over a high, snow-clad mountain and down into Redman's creek until we came to Redman's Gap. Here we found we would have to cross the South Branch of the Potomac River. And we found, to our disgust that the ice on the river was not

strong enough to bear our weight. George Dare and Bill Stephenson finally located a boat, which they hired, and by means of breaking the ice in the river, we crossed to the other side. Then began a climb in that 45 degree landscape where a fellow could taste the dirt on the ground without bending over. It was a tough grind climbing up that mountain side for 1,200 feet thru loose rock and rubble that had fallen from the cliffs that surmounted the mountain top.

Finally we reached the entrance of the little known Peacock Cave. We found it to be an "A" shaped opening at the base of a high cliff and evidently the exit of a small river a few million years ago. Loading ourselves down with cameras, flash-lights and carbide lamps, ropes and rope ladders and a collection bag for snails, bats, salamanders and cave crickets, we entered. For the first 80 or 90 feet we had to crawl on our stomachs. Then we found we could crouch or half-stand in the interior of the cavern.

We started from the entrance of this unexplored cavern to map and picture its many ramifications and numerous passages. We progressed some 600 feet until we had to corkscrew upward to an upper level about 20 feet above the passage we had been following. All the time, according to our mapping compass, we were bearing due north with just a variation of less than 10 degrees from the beam. I mean that all the time we were progressing, we were bearing almost true north. Finally we came, after a difficult climb up a flue, or chimney, into a large circular room about 30 feet in diameter with a floor of hard packed red clay. This was almost the end of the cavern and we found the back end of the cave clogged with a million years accumulation of red clay, rocks and fallen boulders. We made a rough calculation from our notes and

found we had reached the end of this cave and had travelled something like 985 feet, that is, from entrance to the navigable end.

This expedition was one of the most fruitful we have ever made in company with The National Speleological Society. First of all was the invigorating hike of some three miles up mountain side and down, the dangerous crossing of the ice-filled river and the strenuous climb to the summit where the entrance of the cave was located. The weather was perfect. Temperature hovering close to the 20 degrees, bright sun, clear as a crystal and very little snow on the eastern slope of the Alleghenies.

As for animal life in this Peacock Cave, we were treated to a grand surprise. We found in this cavern a type of animal that is given to few scientists to see or study. I refer to an animal called *Nectoma Pennsylvanica*, or the Allegheny wood rat. We discovered the pretty creatures in vast numbers in Peacock Cave. They are about the size of a grey squirrel and close on to 16 inches long. They have ears a trifle bigger than the repulsive European, or house rat. The feet and belly of this rare animal are ivory white, then it shades upward into a sort of a dove grey and terminates in the back into a fawn colored tan or light brown. The fur is sleek and neat, something like a seal. The tail is not scaly like the common house rat but covered with short hairs. I never did like rats and could see nothing pretty in any of them. In fact I am afraid of any rat. I will pick up almost any kind of a poisonous snake with just bare hands--but with rats and spiders, I quit. George Dare tried to grab the largest specimen with his hands and chased it my way. I screamed like some old lady and gave it plenty of clearance. I'm not snatching up any rats no matter how pretty they look to me. I have no use for them.

The nest of the Allegheny wood rat is a curious affair. In fact we discovered two types of nest. One type was a dome-like structure, something like a miniature beaver hut, made of sticks and lined with bark or moss. The other type was chewed-up bark, something like excelsior, and about 14 inches in diameter and at least eight inches high. In this downy nest the rat had hollowed himself out a snug nest.

Near the entrance of the cavern we discovered about a half-bushel of fresh red cedar fods or twigs. Farther back in the cave we found that the rats had clipped these cedar twigs down the mountain side, dragged them into the mouth of the cave until they had a sizeable bundle of food and then transported them from the entrance to their nests. As near as we can figure the rats live on cedar needles, berries and bark during the winter. Very little cuttings of nuts were found. The rats either eat the meat and shell of the various nuts or else go without. That remains to be determined by further study.

In Peacock Cave we also found the little pipistrellus bat and the larger long-eared bat. "The Book" says that most bats migrate down south for the winter while the laggards remain in the north in some hollow tree, or cave, in a state of hibernation. In a cave the temperature usually remains about 54 degrees all winter long. Our thermometer was broken before we reached Peacock Cave and we were unable to take the February 22 temperature. We know that the temperature was below freezing in one spot where we found bats hanging upside down from the ceiling and ice stalactites on the floor of the cave. Most of these bats were covered with larvae or parasites working in the cold on their sleeping host.

We also found a curious type of fly in the cave but were unable to induce it to enter the

alcohol bottle. Very few crickets were found and no salamanders as Peacock Cave is a "dead" cave. By dead cave we mean a cave that has no living formations or stalactites in the process of being formed. We did find one large room that looked to me like the Garden of the Gods in Colorado with grotesque, twisted pillars and columns and fallen and broken stalactites that rang like an iron anvil when ~~we~~ struck. And we found about a bushel of cave pearls. Cave pearls are a rare formation ~~being~~ about the size of a hazel-nut and covered with a pure coating of lustrous, pearly-like calcium.

Then there was the wall covered with a growth of stone, or calcium formations that looked for all the world like little mushrooms. And we found gladiators' shields in stone, the elephant's ear, little pudgy stone Buddas and grinning heathen gods ...all formed by nature a million years ago. We found the rare helictite which is something like a stalactite except that it sometimes grows out like a barb at a 45 degree angle. We found a room of formations with helictites growing like the twisted roots of a large tree.

Some day a scientist or two will further explore this Peacock Cave and find things that will surprise them. All we can do is to tell them what may be found in there that will bear further study. In my opinion, gathered after exploring some eighteen or twenty unexplored and unknown caverns, this Peacock Cave lends itself the best for thorough scientific study. I should think that the fact alone of its being the headquarters of that rare Allegheny wood rat would make it a paradise for biologists and nature lovers.

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LONG EARED BATS

Within the past year the society has collected many species of long-eared bats, yet not a single one of these bats has been found in caves below 2200 ft. in elevation. All of these caves have been located in Pendleton Co., W. Va.

On February 22, 1941, long-eared bats were observed hibernating in Peacock Cave where the temperature was below freezing. Although the exact temperature was not measured, ice deposits in the form of stalactites and stalagmites of ice were present and not melting at the point of hibernation. A few species which were collected appear to be no more dormant than the average bat hibernating at temperatures in the 50's. They were immediately aroused, and attempted to bite the collector. The point of hibernation was in total darkness about 150 ft. in from the entrance of the cave. The cold condition at this point was apparently produced by a strong in-draft of outside air. About 500 ft. further in this same cave the temperature was apparently normal temperature encountered in caves in this area.

