The AMERICAN CAVER

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CAVES OF PENNSYLVANIA

by

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With Special Articles

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THE AMERICAN CAVER

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THE SOCIETY serves as a central agency for the collection, preservation and publication of scientific, historical and legendary information relating to speleology. It arouses interest in the discovery of new caves and encourages the preservation of the natural beauty of all caverns.

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Preface: A Special Message

BEFORE YOU VISIT a single cave, even before you read the text of this volume, stop to consider several vital points:

Not one of the 272 caves herein described belongs to the public. All are private property. Most of the owners have been extraordinarily generous in permitting interested persons to visit caves on their property, often granting picnicking and camping privileges as well.

The surveys and studies reported here involved repeated trips and commonly resulted in the growth of mutual respect and friendship between owners and explorers. We sincerely hope that the persons who use this report will endeavor to maintain this same high degree of consideration and respect.

It is our conviction that those who are sufficiently interested in caves to make serious use of this book will whole-heartedly subscribe to the basic rules of cave safety and conservation:

1. Never go into a cave alone; always carry extra sources of light; know the limits of your equipment and your strength.
2. Leave all formations for future generations to enjoy—nature's artistry over thousands of years can be destroyed in a misguided moment.
3. Help to save the animal life of caves from thoughtless collecting or disturbance; let every cave be truly a wildlife sanctuary.
4. Leave caves as unmarked and unlittered as they were when the first explorer discovered them.

This report is limited to Pennsylvania but much of the information in it—about fossils, present life, and geology—is applicable to a much wider territory.

A few other states have more caves, or bigger or more extensive ones, but the choice of Pennsylvania was appropriate. The number of classic finds of cave deposits of fossil bones is unmatched in any other state. The bats and other forms of cave life have been carefully catalogued, and scores of caves have been surveyed, mapped and photographed. The collections of folklore and legend are invaluable.

For more than 20 years studies of various aspects of Pennsylvania speleology have been in progress, resulting in an impressive series of scientific and popular reports. Two presidents of the National Speleological Society, three grottoes, and many members have worked actively and long in preparing this volume—a large scale cooperative effort unmatched in any other state report.

In conclusion, we invite you to make this your guidebook to good caving. Enjoy its tales of adventure, visualize the extinct creatures that lived here in ages past, recognize and safeguard the surviving fauna, and appreciate the wonder and fragility of cave formations.

This book represents the limits of our present knowledge—use it to chart your course to rich experiences and to new discoveries in the caves of Pennsylvania.

CHARLES E. MOHR
President

December 31, 1953
Greenwich, Conn.

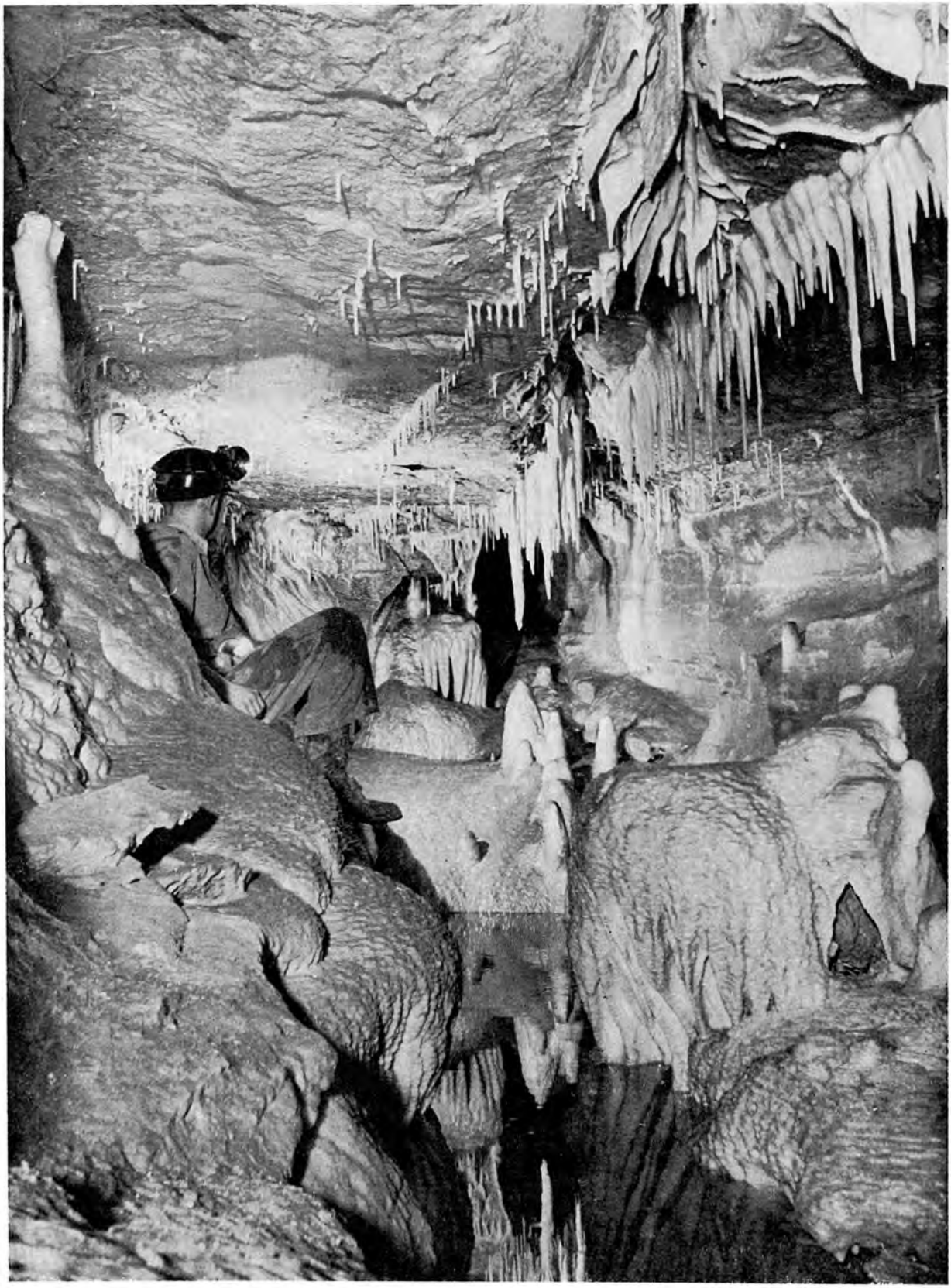

Photo by C. E. Mohr

The quiet beauty of subterranean architecture, broken only by the rhythmic drip of water into limpid pools, rewards the efforts of the spelunker who has the stamina and courage to challenge the unknown. Scene in Peiper Cave, Cumberland County.

Geology of Pennsylvania Caves

By WILLIAM E. DAVIES

Geologist, U. S. Geological Survey

Almost all Pennsylvania caves have developed as a result of solution excavation of limestone and marble. These relatively soluble rocks are found in practically all physiographic provinces in the State.

The Coastal Plain, lying along the extreme southeastern part of the State, is an area of relatively low relief underlain by sands, gravels, and marls. No solution caves have been reported in this area, although small shelter caves are found occasionally.

The relatively uniform upland lying between the Coastal Plain and South Mountain is the *Piedmont Plateau*. It is an area of complex, folded rock, much of which is highly metamorphosed. Within this complex are two marbles, the *Franklin* that crops out in Berks, Bucks, Chester and Northampton counties and the *Cockeysville* that is found in Chester County. These marbles are similar in appearance, generally white. They are coarsely crystalline in texture. The Cockeysville marble is about 1000 feet thick while the Franklin is probably about 200 to 500 feet thick.

Although the marbles have been considered PreCambrian in age by most geologists, the Stoses assign these marbles in Carroll County, Maryland, to the lower Cambrian and suggest they are equivalent to the lowest Cambrian carbonate rocks found in the Cumberland Valley.

In the western and central parts of the Piedmont, in Montgomery, Chester, Lancaster, York, and Adam counties, Cambrian and Ordovician limestones crop out. The area underlain by these limestones is a rolling lowland known respectively as the Chester, Lancaster, or York Valleys. These limestones are similar to the limestones of the same age in the Cumberland and Lebanon Valleys.

The Triassic limestone conglomerate, the *New Oxford* formation, that lies along the south side of South Mountain, in Adams, York, and Berks counties is composed in part of beds of pebbles of Paleozoic limestone cemented by fine-grained gray or red limestone.

West of the Piedmont is a *mountainous belt of folded Paleozoic rocks*. On the eastern side of the belt is a broad lowland, the Cumberland or Lebanon Valley, that is underlain by broad expanses of limestone and shale. The oldest limestone formation, the *Tomstown*, is Upper Cambrian in age and is composed of thin-bedded to massive dolomites and limestone, light gray to pink in color, up to 1000 feet thick.

The *Waynesboro* formation, consisting of sandstone, thin siliceous limestones, and some massive limestones, lies above the Tomstown and

Photo by C. E. Mohr

Fig. 1 — Typical sinkhole — one of Taylor wells, Bedford County.

is overlain by 500 to 3000 feet of *Elbrook* limestone, a series of light blue to gray, shaly limestones and calcareous shales, with some massive limestones and dolomites in the middle of the formation.

The highest Cambrian formation (often assigned indefinitely as Cambro-Ordovician), the *Conococheague* limestone, is massive, dark blue, and banded, with zones of oolites and cryptozoon reefs at the base. The formation averages 1500 feet in thickness.

The *Beekmantown*, the lowest Ordovician formation (or the upper part of the Cambro-Ordovician), consists of laminated, fine-grained, blue to gray, relatively pure limestones ranging from 1500 to 2400 feet in thickness. The *Stones River* formation, which lies above the Beekmantown, consists of black to dove-colored, thin-bedded to massive, pure limestones and dolomites, totaling 250 to 1000 feet thick. The highest limestones of the Ordovician are in the *Black River* group which consists of a series of blue to gray argillaceous limestones from 100 to 600 feet thick. The Upper Ordovician, above the Black River group, is made up of shales and sandstones that underlie the Valley adjacent to the limestone areas, and are called Martinsburg or Reedsville shale.

The mountainous area lying between the Cumberland or Lebanon Valleys and the Allegheny Mountain is underlain by a thick series of folded rocks that are lower and middle Paleozoic in age. The terrain is an alternation of long uniform ridges and narrow valleys with a general northeasterly trend. In this area the oldest rocks are the Ordovician limestones which form the broad lowlands of Kishacoquillas Valley in Mifflin County, Nittany Valley in Centre County, and Morrisons Cove in Bedford and Blair Counties. These limestones are similar in lithology to those in the Cumberland Valley but the thickness of the formations is much less.

Rocks of Silurian age lie directly above the shales and sandstones of the Ordovician. The lower portion of the Silurian contains mainly shales and sandstones. Thick limestones, suitable for cavern development, occur only in the Upper Silurian Cayugan series. Impure limestones of local extent occur in the *McKenzie* formation, the lowest formation of the Cayugan series, but

Photo by C. E. Mohr

Fig. 2—Fractured rock faces characteristic of a fault. Wind Cave, Lancaster County.

no caves are reported in them. The next higher formation, the *Wills Creek* formation, consists of 600 feet of alternating calcareous shales, argillaceous limestones, sandstones, and thin zones of relatively pure limestone.

The *Tonoloway* formation is a series of interbedded limestones and calcareous shales totaling 300 feet thick. The limestones are mainly thin-bedded and banded and weather into plates. Some massive beds occur in the lower part of the formation. The Tonoloway formation contains many caverns.

Though the Tonoloway formation marks the top of the Silurian, limestone formations continue uninterrupted into the Devonian. The *Helderberg* formation, consisting of four limestone members, lies at the base of the Devonian. The *Keyser* limestone, the lowest member, is massive and nodular in the lower part and thin-bedded and shaly above. It averages 80 to 200

feet thick and contains many caves. The caves, all relatively large, lie near the top of the formation and extend into the overlying Coeymans limestone.

The *Coeymans* limestone is thin, averaging 3 to 13 feet thick, and by itself is of little significance in cavern development. However, in conjunction with the underlying Keyser limestone it contains some of the largest caves in the State. The Coeymans is a massive, blue, crystalline, in places crinoidal, limestone.

The limestones forming the upper part of the Helderberg formation, the *New Scotland* and *Becraft* members, are thin, arenaceous and contain a large amount of chert.

The Devonian system, above the Helderberg formation, consists of clastic rocks, and no significant limestones are met with until the *Loyalhanna* and *Greenbrier* formations in the Mississippian system. These limestones are from 40 to 60 feet thick in Fayette, Westmoreland, Somerset, and Cambria Counties where the rocks lie relatively flat. The *Allegheny Plateau*, of which these counties are a part, is a rolling upland cut by deep rounded valleys. Several distinct ridges, formed by broad gentle anticlines, cross the area with a northeast-southwest trend. The Loyalhanna and Greenbrier formations are brought to the surface along the flanks of these ridges and on the sides of deep valleys cut into the upland. The limestones are arenaceous to pure, gray to pink, massive, and cross-bedded. Several relatively large caves are developed in these limestones.

The Allegheny Plateau is formed mainly of Pennsylvanian formations. These rocks are predominantly coal, sandstone, and shale. Interstratified within the formations, however, are many bands of limestone, a few of which are thick and extensive enough to contain caverns. The most important of these are the *Washington, Benwood,* and *Uniontown* limestones in the area south and west of Pittsburgh and the *Freeport, Kittanning* and *Vanport* limestones in Lawrence, Beaver, Butler, Armstrong, Clarion and Jefferson counties. The individual beds of limestone in these formations range from a few feet to over 40 feet in thickness and are generally impure.

Patterns

With the exception of rock shelters, the caves of Pennsylvania show a tendency to develop along joints. Faults, cleavages, or fractures are of little significance in controlling the direction of passages. In most caves one set of joints exerts major control over the pattern with the larger passages developed along them, and subordinate side passages follow the secondary joints.

In flat-lying Mississippian and Pennsylvanian limestones, caves are simple in pattern. Generally one main passage is developed that follows a major set of joints with occasional offsets along subordinate joints. Multiple levels are confined to local sections of caves and are connected by vertical cliffs or shafts. Passages slope uniformly along the dip of the rocks.

In folded strata, where caves lie on the flanks of folds, passages develop as fissure-like openings along vertical or nearly vertical joint planes. The passages vary from a few feet to over 100 feet high and consist of several parallel openings. The passages generally are offset along the dip where they occur in more than one level. Caves lying near the crests of anticlines have a maze of interlacing passages equally developed along two or more sets of joints. This results in a plan resembling city blocks. Bedding exerts little control in cavern development in Pennsylvania except to modify the cross-sectional shape of some passages.

Cavern Features

Passages in Pennsylvania caves are relatively simple in shape. Practically all are rectangular in cross section with the height greater than the width. Some low, narrow passages, referred to as crawlways, are circular or elliptical in outline. Others are narrow vertical fissures that require considerable squeezing to traverse them. The most complicated type, consisting of a low broad opening with a fissure at the base, is known as a "keyhole" because of its characteristic shape.

Cave walls and ceilings are generally bare limestone with fluted or pitted surfaces. In some caves, however, the rock is hidden beneath a thick deposit of laminated clay and silt. Floors of bare limestone are seldom seen except in stream channels. Clay fills or piles of fallen rock form the floors of most caves in the State.

Circular openings, some of them up to 100 feet high, are developed in the ceilings of many caves. These openings, known as dome pits or chimneys, often have water falling down them. Their walls, ribbed or fluted, are covered with formations, and in some cases they connect with higher passages. Pits of similar size, developed in the floor, are known as wells.

Descending vadose water in limestone terranes dissolves considerable amounts of calcium carbonate that is deposited in many beautiful structures, called formations or *speleothems,* when the water enters cavern passages. The formations deposited by dripping water are known as *dripstone* and include *stalactites, stalagmites,* and *columns.* Others formed by deposition from thin films of water are *flowstone* and are typically mound or slab-shaped.

Earth fills, consisting of fine silts or clays with subordinate amounts of gravel and sand, are found in most caves. The deposits range from a few inches to many feet in thickness, and in general, are firm though damp. In a few caves they are saturated with water and have the consistency of a thick mud. At present cavern streams are removing clay fills rather than depositing them.

Rockfalls, known as "breakdown", are a common feature of caverns. In Pennsylvania, however, most caves are practically free of this feature as passages are generally not large enough to permit extensive falls. Small slabs of rock measuring up to a foot square and several inches thick are scattered throughout the caves. They are most common near the entrance and result from breakage along bedding planes.

Origin of Caves

There is a general agreement among most speleologists that practically all caves are developed as a result of solution processes. Beyond this point, however, there is considerable divergence of opinion. Until 1930, when William Morris Davis published his paper on the origin of caves, there had been little effort to consolidate the information available and produce a theory of origin that was universally applicable. Individual workers proposed theories that pertained to a single cave or groups of caves and included postulations that caves were (1) voids that have existed since the limestone was formed, that they were (2) developed as a result of a great deluge, or that (3) streams flowing underground cut them from the limestone.

Subsurface water, which is the solvent that acts on limestone to produce caves, occurs in two zones. In the upper or *vadose* zone close to the surface, pores and cracks in the rock are *filled with air.* Water in this zone is *transient,* passing from the surface to the deeper saturated zone. In the saturated zone, the *phreatic* zone, the pores and cracks in the rock are *filled with water.* The junction beneath the phreatic and vadose zones, known as the *water table,* fluctuates according to climatic conditions; but, in general, it reflects the topography of an area, rising beneath the hills and dropping in the valleys.

According to the theory proposed by William Morris Davis, cavern development takes place in two distinct cycles. The first occurs in the phreatic zone where the pattern of the cave is established, and passages and rooms are excavated to maximum size. When passages are elevated above the phreatic zone by regional uplift, the second cycle is inaugurated. This cycle, in the vadose zone, is characterized by the development of flowstone and dripstone and the modification of existing passages by subterranean streams or rock falls. Davis related the first cycle to regional

Photo by C. E. Mohr

Fig. 3—Breakdown of ceiling slabs smashes large stalagmite at right. Lycoming County.

peneplanation and keyed the entire development of caverns to the *peneplane cycle* as follows:

1. Solutional development of deep-seated network of fissures, galleries, and shafts *in the phreatic zone* beneath a peneplane surface.

Photo by C. E. Mohr

Fig. 4—Large solution passage partly filled with clay deposit. Hipple Cave, Bedford County.

2. Enlargement of openings to mature proportions, still beneath the water table.
3. Regional uplift with change from phreatic to vadose conditions in cavern passages.
4. Depositional replenishment by dripstone and flowstone.
5. Degradation of cavern roof and walls by erosion and final peneplanation.

J Harlan Bretz modified Davis' theory by introducing a third stage in the cavern cycle. This stage, occurring in the transition from phreatic to vadose conditions, is characterized by deposition of *clay fills* in cavern openings. The clay is derived from the surface and transported to phreatic reservoirs where it forms deposits that may completely fill cavern passages. The structure and texture of fills indicate they were deposited in quiet water, (gravel and sand in fills in Appalachian and Kentucky caverns tend to discredit this). Upon uplift, vadose streams flowing along the cavern passages excavate channels in the clay and may ultimately remove it.

Theories opposing the two cycle development of caverns have been proposed by several authorities. Swinnerton postulates a single vadose stage for cavern development in which both excavation and replenishment take place. In this theory cavern systems are developed by "near surface water which flows laterally in the fluctuating top of the water table towards the principal surface streams."

Malott's theory of cavern origin agrees with Davis in that the patterns of caves evolve below the water table. However, Malott postulates that *vadose streams develop underground courses* along selected passages of primitive cavern systems and enlarge them, ultimately producing a mature, integrated system of passages.

A one cycle theory proposed by Gardner postulates that the initial pattern and cavern openings are developed in porous horizons where water is under hydrostatic pressure. As valleys cut these aquifers, *vadose water actively circulates* and enlarges the passages to mature size. As the valley is cut down, successively lower aquifers are tapped, and multiple cave levels develop. As relief increases, the vadose streams drop to lower levels, and the upper passages are dry. Dripstone and flowstone are formed at the same time that vadose waters are enlarging the primitive cavern openings to mature size. Gardner applied his theory to areas of thick limestones with gentle dips, a condition that is lacking in Pennsylvania.

The cavern features observed in Pennsylvania are best explained by the theories proposed by Davis and Bretz. However, certain modifications are necessary to explain more fully specific conditions. Though both Bretz and Davis related the phreatic cycle in cavern development to regional peneplanation, more specific correlations appear possible in caves in areas of folded rock. The caverns of the Appalachians are developed at *uniform levels* that are closely related to *Pleistocene river terraces*. Where a cave is composed of more than one level, the various levels are developed with a uniform vertical spacing that coincides with terrace intervals.

It is more appropriate, therefore, to relate the state in which maximum development of cavern passages occurs to *a zone directly beneath the water table* during a period when straths or local base levels are formed rather than to random development below a peneplane as Davis and Bretz proposed.

Another modification in Bretz's theory is necessary in the case of clay fills. Those observed in Appalachian caves contain *cross-bedded deposits of gravel, sand, and silt as well as thick unstratified clays.* Bretz's proposal that the fills were formed in phreatic reservoirs apparently does not apply here. The fills are a result of *alternate vadose and phreatic conditions* in which active subterranean streams deposit sand and gravel when the water table is low and fine silt and clay when the water table is high and phreatic conditions exist. Such alternations would occur as the phreatic stage of excavation drew to a close and uplift of the cavern passages began.

Age of Caves

Caves obviously are younger than the rock that encloses them and older than the deposits that fill them. The range between such limits, however, is too great to provide any sound basis for estimating age.

Determinations based on the rate of solution, on the size of formations, as well as upon guesswork have been proposed, but as yet no suitable method has been established.

In the Appalachians there is a noticeable tendency for cave passages to develop at uniform levels that are related to peneplane or terrace levels. Since the caves are in highly folded rock the uniformity of levels cannot be ascribed to structural or lithological conditions. Studies now underway indicate that the development of the passages paralleled the development of terraces, and that the age of the cave can be determined by its relation to terraces. The majority of caves in Pennsylvania appear to be related to Pleistocene erosion levels, but more study is necessary before this conclusion can be considered to be final.

Karst

Limestone areas develop unique topography. Known as *Karst,* it is characterized by sinkholes, subterranean drainage, and thin soil interrupted by limestone outcrops. In Pennsylvania karst is developed in various ways. The limestones of the plateau in Western Pennsylvania show few karst characteristics as they crop out on the sides of hills and do not form the surface over extended areas. Springs and bare ledges of limestones are common, but sinkholes are rare.

In the mountainous areas underlain by folded rock, sinkholes are common. They occur both in valleys and on ridges, and may be narrow and deep or broad and shallow. The soil often is shallow and full of slabs of weathered limestone. In cleared areas, on the sides of hills, soil slumps are common and expose bare rock. *Karren* (bare bands of limestone) are seldom found in this area.

In the Cumberland and Lebanon Valleys karst features are more spectacular. The rolling surface is pitted by numerous sinkholes, ranging from 10 to 20 feet wide and 10 feet deep to over 100 feet wide and 100 feet deep. The sides of the sinks attain steep slopes but are seldom vertical. Locally several sinks are united to form shallow uvala. Karren are present over much of the valley, varying from isolated, interrupted bands of limestones to areas in which the surface is composed of nothing but low outcrops of limestones along the strike. They are developed to a maximum extent along outcrops of the Beekmantown, Conococheague, Chambersburg and upper Stones River limestones.

Karst features are generally lacking in the areas of marble in the Piedmont. Valleys are broad with gentle slopes, and only occasional shallow sinkholes are encountered. Surface exposures of the marble are infrequent and karren are absent.

Subterranean drainage, characteristic of karst areas, is developed to a small extent in Pennsylvania. The maximum development is in the Nitanny Valley where many streams disappear underground for considerable distance and resurge as large springs.

In the Cumberland and Lebanon Valleys major streams remain on the surface, but smaller tributaries are subterranean except in wet seasons. The subterranean drainage network in this area is extremely complex, and much study is necessary to unravel it. Similar conditions exist in the Kishacoquillas Valley in Mifflin County.

Temperature and Humidity

Three zones of temperature and humidity are encountered in most large caves. The area *first* encountered, close to the entrance, has conditions that approximate those at the earth's surface. The *second zone* extends from just inside the entrance to variable depths in the cave. It has fairly constant temperature and humidity with slight variations due to air currents. The *inner zone*, occupying most of the cave, is of constant temperature and humidity.

The temperature in the inner zone is close to the *mathematical mean* for the immediate area in which the cave lies. In Pennsylvania it ranges from 50° to 57° F. It is, of course, affected by elevation as well as latitude.

Excerpts from an article entitled "Pennsylvania Caves" by R. W. Stone appearing in Proceedings of the Pennsylvania Academy of Sciences, Vol. 27, pp. 167-168, 1953.

Tabulating the descriptions of 200 caves reveals that 40 per cent are in hills and 60 per cent in valleys and that 70 per cent of the caves are in beds of low dip and 30 per cent in beds tilted more than 30 degrees. Of these caves in high-angle beds, 20 per cent are in limestone or dolomites of Cambrian age, 30 per cent in Ordovician strata, and 40 per cent in Tonoloway and Helderberg limestones of Silurio-Devonian age.

Classified by geologic age or member regardless of dip of the strata, 10 per cent of the caves are in rocks of Cambrian age, 53 per cent in Ordovician limestone, about 27 per cent in Helderberg, three per cent in Loyalhanna, and three per cent in Vanport limestone, and four per cent in sandstone.

These figures seem to indicate that caves occur more commonly in Ordovician limestone of low dip in valley topography than in other relationships.

Bone Caves in Pennsylvania[1]

By JOHN DYAS PARKER

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Many people are puzzled by fossil remains found in caves. Frequently the question is asked, "How did the bones get there?" Another question invariably follows: "What is done with the bones after they are found?"

Actually there are several answers to each question. The paleontologist is a cross between a jigsaw puzzle fan and a detective. As he collects the bones he uncovers clues. When he pieces the bones together he completes his puzzle. Armed with his clues and his restored bones, or skeletons, he can then tell a great deal about the climate and geography of the area at the time the animals were living.

When this information is correlated with that obtained from other bone finds, whole pages of the more recent history of the earth are revealed.

In Pennsylvania the rocks were all laid down before the mammals and true birds made their appearance. For that reason caves have assumed a major role in the preservation of animals and later plant remains in the State.

The investigating paleontologist must first determine why the bones are in a cave. There are several agencies that carry organic remains underground. One of these is the habit of some animals to den-up in a cave. Frequently these animals, which are predatory by nature, will carry a victim or a partially eaten carcass to his hideout. When an investigation of Centerport Cave (Berks County) was made for this issue of the *American Caver* we found several lower jaws of hogs in the cave. Each jaw showed unmistakable saw marks or kerfs. Fox droppings and its odor disclosed more of the story. A red fox living in the cave had probably stolen the jaws from a nearby farm where its owner had slaughtered several hogs a few months before.

While mapping Guthsville No. 1 Cave (Lehigh County, p. 112) a grotto heaped with the remains of chickens was found. Closer inspection revealed signs of a skunk which evidently was pillaging a nearby chicken farm. In both these cases there were tooth marks on the bones.

Occasionally an animal that frequents caves dies underground and the body eventually becomes skeletonized as evidenced by several dead bats found still clinging to the roof of Aitkin Cave (Mifflin County), near Siglerville.

Photo by C. E. Mohr

Fig. 1—Traps in the form of sinkholes account for several deposits of fossil animals. Bootlegger Sink, York County.

[1]I wish to thank Dr. H. Radclyffe Roberts, Director of the Academy of Natural Sciences for allowing access to material in the Paleontological collections and to Mrs. Venia T. Phillips, librarian of that institution, for turning over to me numerous papers of the S. N. Rhoads and Charles Wheatley collections. Thanks are also due Brother G. Nicholas, of La Salle High School, Cumberland, Maryland, for granting access to unpublished material on the Cumberland Bone Cave.

Fissure traps may also account for fossil remains. Some deep pot-hole type caves are natural traps which allow animals to either step or slide into a fissure from which there is no return. The animal then perishes of hunger and exposure if not killed by the fall.

An illustration of a cave acting as a trap came to the attention of the author at Mongold (Elkhorn Mountain) Cave in Grant County, W. Va. A female skunk led a file of young across a plank over the entrance and the third one from the end fell off the plank into the abyss. The last two skunks in line, blindly following the one in front, also plunged off the plank. A few days later, during a routine exploration, the cleaned skeleton of one skunk was found at the bottom of the pit, together with two live animals. One of the living ones was very weak but was attempting to eat its companion who resisted so feebly that it was killed and partially devoured before the exploring party returned to the surface.

Sometimes water is a transportation medium. If an animal dies or is killed and perhaps partially eaten in a surface stream bed that leads underground, sooner or later floods will probably wash the bones into the cave. They may be single bones or only partial skeletons deposited in cave clay, usually with water-worn pebbles. Often the bones in deposits of this kind are broken by the water and rolling rocks. Also they may have been weathered on the surface from exposure to the elements. Finds of this type never consist of articulated skeletons, and seldom are the skeletons complete. A deposit of this type found in 1871 at Port Kennedy Cave (Montgomery County), yielded the largest deposit of fossil bones yet uncovered in Pennsylvania. Excavations were carried on during much of the last half of the 19th century.

Primitive man also carried bones into caves. This type of deposit can be recognized because the savages in charring the bones and cracking them to suck out the marrow, often threw them together with firestones, implements or charcoal into the bone middens. Durham Cave (Bucks County), near Riegelsville, contained examples of such deposits.

Modern man, too, is responsible for bones being found in caves. An unnamed cave of the Baker Cavern system is located on the Reed farm, Williamson, in Franklin County. In its entrance pit was found a huge pile of bones. Investigation disclosed that all the bones were those of hogs. Further inquiry revealed that many years ago a farmer had destroyed all the animals when they were stricken with hog cholera and had thrown the bodies into the cave.

Almost every sinkhole between York and McConnellsburg and from Carlisle to the Maryland line holds horse or cow bones. During the Gettysburg campaign of the Civil War farmers drove their herds into sinkholes to hide them from the Confederate cavalry. In many cases the animals were slaughtered on the spot to keep them from Confederate hands. Reichards Cave, Waynesboro (Franklin County) was discovered when D. L. Reichard and his son found bones of horses known previously to have been killed in a sinkhole on his property. McCoy Cave, Edenville (Franklin County), had similar use. Members of the McCoy family have told of their parents hiding their livestock in sinkholes during a cavalry raid.

Occasionally spelunkers add to the bones in caves. In Schofers Cave near Kutztown (Berks County), several breastbones of birds were found. They proved to be chicken bones discarded from the lunch of former work parties.

Pennsylvania is most fortunate in possessing several important "bone caves". The first major work in interpretation of their contents was by Titian Peale, the famous painter who deposited many of his finds in the Academy of Natural Sciences of Philadelphia. In 1834 the botanist Constantine Schmaltz-Rafinesque explored Durham Cave, near Riegelsville (Bucks County), before quarrying operations had started there. Dr. Joseph Leidy was probably the first real speleologist in the State. The initials of Prof. Leidy and his famous student, Prof. Edward D. Cope, were found in several caves thought recently to have been opened for the first time. The fruits of the pioneer Pennsylvania cave explorations of these men as well as those of Dr. H. D. Rogers, Charles Wheatley, S. N. Rhoads and the early Pennsylvania Geological Surveys are all deposited at the Academy of Natural Sciences of Philadelphia.

The most important bone cave in the State was undoubtedly the cave usually called Port Kennedy Bone Cave, Port Kennedy (Montgom-

ery County). This fissure cave in the side of the Archibald Erwin quarry at Port Kennedy is now under water. It was first described by Charles Wheatley of Phoenixville who removed bones through the 1870s. These were also deposited at the Academy of Natural Sciences of Philadelphia. Wheatley's work stopped when he reached

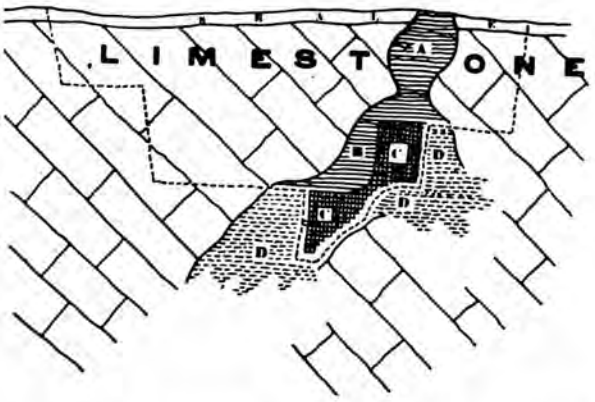

Fig. 2—Diagram of the Port Kennedy Bone Cave as pictured by H. C. Mercer (1899) showing, by shading, the supposed shape of the cave which was 20 to 30 feet wide at the mouth. It was excavated to a depth of 50 feet as follows: A—by Wheatley in 1871; B—by Dixon and Rhoads in 1874; C—by Mercer from 1894 to 1896; D—portion left untouched because of excessive and increasing influx of water in 1896.

the water table. By 1894, however, the water level had been lowered in the quarry and D. N. McCadden and S. N. Rhoads reopened the pit. In 1895 Dr. S. G. Dixon took over the project and in 1896 he turned the field paleontology over to Dr. H. C. Mercer. Prof. Cope described the fauna of this cave. They removed 300 tons of bone material and clay before the water seepage equaled the capacity of the steam pumps. Rhoads estimated that Wheatley and he had removed another 300 tons. When the operation was abandoned Mercer estimated that only one-third of the bone deposit had been worked. Many specimens of 53 species were recovered from the cave, of which 18 species were claimed new to science.

Recent explorations in this area in the caves of the Valley Forge system by James A. Fowler, William R. Murphy and the author have revealed no similar deposits in nearby fissures. The material in the Port Kennedy fissure is now buried under tons of tailings, water, and lime-sludge waste from the Ehret Magnesia Manufacturing Company plant.

In the Frankstown Quarry, Frankstown (Blair County), workmen uncovered a bone filled fissure in 1907. These bones were exhumed by members of the Carnegie Museum staff under O. A. Peterson who described a fauna of 37 species of which 3 species were said to be new to science. They were deposited in the Carnegie Museum collection. The cave has since been quarried away.

Durham Cave, previously mentioned, has been explored by several parties. This site is particularly interesting because it was the storeroom of a Lenape Indian village as late as the 1720s. For this reason several paleontological and ethnological expeditions were conducted there. The major part of the cave has been quarried away, the only portion remaining being the "Queen Esther Room" and the rear portion of the main room. The author and M. Girard Bloch, recently prospecting the site, were nearly crushed by a huge rock, the size of a large auto truck, which fell from the roof without warning. The prospect was terminated at once and the cave has been posted as unsafe. The best work on this cave was done by Rogers and Leidy. Mercer reopened the exploration and added many species to previous finds. Some of Rogers' specimens were destroyed in a fire at Lafayette College but all the rest were deposited in the Academy of Natural Sciences of Philadelphia.

Hartman Cave, Stroudsburg (Monroe County) was prospected by T. D. Paret in 1887 and many bones were removed. This material

Photo by C. E. Mohr

Fig. 3—An accumulation of clay and bones exposed by undercutting by cave stream during flood. Bootlegger Sink, York County. These bones are all of recent species — not more than a few hundred years old.

is also deposited, in part, at the aforementioned Academy.

In 1947 members of the Pittsburgh Grotto and the Pittsburgh Explorers Club visited the New Paris fissures, New Paris (Bedford County) where in one they found an American Elk. This was removed by a scientific party from the Carnegie Museum in Pittsburgh under the direction of J. Kenneth Doutt. This skeleton, now deposited in the Carnegie Museum, was entire, being the only one found in this area, although skulls were found in several caves.

While compiling material for this issue of *The American Caver* the New Paris fissure was again visited and an opossum in an advanced state of putrification was found at the spot where the elk had been exhumed; a fossil in the making.

In 1950 Bernard Smeltzer and the author found bones in a rocky matrix in Bootleggers Sink, Emigsburg (York County). These were associated with recent land snails. Dr. George Gaylord Simpson of the American Museum of Natural History confirmed our determination that they were the bones of "recent" animals and not fossils of great age.

Photo by Academy of Natural Sciences of Philadelphia

Fig. 4—Reconstructions of animals from the Pennsylvania Pleistocene. 1. Mastadon. 2. Giant Beaver. 3. Great Bison. 4. Sabre-toothed Cats. 5. Cave Bear. 6. Giant Sloth.

When workers of the Western Maryland Railway, in 1912, blasted a cut for their right of way near Corriganville (Allegany County), Maryland, just four miles from the Pennsylvania line, they uncovered a bone cave of great interest. Originally worked under the direction of J. W. Gidley of the U. S. National Museum and later by C. Lewis Gazin of the same institution, excavations are now being extended vigorously by Brother G. Nicholas under a large grant provided by the Western Maryland Railway. This fissure cave has yielded 52 species of which 12 species were considered new. Much of this material is under study as this article is written. The U. S. National Museum, Washington, D. C., is the depository for the original collection of bones from this cave. Present finds are being deposited in the Carnegie Museum. Undoubtedly these same species of animals also lived in what is now Pennsylvania just a few miles north of the cave.

By utilizing the information thus gleaned from Pennsylvania and nearby States we cannot help but arrive at several interesting conclusions about the environment in which these prehistoric animals lived. Crocodiles, tapirs, peccaries and sloths as found in Durham, Hartman, Port Kennedy and Cumberland caves were subtropical animals. Modern tapirs and peccaries live in Central America. The prehistoric climate, therefore, must have been fairly warm or otherwise these animals would not have been able to live in this area. Undoubtedly these animals lived here before the last ice sheet covered the northern part of North America during the Pleistocene period. Had they occurred later than that time we would not still see remnants of this ice invasion in existence. On the other hand the musk-ox and caribou are subartic animals and must have lived right at the southern extremity of the last ice sheet.

The bison, elk, horse, antelope, camel and sabre-toothed cat indicate an eastward extension of the fauna of the midwestern plains as we now know them. We know from other fossil finds that many of these animals were extinct before the ice age ended.

The mastodon, bear, sloth, porcupine and giant beaver all needed woods with much foliage. The inference is that much of Pennsyl-

vania was covered by woods during an interglacial period, prior to the last glaciation.

Other animals live in a cooler climate today, as is true of the wolf, moose, lynx and grizzly bear. These animals probably were post-glacial in their appearance in Pennsylvania. Of course their relative locations within the deposits would tell the story but unfortunately not all the workers kept accurate records of the depths at which various bones were found. The earlier workers were trail blazers from whose mistakes we must profit. A sufficient amount of research of this nature has been completed throughout the country for us to be certain that there were several separate encroachments of ice from the Hudson Bay region. We are living at the end of one of these ice ages today. Between these several glacial invasions the weather during interglacial times was much warmer than at present. During those times Pennsylvania suffered invasions of South and Central American flora and fauna just as our southwestern states are beginning to do at the present time. The spread of the armadillo in recent years has been exceptionally rapid.

What should you do if you find bones in a cave? Digging cave fossils is not an easy task. Bones are sometimes so soft that they powder to the touch or are easily squeezed out of shape. Many moulding and hardening processes must be used to treat the bones before they are disturbed. Special tools and special knowledge are needed. If you find bones *leave them for an expert to exhume*. Do not take anything out of the cave yourself but write to the Academy of Natural Sciences of Philadelphia. That institution will put you in touch with a paleontologist who can supervise the work and you will be given the credit for the discovery.

Animals That Live in Pennsylvania Caves

By CHARLES E. MOHR

Director, Audubon Center, Greenwich, Connecticut

All Photos by the Author

There are no blind salamanders or eyeless fish in Pennsylvania caves, no white crayfish or blind beetles. Too recently the glaciers ground to a halt almost on top of this State's northernmost caverns. The icy waters from the great ice sheets must have inundated them and quenched any life that previously existed there. Caves that might have escaped the glacial flood waters existed under virtual refrigeration too long for life to have persisted there.

The last glacial period, the Wisconsin, ended some 10,000 years ago, but the present interglacial period has been far too short for the evolution of many new cave species. A few tiny, white, eyeless creatures are found in Pennsylvania caves, but no back-boned animals have become exclusively cave dwellers as they have in more southern regions never exposed to glaciation.

Our cave life is interesting, even though it is much less varied and spectacular than that of the Mammoth Cave area of Kentucky, for instance. Bats of half a dozen species winter in certain of the State's caves. Indeed there are few of the 260 or more caves in which at least one species of bat can not be found during the extended hibernation period.

Even the lights and disturbance of the commercial caves are insufficient to prevent a few bats from seeking winter quarters there. As many as 500 bats hibernate in Woodward Cave, a situation that actually attracts some tourists. So widespread has the interest in bats become through articles in major national magazines that most people welcome a chance to observe the remarkable little mammals when they are inactive.

A reasonably close-up view of a hibernating bat leaves little ground for alarm. Stories of bats getting in women's hair, of them being covered with vermin are quickly recognized as superstitions. Their tiny size and the softness of their fur inspire the onlooker's confidence, and their well known ability to navigate by "sonar" in total darkness wins additional respect for them.

Pennsylvania's populations of cave bats have been studied continuously since 1930. The more important bat caves, Woodward, Stover, and Aitkin, I have visited at least once every winter for 23 years, a total of about 50 visits to each. Many other caves, chiefly in Centre and Mifflin Counties have been included repeatedly in the winter round-ups. More than 100 of the State's caves have been included in this search for cave life, but periodic visits have been narrowed down to less than a dozen caves and two mines.

For a period of five years most of my cave trips were made in the company of Kenneth N. Dearolf. Our combined findings totalled 15 species of vertebrate animals and 126 invertebrates. Several additional species have been found in the last few years.

While most of these animals do not meet the criteria for true, permanent cave inhabitants, many of them find safety underground, security from freezing temperature during winter, or in summer, against deadly dryness and heat.

Favorable Conditions

What are the conditions that make a cave a kind of "underground wildlife sanctuary"? As Davies points out elsewhere in this Bulletin, *temperature* except in the "outer" zone is relatively unfluctuating, in the "inner" zone amazingly constant. The same conditions prevail with respect to *humidity*.

This *uniformity of climate*, with high humidity and low temperature (50-57°F.), protects the cave dwellers against dessication, and permits a lowered but constant rate of metabolism. Aquatic species such as larval salamanders, isopods, amphipods, and planarians also are protected against fluctuation in water temperature. Furthermore, they rarely if ever are left "high and dry" by declining water levels, so extensive is the subterranean reservoir system.

Complete *absence of light* is the most obvious feature of the cave environment. It makes sight superfluous, provides one of the essential requirements for *hibernation* (along with silence and

Fig. 1—Mold growing on droppings (scats) of Raccoon, in Woodward Cave, Centre County.

low temperature); and eliminates green plants as food sources.

Cave dwellers would be without food, if it were not first *introduced* in the form of:

1. Bat guano and droppings of other hibernators or visitors.
2. Wood, leaves, twigs, and seeds, including the mycelia and spores of fungi and molds which may develop luxuriantly in the absence of light.

Living and dead cave dwellers also are important sources of food.

Since many cave entrances are so situated that wood and other debris neither falls into them nor is carried in by flood, bat guano is the basis for most cave *food chains*. Where bats are numerous the guano supports a variety and abundance of life, particularly where permanent bodies of water exist. Larger cave creatures devour the more minute forms. The largest, cave rats and bats, regularly venture outside the cave to feed. Cave crickets and salamanders do so at least part of the time.