These same bats hibernating under similar conditions have also been observed in School House Cave.

Temperature Variations

The assumption that all caves possess an even temperature approximately equal to the average yearly temperature at the location of the cave appears to be true only of caves or portions of caves that have a very low rate of air circulation. Temperatures as low as 35 degrees have been observed 900 ft. in School House Cave at the so-called "Jumping-off Place". Ice has been reported 150 ft. in from the entrance of both Peacock and Trout's Cave. Ice has been observed under the leaves in the entrance room of School House Cave approximately 100 ft. from the actual entrance, sometimes as late as July. In Witherose Cave on March 22 of this year temperature variations of 37 to 51 degrees were encountered. The main factor causing these low temperatures so far inside certain caves appears to be the forced circulation of air, which is apparently controlled by the size and shape of the openings and passageways and may also depend upon openings at different levels to insure the circulation. In School House Cave it has been discovered that at least part of the circulation is probably due to passages connecting the dome room and the entrance room (a difference of elevation of over 70 ft.). Cold air apparently flows in the large entrance, into the entrance room, back through the upper passage, over the jumping-off place, and then drops to the Cascade Pit, (the lowest point in the cave) and returns, warmed, along the lower passage into the dome room, and then through small interconnecting passages to the floor of the upper part of the entrance room. Such air then escapes through the entrance to the outside and maintains a constant forced in-draft circulation of air. For more complete accounts of this phenomena see "Mountaineering in West Virginia", by Culverwell, in the Potomac Appalachian Trail Club Bulletin, January, 1941. See bottom of p.4 and top of p.5 and included maps.)

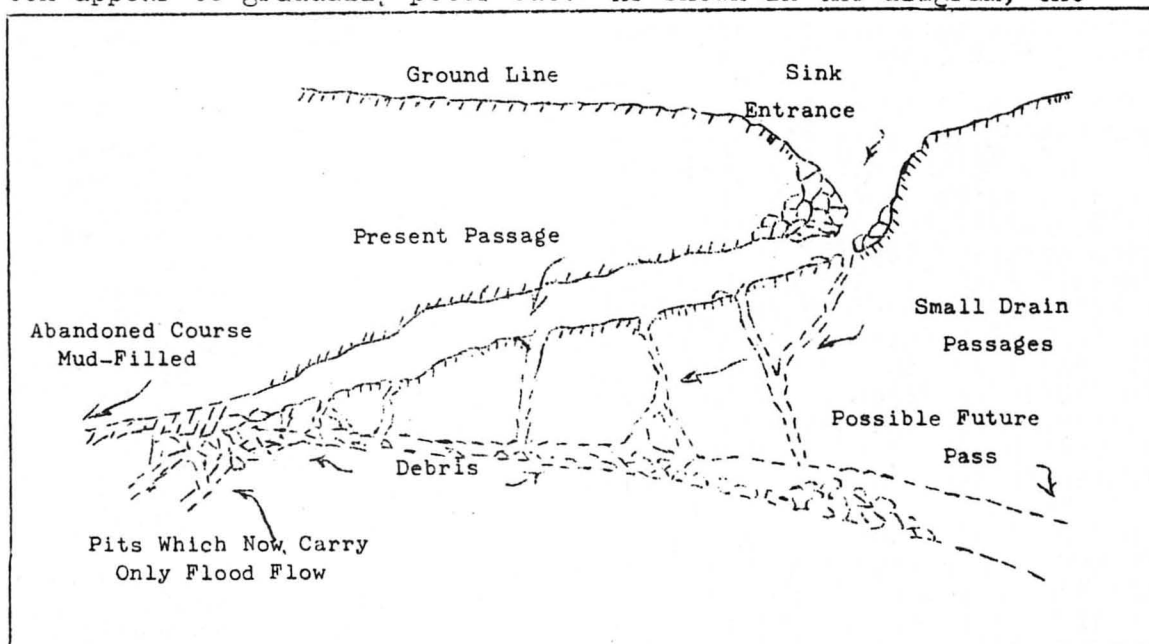
Bat Movements During Hibernation

In Witherose Cave (see Bulletin of the Speleological Society of U.S., June, 1940) it has been observed that the bats apparently use different parts of the cave for hibernation at different times of the year. In Nov., 1938, 1939, and 1940, large clusters of bats, mostly

Myotis Sodalis, have been observed in the eastern parts of the cave, especially in the back parts of the cave. In April, 1939, March, 1940, and March, 1941 large clusters of bats were observed in the western part of the cave, while relatively few were observed in the eastern part of the cave. On the first of May, 1940, the majority of the bats were in the center parts of the cave. The reason for the change in the location of the clusters to other parts of the cave is not understood at present. In April, 1941, the clusters were observed where the temperatures were 40 to 42 degrees. It could hardly be presumed that the bats were awakened from their hibernation and were moving near the entrance of the cave, since the bats collected in April, 1939 were so dormant that those knocked off the wall were easily picked up later.

Passages That Peter Out

John's Cave offers a new explanation why certain caves having passages apparently formed by large streams of water, but which often appear to gradually peter out. As shown in the diagram, the



water apparently flowing down a solution channel has gradually formed new paths down the lower levels. Only at times of flood the older paths through the cave are used. The older or more or less unused portions are not exposed to the same amount of water wear and therefore are smaller. Also these portions gradually become choked with mud and debris. As the flow through the main water course would be gradually lessened with the formation of added passages to the lower level and since each succeeding passage will have a steeper gradient or greater total fall and thus be able to carry a greater volume of water in relation to its cross-sectional area, none of the passages connecting the lower level may in the average case be reasonably expected to reach a sufficient diameter to permit a human to pass. Often the entrance of the down drain passages may be obscured by sand and silt or be so small as to escape notice. This should help to explain in some measure why so many large and apparently main passages appear to just peter out. While the above facts as stated observed in John's Cave appear to be a perfect example of this phenomenon, Hell Hole and Clyde Cochraine also furnish other similar ex-

amples. A further and more detailed report on this phenomena will be published in the future, it is hoped.