The fact is that most of Pennsylvania's cave fauna can be found regularly in cellars and beneath sheltered rock ledges—places where living conditions are cave-like. Most of the insects found in caves (see Frost's article elsewhere in this Bulletin) as well as most of the myriapods and molluscs are either *temporary* (hibernating) dwellers there, semi-cave inhabitants, and strays or chance visitors.

Among the hibernating insects are three species of moths, including the familiar, pink *Scoliopteryx libatrix,* which is found in Europe as well as in North America. Much less common are the moths *Plathypena scabra* and *Hypena humili.*

What appears to be a hibernating honey-bee with a single pair of wings instead of two pairs, is actually a "flower-fly", *Eristalis tenax.* Sometimes a dozen or more will be found crowded together in a crevice in the twilight zone of a cave.

Both *Culex* and *Anopheles* mosquitoes winter in caves, but they are outnumbered by fungus gnats, *Sciara,* which can be recognized by their curved hind legs which hang down, not touch-

Fig. 2—Fungus mycelium spreading out from decaying log from which it draws its nourishment. Right—Fruiting bodies of fungus—mushrooms.

ing the ceiling or wall. These latter are found in caves throughout the year.

Most familiar insect underground is the so-called cave "cricket", actually a type of "long-horned" grasshopper or katydid. The beautifully marked *Ceuthophilus* is more common than the pale yellowish brown *Hadenoecus puteanus,* related to the true cave-dweller of Kentucky and Tennessee.

Fig. 3—Cave cricket found in most caves is the graceful **Ceuthophilus.** Found also in cellars and under logs.

Daddy-long-legs or harvestmen also are seen frequently, occasionally in masses numbering several hundred. A dense, interlocking group of them sometimes performs a pulsating dance and produces an odor suggestive of a distant skunk.

The spelunker who wishes to find cave insects will travel slowly, inspect the walls and ceiling of the twilight zone, and look for wet spots on the floor, especially for rotting wood. Cave life is far more abundant than an hour's search would indicate. Entomologists generally set traps for cave insects.

A large vial containing a saturated solution of picric acid (or some other preservative) is buried up to the rim in the floor of the cave. A smaller vial containing bait is suspended inside.

Fig. 4—Female cricket lays eggs in soft earth with sword-like ovipositor. This is the rarer type, **Hadenoecus.**

Limburger cheese or decaying meat are excellent baits. A flat rock, placed over the vial but elevated by several small stones permits creatures smaller than crickets to reach the vial, fall in, and be preserved. Periodic visits (at intervals up to 6 weeks) are made to collect the "catch". An aspirator also is useful in collecting soft-bodied, fragile insects.

Aquatic Life

The cave creatures most modified to cave existence are those living in the water. Most familiar is the *horizontally* flattened isopod, *Caecidotea* or *Asellus,* up to half an inch long, generally white and eyeless. Isopods occur commonly in underground waters, especially if wood or guano is present. Amphipods, *Synpleonia, Gammarus,* or *Crangonyx,* related to the "sand fleas" of the seashore, are hump-backed and *ver-*

Fig. 5—Harvestmen sometimes gather in large numbers, as in Veiled Lady Cave, Centre County.

Fig. 6—Amphipod, left, is flattened vertically. Isopod, right, generally larger, is flattened horizontally.

tically flattened. They are less common than isopods and harder to see.

Most remarkable of aquatic creatures are the flatworms or planarians. Though related to the injurious, parasitic liver flukes, these cave forms are free-living and harmless. They can stretch their flattened white bodies into many shapes as they alternately spread and stretch, twist and glide. A new species, *Speophila pricei,* first found in Refton Cave, has been found in a number of eastern and central Pennsylvania caves, while another species has just been discovered in western Pennsylvania.

Crayfish, occasionally found in caves such as Arch Spring which have streams continuous with surface drainage, show no special modifications.

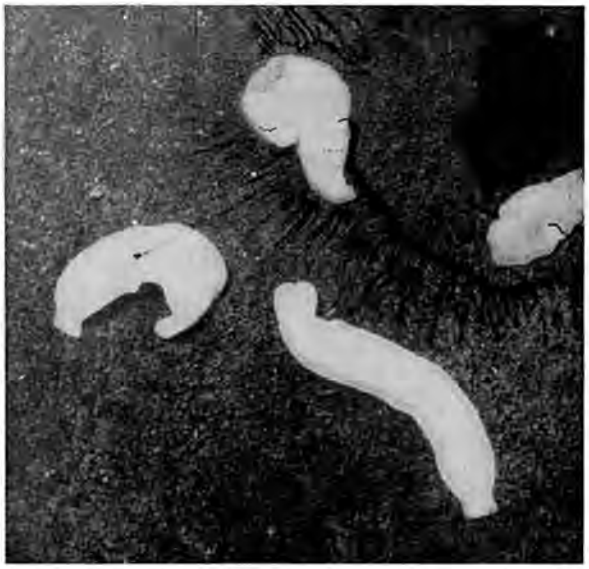

Fig. 7—Blind, white planarians change shape as they flow along.

Cave Vertebrates

Back-boned animals are larger and more conspicuous than the invertebrates. But with the exception of bats they are rare indeed. Blind, white fishes have been reported at intervals but always have proved to be half-starved, pale, eyed fishes, often washed into caves during floods and trapped there as the waters subsided.

A single blind fish is known from Pennsylvania. It was a blind Catfish sent to Edward Drinker Cope in 1864, from the Conestoga Creek, Lancaster County. While some thought that the fish came from a subterranean stream feeding into the Conestoga, ichthyologists say that blindness is by no means extraordinary in this group of fishes.

Reptiles are not natural cave dwellers but I have seen a Garter Snake wintering as much as 300 feet underground, in Ecton Mine. Turtle shells and snake skeletons are found often enough in pit-type caves to indicate that reptiles die quickly if they enter caves and can not get out again. Farther south snakes are occasionally found around cave entrances and have been known to hibernate in caves.

Amphibians

Frogs occasionally spend the winter in caves where there is running water. Usually it is the Meadow or Leopard frog, *Rana pipiens.* In addition to this species I have found large Bullfrogs. *R. catesbeiana,* and Green Frogs, *R. clamitans,* 300 feet underground in Ecton Mine. Occasionally in summer they are found a short distance inside, evidently retreating from heat and dryness outside. In Refton Cave's underground lake several large Wood Frogs, *R. sylvatica,* seem to find an ample supply of food, probably chiefly in the form of insects dropping into the sink-hole entrance.

Salamanders are normally nocturnal and require a wet, damp, or at least moist environment. Caves would appear to offer ideal quarters. Actually, salamanders seldom are found in caves in this State. Occasionally Red-backed Salamanders, *Plethodon c. cinereus,* and Slimy Salamanders, *P. g. glutinosus,* are found beneath wood, leaves, or stones inside the entrance. The Two-lined Salamander, *Eurycea b. bislineata,*

may be seen along underground streams. Seldom do these salamanders measure over three inches in length.

A larger, and more truly a cave species is the so-called Purple Salamander, *Gyrinophilus p. porphyriticus.* Often five or six inches long this robust salamander is actually salmon-colored. The larvae have gills and live in the water at least two years. The adults may be found in or out of water. I have seen them most often in the Johnson Caves in Mifflin County.

Herpetologists know that the Long-tailed Salamander, *Eurycea l. longicauda,* lives in wells and springhouses, and that it occurs in several mines where there is running water. In actual caves, however, it is rare.

The largest cave population known, about 100 individuals, was revealed by the late George Burhans in a Maryland cave, during the NSS Convention at Hagerstown in 1952. A larger population, totaling more than 300 salamanders, occupies the Ecton Mine near Valley Forge. Observations made during nearly 60 trips, from 1941 to 1948, resulted in the discovery of the eggs, never previously known, and the recognition of an abrupt emigration of the salamanders from the cave in April and May and a return in fall. The winter is spent in the cave.

Fig. 8—This Slimy Salamander is the species most often found in caves in this State.

Fig. 9—Largest cave-dwelling species is **Gyrinophilus.**

Fig. 10—This Long-tailed Salamander sometimes assembles underground in great numbers.

Even with so large a population, specimens were not collected. Far more can be learned about salamanders in caves, once they are positively identified, by repeated observations in their natural environment. Courtship, egg-laying, length of larval life, rate of growth, feeding habits, and migrations all need further study which can best be carried out under cave conditions. Most cave populations are too small to justify *any* collecting.

The first cave record for the Red Salamander, *Pseudotriton r. ruber*, was established in December 1953, in Penns Cave. It was seen along the mud bank within a foot of the stream, more than 100 yards inside the cave. It retreated into a tunnel whenever approached.

Fig. 11—Big Brown Bats hang in the coldest parts of caves. This is the biggest cave bat.

Bats

Six species of bats are known from Pennsylvania caves:

1. The Big Brown Bat, *Eptesicus f. fuscus*, largest (12 inch wingspread; 44-48 mm. forearm), hardiest species, rarely entering caves before December, and leaving by March. This is the most erratic species in the State. Colonies of 200-300 have been seen during a few winters in Woodward and Maitland Caves, but generally no more than a score are seen.
2. The Pipistrelle or Pygmy Bat, *Pipistrellus subflavus*, smallest common bat (9½ inch wingspread; 33 mm. forearm) is readily identified by its yellowish fur, *pinkish skin* membrane on arm, and solitary habitat. It hibernates from September to May, and can be seen in almost every cave. Populations of a hundred or more are unusual, though much larger numbers have been found by Wayne Davis in a few caves in the mountains of West Virginia.

Four species of little brown bats, *Myotis*, occur in the State:

3. Little Brown Bat, *Myotis l. lucifugus*. Commonest bat in our caves, numbering in hundreds in possibly a dozen caves, and several thousand in Aitkin Cave and in Durham Mine. Forearm: 34-40 mm. Color of fur varies considerably from dull sooty gray to golden brown, generally with a *yellowish cast on the under parts*. Bats of this species have been taken in Durham Mine 13 years, 7 months after they were banded.

Fig. 12—Little Brown Bats hang in loose clusters. Bats hang head downward to rest or hibernate.

4. Least or Leib's Bat, *Myotis subulatus leibii*. Smallest and rarest bat, recognized by pointed black ears, black mask, keeled calcar, and solitary habits. Forearm: 28-32 mm. Most specimens show a golden, silky fur but some are rather sooty. Though seen occasionally in caves in other parts of the State, more than 90% of all Pennsylvania records have come from an area in Centre and Mifflin Counties which falls within a circle with a 22-mile diameter. The only other known wintering concentration, discovered by Hitchcock, occurs in a few caves in eastern Ontario, 325 miles to the north. The summer range remains largely a mystery.
5. Social or Pink Bat, *Myotis sodalis*. Though difficult to recognize as an individual, groups of this species are easily spotted through their characteristic matlike clusters. They are so tightly packed that little more than their faces are visible, and their pink (rather than dark brown) lips are quite noticeable. Wing membrane on arm is more sooty and fur has a pinkish or purplish cast (never yellowish brown). Forearm: 37-40 mm.

Fig. 13—Three solitary species: Left—A Pygmy Bat or Pipistrelle, covered with moisture, making it look white. Center—Little Long-eared Bat. Right—Least or Leib's Bat. Not precisely to same scale.

Three colonies of these bats known 20 years ago have disappeared. Penn's Cave and Aitkin Cave each had about 2000, Hipple Cave 500. Disturbance by tourists in the two commercial caves, by numerous spelunkers or by floods in Aitkin Cave, may account for their disappearance. Populations in Kentucky appear to have remained constant.

6. Little Long-eared Bat, *Myotis keenii septentrionalis.* Seen in small numbers, chiefly during spring and fall, possibly during migratory movements. Recognized by larger ears—when gently laid forward along the head they project 2-3 mm. beyond the nose and are more rounded than pointed at the tips. Fur is more silvery and silky than on *M. lucifugus.* Not more than ten individuals have been reported from a Pennsylvania cave though it is a common bat during summer. Winter colonies have been found in New England and eastern Canada.

Fig. 14—Tightly clustered Social Bats in Penn's Cave, Centre County. 1933.

Best chance for a "find" among cave bats is the Lump-nosed or Long-eared Bat, *Corynorhinus r. rafinesquei,* (ears *more* than one inch long). A specimen is reported to have been sent to S. F. Baird in Washington before 1860, from Meadville, Crawford County, an area without caves. It has recently been discovered in a cave in southern Ohio, and does of course, occur commonly in several caves in the mountains of Pendleton County, West Virginia, but *only at elevations over 2000 feet.*

Protecting Bat Colonies

There seems little doubt that bat colonies suffer if disturbed frequently during the hibernating period. If completely aroused, bats fly about using up some of their energy reserves represented by accumulated fat beneath their fur. It is quite possible that too many such unseasonal flights might exhaust their reserves before flying insect food is again available.

Many of the bat colonies in the State are being studied by speleologists licensed as cooperators by the U. S. Fish and Wildlife Service. They are being visited at planned intervals and should not be too closely approached at other times.

Data which can be gathered by the non-bander include the following observations which are sorely needed:

Time of arrival and departure: very little is known about the beginning and end of the hibernation period, especially the rate at which colonies build up in fall or dwindle in spring. No cave colonies have been reported during summer in Pennsylvania.

Shifts of roosting places within the cave: especially in relation to season and outside (as well as cave) temperatures.

Causes of mortality: virtually untouched by predators, bats may be trapped by rising waters (60% of the Aitkin colony is believed to have perished in the "Deluge Underground" in November 1950 described on page 34 *et seq.*) or frozen in early cold snaps. Unexplained concentrations of bat bones have been found in several caves.

Obviously, records taken on a series of visits are more significant than those for single trips but even isolated observations may be valuable.

Other Mammals

Next to bats, bears are most often associated with caves in the public mind. But not since the Ice Age have bears commonly been cave dwellers. Instead of caves, they pick cavities under logs, overhanging ledges, and even big hollow tree stumps to snuggle into for their winter of semi-hibernation.

Most splunkers have detected the unmistakeable evidence of cave-exploring Skunks, and Raccoon scats (droppings) and tracks are frequently seen well inside caves. Walking into Hartman Cave one warm spring day I was nearly knocked down by a White-tailed Deer that bounded past me from inside the cave. Probably it had sought shelter from the sun.

The commonest cave rodent by all odds is the Allegheny Cave Rat, *Neotoma magister*, familiar in the West as the Pack or Trader Rat. Many of the caves in central and western Pennsylvania show evidence of this interesting native rat—its dome-shaped nest of red cedar or wild grapevine bark, its "museum" a collection of brightly colored paper, metal, and other pilfered objects, plus stored, dried ferns, mushrooms, nuts, and other food items, and possibly, less commonly found, its isolated "latrine".

The Cave Rat is cleanly, inquisitive, and relatively fearless. Many a cave explorer has approached within arm's length of one. In Wind Cave, Lancaster County, twenty years ago I watched 40 persons file by a ledge where a Cave Rat sat, seemingly fascinated by the unprecedented parade.

Fig. 15 — Cave Rats are cleanly, native rodents, not to be confused with the imported Norway Rat, carrier of disease. They are active at night.

Neotoma was known first from fossils collected from caves near Carlisle and Harrisburg by Spencer F. Baird for the Smithsonian Institution in 1857. The first specimens in the flesh came from Lewis' Cave Rocks, near Pine Grove Furnace, in 1893 and were long believed to represent a different species than the fossil Cave Rat. Extensive studies by Earl L. Poole proved the supposedly extinct form and the present day one to be identical. They have, however, disappeared from the limestone caves of eastern Pennsylvania. They still may be found at the Pinnacle Grotto and subterranean crevices at Hawk Mountain.

A smaller rodent which superficially resembles the Cave Rat is the familiar White-footed or Deer Mouse, *Peromyscus leucopus noveboracensis*. These spry little animals are regularly seen in a number of caves, reaching really precarious perches. In Tippery Cave I was astonished to see a White-foot scamper up a vertical wall and over a projecting ledge, to pop into a soft, grass-lined nest.

Birds

Screech Owls are the only bird which enters caves with any frequency. I have seen one perched on a stalagmite more than 100 feet inside Woodward Cave, and occasionally found them in caves outside the State. Barn Owls have roosted and possibly nested in the pockets in the ceiling of Durham Cave.

The most familiar bird around caves is the Phoebe which fastens its nest to the rough walls, sometimes well within the twilight zone. Audubon wrote of finding Phoebes in a cave (actually Ecton Mine) in 1803, banding the young with silver thread, and finding two of them the following spring—the first bird banding in America.

In conclusion, remember that cave fauna is one of our rarest speleological resources. It is perishable and irreplaceable. It is more important that cave inhabitants be left to reproduce and maintain their kind than to add to the already adequate museum collections of most species. The spelunker's best contribution is to observe and describe (and photograph, if possible), and to make his report to the specialists. He must then rely on the judgment of the expert as to how the study of the cave dweller can best be carried forward.

Fig. 16—Phoebes build a nest of mud and cover it with moss. It may be located well within the entrance.

Cave Insects

By DR. S. W. FROST

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All Photos by Charles E. Mohr

Insects are of ancient origin, dating back at least to the Carboniferous period. They perfected a way of living hundreds of centuries before man, in fact, before any of the higher animals existed. It is not strange that some, the most versitile of all animals, became adapted to the cave habitat. Those that succeeded in adjusting themselves to this peculiar ecological niche are known as cave or cavernicolous insects.

A cave is a portion of the subterranean environment and one would expect similarities between the species found in caves and those that live in the soil. Uniform temperature, relatively high humidity and complete absence of light, except at the entrance of caves, are factors common to both groups. The scarcity of food in caves and ample room for movement create new problems for the cave species.

Fig. 1—The author Stuart W. Frost, on one of his numerous insect-collecting trips.

Cavernicolous insects usually occur among species that naturally live in the soil or are subterranean in habit. They are by nature photonegative. Their habits are those of scavengers or predators. Such species find food more readily in caves. They often show a tendency towards a wingless and an eyeless condition. Roaches, for example, characteristically shun light. Their near relatives, the cave crickets, likewise shun light and are subterranean in habit. Among the ground beetles (the Carabidae) we find a similar condition. Some of the most interesting cave insects occur in this group. The cave-inhabiting species have not essentially changed their habitat. They have become more specialized for their existence in the dark. In a like manner the spring tails (Collembola) and the bristle tails (Thysanura) are found commonly in the soil, are exceedingly common in caves, and are everywhere photonegative.

A distinction should be made between the cave insects and others that may occur in caves. All loosely may be termed cavernicolous species. Four groups are recognized, true cave species, semi-cave insects, temporary visitors and accidental inhabitants.

True cave insects are relatively scarce. They have existed in caves for millions of years and have become modified in form and structure better fitting them for this habitat. Eyes are often reduced or lost. The eyes of the Pselaphid *Macharites mariae* are said to be present or absent depending upon the distance it lives from the entrance of the cave. Cavernicolous species are often lighter in color but are never white. The appendages are often long and attenuate. The Carabidae usually have long legs and antennae. The crickets have conspicuously long antennae. There is a tendency for the cave species to become more hairy and to have better developed tactile organs. Wingless species are especially noticeable in the Orthoptera and the Mecoptera where wings are usually well developed in the terrestrial forms. In the Carabidae the second pair of wings is absent and the elytra are fused down the back.

True cave insects are confined to a permanent existence in one cave or a series of closely connected caves. They are not found in the more

recent, post-glacial caves such as the limestone caves of Pennsylvania. The northern limit of cavernicolous species in Europe coincides with the southern limits of glaciation and the same

Fig. 2—Bernard L. Smeltzer collecting cave insects with an aspirator.

no doubt is true in North America. Ancient caves such as the Carlsbad Caverns of New Mexico, Mammoth Cave in Kentucky or Wyandotte Cave in Indiana, are each inhabited by different species.

Semi-cave species are found frequently in the caves of Pennsylvania. They include species that are found commonly in dark places such as deep crevices in rocks, in old sheds and buildings. They can readily adapt themselves to caves and are frequently referred to as cave species. The cave cricket *Ceuthophilus gracilipes* and the so called cave spider *Meta menardii* are excellent examples They are found in practically every cave in Pennsylvania and occur equally as commonly in suitable dark places outside of caves. Many of the Collembola and beetles of the families Carabidae and Staphylinidae also fall in this category.

Temporary inhabitants of caves may also be numerous. They include hibernating species such as mosquitoes, moths, harvestmen, and numerous flies. These insects are usually found near the entrance of the cave, often in the twilight area. They may occur in the darker parts,

Fig. 3—Cave spider, **Meta menardii**, also dwells in cellars.

especially where the temperature is less severe than that outside the cave. The parasites of bats are also considered as temporary visitors.

The accidental inhabitants of caves are usually most abundant. Many insects are washed into caves by streams. Even immature may flies, stone flies and dragon flies may gain entrance in this manner. They usually develop despite the darkness and the adults emerge. Such insects may live for a considerable time and succeed in escaping from the cave, or they may perish there.

Dearolf (1941) lists 126 species of invertebrates from the caves of Pennsylvania. The Arthropods constitute the largest proportion of this cave fauna. Seventeen species of Arachnids have been taken, of which 57 per cent are spiders. Of the 79 species of insects from Pennsylvania caves 44 per cent are Diptera, 22 per cent are Coleoptera and 18 per cent are Springtails.

The inhabitants of caves should be considered also from the standpoint of number of individuals. The springtails are probably the most numerous. Certainly they are the most frequently seen insects in Pennsylvania caves. They are minute scavengers and compete for the scanty food supply found in caves. When a small bait trap is buried in a cave, its top level with the floor, thousands of springtails can be captured in a few days.

For the species that have succeeded in maintaining themselves in caves, three factors are important; a relatively stable food supply, a uniform and comparatively high temperature and a high and constant humidity.

Fig. 4—Cave moth, **Scoliopteryx libatrix.**

The food that supplies nourishment for cavernicolous insects is often scanty and the source is frequently irregular. It is well to remember that cave species depend upon the fauna and flora of the surrounding area. All cave insects and their food originally came from the outside. Green plants, the food of about fifty per cent of the insects, of course are absent in caves. Roots of trees may extend through the roof of a shallow cave. The dung of larger animals, especially the guano of bats or the feces of rats, is an important source of food. Bats are conspicuous inhabitants of most of the larger caves and guano frequently accumulates in great heaps beneath their roosts. During the summer they leave the caves at night and return with prey, discarding portions which serve as food for insects.

Streams wash in much debris such as leaves, twigs and nuts, adding food for many species. Fungi and bacteria grow on the plant debris which in turn form food for certain species. Collembola and Thysanura feed upon decomposing vegetable matter which is one of the principal sources of food in caves. Some Collembola feed upon colloidal substances carried by the water that seeps into the cave. These insects often collect in large numbers on stalactites and stalagmites to obtain food from their moist surfaces. Roaches may be predacious upon Collembola or arachnids or feed upon decayed matter. An occasional dead animal serves as food for some cave species. The predators and the scavengers thus abound in caves.

The isolation problem is an interesting one. Although cavernicolous insects have been described from many parts of the world, large caves are generally widely separated and species cannot wander from one to another. The distance between caves is an important factor contributing to the development of unrelated species in different caves. Caves are generally more completely separated than islands. Since cavernicolous insects are strongly photonegative and avoid dry atmospheres, the chances for a species to wander from one cave to another are very slight. It is generally believed to be impossible unless the caves have underground connections.

Recently a shrimp (Amphipod) *Gammarus minus tenuipes* was found in Kooken cave near Water Street. This species has been known in West Virginia caves but this is the first record north of that State.

Fig. 5—These flies, found hibernating in several Pennsylvania caves, are easily mistaken for bees but have only **one** pair of wings. **Eristalis tenax.**

History and Legends of Central Pennsylvania Caves

By HENRY W. SHOEMAKER

Pennsylvania State Historical and Museum Commission

In September, 1892, a tawny-haired hazel-eyed youngster met an aged Seneca Indian named Isaac Steele. The wide-eyed boy hung on every word of the venerable redskin's description of the history of the surrounding West Branch and Bald Eagle Valleys. The unquenchable interest inspired by the Indian's stories led to a life-long pursuit of the folk tales and legends of the Pennsylvania Mountains. In the 60 years since 1892 Col. Henry W. Shoemaker has written tens of thousands of words in the Altoona TRIBUNE, in pamphlets and books, about the caves of Pennsylvania, and about their legends. The following excerpts from his writings are reprinted with his permission. He is a past President of the Pennsylvania Cave Men's Club, and an Honorary Member of the Pennsylvania Cavemen's Association.

According to the first settlers of Centre County there was an "upstairs" Centre County and a "downstairs" Centre County. The upstairs part was the farming and mountainous surface of the county; the downstairs, the network of subterranean labyrinths which honeycomb almost all of the eastern part of the county. All kinds of fabulous tales were told to the first settlers by the Indians, of redmen getting lost in caverns of Brush Valley in the north end of the county, and emerging into daylight at the southern end in the Seven Mountains.

These tales were of a profound interest to the medley of races who began to populate Centre County in Revolutionary times. All of them, Ulster Scots, Huguenots, Alsatians, Palatines, Swiss, Waldensians, Bohemians, Spaniards, Portugese, Greeks, Welsh, Jews and Gipsies brought with them some memory of dark, mysterious caverns at their former homes overseas and applied them anew to the endless caves, sinks and chasms which they found throughout Centre County.

Some of these old traditions were transferred intact, others gracefully blended with the cave-lore of the Indians. The redmen of Centre County did not disappear all at once but faded out gradually and not before they had left a goodly store of legends and traditions behind them.

Then there were the stories which sprang up, based on actual occurrences in these Centre County Caves, after the settlers arrived. These should have been history but as written history failed to recognize them they became folklore, which is an historical by-product, or unrecorded history.

The Rev. W. W. Sholl took this writer on his first complete tour of the Centre County Caverns, Penn's, Red Panther's, Mallory's, Veiled Lady's, Red Lick, Lewis' Crawl, Diamond, Blue Rock, Gold Water, Chalybeate, Sulphur, Stepladder, and the rest, in the late nineties. [Ed: A number of these have not been located or recognized today.]

Probably as quaint and curious a cave as Centre County, or any other region holds, is Stover Cave which is between Aaronsburg and Pine Creek in Penn's Valley. It has the advantage of being situated in a deep bowl, until lately hidden by primeval pines and hemlocks and a hundred yards within the entrance one descends by a ladder into a huge chamber.

Dancing in Stover Cave

A dancing floor was built in the amphitheatre of the Stover Cave, and there every Saturday night, winter and summer, the young folks danced far into Sunday morning to the strains of the dulcimore, the dudelsok and the geik. There was only one drawback to the Stover Cave; the few Indians that lurked in the dark coves in the mountains, adjacent to Penn's Valley, knew of it, and being ardent music lovers, would sometimes "drop in" at the dances, arriving by underground paths, best known to themselves and departing as mysteriously as they came. There was always the fear that the red-

skins might betray the secrets of the dancing floor, but it was felt less risky to let them come and go as they pleased than to antagonize them.

Perhaps the belle of Penn's Valley during the last years of the 18th Century was Cassella Dolet, a dark Huguenot girl, who had come to Centre County with her family from the Oley Valley in Berks County.

A young Indian helped her parents harvest. His admiration for Cassella was manifest but Cassella repulsed him with firmness. One night when the dark Cassella repaired to Stover's Cave for the Christmas Eve ball, she was amazed to see the Indian. He whispered something to her, which years afterward she said was that unless she would elope with him that very night to what is now Potter County, he would tell her parents of the whole of the dancing orgies in Stover's Cave. The beautiful Cassella dropped from his arms in a dead faint to the dancing floor. The redskin sprang towards the ladder, shouting in Pennsylvania Dutch, "Once I am out of here I will tell every Preacher in Penn's Valley." In a body, every male and female dancer rushed after the Indian as he scuttled up the steep ladder with the agility of a flying squirrel. Several pistol shots were fired at him, but he gained the outdoors and disappeared into the forest night.

When the excited dancers returned to look after poor, stricken Cassella, the lovely girl was nowhere to be found. Abendunkel had laid his plot well. A confederate was lurking at the subterranean exit to the cave, and when the dancers' backs were turned, he picked her up in his arms, and carried her into the depths of the cave, where another Indian with a torch led the way, emerging with her from Stepladder Cave near Penn Hall. There Abendunkel, who was a swift runner, was awaiting them with an ultimatum. Cassella must go with him to the North, or he would tell her parents. Knowing her parents, she chose the North. The Indian had saddle horses ready, and the long wintry journey began. It ended near the headwaters of the Genessee River.

There Cassella remained an unwilling "white squaw" to the time of her husband's death. Cassella told a respected white family named Clark, who had settled nearby in 1811, that she had not been like Mary Jemison or Frances Slocum, a contented redman's bride, but wretchedly unhappy for half a century and wanted to go to Penn's Valley. She returned and lived there a few years 'till her death at the age of 85.

The disappearance of Cassella Dolet had broken up the secret dancing club, and sent its members back to church. Years later, some of their children secretly relaid the dancing floor in the cave, where they kept it up until about 1870, when a series of revivals swept through Penn's Valley and pictured dancing as being under the devil's own patronage. It was again given up, and became a storehouse for milk and butter.

Mallory's Cave

Mallory's Cave, a few miles east of Rebersburg, in Brush Valley, has also its quota of legends. It is one of the few vapor caves, or hot-air caves in Pennsylvania, and was resorted to by Indians for medicinal purposes. A jet of warm air shoots out into the cave and tempers the water of the underground stream. High up on the side of Nittany Mountain, north of the cave, is a grim old brown-stone farmhouse, once a fort for defense against Indians and Tories.

Veiled Lady Cave

Just inside Veiled Lady Cave, high on the left is a white formation resembling a woman seated on a ledge—the figure for which the cave is named.

The story of the Veiled Lady was told by Prof. J. H. Chatham, the Poet of the West Branch Valley. While teaching in Brush Valley in 1867, he explored the cave with some of his pupils and heard the tale from Grandmother Grenoble.

At an assembly of Indian chiefs with the Swedes, Huguenots, Palatines, and Scotch-Irish to sign papers specifying property rights, the proud Patricia McCochran became suddenly enamored with a young stalwart and handsome Seneca warrior named Strongheart. It was a case of love at first sight, and Strongheart's proposal that she flee with him to his lodge in Canada was accepted. They planned to meet that night at the mouth of the cave.

Patricia eluded her parents and went to the rendezvous as appointed, seating herself on a ledge to await the coming of her lover with his ponies. It was bitter cold and Patricia drew her

heavy veil and cloak about her with some impatience, for this aristocrat never willingly awaited for anyone. But because of her great love and desire, she restrained her impulses and waited. A biting wind chilled her and drifting snow caught on her veil. Her body and then her mind became numb, and her heart turned to stone within her.

According to the legend, Strongheart had approached the rendezvous early, tied his ponies, and proceeded down the slippery path on foot. He stepped on a caltrap, or poisoned barb set there by some white man who hated all Indians, and with a groan of agony put the other foot down, only to have the soft moccasin pierced by another poisoned caltrap. Knowing instantly that his death was near he crawled on hands and knees to the entrance of the cave, hoping to live until Patricia arrived, and that he might die in her arms. But it was early March, Grenoble Run was swollen and pouring into the mouth of the cavern, and the rocks were covered with ice. Strongheart slipped, rolled in the stream, and his body was carried into the cavern, hurtled through the tortuous passage and disappeared far underground to the hidden lake. His last cry of pain and despair can still be heard in the depths of the cavern, and Lady Patricia, his promised bride, heavily veiled, still sits at the cavern's mouth, shrouded in white cave formation.

Woodward Cave

Red Panther's Cave, along Pine Creek, two miles west of Motz Bank, now Woodward, is latterly named for the nearby town. Indians and pioneers alike knew it by the name of an old-time renegade Indian chief. The cave also figures in legends of David Lewis, the famous robber of the Centre County roads who died in Bellefonte jail, July 20, 1820, after having been shot down by a sheriff's posse.

Lewis was considered by some to be a Pennsylvania Robin Hood. "He took it from the rich and gave it to the poor", was a password that admitted him to shelter and assistance in every mountain cabin. Something of a Don Juan as well, Lewis stole the heart of many a young woman, having many a rendezvous within the subterranean vault of Red Panther's Cave with beautiful Daltera Sanry and others. The Indian's story goes like this:

Red Panther was the son of an aged Seneca Chief, whose tribe lived in the Valley of the Beech Tree. The beech tree from which the valley took its name was beloved by the Storm God, and was reverenced by the Indians throughout the entire section. The beech was immune from the lightning of the Storm God, and under it the tribe would gather during fierce electrical storms, knowing that beneath its protecting branches they would find shelter and safety.

Personal triumphs, however, turned the head of Red Panther, and he became cruel and warlike. He respected neither the beech nor the Storm God, and often threatened to destroy the tree to show that he considered himself mightier than the Great Spirit. Finally, upon his return from an unusually successful hunting expedition, the young brave cut down the tree in spite of the pleadings of his aged father. Red Panther then ordered his favorites to cut it into proper lengths, and when this was done, the sticks were carefully laid in a heap and the proud warrior leaned forward to light the blaze himself.

As he did so, a sudden and terrific peal of thunder echoed from the clear sky, followed by a stroke of crimson lightning. The entire tribe was stunned by the shock for an instant, and upon their recovery, the lifeless body of Red Panther was discovered lying across the newly kindled fire. The Storm God had taken his revenge.

Mountain River, the young brave's father, was the first to reach his side, and lifted up his son's body tenderly. Not a mark of any kind was found on the corpse, but life had departed.

Hoping to appease the wrath of the Storm God, the chiefs of the tribe decided to place the body in the cavern in a near-by hillside, which had long been reverenced in religious ceremonials. After prolonged prayer, the mortal remains of Red Panther were taken to one of the largest of the chambers in the cave and placed in state. Chanting the tribal funeral dirges, the guard of honor withdrew, leaving the corpse alone in its natural sepulchre.

After due time, in which all manner of supplication was offered, Mountain River and his chiefs returned to the cave, expecting that the Storm God would relent and restore the young man to life. Instead, they found that water from the roof of the cavern had fallen on the

body and the luxurious bier on which it rested, turning the whole into solid stone. The outlines of the body were preserved perfectly in the rock formation, and fearing another sacrilege, Mountain River and his followers withdrew, leaving Red Panther to sleep his last sleep undisturbed.

Penn's Cave

It is not generally known that the namesakes, or perhaps distant relatives of America's greatest poet, Edgar Allan Poe, were the first white men to own Penn's Cave. A patent for these lands was issued by the Commonwealth of Pennsylvania to James Poe, dated April 9, 1789. James Poe only lived on the Penn's Cave farm a short time, spending most of his days at his homestead in the valley bearing his name in the southern part of Centre County. There is no record that Edgar Allan Poe, during his famous visit to Central Pennsylvania in 1838, ever paid a visit to his namesake at Penn's Cave. Prior to the time of this trip he was residing in Philadelphia, and was on the staff of the "Gentlemen's Magazine." He was in need of money, being heavily in debt, and thought that doubtless his wealthy namesakes in the mountains would help him. He visited Poe Valley, and later crossed the Seven Mountains to Milroy and Lewistown, from which latter town he returned to Philadelphia. He was much impressed with the large cave on the Naginey farm near Milroy, and at the Mammoth Spring on the Alexander farm, not far from Reedsville.

The first story that the Seneca Indian, Isaac Steele, told me as a small boy was "The Legend of Penn's Cave". Briefly related, it tells of the sad fate of the first white man to enter the cave and about the Indian maiden for whom Nittany Mountain and the Nittany Valley are named.

It was a Pennsylvania Huguenot, Malachi Boyer who entered this region about 1748, many years before white settlement had advanced west of Sunbury. He was friendly with the Indians, and became acquainted with old chief O-ko-cho and his tribe who camped on Spring Creek. The chief had seven sons and one daughter, Nita-nee. Malachi found the girl washing a deer hide, and was attracted by her beauty and industry. The liking was mutual and after a clandestine courtship—because marriage between the white and red races was frowned upon—Malachi and Nita-nee stole away one dark night, planning to reach white settlements and there make their home.

The fugitives were pursued and overtaken by the seven brothers, and Malachi was brought back to be tortured. A novel method was employed. He was thrown into the stream at the entrance of Penn's Cave, where the water is said to be 30 feet deep. When he was exhausted by swimming, for the Indians kept him from climbing up on the ledge, he swam back into the dark recesses of the cave and there crawled out of the water. Indians guarded the small exit to the dry cave also, and Malachi swam and crawled about for a week trying in vain to find another exit. When hunger became unbearable, made worse by huge salmon and shad swimming about, and the brothers of Nita-nee repulsed every attempt at escape, Malachi used his last strength to hide himself, and there he died.

When he had failed to appear at either exit for two days his Indian tormentors searched the cave, found his body, and sank it with stones in the deepest part of the underground river.

Kooken--Pennsylvania's Toughest Cave

By WILLIAM DEVITT, III
Batchelor of Science in Mining Engineering, Pennsylvania State University, 1953

No other cave in the State has had as interesting a history in so short a period as Kooken's. None has been so well recorded, thanks to the interest and persistence of the author who spent months running down records and interviewing dozens of persons. As president of the Nittany Grotto he has had a lot to do with the recent discoveries which bring this account down to the present time.

This is the story of Pennsylvania's deepest, toughest, and possibly largest cave. The locale is the Robert Kooken Farm, 2 miles north-northwest of Water Street, Huntingdon County. The time is the summer of 1930.

A geologist, exploring at the foot of the mountain, notices that all the surface streams disappear into a series of sinkholes. No other surface streams can be found until one reaches the Juniata River, a mile and a quarter to the northeast. This indicates the likelihood of a cavern, probably a big one, he tells Mr. Kooken.

The story came to the ears of coal operator William Mines. He agreed to put up the money for some reconnaissance. Two coal miners were hired, Neuville Rogers and John Bougher, as well as Theodore Price, a mine inspector who could supervise operations. The miners first dug where the streams sank into the earth but could find only short passages. More digging was then attempted on the nearby Anderson farm where a 20-foot hole had recently opened into a small cave beneath the field. Further searching brought them to a 6-inch hole at a low point in Kooken's field.

Surface waters had long drained into this hole. A steady blast of cool air came forth from it, further suggestive of a cavern below. Starting to dig here, the men quickly broke into an awesome shaft down which pebbles rattled endlessly.

Timbers, planks, and ladders were employed to brace loose rock and to aid in the descent. About 75 feet beneath the surface the vertical chimney became a steep chute of narrow dimensions, and 140 feet below the field this tube-passage ended at the ceiling of a large room.

Far away in the darkness could be heard the drip, drip of water from the high ceilings and the gurgling of streams along the floor. A rope was necessary for the descent over a 40° rock slope to the floor, 190 feet below the surface.

The cave led off to the left over a 30-foot ridge of very slippery clay to a deep pool. Beyond, through a low but wide tunnel, was another large room, and the cave led onward. Here and there were wide, deep clay pits, filled with water, and narrow fissures through which one climbed or descended precariously to levels above and below the clay-floored one. The lower level contained a flowing stream and numerous pools; the highest level consisted of a non-continuous series of nearly vertical fissures connected by horizontal passages.

At a point 1900 feet from the entrance a 10 x 10-foot chimney led upward at a 50° angle to a point near the surface. Since it would make

Photo by Nittany Grotto

Fig. 1—The 40° rock slope to the floor of the big room in Kooken Cave, Huntingdon County.

a much better "entrance" the miners spent the summer of 1931 digging through to the surface. Dynamite was carried underground and after several blasts through weathered rock the men poked their bar up through the roof—into the sunlight!

The hole was widened and this entrance was used exclusively during the next year. Most of the long chestnut logs, of which the ladders and handrails were made, were slid down this slope and carried through the cave.

Spring rains began to wash good topsoil from the field into this hole so it was finally filled with field stone and dirt and cultivated over. Exploration continued until 1934 when a minor misadventure evidently brought the work to a halt. A large rock projected into the lake between the two large rooms. In hope of opening a passage toward the river an attempt was made to blast off the obstruction. Unfortunately, the boat which had been so laboriously built in the cave, drifted loose from its mooring and was demolished in the blast, foiling further exploration in that direction. All operations stopped soon afterward.

Over twenty ladders and fifteen bridges had been built, apparently in an attempt to prepare the cave for commercial operation. Mr. Mines had planned to build an amusement park in the woods and to feature a cave trip as the main attraction. He lost interest when continued attempts to find a more negotiable entrance failed. Some believe, however, that the extensive exploration was an attempt to find traces of the lead-zinc ore which had once been mined extensively in nearby Sinking Valley.

For seven years the cave was visited infrequently until Dr. S. W. Frost of the Pennsylvania State College "rediscovered" it in 1941. Numerous trips were made by Frost and several students, including C. Edwards, L. E. Smith, and E. S. Richardson who mapped the main portion of the cave. In November, 1941, Frost guided 25 members of the National Speleological Society, including several women, through the cave. Soon afterward, in the September, 1942, Bulletin of the Pennsylvania Department of Internal Affairs, Kooken's Cave was first described.

Shortly after World War II, surface water from a flash flood poured into the shaft, tore down ladders, and blocked the chimney with

Photo by Nittany Grotto

Fig. 2—Slippery, mud-encrusted bridge over one of the numerous wide, deep clay pits in Kooken Cave, Huntingdon County.

mud. Members of the Philadelphia Grotto of the NSS spent two lengthy work trips reopening the cave.

During the winter of 1948 a newly organized group of local spelunkers, the original Nittany Grotto, under the leadership of Robert Zeller, Jr., first visited the cave. They found the timbering and platform near the top of the entrance shaft badly rotted and hardly capable of supporting the fifteen feet of loose rock overhead. Old railroad ties and timber cut with permission from a nearby woodlot were used to crib a ten-foot deep entrance shaft and rebrace the room at the top of the chimney. Another safety project was the removal of all loose rocks and rotten ladders along the descent. Once again the shaft was found blocked by fill. Several trips were spent removing this clay and rock seal and finally access was again gained to the lower chambers.

As a special project, Zeller undertook a gravimeter survey on the surface across the two large rooms as well as a detailed survey of the entrance chimney. During the following three years the

Grotto was disbanded but groups from as far away as Philadelphia and Pittsburgh still periodically glimpsed Kooken's wonders.

Following the reorganization of the Nittany Grotto in the spring of 1951 trips into the cave became quite frequent. These visits resulted in the rediscovery of three extensive passage systems not known since the days of the miners. Forty feet above the floor of the second room experienced spelunkers scaled a steep, slimy wall to reach a dark hole. From there a tunnel led 150 feet to the bottom of a 110-foot high chimney, up which were old ladders leading to yet unexplored portions of the cave, known only to the original explorers, now dead. Halfway through the cave is a higher unexplored level, and halfway up the sloping inner chimney, 2000 feet from the entrance, a series of crawlways and narrow fissures has been discovered. Here a party of Nittany Grotto members has continued 400 feet beyond the known limits of the cave into an unexplored area of large rooms, water passages, and numerous giant chimneys. Sandstone boulders on the floor here give evidence that this portion of the cave may be under the area where the surface streams sink during the winter season.

One of the very few partially unexplored caves in Pennsylvania, Kooken will long challenge the most persistent explorers. Practically all of the cave is of walkable height. Formations are infrequent but consist of massive and spectacular orange stalactite draperies and flowstone cascades. Everywhere one must be extremely careful lest he put too much trust in a rotting ladder spanning one of the many deep pools or lose footing on the perilously slippery ridges and slide into the cold (48°F) water. Jagged rock and few footholds in the chimneys make vertical travel equally as difficult. Because viscous mud is usually underfoot, traveling in the cave invariably results in one's clothing becoming plastered with the brown clay. During the winter the water table rises often as much as thirty feet, cuts off access to the cave, and adds a new coating of mud to walls and floor.