Varying Moisture Conditions

A most interesting moisture condition was observed recently in Mohler's Cave. In April, 1940, the first party from the society to enter Mohler's Cave found the upper levels practically bone dry, but were stopped in the lower passage by a series of large lakes. Later, in August of the same year, the exploring party found the upper level extremely muddy, but the lakes which had stopped the party before were completely dried up. Apparently the moisture conditions in the upper level of this cave must either vary quite closely to the instant surface conditions, while the moisture condition in the lower parts appear to follow the seasonal trends. The mouth of the cave, however, drains the immediate area and it would appear that the surface rainfall would cause a fluctuation in moisture content in lower level as well as in upper levels. It has been suggested that perhaps moisture condensation in the upper level in summer time may account for the moisture conditions observed in this portion of the cave. A study of moisture conditions correlated with the rainfall in the immediate region should prove well worthwhile and illustrates the need for extensive study on humidity and temperature conditions of caves in general.

Rate of Cave Fill

The floor of the main lead in Hermit's Cave (near Gandy Sinks, W. Va.) is fast being filled in with mud and silt, if reports by the society are correct. Old-timers report that they were able to walk through all the main passages of this cave. (Incidentally, they report finding the body of an Indian at the extreme end of the cave.) But the exploring party of the society on Labor Day, 1940 had to crawl for over 100 feet in the lowest part of the passage. The Steubenville group plans to complete the exploration of this cave and keep track of the rate of filling in, if such is actually fast enough to be observable. It has never been known what actually became of the Indian body found in the far portions of this cave.

Epsom Salt Crystals

Epsom Salt Crystals so fine that they resemble a mold or fungus were found recently in Fithers Cave. Unfortunately no pictures were taken of this rare formation. For further information as to these crystals, see the letter of Dr. Schaffer included elsewhere in this issue.

Lake Formation

The pool in Grandpappie's (Ogder's Cave), which prevents access to the main part of the cave is reported by natives to have been formed quite suddenly about ten years ago. There appears to be no noticeable inflow into this pool and no overflow drain has yet been found. Still the level of the pool is reported to remain constant from season to season and year to year. The pool can be drained by syphon, but refills in about one week. This illustrates on a small scale the filling up of passages with water which appear to have occurred at some time or other during the life of most of the main passages of many of our large caves, as for example, Luray, and Seneca Caverns.

BAT COUNTING

In Trout's Cave, Feb. 23, 1941, between 1600 and 2400 bats (*Myotis Sodalis*) were observed in one room alone. Estimates were made by counting representative clusters, and then counting the clusters in a quarter section of the area which the clusters occupied. Counting of small clusters was done individually, while large clusters were estimated by counting the rows in both directions, and by counting the number of bats in the rows in both directions. The largest cluster had 110 bats while the smallest had 12 individuals. The average of the clusters was estimated to be from 25 to 30. The computation of the bat population was made as follows: There were 18 clusters in the area where the clusters were counted. Thirty bats to the cluster gave 560 for the maximum no. of bats for this area, thus giving 2240 bats for the entire room. Allowing 10 per cent error, the maximum number was 2464 bats or roughly 2500. The minimum number by the same procedure was calculated as follows: 18 clusters at 25 bats per cluster, or 450 bats for the counted clusters, or 1800 for the entire room. Allowing 10 per cent error, the results were 1620 or roughly 1600. These figures, 1600 to 2500 represent a wide variation, but should accurately define the actual maximum and minimum limits of the colony. The reason that the figures of 25 to 30 per cluster were used rather than an average of 27 $\frac{1}{2}$ was that they represent the limits of accuracy of the estimation. Thus they serve to more accurately define the actual limits of the size of the bat colony. The average figure of 2050 bats in the colony can be obtained by taking the mean of the two computed limits, if a single average figure is desired.

EQUIPMENT

Due to the transfer of Jean Williams to the west coast, he has had to turn over Chairmanship of the Equipment Committee to Mr. James Lavelle. Members and friends are all urged to make all their purchases of special equipment through the medium of the Equipment Committee. The Equipment Committee now has a fairly complete stock of carbide lamps and parts on hand, and can give immediate delivery on these items.

Funds for making the original purchase of the lamps was advanced by Mr. Williams. A discount of 40 per cent was secured. It is planned to sell all items at list price and use the profit for the stocking of further items of equipment. In the near future it is hoped that the Equipment Committee will also be able to stock hard cave hats and to arrange for the construction of both cave knapsacks and jumper made on our specification. Orders sent to any of the society's officers will be immediately forwarded to Mr. Lavelle, should his address become misplaced.

The next issue of the Bulletin--Work is already under way on the next issue of the Bulletin--When the next issue appears is largely dependent upon how rapidly material for it is received--An issue of the Bulletin in Sept. or Oct. is our present aim. Help Make This Your Bulletin--The Editors need more original articles--Make this your Bulletin by your contribution.

C A V E L O G

(Ed. Note. In lieu of publishing a detailed report of every cave visited by the society, a log of all caves visited will be kept and published with but brief reference to the cave structure and the progress of its exploration and study. The complete records of all caves referred to are of course available to any member so interested. A few selected reports will, however, be published in each issue of the bulletin as space allows. Comment on this new policy is solicited.)

The cave log constitutes a brief summary of the caves for which data has been furnished to the files of the society. For a more elaborate report, reference may be made to the files of the individual cave. The caves here below listed include all of those for which the society has the individual record file. Further cave logs issued in succeeding issues of the bulletin will be limited to new caves and unusual facts concerning previously recorded caves.

North Carolina

Bat Cave--near Lake Lure, N. C., shown on State road maps, but is misplaced. A small granite cave, much like Rumbling Bald, only smaller; partially explored; no record of fauna.

Rumbling Bald Cave-- Lake Lure, N. C. - A full report is previously set forth in this bulletin.

Pennsylvania

Dulaney's Cave- Uniontown, Pa. Large cave reported in Stone's book on caves of Pa. Surveyed for fauna.

Needy's Cave-- Waynesboro, Franklin Co., Pa. A medium size cave, reported in detail in Stone's book on Pennsylvania Caverns; explored and mapped about 200' further than set forth by Stone; further work still to be done; has running stream; surveyed for fauna.

Virginia

Allen's Cave-- Front Royal, Warren Co., Va. reported in some detail in this issue of the bulletin.

Baldwin's Caves-- Front Royal, Warren Co., Va. Four small caves; reported in some detail in this issue of bulletin.

Beatty Cave-- Milboro Springs, Bath Co., Va. A small dry single room cave; explored and mapped.

Blowing Cave--Milboro Springs, Bath Co., Va. Reported in full in June bulletin of D. C. Speleological Society, June, 1940.

Clark's Cave- McClung, Bath Co., Va. Medium size cave with fairly complicated passages; partially explored and mapped; map completed of explored portions; a few formations; no running water observed.