The most experienced Kooken spelunkers claim that more than a dozen passages still await exploration. Those who attempt to reach Kooken's unknown end will find that almost superhuman endurance and mountaineering ability, plus adequate equipment are necessary for such a venture. Only speculation can now describe subterranean wonders that still await the spelunker's lamp beneath Robert Kooken's rolling fields. Of all caves in Pennsylvania, Kooken will tempt and thwart more explorers in future years than any other of the known (1953) caves in the State. See map on page 104.

Deluge Underground

By DONALD R. GRIFFIN
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The experiences related in these pages were described in a letter written by Doctor Griffin to Charles E. Mohr in January, 1951, about six weeks after the great storm during the Thanksgiving weekend of 1950. This is possibly the first American eye-witness account of what can happen in a cave when a deluge occurs above ground. Extracts from the letter are here printed with the writer's permission.

There were six of us in the party which had arrived Friday at Aitkin Cave to photograph ocillograph recordings of bats' cries. Ted Hammel was a graduate student whose wife remained home with their baby this Thanksgiving vacation. Two younger, gayer, baby-free student couples had come, Ken and Anne Rawson late from Swarthmore College, and Mac and Susanne Johnson. We planned to camp under the hemlocks close by the cave.

Photo by C. E. Mohr

Fig. 1—Bats in this colony were completely submerged in the flood. Some, hanging in very highest points, survived in pockets of trapped air. Aitkin Cave, Mifflin County.

While chatting pleasantly with the Aitkins we noted that the creek was so low that we could wade with rubber boots directly from our roadside parking spot. That way we would have only a quarter-mile walk instead of a three-quarter-mile scramble imposed by the local topography when the creek is high and the cave must be approached from its own side of the creek at a bridge next to the Aitkin farm.

So the several pack boxes containing amplifiers, oscillograph, camera, tents, sleeping bags, food, cooking gear, etc., etc., etc., were ferried and carried to the vicinity of the cave, and camp fairly well set up in time for a well-cooked supper just after dark and just before the first sprinkles of rain began. In fact the apparatus had even been carried into position in a suitable spot 100 feet or so into the cave, and the Rawsons and Johnsons had explored the rather extensive ramifications while Ted and I arranged the electronic gear for action.

Aitkin Cave has few large chambers; but many lengthy crawlable passages which interlace in three dimensions so that an ambitious spelunker could probably wriggle for a total of a half-mile or more all told. Part of the creek flows through the lower reaches of the cave, and some sections can be reached only when the water is low enough to allow one to squeeze through passages which descend to a fairly low level. Even at best this is a muddy crawl. Twenty feet in from the entrance is a small canyon, three feet wide and fifteen feet deep which I had often before seen with one to four feet of water in it.

Today however, it had barely a trickle, and this was why the Rawsons and Johnsons were able to explore many deep, inner reaches of the cave where I had never penetrated.

After crossing the little canyon, either by a jump and grab or by walking up a slippery, sloping plank, one climbs up and over a muddy hump, down into a dip about as low as the top of the canyon, and then up another muddy hill to an intersection of passages at roughly the level of the cave entrance. It was at this intersection that the appartus was set up, complete with an excellent cathode ray oscillograph. A few preliminary records had been made, and a cage-full of bats caught (about 300 out of a total population of at least 2000), when a minor type of battery trouble caused me to suspend operations for supper. After supper a mild rain began and we gladly retreated to our tents for the night after leaving everything reasonably ship-shape. The tents were three two-man jobs, pitched on selected high points in the woods above any possible water or rain run-off level, and sheltered from the wind by a ridge at the foot of which the cave has its entrance.

As the storm developed its fury during the night we were reasonably snug and dry, even Ted and I in my 15-year-old canvas tent. The other two tents were newer and more waterproof. The rain sounded like hail and every now and then a tree could be heard falling. The crashes of falling trees were rather muffled by the noise of rain and wind so that I assumed most of them were falling on the top of the ridge. In the morning, however, one fallen hemlock lay about 50 feet from our tent. Still Ted was wet enough by daybreak to be glad of an excuse to dress; for his sleeping bag was less water-resistant than mine.

Breakfast was somewhat dismal; for the nice dry niches at the cave entrance were now less so. The drip of caves stops when the ground above is dry and resumes again after a heavy rain; even solid rock is not watertight. So what had been dry spots were now likely to be little shower baths. But warm porridge and coffee were somehow brewed by the faithful distaff contingent while I went in to inspect bats and apparatus. Both were in fine shape despite some dripping near the latter. Of course the stream had risen somewhat, and the little canyon was half full. But there was no reason to be concerned, I had seen the water higher than this before, and the main passage could not have been wetted for many years since it showed no water marks and at several low points contained planks or logs which would have floated away had the water ever reached them. And I could personally vouch for the fact that several had been in exactly their present spots for five years.

The first job was to bring out a storage battery from the apparatus location and exchange it with that in one of the cars. I should mention that even the 100 feet of passage between entrance and apparatus had many stretches less than four feet high, and others where the lower portion through which one walked was too narrow for the pack boxes. Here the battery in its pack box had to be lifted by a rope down over a little cliff of 20 feet or so, or on the way out, lifted up.

While this was being done at about 8 a.m. the water in the canyon evidently rose just to a threshold over which it could spill into the second low point between entrance and the elevated portion of the cave where the apparatus was set up. Hence the water at this low point rose two or three feet in a couple of minutes, and left a pond between us and the intersection where bats' sounds were to be studied. Still, however, the apparatus was a good 20 feet above this new water level, and 15 feet or so above the highest point that water could possibly have reached during the past several years. So we were not too concerned, and struggled out with the battery pack to have a look at the outside conditions.

To our surprise we saw that the tents were just at the shoreline of a new and growing lake which had spread out from the creek bank. After hastily dragging the tents to ten foot knolls, far above any possible water level, I went back to look at the situation inside the cave. There the water was rising almost visibly; the canyon was almost full to the brim; and the second dip was six or eight feet under. A cage of bats which had been set down on a dry spot fifteen minutes before was in a foot of water and the little beasts were clustered even more tightly than usual around the top of the wire; for only thus could they stay dry. To return to the apparatus now meant swimming, with no assurance that the accelerated rise in water level would not interfere with the return trip. But still the water

was ten feet below the entrance or the apparatus site, so that little more than profanity seemed called for.

After the few items of equipment left at the cave entrance together with food and utensils had been moved to the zone around the cave entrance farthest from the raging torrent, and yet not quite out in the rain again, we took another look at our three tents on their perfectly safe knolls. One was already being lapped at hungrily by the rising waters, so with even more haste we moved them to the tops of the ridges, one to the ridge over the cave entrance, the other to high ground a quarter of a mile in another direction. During these two forced moves in pouring rain the contents of the tents did not become any drier.

Another return to the cave entrance resulted in immediate attention to our few remaining belongings which were rapidly being approached by the still rising waters. It was no longer a matter of keeping things dry but of keeping them at all, so up the hillside they were dragged, rain or no rain. By noon the water had filled the cave right to its entrance.

About this time thoughts of a farmhouse stove became very difficult to restrain, and indeed there was now nothing to keep warm doing; our cave was filled up. So we loaded our packs with our most useable food and most nearly dry or dryable clothes and set out for the Aitkin farm. There we were welcomed most warmly, and that adjective is applicable in all its meaning.

The flood had covered the road in several places, although fortunately our cars were not inundated. Part of the Aitkins' barn was under water and the hogs had been turned loose despite the rain and (now) sleet; for the pigpen was nearly all under. We and our wet textiles surrounded completely the two Aitkin stoves for the next twenty-four hours. By night we had sleeping bags dry enough to use in an abandoned house adjoining the farm. We thought of the hay; but it turned out that modern progress dictates *bailed* hay. Still the girls developed a reasonably good supper, and we went to sleep content that the rain had now turned to snow and the creek had stopped rising.

In the morning there was about 18 inches of snow, the creek was down only slightly, and the mercury was down much farther. Sunday we spent carrying back our rigid, icy possessions and hopefully watching a snail-like recession of water level in the cave. By four in the afternoon we had assembled everything that we left outside the cave; and the water was down almost to the top of the first canyon. We could get to the second dip, which was still filled with 8 to 10 feet of water. Mac Johnson displayed heroic mountaineering skill and rigged a log which made it possible to get across this water to the site of the apparatus. In the interval we had hopefully speculated about the geometry of the various levels in the cave; but there was no doubt that the passages at this intersection, and indeed the whole cave, had been totally filled.

Photo by C. E. Mohr

Fig. 2—Fifteen-foot canyon was virtually dry before storm. Water quickly rose to bridge level (where explorers are standing) and then continued rising to fill cave. Aitkin Cave, Mifflin County.

Most of the apparatus was physically present, or had washed only a few feet, held together by the electric cables. There were dozens of bodies of bats scattered where the falling water had left them, and the cave was filled with a deep, bass, intermittent gurgling, so low in pitch that it could be felt as much as heard. This, we decided, was the water just dropping to reconnect with some body of trapped air which must have been bubbling forth as from a submerged bottle.

A few bats had survived because they were roosting in pockets in the ceiling from which the air could not escape; but it seemed likely that the principal survivors were our captives (most of which we now released). Neither Mr. Aitkin in his seventy odd years, nor, evidently, the bats had seen or expected any such water level. By mid-evening we had everything back to the cars (the road had again become passable, or fordable), and only then did my car radio inform us that our little creek was not alone in its flood. The Rawsons innocently radioless and happy started directly home and actually reached Ithaca at 6 a.m., just meeting the receding waters and squeeking through the cities which our radio was telling us could not be passed. Impressed by the radio warnings we stopped and spent the night en route. Both contingents got back to work at about the same time, late Monday afternoon.

After some weeks of intermittent drying, brushing, washing, and re-drying, it is still not clear just how much of the apparatus can be restored to working order. The condenser microphone was unscathed since it had been sealed in a bottle; and the few feet of film in the camera was developed none the worse, showing at least a few bat pulses recorded under natural conditions.

Limestone Mines

By RALPH W. STONE

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Extensive underground excavations made for the recovery of limestone should be mentioned briefly because they might at some future time be used for underground factories, storage, or refuge, for which purposes caves in Pennsylvania are not suitable. Unlike caves with their irregular floors and walls and variations in width and height, the mines in flat-lying limestone beds have practically level floors and ceilings and fairly smooth walls. The entrance may be near stream level or high on a bluff, but in either case the adits or tunnels may be a few hundred to several thousand feet long, the rooms large, and useable space extensive. Mines on steeply-dipping beds may be entered by shaft, have level floors and considerable volume over head but are less suitable for other use than the production of rock.

Limestone is mined mostly for flux, cement, road construction, crushed stone, and agricultural lime.

The flat-lying Vanport limestone in the Allegheny or Lower Productive Coal Measures formation is mined in several western counties where it is from 10 to 23 feet thick. Entries are driven 20 to 30 feet wide, and rooms 40 feet wide with 20-foot ribs. Mining takes 9 to 19 feet of the limestone, leaving some in the floor and ceiling. Rooms 40 feet wide rarely need support.

Mines in the Vanport limestone in Armstrong County are at Bradys Bend, Buffalo Creek, Kittanning, and 1 mile south of Templeton; in Beaver County near Ellwood City; in Butler County at Annandale, Osborne, and West Winfield; and in Lawrence County at Chewton, Hillside, and Wampum.

Where the Loyalhanna sandy limestone of Mississippian age lies flat in southwestern Pennsylvania and is 50 to 60 feet thick, 40 to 50 feet of it is mined out. Drifts and pillars may be 40 feet wide and headings are driven hundreds of feet. Mines in this limestone are in Fayette County 3 miles southeast of Connellsville and 2 miles east of Dunbar; and in Somerset County 2 miles west of Garrett. Also in Somerset County are several mines in the Greenbrier and other comparatively thin limestone beds.

Ordovician limestone 30 to 75 feet thick is mined in Centre County in the vicinity of Bellefonte by shaft or slope, depending on the dip of the beds. Two inclined shaft mines at Bellefonte are worked on several levels by overhead stoping method. The stopes are 300 feet long, 55 feet wide, 150 to 190 feet high, and separated by 40- to 50-foot pillars. One mine is 300 feet deep and the other more than 700 feet deep with drifts several thousand feet long. Slope mines are near Pleasant Gap.

Mines in Cambro-Ordovician limestone in eastern Pennsylvania include two room-and-pillar mines for high-grade limestone in Dauphin County near Hershey and one for cement rock in Lehigh County at Coplay; a mine just west of York in York County with entries 20 feet high, 40 feet wide, and several hundred feet long; and an inclined-shaft mine in Montgomery County at Bridgeport that is 300 feet deep, with two levels on each of three beds of marble that are worked by overhead stoping.

Commercial Caves of Pennsylvania

By RALPH W. STONE

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Most of the State's largest, best decorated, and most colorful caves have been developed and opened to the public. Eleven of them are now in operation, while four once commercial caves are no longer operated. Descriptions of these four, Hipple Cave in Bedford County, Tytoona Cave in Blair County, Veiled Lady Cave in Centre County, and Seawra Cave in Mifflin County will be found in the section on undeveloped caves. Another cave or two may shortly be opened to the public.

Pennsylvania's "show caves" are scattered from the extreme eastern section of the State, between Easton and Reading, to the central, mountainous counties, lying north and west of Lewistown and Huntingdon. Three caves farther south in the State are located near Bedford, Harrisburg, and Chambersburg. A leaflet showing the location of these eleven caves and describing their features has been prepared by the Pennsylvania Cavemen's Association, and is available free from the Secretary, Myron Dunlavy, Jr., Route 1, Huntingdon, Pa.

Longest in commercial operation is Crystal Cave, having been opened in 1873, while boat trips through Penn's Cave began about ten years later. Lighted at first with kerosene lanterns both caves are now electrically illuminated as are all the commercially operated caves in the State. Bridges, stairways, and well constructed walks further add to the visitors' comfort in viewing the remarkable geological features of the caves. Occurring as they do in limestone strata of different ages and characteristics, the eleven caves are surprisingly varied. In fact many geology classes both from Pennsylvania and out-of-State colleges annually visit and study the geological features of a number of these outstanding show caves. The informative lectures and discussions overheard by the cave guides often are reflected in their narration during later public tours.

Caves are comfortable to visit the year 'round. Having a uniform temperature in the low 50°s, they are cool enough in summer to make a sweater or jacket desirable. The more active spelunker in a wild cave, however, generally keeps warm without a sweater.

Commercial caves offer the photographer an opportunity to take unique color pictures. Either flash pictures, or time exposures made with the camera on a tripod, will produce beautiful records of a vacation trip or provide unusual slides for lecturing or teaching. In addition, color slides may be purchased at a number of the caves.

Names and addresses of the operators are here listed:

Alexander—
The Alexander Caverns, Inc.
Reedsville

Baker—
M. L. Burgan, Williamson

Crystal—
Crystal Cave Company, Inc.
Berks County Trust Co. Building
Reading.
J. Douglas Kaufman, President

Historic Indian—
Harold A. Wertz, Spruce Creek

Indian Echo—
Edward S. Swartz, Hummelstown

Lincoln—
Myron Dunlavy, Jr., Huntingdon

Lost River Caverns—
Lost Cave Corporation
E. C. Gilman, Hellerstown

Onyx—
Lewis Snyder, R. D. 2, Hamburg

Penn's—
William P. Campbell, Centre Hall

Wonderland—
Philip J. Hughes, Bedford

Woodward—
Woodward Cave Co., Inc., Woodward

In the following descriptions detailed directions are omitted because prominent road signs lead the visitor to the caves without difficulty.

ALEXANDER CAVERNS[1]

Located about 9 miles north of Lewistown, Alexander Caverns is about 3½ miles from U. S. Route 322, either at Reedsville or Milroy.

The early settlers in this region discovered a huge spring or underground stream issuing from a large archway in a limestone cliff, not far from Honey Creek, and called it Mammoth Spring. Presumably men explored the underground stream by wading and probably by means of a small rowboat or raft.

In 1926, two young men, John Speilman and Henry Schmidt of Pittsburgh, made their way up stream and about 400 yards from daylight found a clay bank well above stream level. They climbed the bank and wriggled through an opening to discover a wonderland of cave formations. They reported their discovery to the owner, a Mr. Alexander, who invited Messrs. Weaver and Hosterman, owners of Woodward Cave, to examine this new place with him. The three men formed a company and prepared the cave to receive tourists.

Using Mammoth Spring for an entrance would have required conveying visitors by boat, limiting the number that could be handled in a given time. Instead, a slope was sunk through solid limestone to the inner end of the dry cave. A flight of 115 concrete steps takes visitors 65 feet below the surface.

The dry cave was opened to the public May 30, 1929, and the wet cave the following August. A low earthen dam near the mouth of the cave and a dock on the bank of the stream at the end of the dry cavern made possible the use of a flat-bottom boat, but high water a few years later washed out the dam and discontinued exhibition of the wet cavern save as it can be seen from the dry cavern.

Alexander Caverns is in the Trenton limestone of Ordovician age. The bedding is nearly horizontal. The wet cavern is developed along vertical joints that cross at near right angles. The course of the main joint is N.70°W. The dry cavern trends about N.30°E. and is wiggly. A marked contrast between the two is the great abundance of formations and the moderately low ceiling, 15 to 20 feet, in the dry cave and in the wet cave stalactites and blankets of dripstone here and there on lesser joints, width ranging from 40 to 100 feet, and the much greater height, up to 65 feet.

Fig. 1—Garden of the Gods, Alexander Caverns, Mifflin County.

The length of the dry cave is about 300 yards. The first 100 yards is a passage through bare limestone; the rest is a gallery which in variety, color, and perfection of stalactites, stalagmites, drapery, and columns rivals the most celebrated caves in the United States. The pristine beauty of this cave makes it a photographer's delight, and one of the finest color movies made underground has been filmed here. From the dry cavern down stream to Mammoth Spring is nearly a quarter of a mile.

BAKER CAVERNS

State Highway 995 passes the entrance of Baker Caverns, about 12 miles southwest of Chambersburg. It is on a farm owned by Mr. J. E. Baker of York, Penna. When first seen by the author it was a small opening in a pasture 30 feet from the road. It was opened to the public July 2, 1932 by O. G. Edwards and M. L. Burgan who had leased the rights from the owner of the farm. A two-story building that includes office, cave entrance, and living quarters was erected over the site.

[1]Editor's Note: Word has been received as this issue goes to press that Alexander Caverns has been closed. Information regarding the time of reopening is not available.

On descending short flights of stairs into the cave, the guide leads the group south along a spacious passage down a slight grade to a small chamber called the turtle. Here the visitor is likely to notice that the Stones River limestone beds are nearly vertical and that the walls and ceiling are light colored and clean. The strike of the beds is N.55°E., dip 70° SE. Some passages are along the bedding and others cross it. Taking a right fork, one ascends a few steps and comes to the high point in the cave, close under the surface. Continuing to the south end of the cave and turning back north, one cannot help but admire the cave formations, dripstone and flowstone that ornament the passages and side passages, the latter too small, however, to enter.

Having completed a loop and returned to the entrance stairs, the guide leads his party past the staircase and along a straight passage that was opened to give access to the north cavern, at the far end of which is the Cathedral, a nearly circular, spacious room well ornamented with dripstone and flowstone formations. Weddings have been solemnized here. This being a low point in the caverns, the return to the entrance stairs is slightly up grade.

The route traversed, including steps retraced, is about 250 yards and is easily covered in 40 minutes. The limestone beds that originally were deposited as mud in flat layers on a sea bottom now stand on edge, in places nearly vertical, but in small passages on the east side apparently decreasing in angle of dip.

Fig. 2—Scene in Baker Caverns, Franklin County.

A projecting slab of cave formation in the main south passage may be explained as having been deposited on a clay filling of the passage that has subsequently been washed away. This implies running water, which doubtless has entered the cave at times since the lowering of the water table or upper level of ground water.

Although comparatively small, Baker Caverns exhibit many interesting features to the tourist and problems for the speleologist.

CRYSTAL CAVE

Along U. S. Route 22 east of Hamburg and on U. S. Route 222 between Reading and Allentown, wayside signs indicate the nearness of Crystal Cave. It is 3½ miles almost due west of Kutztown and 2 miles east of Virginville, and within a few miles of both main highways by hard-surfaced roads.

Crystal Cave was discovered November 12, 1871, by William Merkel while quarrying limestone on a hillside 80 feet above a creek. In March 1872 Gideon Merkel, owner of the property, sold it to D. F. Kohler for $5,000. Mr. Kohler built a house and road and opened the cave for public inspection in 1873. Thousands of people have visited the cave yearly for eight decades. Picnic and camping facilities are available.

A belt of limestone of Ordovician age extending for several miles across Berks County well within the bounds of the Martinsburg formation contains five caves, Schofer, Crystal, Dragon, Dreibilbis, and Onyx. The course of this belt is N.80°E. but the strike of the beds at Crystal Cave is N.15°W. at the entrance and N.65°W. midway, and the dip N.E.40° at the entrance and 56° at a point 150 feet inside. In the inner half of the cave the beds are nearly vertical. The rock is massive to thin-bedded and shaly limestone of varrying composition from limy to sandy.

The main roomy part of the cave was produced by ground water dissolving the more soluble rock along the curved bedding. Narrow fissures branching off from both sides of the main passage nearly at right angles to the strike

of the rocks have been opened by solution along joints. Far within the cave thin quartz veins project nearly an inch from the wall and demonstrate how much less soluble is quartz than limestone.

Crystal Cave is small but roomy and has a variety and abundance of cave formations that make it well worth seeing. It is visited annually by geology classes from distant colleges and universities. It is about 350 feet long or the length of a city block. The route covered by visitors is about 250 yards, part of which is retraced.