Fountain Cave-Grottoes, Rockingham Co., Va. A medium size cave; with large rooms and considerable decorations; entrance about 1000' from Grand Caverns (old Miers Cave, now commercial); explored and surveyed for fauna.

- Front Royal Caverns-- Front Royal, Warren Co., Va. Several small sink holes; one or two fair size rooms; a few good formations; attempts are being made to develop these caves commercial.
- Horse Shoe Cave-- Front Royal, Warren Co., Va. This cave fully reported in this issue of the bulletin.
- Jenning's Cave-- Lacy Springs, Rockingham Co., Va. Small cave reported in bulletin, D. C., June, 1940.
- John's Cave-- Ninevah, Warren Co., Va. A small cave; explored, mapped, and surveyed for fauna; possesses permanent pool, but no running water; no formations worth mentioning.
- Limekilm Cave-- Lexington, Rock Bridge Co., Va. A small but spacious cave; explored and mapped; has running stream- one pit 20' deep, needs rope ladder; a little formation; no record of fauna.
- Madden's Cave-- New Market, Shenandoah Co., Va. Reported in full in bulletin of D. C. June, 1940.
- Ogden's Cave-- (also known as Grandpappy's Cave) Middletown, Frederick Co., Va. A reputedly large but probably medium size cave. Exploration is difficult due to siphon type lake 200' from entrance. Cave explored and mapped for over 1000'. Excellent rimstone formations; running stream; no record of fauna; more work of exploration to be done.
- Reed's Cave-- Lacy Springs, Rockingham Co., Va. A small cave reported in D. C. bulletin, June, 1940.
- Rhea's Cave-- Milboro Springs, Bath Co., Va. Small cave reported in bulletin of D. C. June, 1940.
- Rock House Cave-- White Hall, Frederick Co., Va. Small, single passage cave; explored, mapped; some fauna collected.
- Showalter Cave-- Lexington, Rock Bridge Co., Va. Size unknown; exploration halted after 400' by series of lakes; most of passages small; part explored fully mapped; some fauna collected.
- Spring Hill Cave-- Lexington, Rock Bridge Co., Va. A medium size cave; extremely muddy and extremely complicated; may be classified as dangerous; not recommended for the novice; permanent stream; no large rooms; little formation; several drops in excess of 20'; partially explored; some fauna collected; more work to be done.
- Sugar Nut Cave-- Mauzy, Rockingham Co., Va. A small cave; some very interesting formations, with bluish tinge; partially mapped and explored; some fauna collected. Springs, Bath Co., Va.

Witherow's Cave-----Reported in detail in Bulletin of D. C. June, 1940. Since then new rooms discovered; also running stream discovered; new surveys for fauna; further detailed reports expected to be released.

West Virginia

- Bender's Cave-----^{HAINESVILLE}~~Kearneyville~~, Jefferson Co., W. Va. A small well-decorated cave; kept closed by owner; explored and mapped; some photos taken by Eno.
- Brandywine Cave-----ST(also Prop's Cave) Brandywine, Pendleton Co., W. Va. A medium sized cave; fairly well decorated; has 75' drop into last room; exploration conducted over drop for first time under leadership of Arthur Lembeck; no reports as to fauna.
- Briar Sink Cave-----Summit Point, Jefferson Co., W. Va. A small sinkhole; mud clogged after 60'; explored, but not worth mapping.
- Bruce Town Cave-----Bruce Town, Jefferson Co., W. Va. A small cave; probable remnant of large system; would require digging to fully explore; fauna collected.
- Bird Orchard Cave-----Middleway, Jefferson Co., W. Va. A small mudfilled sink; fully explored; too small for mapping. No fauna.
- Cedar Hill Cave-----Cabins P. O., Pendleton Co., W. Va. Small cave; explored and mapped; fauna collected; no running water.
- Clyde Cochrane Sinks---Hillsboro, Pocahontas Co., W. Va. Medium size cave; ends in lake; cave consists generally of a recent surface drainage channel; explored and mapped; fauna collected, but none from lake.
- Crystal Lake Cave-----Charlestown, Jefferson Co., W. Va. A small excommercial cave; has small lake; no records of fauna.
- Dead Dog Cave-----Charles Town, Jefferson Co., W. Va. This cave reported in full in this issue of the bulletin.
- Donaldson Cave-----Hedgesville, Berkley Co., W. Va. A fair size cave but very (?) dangerous; partially water filled and roof collapsing; only explored cursorily; no record of fauna.
- Dyer's Cave-----Wardensville, Hardy Co., W. Va. Medium size cave; running stream; entire cave old stream course, consistently dropping at a rate of 15 or 20 degrees; surveyed and mapped; some record of fauna.
- Gandy Sinks-----Oceola, Tucker Co., W. Va. One-half mile natural tunnel with flow stream; average width of cave approximately

50 and height 20'; at lower end has several large rooms and some formation. In time of flood stream fills entire cave, so is dangerous at such times; mapped and surveyed for fauna.

George Washington Cave-- Charles Town, Jefferson Co., W. Va. Ex-commercial; very small; practically no formations; is of historical interest; mapped and surveyed for fauna.

^{DITMER}

Harper's Ferry Caves-- Bulova, Jefferson Co., W. Va. Several sink holes in series; apparently disconnected; all possess one or two fair-sized rooms; partially explored.

Hermit's Cave-- Occola, Tucker Co., W. Va. Medium size cave; partially explored and mapped; more work yet to be done.

Hellhole-- Riverton, Pendleton Co., W. Va. A very large cave; large rooms and passages on several levels; initial drop into cave 167'; exploration believed to be complete; some record of fauna; subject matter of a report in bulletin of D. C. June, 1940.

Higgenbottom Cave-- Frankfort, Greenbrier Co., W. Va. Referred to in State Geological report on Greenbrier Co. Surveyed and mapped; some record of fauna; running stream throughout the entire length.

John Brown's Cave-- Harper's Ferry, Jefferson Co., W. Va. Fully reported in bulletin of D. C. June, 1940.

Linbergh's Hole-- Rippon, Jefferson Co., W. Va. A small sink hole; digging is required to effect entry; no exploration as yet; mouth surveyed for fauna.

Moyer's Cave-- Halltown, Jefferson Co., W. Va. Medium size cave; two levels; active stream; large lakes in wet weather; partially reported in bulletin of D. C. June, 1940. Now fully explored and mapped; some record of fauna.

Peacock Cave-- Smokholes, Pendleton Co., W. Va. Medium size cave lying near crest of mountain; very dry and dead; many dead formations; partially explored and mapped; some record of fauna.

Perry's Hole #1-- Clip, Jefferson Co., W. Va. Small sink hole; reported in June bulletin, D. C. June, 1940.

Perry's Hole #2-- Brucetown, Jefferson Co., W. Va. Entrance partially clogged; needs digging; no exploration as yet.

Rocky Bottom Caves-- Bunker Hill, Jefferson Co., W. Va. A group of small caves; largest about 100' in length; rocky bottoms are probably the remains of a collapsed cavern of considerable size and extent; existing caves appear to be only small side passages of original system; partially explored,

not mapped; some fauna collected.

Ruddle's Cave-- Riverton, Pendleton Co., W. Va. A medium size cave; some interesting formations, one a red flowstone column, another a pure white cascade, 35' high; entrance passage for 100' or more almost impassable for a fat man; a 20' rope ladder is needed for descent into main room; explored, mapped, and some fauna collected.

Schoolhouse Cave-- Riverton, Pendleton Co., W. Va. Large cave exceedingly dangerous and difficult to reach main portion; exploration in progress two years still continuing; rock-climbing ability a pre-requisite for one undertaking to enter the main parts of the cave. Running stream; many interesting formations; many large pits or wells; record of fauna from this cave still quite deficient; this cave reported in detail in bulletin, January, 1941. Main exploration work and mapping done by rock-climbing group.

Simmon's Cave-- Cave P. O. Pendleton Co., W. Va. Small cave with fair formations; a lake; and largest single room (420 X 165 ft.) reported in West Va.

Silzer's Cave-- Tomahawk, Berkeley, W. Va. Medium size cave; a maze of small cross passages; fairly well explored and mapped; work still continuing; surveyed for fauna; additional notes on cave in this bulletin and in bulletin of D. C. June, 1940.

Snedgar's Cave-- Droop Mountain, Pocahontas Co., W. Va. Large cave with several large rooms and maze of smaller passages; worked for salt peter during Civil War; practically no formations; no running water, but permanent pool; partially explored and mapped; some record of fauna.

Trout Rock Cave-- Franklin, Pendleton Co., W. Va. Medium size cave; fairly complicated passages; very dry and dirty; all passages appear to be covered with soot; excellent display of fossils; partially explored and mapped; some fauna collected.

Whitings Neck Cave-- (also known as Mary Miller Cave) Scrabble, Berkeley Co., W. Va. A small cave with good decorations; one 45' drop; no running water; (considerable number of pictures taken); a good cave for photography; explored, mapped and surveyed for fauna.

DEVELOPED CAVES AND SIMILAR COMMERCIAL ENTERPRISES

Since the organization of our society, the following have either actively cooperated with the society in its study of Speleology or extended to the Society or individual members thereof some specific courtesy.

Kentucky

Floyd Collin's Crystal Cave

Hidden River Cave

Kentucky

Mammoth Onyx Cave

Maryland

Crystal Grottoes of Md.

New Mexico

Carlsbad

New York

Howe Caverns

North Carolina

Chimney Rock

Linville Caverns

Pennsylvania

Lincoln Caverns

Virginia

Dixie Caverns

Endless Caverns

Luray Caverns

Shenandoah Caverns

Skyline Caverns

West Virginia

Seneca Caverns

Smokhole Caverns

SYSTEMATIC LIST OF THE FAUNA COLLECTED FROM CAVES

(This list, as compiled from the records of the Fauna Committee of the National Speleological Society is necessarily incomplete both from the fact that some specimens still await identification by specialists and because new additions have been to the records since this list went to press. Such additions will appear from time to time in subsequent reports of the Fauna Committee to be published in the Bulletin.

PHYLUM PLATYHELMINTHES
Class Turbellaria

(Planarian worm- sp?)

Needy's Cave, Waynesboro, Franklin Co., Pa.- a flatworm blind and without pigment was common in this cave on bits of wood and other debris in the cave stream. This may belong to the genus *Speophila* since a species of this genus (*S. pricei*) has been reported from both Veiled Lady Cave, Center County and Brownstone Cave, Pennsylvania by Gerrold.

PHYLUM MOLLUSCA
Class Gastropoda

The Molluscan fauna of the caves constitute both the true cave snails which reveal modifications associated with cave life and other snails which do not form a portion of the cave fauna but which are snails which ordinarily live in leaf-mold in damp woodlands on the outside and become a part of the cave picture only insofar as the shells are drifted in by surface waters through sinks, etc. The latter species will not be enumerated in this report.

Cave Snail (Fontigens sp.)

Skyline Caverns, Front Royal, Warren Co., Va.- this snail lives on the rocks in the flowing stream in the cave. According to Dr. Morrison it represents a new species and, while related to the

snails of the genus *Fontigens* which inhabit springs and spring-fed streams, it, unlike the species on the outside, is partially blind.

Cave Snail (Red snail)

Skyline Caverns, Front Royal, Warren Co., Va.- this snail is totally unrelated to the above species and apparently belongs in a distinct genus. It is totally blind and the only pigment is a bit of red in the nervous system. Unlike *Fontigens*, which inhabits the flowing stream in the cave, this species was taken from a series of cascading flowstone pools in the cave. While this species has no close relatives in the Shenandoah region, its relatives are ones which live in rapid water.

PHYLUM ARTHROPODA

Class Crustacea

Order Copepoda

(Copepods- spp?)

John's Cave, Ninevah, Warren Co., Va.- a small series of as yet unidentified copepods were collected from a small pool in the cave.

Order Isopods

Cave Isopod (Asellus sp.)

Skyline Caverns, Front Royal, Warren Co., Va.- this isopod, probably a new species, is common throughout the stream in the cave.

Order Amphipoda

Cave Amphipod (Synpleonia sp.)

Skyline Caverns, Front Royal, Warren Co., Va.- this is a blind, unpigmented species and according to Dr. Clarence R. Shoemaker of the United States National Museum represent a new species. Specimens of blind, unpigmented amphipods have also been recorded from Needy's Cave, Waynesboro, Franklin Co., Pa. and Kenney-Simmons Cave, Cave, Pendleton Co., W. Va. These may well belong to the same genus and may also prove to be new species.

Order Diplopoda

Cave Milliped (sp?)

Skyline Caverns, Front Royal, Warren Co., Va.; Needy's Cave, Waynesboro, Franklin Co., Pa.- two millipeds which were pale and washed with respect to color collected in these caves are awaiting identification, one being in the hands of Dr. H. F. Loomis, United States Department of Agriculture and the other the United States National Museum.