On passing the entrance doors one descends two short flights of concrete steps in a passage 12 feet wide that shortly expands to 30 feet. Here is a conical stalagmite on the end of a great dropped block lying on the floor. The accumulation of travertine formed from drippings of lime-bearing water from the ceiling indicate that this block has lain in its present position for thousands of years. In the wide space called the Crystal Ball Room one wall sparkles with light reflected from crystal faces and it is from these that the cave gets its name.

A flight of steps leads to a higher level and a larger room, about 40 by 150 feet, from the far upper end of which one gets a good view of this underground wonderland. The vaulted ceiling in blue, green, orange, buff, and white is hung with small stalactites, and the floor is studded with stalagmites that average 2 feet high and 8 inches in diameter. Here too are thin sheets or drapes of white dripstone banded with brown that resemble ribbon or bacon strips. The travertine assumes the shapes of bird, beast, fish, and other objects that are pointed out by the guide. Some stalactites give out a musical note when struck.

HISTORIC INDIAN CAVE

This cave is in northern Huntingdon County, directly on Route 45 at Franklinville, about 13 miles east of Tyrone and 8 miles north of Water Street, on the bank of Spruce Creek.

In 1928 Mr. Harold A. Wertz bought a part of the farm on which the cave is located, and prepared the cave for the reception of visitors. He has operated it summers for 25 years.

Being on a highway leading to State College it is favorably situated. It gets its name from

Fig. 3—Natural Bridge, Crystal Cave, Berks County.

reputed occupation by Indians as temporary shelter.

Flowstone and dripstone are abundant in this cave and the various rooms and passages are lined, hung, and studded with stalactites, stalagmites, and cascading curtains of calcium carbonate, all revealed by hidden lights. A wall of white dripstone resembling a cataract is one of the prettiest features to be seen here. Another is the so-called Lily Pad Pool, a grotto far back underground where calcium carbonate has been precipitated around the edges of small pools and has built up narrow little walls of rimstone at different levels occupied by the standing water. A spring of crystal-clear water forms an upper pool that discharges over a natural spillway to the lower pools.

The most novel feature in the cave is the grotto of Wahwah-taysee, where, when the elec-

Fig. 4—Council Room, Historic Indian Cave, Huntingdon County.

tric lights are turned off, many small spots in the ceiling glow like fireflies. This phenomenon is said to be phosphorescence produced by certain crystals absorbing light from the electric bulbs and so becoming visible in the dark.

The Historic Indian Cave is in beds of Ordovician limestone possibly younger than Beekmantown, that strike N.40°E. and dip SE.40°. The cave is developed mostly along parallel joints at right angles to the bedding and the pattern therefore is somewhat rectilinear, characterized by long, narrow passages. The route over which visitors are guided is about 1700 feet or one-third of a mile, including about 500 feet of retraced steps. In a cave, however, as in a city street, the view from the opposite direction is different.

The size of some stalagmites suggests that this cave must have been formed thousands and thousands of years ago. If, as is generally believed, it takes 100 years for a cubic inch of dripstone to accumulate, then this cave must have had something like its present dimensions for tens of thousands of years.

Photo by B. Smeltzer

Fig. 5—End of North Passage, Indian Echo Cave, Dauphin County.

INDIAN ECHO CAVE

Indian Echo Cave is 10 miles east of Harrisburg and one-half mile south of Hummelstown. It is in nearly horizontal beds of Beekmantown limestone of Ordovician age and developed along two vertical joint planes that meet nearly at a right angle. Proximity to a village and easy access made it a rendezvous for venturesome spirits for more than a hundred years. There was little vandalism, however, because the ceiling is so high that many formations are out of reach.

In 1929, Indian Echo Cave, Inc., with John N. Bieber as engineer in charge, closed the huge mouth with a board wall and door, developed the cave and opened it to the public. From the parking ground visitors descend a flight of concrete steps past a natural rock garden to the huge entrance, along Swatara Creek.

The first notable feature is the large size of the cave, the broad way sloping gently down to the main room 250 feet from the entrance. Here the width is 80 feet and the ceiling about 50 feet high. From the door straight through to the back is a distance of 400 feet. At the far side of the main room is a stalactite 10 feet long and 2 feet in diameter called the Ear of Corn. Just beyond it and overhead is a natural bridge and a cascade of dripstone under a 40-foot ceiling.

The ceiling and upper walls of the main room are covered with a fine display of stalactites and masses of dripstone. In a corner where formerly the north passage was reached by climbing up and crawling through a hole, an entrance has been made at floor level. This North Canyon 300 feet long is only a yard wide at the bottom but widens upward and the ceiling in places is 80 feet high. The best part of the cave for dripstone formations begins here. This passage was 175 feet long until late in September 1930 when, by excavating a mass of clay, a continuation was found that had never before been seen by man. Great columns and slender pendants of pure white and colored dripstone found here rival in beauty and daintiness the best in the State.

A tunnel 50 feet long by-passes a lovely small pool reflecting a nature-ornamented low ceiling, and a bridge over crystal-clear water takes visitors to the end where the variety and beauty of the formations is extraordinary.

The person studying the origin and history of development of caves finds particular interest in the lower few feet of the walls of the North Canyon. A definite dark water line traverses the dripstone and below it is an extensive development of calcite crystals on the dripstone. These crystals undoubtedly grew under water, yet the dripstone to which they are attached was deposited in an air-filled chamber. From this it must be concluded that after the dripstone was formed, something occurred that choked the outlet with clay, and formed a pool in which the crystals grew. Standing on the bridge in this end of the passage one gets a close view of the crystal lining, for the quiet water is as clear as air.

On the return trip, in the main room, visitors are taken to an upper level by easy steps to a point where an excellent view is had of the room below and of its dripstone-ornamented ceiling from another angle. Descending by other steps, one is in the place where Amos Wilson, "The Pennsylvania Hermit", lived for 19 years, and the smoke-blackened crevice that served as his chimney.

LINCOLN CAVERNS

Lincoln Caverns are directly on U. S. 22, about 3 miles west of Huntingdon. It was discovered in May 1930 when a new location for the highway was being graded.

The cave was opened to the public by the owner of the land, Harry B. Stewart of Alexandria, Pa., June 25, 1931. It was first called Hi-wa-may Caverns from the position beside a highway and the month in which it was discovered. It was renamed William Penn Caverns in February 1932. Myron Dunlavey of Buffalo, N. Y., bought the Stewart property and changed the name to Lincoln Caverns.

The cave is in Helderberg limestone which strikes EW. and dips N.70°. Some joints have a N.10°E. course but seem not to affect materially the cave pattern. Excavating the clay that now fills some branch passages might disclose extensions. A sink hole in the hill above the cave gave access years ago to another one that has since been prepared for visitors by making an entrance and a graded path on the hillside. No connection with the lower main cave has been discovered.

One enters a high vaulted room about 25 feet in diameter, with abundant dripstone on the left wall. On the right is the entrance to a channel about 200 feet long. Just inside are

Fig. 6—Chapel Room in Upper Cave, Lincoln Caverns, Huntingdon County.

two formations called The Pagodas that may be massive stalagmites or merely mounds faced with dripstone. At the far end, which turns back toward the main entrance, a tunnel driven a few feet connects with another passage.

From the entrance lobby a high-ceilinged narrow passage, entered by descending a few concrete steps, leads straight under the hill. The

walls here are ornamented with myriads of white beadlike formations developed mostly along the nearly horizontal bedding of the limestone.

Although this passage or crevice is only a few feet wide, the ceiling is so high that it is seen only dimly. From it descends a cascade of flowstone of pastel colors and sparkling brilliance that rivals the best in the State. Although this cascade is magnificent viewed from below, its height is appreciated when seen from above.

At the top of a second short flight of concrete steps a ponderous stalactite hangs in a natural niche over a small water-filled basin. At the far end and lowest point in the cavern is a small pool and a low roof that prevents further exploration in that direction. But turning back into the Purity Room on this lower level the eyes are greeted with a fine display of slender dripstone pipes, curved pendant panels banded with brown like bacon strips, miniature rimstone terraces with shallow pools, thin deposits of flowstone on the walls and thick ones on the floor. Most striking is a pure white flowstone cascade that begins high up as a point and widens as it descends. White calcite beads, some looking like popcorn, are abundant here.

By climbing the stairs to the Statue of Liberty, a rough stalagmite high up in the east end of the canyon, one can glimpse a small pool in a low recess and have a magnificent view of the formations in the upper part of the Purity Room and of the canyon-like passage. The view from above is worth the climb.

The distance covered is about 200 yards, including retraced steps and the trip requires 30 to 40 minutes. The temperature is 52°F. the year around.

The upper cave is smaller, has fairly wide irregular passages with high ceiling, all kinds of colorful cave formations, and some visitors think it is prettier than the main cave.

LOST RIVER CAVERNS

About four miles southeast of Bethlehem on Route 412 is Hellertown. The cave is one-half mile east of Hellertown.

This cave was discovered in 1883 by men quarrying limestone. As the quarry cut deeper into the hill a passage was disclosed that is now the entrance to the cave. The earliest use of the cave was for dancing on summer nights. A platform built in a wide room 200 feet from the entrance, and the low temperature, 50°, made its use enjoyable and attracted many people before the turn of the century.

The plot of ground containing the cave, long known as Hellertown cave, was bought by E. C. Gilman in the spring of 1930. After the necessary preparations, the cave was opened on May 24, 1930. Mr. Gilman named it Lost River Caverns because of a stream that enters at the far end and loses itself underground.

The cave is in the Conococheague limestone of Cambrian age, which is thin to massive bedded and here makes a low ridge. In general the beds strike N.50°E. and dip NW.38°.

The passages are irregular, somewhat winding, and expand in places to rooms. The floor has gentle grades and there are only two short flights of steps. Just inside the entrance the main passage following the bedding is straight away, with a parallel passage on the right. Several minor crevices lead off from it.

Midway of the length of the cave is a bridge over water 5 to 6 feet deep called Lost Lake. A branch of the cave here turns to the right for 100 feet or more and ends at the Lost Falls. The

Fig. 7—Chapel, Lost River Caverns, Northampton County.

Lake Room is 40 feet long, 15 feet wide and high, and has many stalagmites.

The inner half of the cave consists of three rooms in a fairly direct line from the entrance and beyond the first steps. The first two are each 50 feet long and about 15 feet wide, and the farthest is about 35 by 40 feet. These rooms are partly separated by constrictions, and the first two are tied together by a narrow passage on the left over 50 feet long. The highest ceiling in the cave is about 40 feet. A room opened in 1930 has a subterranean stream with a flow of about 2 million gallons per day. Water temperature is 50°F., the same as the air in the cave. The new passages and rooms are hung with many stalac tites. Crystals of cave onyx sparkle in the flowstone that covers the walls.

Both in Lost River Caverns and in Indian Echo Cave part of the route traversed by tourists is on a bridge over several feet of crystal-clear water. A tour of the cave requires about 40 minutes.

Religious services, weddings, and christenings are held in a dedicated chapel in the cave with soft background music. No charge is made for admission to attend religious services.

Lost River Caverns is equipped with photo flood lighting for those who wish to take photographs. Powerful ultra-violet lights are used to display the extensive collection of fluorescent minerals and the natural fluorescent minerals of the cave.

An all masonry building 110 feet long erected in 1953 contains the Gilman Museum of Rocks and Minerals, and the mineral and souvenir stand.

ONYX CAVE

Onyx Cave is about 17 miles north of Reading, and 5 miles southeast of Hamburg.

This cave has been known since 1872 when blasting in a limestone quarry broke into it; but for 50 years it was undeveloped. It was first called Lukenville cave.

The cave was opened to the public in May 1923, by Irvin E. Dietrich who named and advertised it as Onyx Cave because of the calcium carbonate cave formations striped in white, brown, and red like true onyx. Mr. A. S. Hunsicker,

Fig. 8—Giant stalagmite, Onyx Cave, Berks County.

Hamburg, bought the cave in April 1929. After several years of commercial operation in summer the cave was closed during the Depression but operation was resumed when it was acquired by Lewis and Hattie Snyder of Virginville who now operate it.

This cave is the westernmost of five caves, Onyx, Dreibilbis, Dragon, Crystal, and Schofer, that occur in a narrow east-west belt of limestone in the Martinsburg shale formation of Ordovician age. The limestone is massive to thin bedded and the beds are nearly horizontal. The cave was produced by solution along vertical joint planes, some of which cross or connect with others at right angles.

The cave is 12 to 15 feet wide in the first 60 feet, then narrows to 8 feet. About 125 feet from the entrance a fissure along a straight joint leads off to the right for 100 feet. A large stalactite fallen from the roof thousands of years ago lies on the floor at this point. This fissure is spanned

by a deposit of cave onyx or flowstone probably originally deposited on clay that filled the lower part of the fissure. After the lime was deposited to a depth of several inches the clay was washed out, leaving a long narrow natural bridge. This brightly lighted fissure, lined with dripstone, bridged with flowstone, and with stalactites hanging from the ceiling is one of the striking views in the cave.

The main cavern continues for 60 feet with a width of 8 to 10 feet and a high ceiling, then turns to the right along a joint parallel to that called the Natural Bridge. Thirty feet farther along the cave branches in three directions. To the left are narrow solution channels along joints that cross at right angles. Water stands in the cross passage and the walls are reflected in the pool.

One formation looks like an ice jam in miniature. A layer of cave onyx about 2 inches thick deposited on several feet of clay that nearly fills a cross passage, in some unexplained way was broken into angular blocks, many of which are displaced from their original position and some of which are turned on edge. All of these broken blocks have been cemented together subsequently by a minor deposit of dripstone.

At the far end of the cave, about 275 feet by the route followed, one has a view of the natural bridge from the inner end, sees other named formations, and retraces the route to the exit. The trip through the cave is about 220 yards or the length of two short city blocks.

PENN'S CAVE

"America's only all-water cavern" is 4½ miles east of Centre Hall on Route 95 and 23 miles north of Lewistown. It is located at the head of Penn Creek at the base of Nittany Mountain in an area noted for agriculture, scenery and caves. Approaching from the south on U. S. 322 one crosses The Seven Mountains between Milroy and Potters Mills, or coming from Bellefonte over Nittany Mountain one has a superb view of the great limestone valley.

More legend has been recorded about this cave than any other in the State. Col. Henry W. Shoemaker of the Pennsylvania Historical Commission is the author of the 109-page guide book on the cave. Penn's Cave farm was surveyed in pursuance of two warrants granted to James Poh, or Poe, dated January 5 and November 3, 1773 and a patent was issued to him in 1789. The property went to Susanna Poe by will; she married Samuel Vantries and he sold it to George Long. His sons Samuel and Jesse built a boat and charged admission to the cave about 1884 and built the hotel in 1885. The property was sold by them to John H. Herman in 1895. In January 1908 it was bought by H. C. and R. P. Campbell and has been operated by the Campbells continuously since then.

The dry part of the cave was entered by white men through a small hole in a sink before 1800, and by many persons between 1845 and 1860. The all-water cave was first explored about 1860 by Isaac Paxton and Albert Woods, who built a raft for the purpose. It must have been a thrilling experience, for the water is deep, the passage is narrow, and the rock walls are steep. The lumber in the raft was rebuilt into a small boat that was used by picnic parties for some years. A larger boat was launched and admission was charged in 1885 and a few subsequent years. The cave has been on a commercial basis since 1908 and open for visitors the year around.

Fig. 9—Statue of Liberty, Penn's Cave, Centre County.

Penn's Cave is in the Trenton limestone of Ordovician age. The strike is about N.30°E. and the dip SE.20° to 35° in the wet cave and as low as 10° in some parts of the dry cave. The limestone beds are rather massive for the most part and dripstone formations are abundant. The entrance to the cave is a large opening over water 30 or more feet deep where an underground stream or large spring emerges. The stream flows through the cave, eventually by an inverted syphon, then emerges as the head of Penn Creek.

The cave entrance is in a great sink hole which descends to water level. Here visitors board a broad flat-bottomed boat. A powerful searchlight on the boat illuminates formations pointed out by the guide, who also turns on electric lights at various points.

A tour on this underground river reveals myriads of stalactites, massive stalagmites, heavy columns, and sheet formations that have been given fanciful names. In a distance of 1200 feet or nearly one quarter mile the boat passes through a tunnel cut through a limestone ledge in 1929 and comes out on the mill pond. Here the bright daylight and warmth of a summer day may be in sharp contrast with the darkness and 50° temperature in the cave. After a circuit of the pond the boat returns through the cave and the guide illuminates and names many formations not seen on the outward trip.

Fig. 10—Scene in Wonderland Caverns, Bedford County.

Much of the cave is nearly straight, the roof ranges from a few feet to 55 feet above the water, which varies in depth to 35 feet.

WONDERLAND CAVERNS

This cave lies beneath a ridge in the borough of Manns Choice, about 5 miles south of U. S. 30 and 8 miles west of Bedford.

The operation of two limestone quarries on the ridge disclosed the presence of a cave under each many years ago.

The cave under the southern quarry was developed by the owner, Mr. Philip J. Hughes of Bedford, and opened to the public in July 1932. Quarrying operations resulted in the closing of the second cave.

Wonderland Caverns is in Helderberg limestone where it strikes N.30°E. and has a nearly vertical dip on the west flank of an anticline. The Oriskany sandstone is in the valley on the west and the Clinton formation in the ridge on the east.

The entrance through the cave office leads steeply down steps for 35 feet. A horizontal passage cut through several beds of limestone follows the bedding to the south end of the gallery. This gallery is about 10 feet wide, 15 feet high, and 35 feet long and contains abundant flowstone. Part of the east wall is a vertical limestone bed studded with fossil brachiopods, stromatoperoids and horn coral. At the northern end of this gallery more steps lead down 15 feet into the middle of a larger gallery which likewise follows the bedding.

This larger gallery is 10 to 30 feet wide, over 100 feet long, and ranges in height from 8 to 30 feet. At the southern end a pit 20 feet deep contains a small shallow pool of water. This pit is nearly under the entrance and separated from it by 5 to 10 feet of solid limestone.

North of the steps by which this gallery was entered the floor rises and some fine stalactites and stalagmites block most of it. Two passages lead north from this end of the gallery. The first is a small one that leads diagonally downward

and north for 75 feet. It contains many fallen blocks of limestone and much flowstone. The second is an old stream course only 18 inches high that has been followed by explorers for 200 feet and extends farther. A deposit of clay and conglomerate 1 to 3 feet thick covers the floor. The conglomerate, which contains pebbles of sandstone, shale, and quartzite, is in places cemented by calcite to form a hard rock.

The walls of the caverns are generally straight, following the vertical bedding of the limestone. The walls converge to form the ends of the galleries. The original floors were very irregular and strewn with fallen limestone blocks. Differences in solubility of the limestone account for inverted channels and high spots in the ceiling and for the pendant slabs of less easily dissolved rock.

Flowstone and dripstone are abundant and some areas are coated 6 to 18 inches thick. Calcite crystals occur in the cave. Many of them are coated with flowstone and form peculiar projections on the walls. They project horizontally and a few are inclined upwards. The crystals are usually so obscured by flowstone that the crystal base of a projection can be seen only when the crust has been broken away. Some calcite crystals are not coated. As such large crystals could be formed only when the cave was full of water, it must be that in some previous geologic period, long after the cave had been drained and quantities of travertine deposited, the galleries were flooded for a time.

WOODWARD CAVE

Named for the nearest village, Woodward, on Route 45, this cave is about 25 miles west of Lewisburg and 20 miles east of Centre Hall.

As this cave is in a limestone valley at the foot of a steep wooded slope and the entrance is large enough to give ready access to men and horses, it is easy to believe it was frequented by Indians before the coming of white men; also it is reported to have sheltered a band of robbers more than a century ago. Pine Creek is intermittent for several miles below Woodward, flowing underground in dry seasons. It sank below ground before reaching the entrance to the cave but in high stages the creek flowed through the cave and in flood carried much mud and trash into it.

In 1925, the Woodward Cave Company, Inc., consisting of L. L. Weaver, O. M. Hosterman, and Mrs. Temmie Meyer, built a long dike and diversion channel that carries the flood water down the valley away from the cave, and opened the cave to the public.

Woodward Cave is in Trenton limestone of Ordovician age. Here the beds strike N.70°E. and dip S. 15° to 25°. The joints have various courses, N.40-70°W. and N. 10° E. to E.W. A strong joint at the entrance follows the right hand wall of the entrance passage. In some passages the controlling joint is apparent and in others none is noticable but the flat roof contains calcite veins that stand out in relief.

Photo by C. E. Mohr

Fig. 11—Scene in the Hanging Forest, Woodward Cave, Centre County.

The limestone is well exposed in a cliff at the entrance of the cave. It is mostly rather massive bedded but has some shaley layers.

Following a straight passage 10 feet wide for 100 feet, one barely enters a very large room which opens up to the left. Instead of climbing a slope into the big room one swings to the right into a tunnel-like passage which has a rounded ceiling and side walls. About 350 feet from the entrance, one enters a fair-sized room. Along the far wall, two large fallen blocks of limestone lie on the floor. The ceiling is profusely decorated with small, rough stalactites, many of which are

still growing. Prominent joints in the ceiling of this room have a N.30°E. course. During winter several hundred bats hibernate in this room and along the passage to the next room.

A narrow passage 125 feet long, a right turn, and another 100 feet bring one to the Hanging Forest, one of the largest groups of stalactites in the cave. It exhibits a variety of shapes and sizes of pendant forms. Turning back and following another narrow passage brings one to the west end of the large room. This is probably the largest cave room in the State, measuring 200 feet in length, averaging 50 feet wide and up to 30 feet high. At the foot of the few steps leading into this room, the only ones in the cave, there is a hole in the floor and at times water may be seen as much as 30 feet below. Occasionally in winter the rising water table completely floods the inner half of the cave for brief periods.