Class Insecta

Order Orthoptera

Cave "Cricket" (Ceuthophilus sp?)

Whiting's Neck Cave, Berkeley Co., W. Va.; Trout Rock Cave Mountain Cave, Franklin, Pendleton Co., W. Va.- this form was common in both of these caves where it occurred just inside the mouths in cracks and crevices of the rocky walls.

Cave Cricket (Hadenococcus subterraneus)

Cochran's Cave, Pocahontas Co., W. Va.

Order Hemiptera

Wheel-bug (*Arilus cristatus*)

Order Diptera

Mosquito (*Anopheles punctipennis*)

Whiting's Neck Cave, Berkely Co., W. Va.- many mosquitoes have been observed in the caves visited but these for the most part are still awaiting identification. This group is of particular interest because of the fact that the genus *Anopheles* constitutes one of the kinds of malaria mosquitoes.

Class Arachnida

House Spider (*Theridion tepidariorum*)

Cochran's Sink, Pocahontas Co., W. Va.- the spiders are a common element of the life found in very many of the caves but they merely find the caves a convenient place to live where there is abundant food and efficient shelter.

PHYLUM CHORDATA

Class Amphibia

Crimson Spotted Newt (*Triturus v. viridescens*)

Showalter's Cave, Lexington, Va.; Gandy's Sinks, Osceola, W. Va.

Red-backed Salamander (*Plethodon cinereus*)

Whiting's Neck Cave, Berkely Co., W. Va.; John's Cave, Minovah, Warren Co., Va.- all specimens were collected under rocks and leaf-mold, etc. around sink-hole entrances.

Slimy Salamander (*Plethodon glutinosus*)

Siler's Cave, Tomahawk, Berkely Co., W. Va.

Four-toed Salamander (*Hemidactylium scutatum*)

Gandy's Sinks, Osceola, Randolph Co., W. Va.

Purple Salamander (*Gyrinophilus p. porphyriticus*)

Hermit's Cave, Randolph Co., W. Va.; Cochran's Cave, Pocahontas Co., W. Va.

Two-lined Salamander (*Eurycea b. bislineata*)

Skyline Caverns, Front Royal, Warren Co., Va.- two specimens taken on two separate occasions from the banks of the cave stream.

Long-tailed Salamander (*Eurycea l. longicauda*)

Kenney-Simmons Cave, Cave, Pendleton Co., W. Va. - a larval specimen collected from this cave is believed referable to this species.

Green Frog (*Rana clamitans*)

John Brown's Cave, Harpers Ferry, Jefferson Co., W. Va.- a juvenile of this species was collected here in winter where it was presumably hibernating.

Class Reptilia

Garter Snake (*Thamnophis s. sirtalis*)

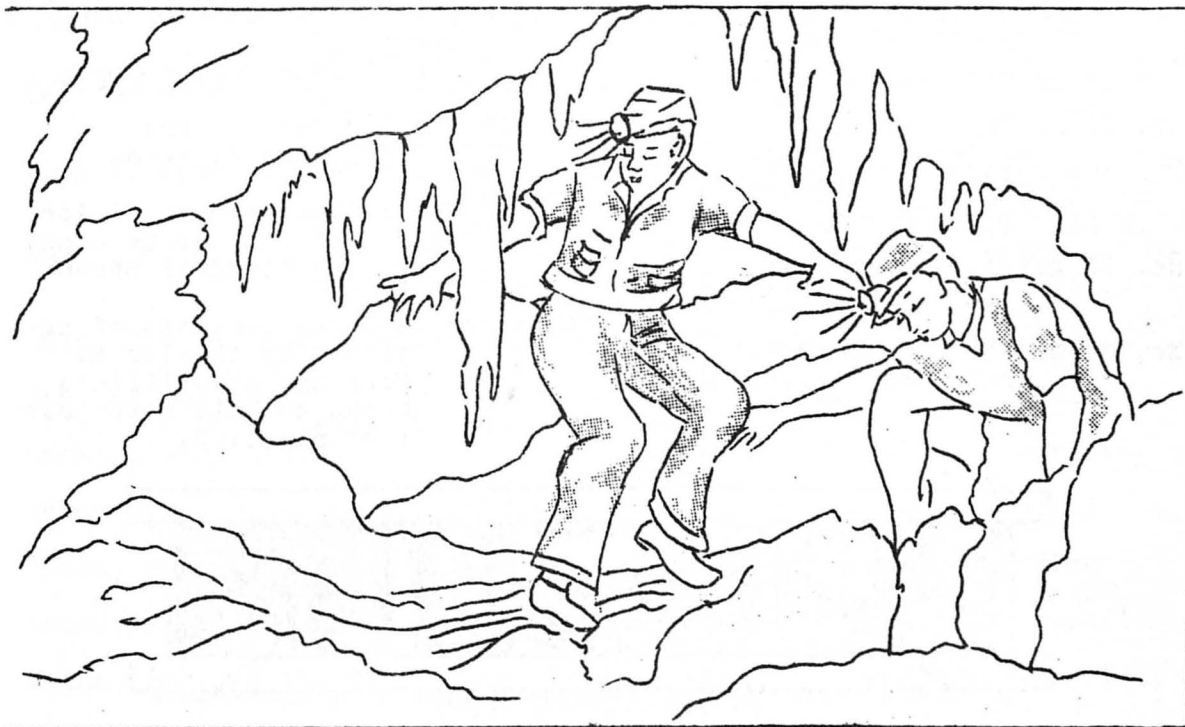
Siler's Cave, Tomahawk, Berkely Co., W. Va.; Gandy's Sinks, Osceola, Randolph Co., W. Va.