In the large room dripstone formation is abundant, including small stalactites and pendant sheets, a few stalagmites, much flowstone, and a dainty natural setting around a little pool. Here also is a huge stalagmite called the Tower of Babel and a large roof block fallen to the floor and built up with dripstone in such a form that it is known as Red Panther's funeral pyre. The legend of Red Panther, written by Col. Henry W. Shoemaker, appears in the Woodward Cave advertising folder and on page 29 of this book. Returning to the entrance completes a tour of nearly one-quarter mile underground.

Descriptions of Pennsylvania's Undeveloped Caves

By RALPH W. STONE

State Geologist, Commonwealth of Pennsylvania (Retired)

Compilation of an up-to-date list of the State's caves was suggested by officers of the National Speleological Society in April 1950 when the author retired from the presidency of the Society. This is not, of course, the first report on Pennsylvania caves. In August 1930 the Pennsylvania Topographic and Geologic Survey published *Pennsylvania Caves,* a bulletin of 63 pages and 34 figures describing 29 caves and mentioning 8 others. The edition of 10,000 copies was distributed widely and exhausted in 15 months. Because this report brought more caves to the attention of the Geological Survey, particularly through the extensive field work of Charles E. Mohr, a second edition of 15,000 copies, revised and enlarged, was issued in August 1932. It contains 143 pages and 68 maps and pictures, described 88 caves, and mentioned 24 more.

In the 20 years from 1932 to 1952 the commercial caves erected more sign boards, printed and distributed more than 200,000 folders and in other ways advertised the underground attractions of the State. The organization of the National Speleological Society in 1939 resulted in the promotion of interest in caves throughout the country. Young people in Philadelphia, Pittsburgh, and State College formed cave-exploring groups and began systematic search for and study of caves in the eastern, western, and central parts of the State. Individuals not connected with any group also began investigating caves, with notable results. This section of the Bulletin is an attempt to describe the 250 "wild" caves of which something is known in 1952.

In recent years the author has been under necessity of depending on others for information. Underground exploration and mapping has been done by younger men and they also have furnished much descriptive material. Appreciation is expressed and indebtedness acknowledged for contributions by Robert Dunn, R. E. Hoffmaster, Robert Ruffing and Edmond Taylor of the Pittsburgh Grotto of the National Speleological Society; by William Devitt, III, Arthur M. Hussey, II, and others of the Nittany Grotto; by John D. Parker and other members of the Philadelphia Grotto; and especially by Bernard L. Smeltzer of Windsor, York County, who has been very active in exploring and mapping caves in the southern and eastern counties. The final editing of the cave reports has been done by Charles E. Mohr, and most of them have been field-checked by members of the three grottoes noted above.

The author is indebted to many other persons too numerous to mention here. Some conception of the large contributions made to this Bulletin can be gained by noting the names in parentheses following many of the cave descriptions. Without their enthusiastic, unselfish help this report could not have been written.

Names in parentheses also include those of E. R. Barnsley, William O. Hickock, IV, and M. N. Shaffner, all members of the Pennsylvania Topographic and Geologic Survey who contributed descriptions of caves in the preparation of the 1932 Bulletin already mentioned. Various quotations taken from that report are identified by one of the above names.

The American Association for the Advancement of Science, through a grant of funds from the Pennsylvania Academy of Science, enabled the writer to secure the services of Devitt and Smeltzer for extended field trips on several occasions during the summers of 1951 and 1952.

For convenience in reference and description, a cave, like a community, must have a name. The commonly known local name has of course been used here. It is likely to be the name of the present or former owner of the land, or of a geographic feature or locality. Less commonly the name may be that of a former occupant, as bear, Indian, wolf, hobo. Where a name was lacking, the writers of descriptions have followed custom and used the name of the owner or nearest village.

Here it is fitting to remark that exploration of wild caves may be dangerous and should not be undertaken by anyone unless accompanied by at least one other person. Nor should one depend on a single source of light. Beside an elec-

tric flash lamp and carbide lamp or lantern, it is advisable to carry candles and matches in a waterproof case. Caves previously unvisited should be explored with caution, the head protected by a hard hat. Word should be left nearby that you are in the cave, and when you expect to emerge. Always report when you leave. Show consideration of the owner by asking permission, before entering on private property.

Definition of Terms Used

A cave is a natural cavity beneath the earth's surface, whose dimensions are measurable in feet, whose walls are bedrock, and usually extending to total darkness.

The glossary of speleology published in NSS Bulletin Six defines a cave as "a natural cavity, recess, chamber, or series of chambers or galleries occurring beneath the surface of the earth and usually extending to total darkness and large enough to permit human entrance." Likewise, that glossary says a cavern is "a large, pretentious, natural underground cavity or cave. A relative term contrasted with cave." In this writing cave and cavern have been used without such discrimination.

Various terms are applied to the common lime formation found in caves, and known as travertine or cave onyx, or recently as "speleothems."

Stalactite is a pendant columnar or icicle-like deposit, generally of calcium carbonate, formed on the roof of a cave by the drip of mineral solutions. *Helictite* applies to a highly contorted stalactite, generally with many twisted lateral branches.

Stalagmite is an uprising columnar deposit, generally of calcium carbonate, formed on the floor of a cave by the drip of mineral solutions from the roof. It may also be formed on a shelf or ledge. When a stalactite joins a stalagmite directly beneath it a column is formed. These two not wholly familiar terms are replaced in this book in part by the single term dripstone, which defines itself.

Flowstone is any calcareous formation deposited on the walls or floor of a cave by flowing water. It is common on walls where water has dribbled for a long time and made a sheet deposit or built up the form known as frozen cascades. Flowstone also is spread over the floor of caves.

Rimstone is the calcareous deposit formed around the edges of overflowing basins. Commonly it is a narrow, rough, serpentine ridge a few inches high with a horizontal crest.

Strike is the direction of the intersection of the plane of the bedrock with a horizontal surface.

Dip is the angle between the bedding of the rocks and a horizontal plane.

Joint is a crack in rock, usually vertical or steeply inclined, one of an approximately parallel set of fissures that may be tight or open, and often in two sets intersecting at right angles.

Further Discoveries

Although this book describes more than 250 caves it must not be assumed to be complete. Sink holes develop and disclose cavities, quarrying operations break into them, and other excavations bare them to view. Lincoln Caverns west of Huntingdon was revealed by drilling for the relocation of U. S. highway 22. Some and perhaps many of the descriptions published here are incomplete because a more venturesome, better equipped, or more slender explorer may go farther than the original explorer.

Readers of this book who know of a cave not mentioned here are invited to call it to the attention of the State Geologist, Pennsylvania Department of Internal Affairs, and to that of the National Speleological Society.

The following descriptions of non-commercial or "wild" caves are arranged by counties (refer to the State map, p. 71 for location of the various counties), the individual caves within each county being listed alphabetically. Locations are north latitude and west longitude. Names of quadrangles are those of U. S. Geological Survey 15′ topographic maps unless otherwise specified.

Conventional symbols for use on cave maps.

ALLEGHENY COUNTY

BELLROCK CAVES

[redacted] **Sewickley Quadrangle**

The caves are situated near [redacted]

The two caves in this group were formed by the vertical parting of massive sandstone and consist principally of long single passages about 15 feet wide and 20 to 30 feet high. The entrance to Cave No. 1 is a 30-foot drop, nearly vertical, requiring a rope to accomplish. From the base of the drop a high, narrow corridor extends ENE. for 120 feet to a roof collapse. The floor slopes steeply from the entrance for a distance of 40 feet and levels off. It is composed chiefly of broken rock and surface debris. At 60 feet from the entrance, the main passage intersects a low tunnel which extends 40 feet to the SE., gradually pinching out into crawlways. A strong current of air flows from this passage.

There are two entrances to Cave No. 2: the larger one resulting from a major roof collapse which has formed a depression on the surface 20 feet in diameter and 8 feet deep. At the base of this sink an 8-foot opening connects with the ceiling of a straight, narrow corridor midway along its length. From the entrance; the floor slopes downward steeply in opposite directions to a depth of 20 feet. Fifty feet from the entrance the NE. section of the passage terminates in a mud bank which rises to the ceiling where a few small holes open to the surface. From a small hole in the floor at the SW. section, a tight twisting passage continues for 85 feet, descending approximately 30 feet in a series of short drops. Carved in the wall at the bottom is the date 1904. It is rumored that this cave once joined with a cave on the opposite side of the Ohio River and during the Civil War period was used in transferring runaway slaves across (under) the Ohio. (Dunn, Hoffmaster, Ruffing)

DRAVOSBURG CAVE

[redacted] **Pittsburgh Quadrangle**

The cave is located [redacted]

The cave is a single passage 100 yards long formed by vertical parting of Morgantown Sandstone in a N.-S. direction. Except for two rooms, the passage seldom attains a width of more than 6 feet and has a maximum height of 30 feet. The 2½-foot square entrance connects with an 8-foot crawlway leading to a room 35 feet long and 15 feet wide. Two small sinkholes above the entrance also join this room. North from here a narrow aisle 70 feet long, 4 feet wide and 30 feet high attenuates in width and height to small crawlways. Paralleling and 20 feet W. of this aisle, a high narrow and inclined passage contains a cascade of iron salts varying in hues of red and brown. There is approximately 100 square feet of this deposit which is ¼-inch deep and washed by an active trickle of water. This passage averages 4 feet wide and is 60 feet long. To proceed S. from the entrance room, a drop of 12 feet must be undertaken. Twenty-five feet from this drop, the passage appears to close but access to a second room can be made by crawling through a low vent near the floor and continuing for 30 feet. The walls of the room are inclined 60° to the horizontal and are 10 feet apart; the lower wall serves as a floor. The room is 25 feet long and has 2 passages proceding from the south end. Both passages are low and wind through breakdown; the lower one peters out within 30 feet, but the upper one extends 50 feet and turns sharply left to join with a much larger passage. The back passage is 100 feet long, 5-10 feet wide and 10-20 feet high. The floor is rough and uneven and opens at a few places to a lower paralleling passage. No bats have been reported in this cave, but the usual insects abound. The presence of recent rockfalls and the passing of trains nearby causing heavy vibration lend an unsafe aspect to the cave. (Dunn, Ruffing)

OTHER CAVES

So called Indian Cave across the Ohio River from Sewickley is only a rock overhang or shelter in Morgantown sandstone that served Indians as a lookout.

ARMSTRONG COUNTY

BRADYS BEND CAVE

[redacted] **Kittanning Quadrangle**

At Bradys Bend, a mile west of East Brady, on the old Scott farm, now the property of John Dewey. The entrance is [redacted]

This cave occurs in the Vanport limestone and exhibits the recticular structure common to most caves in this horizon. The passages range up to head height and a few feet wide. The bottom is damp clay and there are some formations. Penetration to an estimated 250 feet from the entrance was made and the cave appeared to continue indefinitely. Mr. Arthur Walley, East Brody, reports an underground lake in the cave. (Taylor)

BUFFALO CREEK CAVE

[redacted] **Kittanning Quadrangle**

At the west end of Worthington a road parallels Buffalo Creek. [redacted]

The cave is small, with one short side passage to the left, about 25 feet long. In the entrance room a pool about 15 feet in diameter is, at times, about 2 feet deep. The height of the ceiling over the pool is 8 feet. (Hoffmaster, Ruffing)

COVE RUN CAVE

[redacted] **Kittanning Quadrangle**

Along Cove Run at Bradys Bend, 1½ miles west of East Brady, on property owned by John Dewey. The entrance is located [redacted]

This cave now serves as a water reservoir for the Pittsburgh Limestone Co. The entrance has been blocked but access might be gained through a small gate (now locked) in the masonry wall. Mr. Arthur Walley of East Brady reports exploring about 1000 feet (measured by string) years ago and being stopped by high water. The main passage is said to be more or less straight with no side passages and about five or six feet high. Mr. Walley thinks that the cave could be penetrated much further with the aid of a boat. (Taylor)

HINEMAN CAVE

[redacted] **Kittanning Quadrangle**

[redacted]

To enter, one descends a small vertical shaft about 8 feet, lies flat on a wet plank and elbows along for 12 feet through a hole barely 2 feet in diameter, then descends a short ladder in a narrow crevice. This brings one to the level of a labyrinth of passages in the flat-lying Vanport limestone that is 15 to 20 feet thick. The rock bottom of all passages is buried in very wet and sticky clay up to 10 or 12 inches deep and some passages are traversed only by crawling.

The passages are rarely more than 8 feet high, and many are less than 4 feet. Although they vary much in width, the average passage is about 4 feet high and 4 feet wide. The total length of the many more or less parallel and cross passages may be close to a mile. This network pattern indicates solution along joints.

Clusters of small stalactites have been found in this cave, some almost pure white, and, curiously, most of them bulbous, forked, hooked and otherwise of unusual shapes, as well as translucent platy forms.

BEDFORD COUNTY

CLAYCOMB SINK

[redacted] **Everett Quadrangle**

On the property of Alvie Claycomb, [redacted]. It is in the New Scotland limestone of the Helderberg formation. At the bottom of a funnel 10 feet deep, a hole several feet in diameter opens into the top of a vertical shaft about 40 feet deep and 10 feet in diameter. A rope is needed to reach the bottom of the shaft where a steep slope and a drop of about 15 feet bring one to a passage that extends 40 feet north to a sand choke. The passage continues but becomes very narrow. When the barometric pressure is falling a considerable air current flows from the passage. (Taylor)

DONAHOE CAVE

[redacted] **Hyndman Quadrangle**

Donahoe Cave is [redacted]

The entrance is 6 feet square with a drop of 12 feet onto a pile of debris that leads down gradually to a room 20 feet below the surface. This room is about 100 feet long. The floor, covered with breakdown, slants 30° but the ceiling is flat, so the height ranges from 3 feet on one side to 20 feet on the other. Many stalagmites and stalactites have been broken and large areas of flowstone show wear.

A small passage near the entrance becomes impassable after 20 feet. At the opposite end the room is only 1 foot high, but just beyond it is 2 feet high, 6 feet wide, and 40 feet long. At the far end of this room a small hole shows still another room, which, by local repute, is only the beginning of long passages. (Nicholas, Taylor)

DONALDSON CAVE

[redacted] **Everett Quadrangle**

On [redacted] a cave in Helderberg or Onondaga limestone is on the property of David Donaldson. The entrance in the base of a quarry face was choked in 1950. The cave is reputed to be extensive. The quarry floor uncovers several small solution channels that are lined with flowstone. (Taylor)

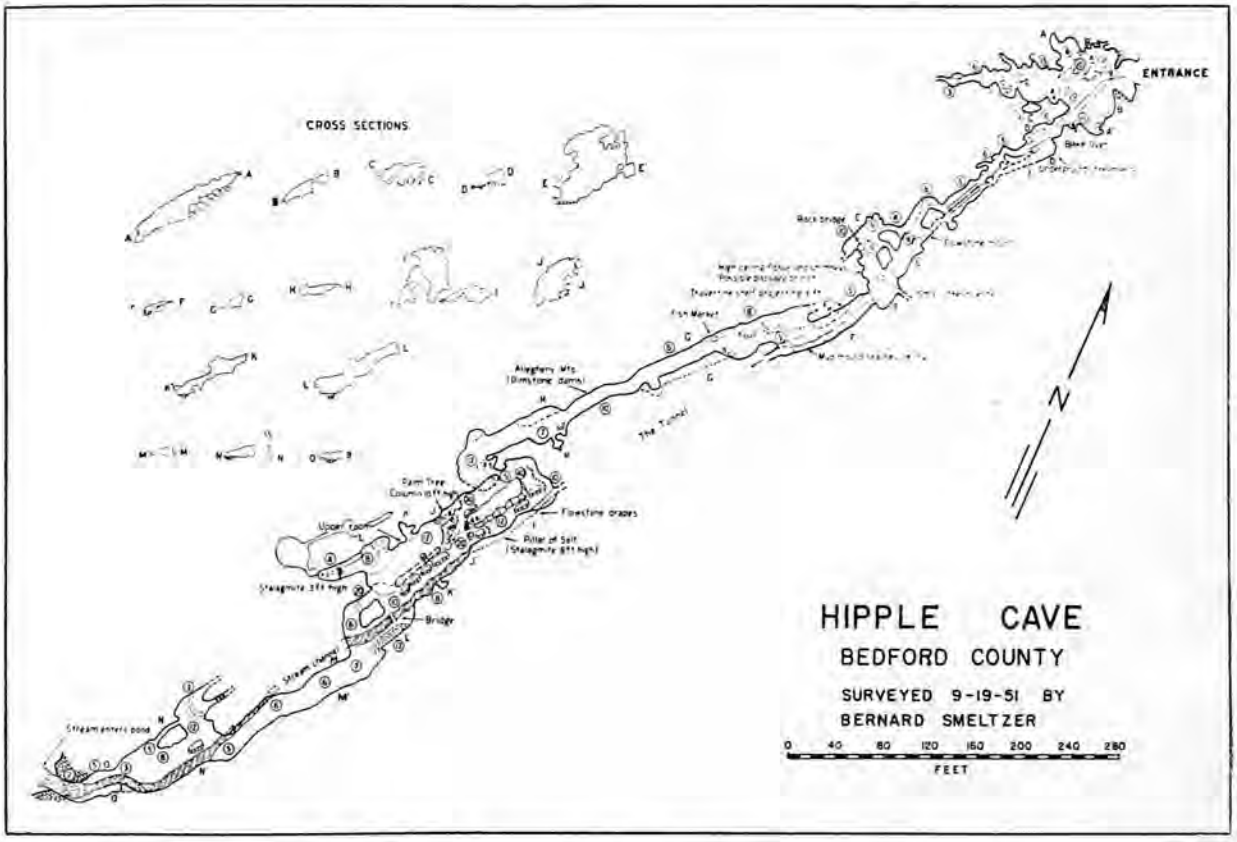
HIPPLE CAVE

[redacted] **Everett Quadrangle**

This formerly commercial cave is located 800 yards east of Waterside. According to tradition the cave was discovered by a pioneer named Hipple, who tracked a bear to the hole. It was opened commercially in 1928 but ceased operations about 1940. Vandals have since smashed the doors and damaged many of the finest formations.

The cave is in Trenton limestone beds that strike about N. 50° E. and dip SE. 28°. The course of the cave is along the bedding. The entrance is a large chamber, a flight of 50 concrete steps leading to a low passage. Near the foot of the stairs a small stream enters and follows along the tunnel for 200 feet. For a few yards the roof lacks head room, but shortly the ceiling rises to 50 feet, and from here on to the end of the cave, a distance of 300 yards, the passage is of ample dimensions.

About 300 feet from the entrance the cave is enlarged by a joint crossing at right angles, beyond which is a straight passage 400 feet long. The cave makes a sharp left turn or offset and resumes its general southwest course. Here are large stalagmites and a column resembling a palm tree. Here the underground stream reappears and is in sight until it emerges from the far end of the cave. In



the upper passage at the far end of the cave a small hole leads to a room about 15 by 20 feet and 6 feet high, with much breakdown, and a parallel passage close under the surface.

KNISLEY FARM CAVE

REDACTED **Clearville Quadrangle**

On the Sam Knisley farm, on the macadam road at the base of Evitts Mountain REDACTED [redacted] According to Mr. Knisley, explorers from Bedford entered the cave about 1942 and reported finding a passage several hundred feet long with large rooms and huge dome pits. There seems to be a good chance of finding a large cave here. (Smeltzer)

LOCKARD CAVE

REDACTED **Everett Quadrangle**

This cave is about REDACTED [redacted]

The Tonoloway or Helderberg limestone strikes N. 20° E. and dips 20° W. A narrow passage about 25 feet long leads along a joint down to a small, low room. From it a low archway leads to another, larger room but farther progress is blocked by a sand fill. The passages are not more than 60 feet long. A small stream flows through them. (Taylor)

MORGART FARM CAVE

REDACTED **Hyndman Quadrangle**

A gully REDACTED [redacted] seems to have resulted from the collapse of a cave roof. Cove Creek flowing through this gully exposes several small openings in the solid limestone. At the lower end of the gully the stream goes underground in the only opening that is big enough for a man to enter. It is 8 feet high, 4 feet wide at the top and 1 foot at the bottom, and can be entered when the stream is low. Exploration was not attempted because the gully can fill to the rim during or shortly after a heavy rain. The stream can be seen at the bottom of a sink hole 100 feet beyond the lower end of the gully. (Smeltzer)

MT. DALLAS CAVE

REDACTED **Everett Quadrangle**

REDACTED

there is a small cave on A. F. Four's Mt. Dallas Farm. It is in the east bank of Snake Spring Valley

Photo by C. E. Mohr

Fig. 1—Column forms trunk of speleothem known as The Palm Tree, Hipple Cave, Bedford County.

Run, just above a spring 100 yards north of the highway.

The Trenton limestone here strikes NS. and dips E. 50°. A hole in the floor of an old quarry gives access to a cave that is open for about 60 feet S. of the entrance. A crude ladder made descent into the cave easy when it was visited in September 1951. Originally this cave had some massive dripstone which a local man called petrified posts, but these were broken and removed by campers. The floor is covered with angular blocks dropped from the ceiling. Visitors will find little of interest.

NEW PARIS CAVES

[redacted] **Bedford Quadrangle**

Four deep fissure caves in Helderburg limestone are located [redacted] The caves are vertical shafts revealed when the surface covering of roots and humus gave way shortly before 1930 in the case of at least two of them. The largest, into which a large tree had fallen, evidently had been open much longer. All must have been open at certain times in the fairly recent past and served as death traps for animals.

All the shafts are too wide to permit chimneying, so ropes or ladders of more than 50-foot length are needed to explore them. When entered in February 1932, shortly after Mr. Taylor had found an elk skull at the bottom of a sinkhole he had opened, water was found 50 to 60 feet below the surface in two sinks. One opened into a large passage which could not be explored because of the water.