Class Mammalia

Little Brown Bat (*Myotis l. lucifugus*)

Caves- Dulaney Cave, Union Town, Pa.
Social Bat (*Myotis sodalis*)
 Madden's Cave, New Market, Shenandoah Co., Va.; Witheros Cave,
 Milboro Springs, Bath Co., Va.
Prouessart's Little Brown Bat (*Myotis keeni septentrionalis*)
 Witheros Cave, Milboro Springs, Bath Co., Va.
Georgian Bat (*Pipistrellus s. subflavus*)
 Madden's Cave, Milboro Springs, Bath Co., Va.; Jennings Cave,
 New Market, Va.; John's Cave, Ninevah, Warren Co., Va.; Sky-
 line Caverns, Front Royal, Warren Co., Va.; Luray Caverns,
 Luray, Va.; Saltpeter Cave, Luray, Va.; Schoolhouse Cave, W.
 Va.; Siler's Cave, Tomahawk, W. Va.; Peacock Cave, Petersburg,
 W. Va.; Needy's Cave, Waynesboro, Franklin Co., Pa.; Rocky Bottom
 Cave, George Washington's Cave, Dead Dog Cave.
Large Brown Bat (*Eptesicus f. fuscus*)
 Madden's Cave, Milboro Springs, Bath Co., Va.; Witheros Cave,
 Milboro Springs, Bath Co., Va.; John's Cave, Ninevah, Warren
 Co., Va.; Saltpeter Cave, Luray, Va.; Whiting's Neck Cave,
 Berkely Co., W. Va.; Trout Rock Cave, Franklin, Pendleton Co.,
 W. Va.; Schoolhouse Cave, W. Va.; Needy's Cave, Waynesboro,
 Franklin Co., Pa.; George Washington's Cave.
Evening Bat (*Nycticeius humeralis*)
 Whiting's Neck Cave, Berkely Co., W. Va.
Long-eared Bat (*Corynorhinus r. rafinesquii*)
 Schoolhouse Cave, W. Va.; Hell Hole, W. Va.; Peacock Cave, W. Va.,
 and Trout Rock Cave, W. Va.

Respectively submitted,
 James A. Fowler
 Fauna Committee

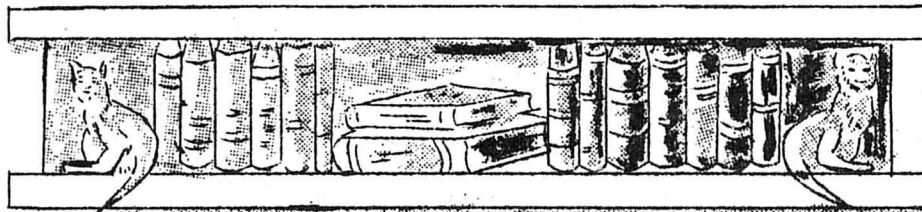


Books received for the Speleological Library since the last report---
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| No. 16 Underground New England
by Clay Perry | No. 20 The Pleistocene Vertebrate
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Maryland
by James W. Gidley and
C. Lewis Gazin |
| No. 17 Ten Years Under the Earth
by Norbert Casteret | |
| No. 18 The Earth and Its Story
by Angelo Heilprin | No. 21-28 Geological Reports of
State of West Va. on
Greenbriar Co., Pendle-
ton Co., Tucker Co.,
Grant and Hardy Co., Po-
chontas Co., Hampshire
and Mineral Berkley Mor-
gan and Jefferson Co. |
| No. 19 Scenery of Florida
by C. Wythe Cooke
(State of Fla. Dept. of
Conservation) | |

Pamphlets received for the Speleological Library since the last report

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No. 2 | No. 35 Prirodoslovne Razprave
Natural Science Papers
from the Muscum Society
of Slovenia |
| No. 29 Mushroom Cave
Science News Letter Vol. 38
No. 4 | No. 36 Grotte De Lombardia
Istituto Italiano Di
Speleologia 1931 |
| No. 30 Our American Caverns
by Russell Trall Neville
Nature Notes Vol. 7 No. 1 | No. 37 Contributo Alla Conoscenza
Della Fauna Cavernicola
Lombardia |
| No. 31 The Fossil Man of Circeo's
Mountain
by Albert Charles Blanc
Natural History Vol. 45
No. 5 | No. 38 The Mammoth Cave of Ken-
tucky
by Horace Carter Hovey |
| No. 32 Pennsylvania Caves
by Ralph W. Stone
Pa. Geological Survey
Bulletin G-3 | No. 39 The Endless Caverns
by Chester A. Reeds |
| No. 33 Altri Quattro Anni
Di Ricerche Speleologiche | No. 40 Nature Underground (Color
Plates of Endless Caverns)
by Mary Mitchell Brown |
| No. 34 Grotte Di Lombardia
Istituto Italiano Di Spe-
leologia 1932 | Addition: Several reprints of ar-
ticles by Charles E.
Mohr and of Griffin's
works on bats have just
been received. |



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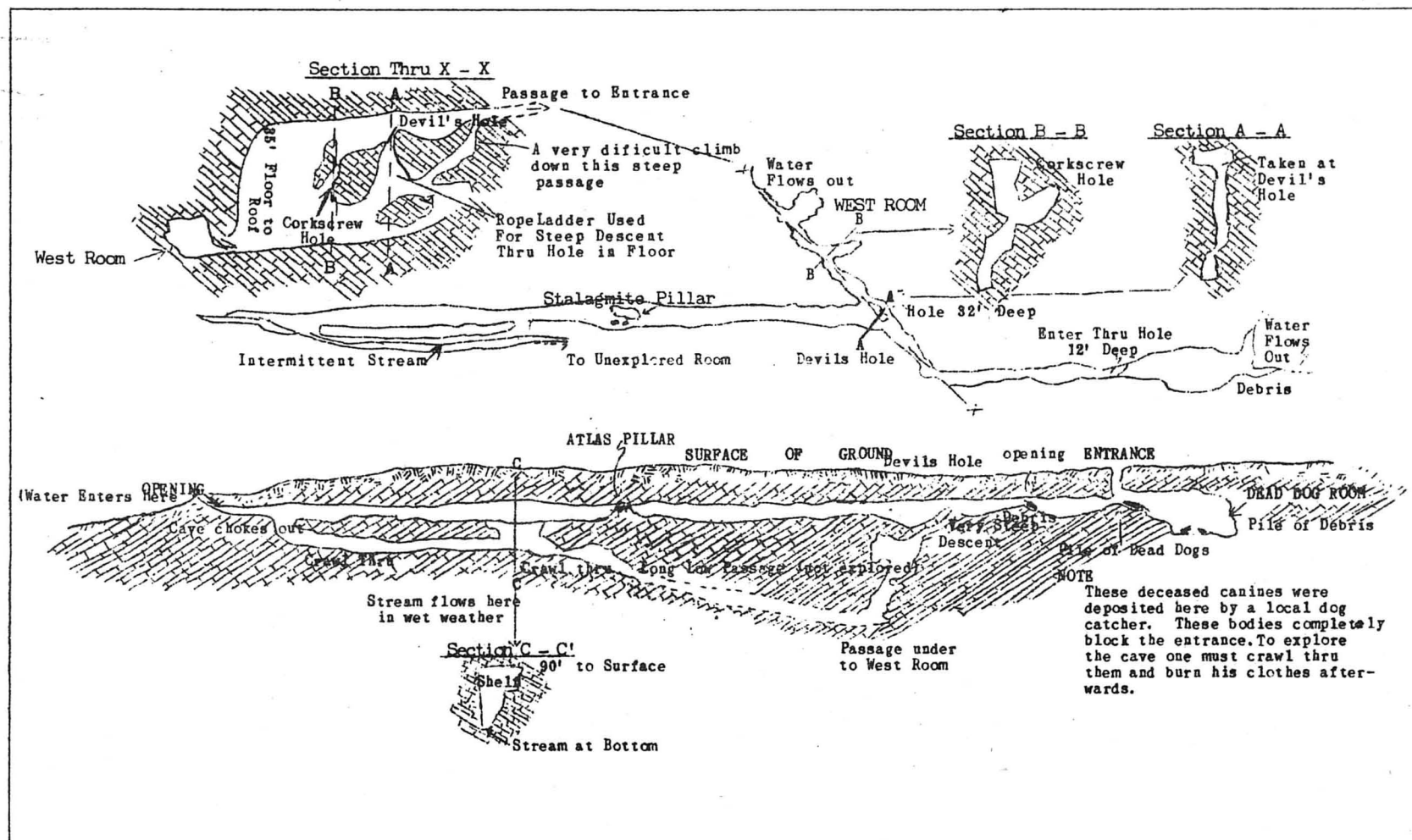
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Address all additions to bibliography, criticisms or suggestions, to Robert Bray, Rd.# 2, Herndon, Va., Chairman, Committee on Library and Bibliography.



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THE SPELEOLOGICAL SOCIETY of DISTRICT of COLUMBIA

MAP of DEAD DOG CAVE

Located in Jefferson County Near Midway - West Virginia

Explored and Surveyed for the First Time on March 10, 1940

Drawn By - Reichard and Stevenson
By Schlichtig - Garland and Hortman, Stevenson

Scale 1" = 20'
5 15 25 30 90 100 Feet

LEGEND

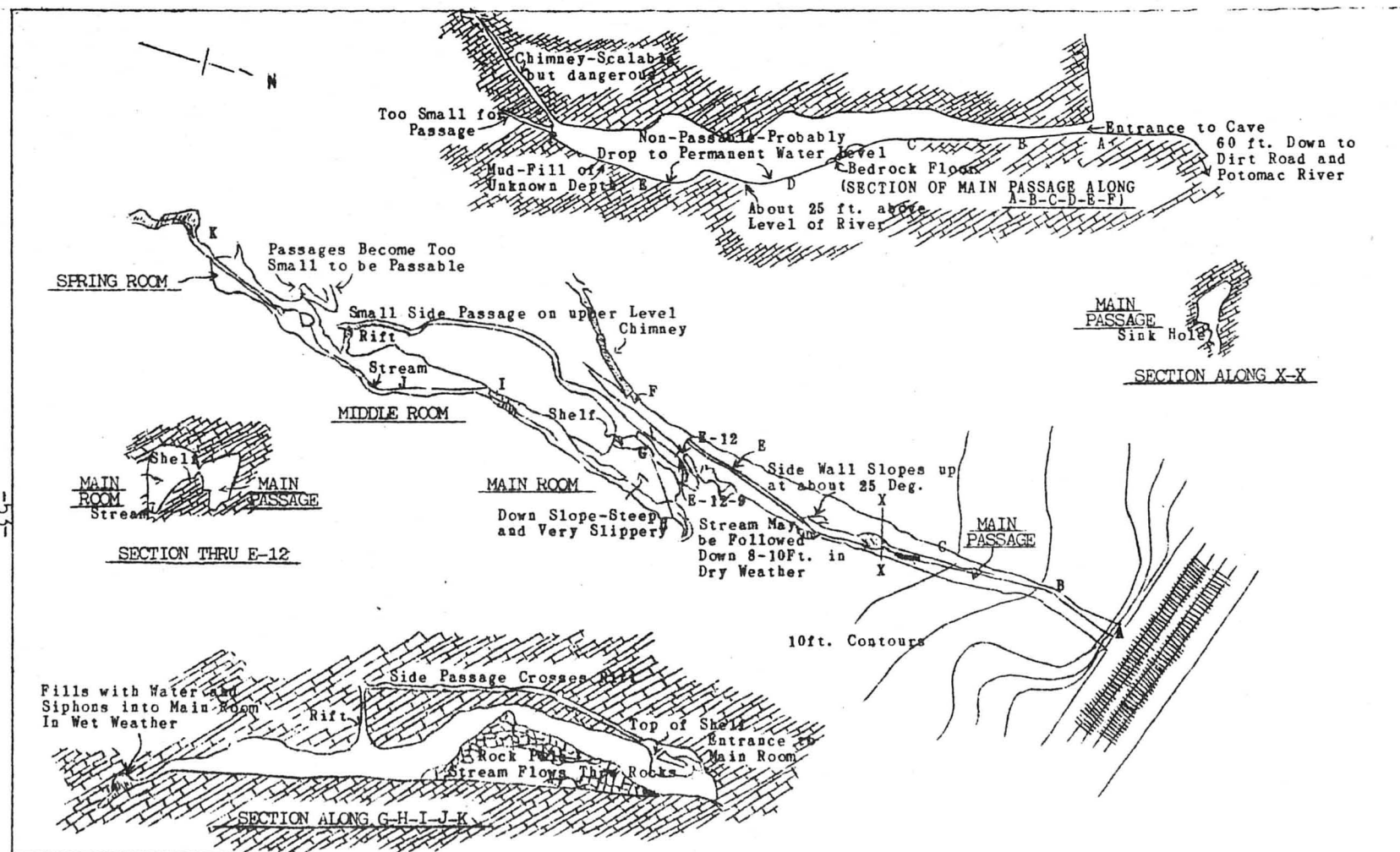
Limestone Section

Known Limits

Not Explored

Sink Hole

Running Water



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THE SPELEOLOGICAL SOCIETY OF THE DISTRICT OF COLUMBIA

Sketch of JOHN BROWN'S CAVE

Harper's Ferry, W. Va.

Surveyed - March 25, 1939

Scale -

By A. B. J. Clark, W. J. Stephenson

Drawn by E. W. Harmon and
W. J. Schlichtig

Standing Water Known Limits
 Not Explored
 Area More than 10 feet above Floor
 Sink Hole Limestone Section