The deepest measured shaft is 84 feet. Another, with an opening 3½ by 5 feet in the earth, opens into a fissure averaging 5 by 15 feet to a depth of 40 feet. Here in April 1948 members of the Pittsburgh Grotto found the skeleton of the elk or wapiti whose skull had been collected by Mr. Taylor nearly 20 years earlier. When excavated by NSS members under the supervision of John E. Guilday, assistant in the mammal department at the Carnegie Museum, it proved to be a virtually complete skeleton. Two of the neck vertebrae, collected earlier, were found to be fused together. When examined, an Indian arrowhead was discovered imbedded in the bone, only an inch from the spinal cord. This dated the shooting as prior to 1800 when the Delaware and Seneca Indians of the region discarded bows for rifles. The last native Pennsylvania elk was killed in 1877 in Centre County.

Excavations of the deepest sinkhole, by J. LeRoy Kay, curator of vertebrate paleontology at the Carnegie Museum, revealed the remains of 16 species of animals: wapiti, deer, bear, porcupine, muskrat, woodchuck, gray fox, opossum, rabbit, meadow mouse, deer mouse, two species of squirrel, snake, box turtle, and bat. (Parker, Mohr)

SALTPETRE CAVE

[redacted] **Hyndman Quadrangle**

A cave that has not been explored by N.S.S. members is [redacted] Elijah Huff is supposed to have mined saltpetre here for the use of the government in making gunpowder in the Revolutionary War. Mr. Raymond Cessna of Rainsburg says he found a large fissure while hunting bear and that back in the 1920s Sanford Fleet, school teacher, obtained saltpetre from this cave. It is presumed to be a crevice on a joint in Devonian sandstone. (Smeltzer)

SHAFFER FARM CAVE

[redacted] **Hyndman Quadrangle**

On the Gerald Shaffer farm, ¾ mile west of the Lutheran Church at the north [redacted] This small cave seems to be developed on three different sets of NE. and NW. joints. The entrance, only 1 foot high and 3 feet wide, leads to a passage 2 to 4 feet high and 2 to 3 feet wide that runs southeast 30 feet. Fissures on the left wall 20 and 27 feet from the entrance extending in a northwest direction are crosscut by a northeast fissure that makes a small opening in the creek bank. Another passage branching to the right 10 feet from the entrance is 26 feet long but not more than 3 feet high and 2

feet wide. Its course is southwest. Ceiling fissures 3 feet high are at the main intersections. One ceiling fissure has small dripstone formations.

This cave apparently is inhabited by skunks, groundhogs, or foxes. Great numbers of crickets were seen in all passages in September, 1951. (Smeltzer)

TAYLOR CAVE

REDACTED **Bedford Quadrangle**

One of the deep fissure caves for which the New Paris area is celebrated is located REDACTED It is on the property of W. L. Taylor. The entrance is like a manhole, 2 feet in diameter, and descends vertically to water at a depth of 62 feet below the surface.

Photo by C. E. Mohr

Fig. 2—One of four sinkholes, Taylor wells, Bedford County.

WEIDLEIN FARM CAVES

REDACTED **Hyndman Quadrangle**

Two small caves on the E. R. Weidlein farm, RED Nearly hidden by trash is an opening 5 feet wide and 2 feet high that leads down over a pile of tin cans into a passage 4 feet wide and 3 feet high leading S. 38° W. A rock fall blocks the passage after 15 feet. The trash heap may block a larger cave for R. F. Cessna says his father went several hundred feet underground at this place.

In the west side of the sink 18 feet north of the first opening a hole 2 feet wide and 1½ feet high, quickly enlarges to 4-foot height, slopes down 30°, and gives access to a room 20 feet long, 5 feet wide and 3 feet high that trends N. 5° W. At the far end an opening less than 1 foot high connects with a slightly higher parallel passage. The room shows evidence of being flooded frequently. Short stalactites line ceiling cracks and calcite nodules project from the walls. (Smeltzer)

OTHER CAVES

A cave reported to be two miles south of Hyndman could not be entered in 1952 without considerable digging. Two small openings in the bank of a stream on land of a Mr. Monette were filled with dirt washed in by high water. A large sink in the top of the ridge suggested that a cave may extend under and connect with the sink. The openings were found by going south from Hyndman on Route 96 about two miles, observing a sign "Little Brook Farm" on a barn, and continuing a few hundred feet to the farmhouse of Benjamin A. Scritchfield, then by traveling due east ¼ mile. (Nicholas)

A deep shaft in Beekmantown (?) limestone is reported on the Jack Stookie farm near Baker Summit in the northern end of the county. (Smeltzer)

At Manns Choice about 100 yards northeast of Wonderland Cavern two openings need further examination in 1953. One entrance in a quarry is 10 feet wide and 6 feet high; it leads down a slope about 30 feet to a horizontal passage that reduces in about 30 feet to a crawlway. The other opening is in the bottom of a depression close by; it is small and leads down over loose rock to a passage connecting with the other cave. A passage running south may connect with Wonderland Cavern. (Smeltzer)

BERKS COUNTY

BALLY (HENRY) CAVE

REDACTED **Boyertown Quadrangle**

In the former Irwin B. Henry Quarry, now the Walter Shuler Farm, REDACTED is a cave discovered in 1925 during blasting operations. The site is one of considerable geological interest. Portions of tunnels and small cavities decorated with flowstone occur in several parts of the quarry, marking the location of former passages. At the lowest point, in limestone conglomerate, is a cave with a total length of 170 feet. Parker found traces of malachite (copper carbonate) along the contact between the blue limestone and the brown shale, deep in the cave.

At times large quantities of canned (bottled) food have been stored here. The moist walls around the entrance are covered with a remarkably luxuriant growth of liverwort.

The main entrance passage runs ESE. for 60 feet, climbing into breakdown to the SE.; it averages 5 to 8 feet high and 4 to 6 feet wide. Branching off to the NE. is a passage in which considerable

breakdown has occurred within recent years. Limestone pebbles dissolving out of a sandy matrix created an interesting pitted appearance but evidently represents a weak supporting medium. Thin nearly horizontal layers of limy sandstone mark major areas of breakdown. Except for the main entrance passage **the cave is definitely dangerous.** (Mohr)

BERTOLET CAVE

REDACTED **Reading Quadrangle**

REDACTED three holes leading to the same cave room. Severe breakdown discourages exploration beyond 20 feet but a crevice in the quarry floor 50 feet south gives a view of a passage with fine, growing stalagmites. The cave is said to continue beneath the former Bertolet house, 200 feet away. (Mohr)

CENTERPORT (MOHRSVILLE) CAVE

REDACTED **Reading-Wernersville Quadrangle**

A cave in Center Township REDACTED is on the Daniel Phillips farm, occupied in 1952 by Wilmer Phillips. It is diagonally opposite the Center Township Consolidated School, ½ mile southwest of Centerport, high on the south bank of Irish Creek in a grove at the edge of cultivated fields. The entrance is in the easternmost of three sink holes, in thin-bedded Ordovician Leesport limestone that strikes EW. and dips S.60°. The three sink holes mark the course of the cave.

In 1952 Robert W. Craig confirmed the description of this cave by Barnsley: "Just inside the small entrance a passage 2 feet high runs west 70 feet. The floor of the passage is inclined because of the dip and ranges from 4 to 20 feet wide. There is little travertine along the passage. At 70 feet from the entrance the passage continues about 15 feet farther but the roof gradually approaches the floor."

COON (SLATE) CAVE

REDACTED **Wernersville Quadrangle**

This cave is on the property of George T. Felbeck, known as Coon Cave Farm, R. D. 1, Wernersville. It is 3 miles south of Bernville, 2 miles southwest of REDACTED The cave is so named for raccoons which used to frequent it. It is reached by following Bernville road 3.1 miles north from Robesonia, turning off on a dirt road to the southeast, taking two left forks in one mile. At second left fork follow road up hill and take first lane to right. Cave is about 600 feet beyond this.

In meadows near the head of drainage a small outcrop of Ordovician Leesport shaly limestone has a small opening that turns slightly to the left into a nearly straight tunnel-like passage in which one can stand erect and walk down a steep grade to water about 70 feet from the entrance. On June 30, 1952, the water appeared to be several feet deep. The cave may go farther. At the inner end the ceiling is about 15 feet high. The cave lacks dripstone formations. (Craig, Stone)

DIETRICH CAVE

REDACTED **Reading Quadrangle**

This cave on the George Dietrich Farm is one mile northwest of Evansville but must be approached from Kent Corners. It is in Leesport limestone of Ordovician age. The beds strike N. 45° E. and dip N. 70°. Sink holes indicate the cavernous nature of the limestone. The entrance is in the near corner of a patch of woods about 0.3 mile behind the farm buildings. It is small and difficult to locate.

Only 8 feet inside the opening is a rock wall with a 50° drop of 57 feet. One should descend only with the help of a rope. At the foot of the wall there is a short horizontal passage about 5 feet high and following the strike. M. Girard Bloch who rediscovered the cave after 20 years reports that 50 feet to the north is another high angle passage paralleling the entrance drop. It leads almost to the surface (roots and dirt visible), and to another horizontal passage leading back toward the entrance. These upper regions appear to be unstable. This cave is a death trap for animals. Turtle shells, numerous bones (not fossilized), fur and animal droppings cover the floor. (Mohr)

Photo by Johonie Mittl

Fig. 3—Temple of the Dragon, Dragon Cave, Berks County.

DRAGON CAVE

[redacted] **Hamburg Quadrangle**

This cave is [redacted] and locally is usually spoken of as the Dreibilbis Cave. The entrance is in a clump of trees in an open field just below the road which runs due east toward Kutztown. The name is based on an Indian legend of a dragon being seen entering the cave during a thunderstorm. A large stalagmite in the main room is named the Dragon.

The cave is in a limestone lense in the Martinsburg shale formation of Ordovician age. The rocks strike N. 70°E. and dip 25°S. The entrance passage is in weathered yellow shale. The first room about 20 feet long, 15 feet wide and 15 feet high is followed by a channel extending S. 55°E., and sloping steeply to a second room 15 by 25 feet and 57 feet from the entrance. The ceiling is less than 6 feet. A 2-foot fissure goes straight into the shale for 20 feet from this room.

In this room the main route turns to the left and with a 15-foot roof slopes down for another 57 feet to the large and final room that is 85 feet long and 35 feet wide. Dropped blocks are on the floor and the ceiling ranges up to 25 feet high. The main feature is the large whitish formation 4 feet thick at the base and 8 feet high and surrounded by brown flowstone. Polygonal quartz veins project as much as an inch from the wall. There are large conical stalagmites, irregular forms in the bedrock, and an overhanging ledge. (Barnsley, Stone)

DREIBILBIS CAVE

[redacted] **Hamburg Quadrangle**

This cave is well-known locally, and reputedly goes on for great distances. It is located on the George Dreibilbis farm about [redacted]

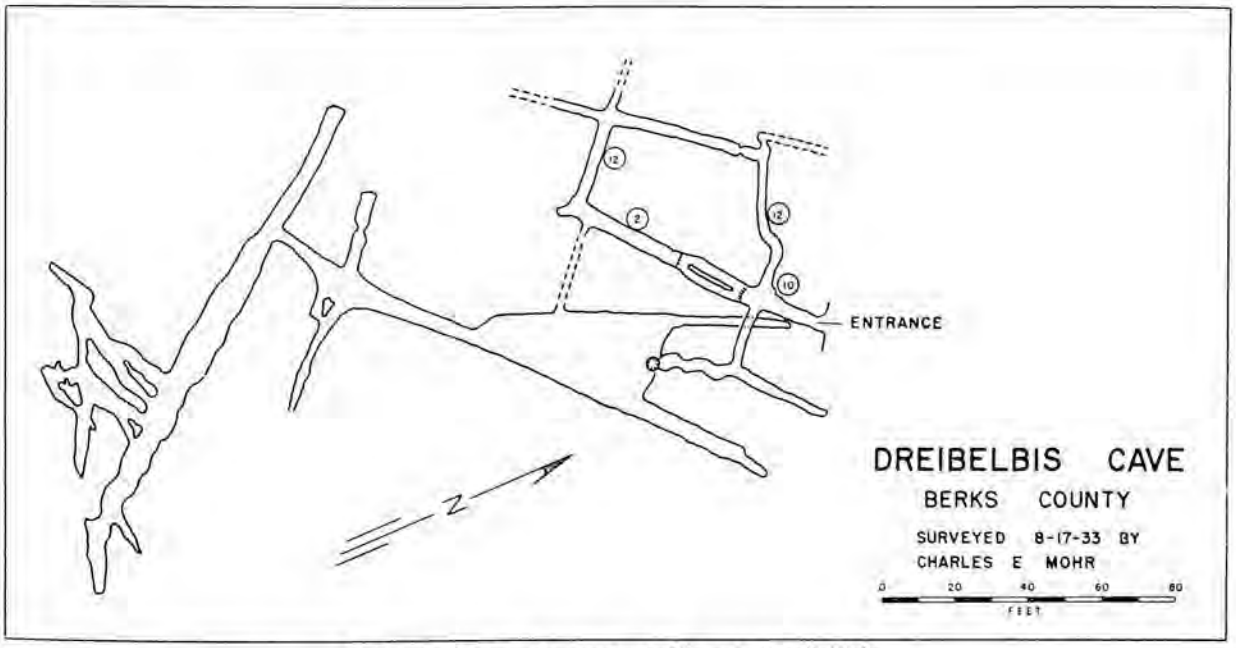
[redacted] in the Martinsburg shale formation of Ordovician age.

The cave is developed along two main systems of joints. Three parallel fissures trending northeast are less than 50 feet apart; one major and several minor joints are almost at right angles. A small hole in the limestone ledge leads to a narrow underground passage trending about N.60°E. A cross crevice is intersected 20 feet from the entrance, and just beyond it a hole in the floor is 7 feet deep. About 45 feet from the entrance a fissure 8 inches wide, 7 feet high, and 25 feet long is on the left. Just beyond this crevice another narrow but traversible crevice turns right. Flowstone and travertine buttons can be seen in this crevice.

Following the narrow passage 20 feet from the entrance on the left, to a seemingly blank wall, one can squeeze through an unpromising cleft into the main part of the cave. The more spacious part is farthest from the entrance. About 200 feet from daylight in a passage trending northwest small quartz veins form "boxwork" and anthrodite crystals ornament the walls.

Parker and Cooper report an interesting geological feature in the rear passage near the chute to the water table, and off the main passage. It is a fault in the limestone and shows how the underlying sandstone has flowed up into the opening, forming a sandstone dike.

The main room runs northeast up over a series of breakdown blocks until it is on a level with the entrance passage. It ends in a surface fill. Parker, Gossett, and Crutchfield established contact with the surface at this point, driving through a 9-foot steel bar. The owner finally admitted that he filled this hole at intervals and wished to have it remain closed.



Editor's Note: Correct spelling is Dreibilbis.

More than 600 feet of passages have been mapped. Some are narrow clefts traversible only by chimneying. (Mohr)

GRESHVILLE CAVE

[redacted] **Boyertown Quadrangle**

This cave is beneath the face of an old quarry in Tomstown dolomite. It is [redacted] The farm is owned by Mrs. Ruth Wilcox. A passage 45 feet long leads from the entrance at the foot of the cliff S.60°E. to a room about 25 X 50 feet with a ceiling 6 to 10 feet high. Several crawlways lead off from the main passage. Sometimes the far end is under water.

Flowstone must have been abundant in an earlier era but evidently was scoured off by torrents of water such as still pour into the cave after heavy storms. Hence great accumulation of water-borne branches and tree trunks litters the quarry floor and a stream sinks out of sight about 30 feet from the cave entrance. (Mohr)

HENRY CAVE (See Bally Cave)

HOBO CAVE

[redacted] **Wernersville Quadrangle**

A cave 2 miles west of Wernersville gets its name from the fact that hoboes and tramps camped in it until the Commonwealth obtained the property as part of the grounds of the State Hospital. The best way to reach the cave is [redacted]

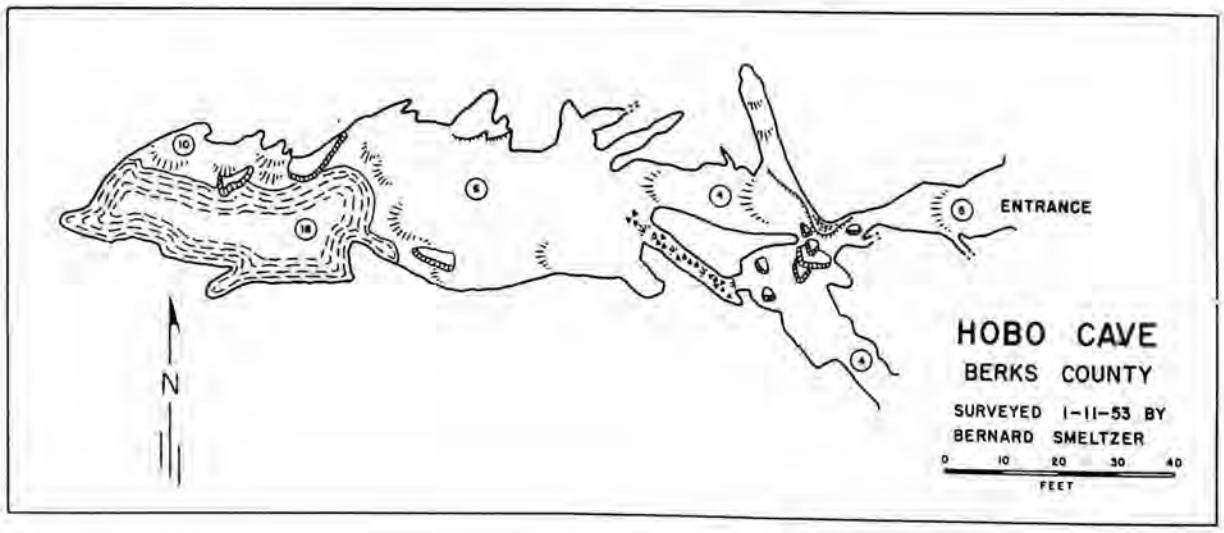
Hobo Cave is in the Conococheague limestone of Cambrian age. The beds strike N.84°W. and dip SW.37°. The cave is developed along bedding planes and on vertical joints trending N.37°, 53°, 84°W. and N.62°E. North of the cave the beds are nearly vertical.

The cave has two entrances 30 feet apart, 8 and 12 feet above the quarry floor. The northern one, 10 feet wide and 6 feet high, bears west, then southwest for 30 feet as a passage 3 to 8 feet wide and 6 to 10 feet high. It intersects a passage 10 feet wide and 4 to 6 feet high leading northwest 30 feet from the south entrance. Flowstone covers a wall on the right that is undercut by a broad opening 3 feet high. A ceiling channel extending northwest is 15 feet high.

The north passage, 3 to 5 feet high, continues west beyond the intersection 28 feet, descending gradually about 20°. A narrow fissure with a talus floor, branching from the far end of the south entrance passage, opens to the left. The cave continues west as a large room 100 feet long and 20 to 25 feet wide. The ceiling height is 3 to 7 feet in the east end and 10 to 18 feet in the west end. The dry clay floor slopes steeply toward the far end of the room where usually there is a pool 50 feet long and up to 12 feet deep. Steep clay banks border the pool on the north and east.

Several short passages on the north side of the room trend N.62°E. along joints, as do the walls here also. The ceiling of the room has channels up to 4 feet deep. A low pendant almost divides the room for 25 feet at the east end. Small helictites follow a ceiling joint just west of the low overhang.

According to Mohr there have been very consistent reports that the cave formerly continued south for a considerable distance. One man described a passage from the main room which he explored about 1895 that led to a room in which there was "a lake large enough to float a steamship". About 10 years ago efforts were made to open a channel but so much clay had washed into the cave that a rock floor at that part of the cave was never reached. (Smeltzer)



HOST CAVE

[redacted]" Wernersville Quadrangle

The entrance to a cave on the Lester A. Klopp farm at Host, a hamlet [redacted] The opening, 12 feet wide and 5 feet high, overlooks a chamber 40 feet long, 20 feet wide, and up to 15 feet high. A vertical drop of 18 feet brings one to the floor composed of an irregular mass of breakdown. Several small passages branch to the north and south from the room. A high fissure on the north leads down over large rocks for 25 feet to a deep pool. A similar fissure leads down and south.

As in many other Berks County caves, thin quartz veins here form a network projecting from the limestone. Stalactites up to 8 inches long are at the highest point of the ceiling and a 5-foot column broken by blasting rests on the east wall. Dripstone is abundant in some of the crawlways, and small calcite nodules occur.

Host Cave is in highly fractured, siliceous Jacksonburg limestone of Ordovician age, underlying Martinsburg shale. The strata strike NW. and dip SE. 25°.

About 400 feet northeast of Host Cave a crawlway 30 feet long leads steeply down to a short horizontal passage. (Smeltzer)

MERKLE CAVE

[redacted] Reading Quadrangle

Mentioned in an early history of Berks County as having a vertical entrance 40 feet deep, this cave was located in 1933 after months of searching. It had been closed since 1910, and was entered again after hours of digging. It was closed again in 1940.

Located on the Seifert-Quier property [redacted], the cave entrance was a 15-inch crevice in the bottom of a small quarry well up on a hillside. The passage opens up slightly and continues down a 40° incline about 60 feet into the first low room. Opening out to the right was a passage nearly 100 feet long, 8 to 12 feet high, decorated with fine columns. A series of narrow rooms had been developed along nearly right angle joints, in a southwest direction for nearly 400 feet, each passage on a lower level and connected by crawlways. Formations were among the finest seen in this part of the State, a photograph of one of the very delicate ones later being published in LIFE. A small "geyser", spurting water a foot into the air was noted.

Several parties subsequently visited the cave but the owners of the property discouraged such visits and about 1940 effectively closed the cave by dumping tons of rock into the entrance. In the last 15 years a dense stand of pine trees has grown up on the hillside obliterating even the location of the small quarry. (Mohr)

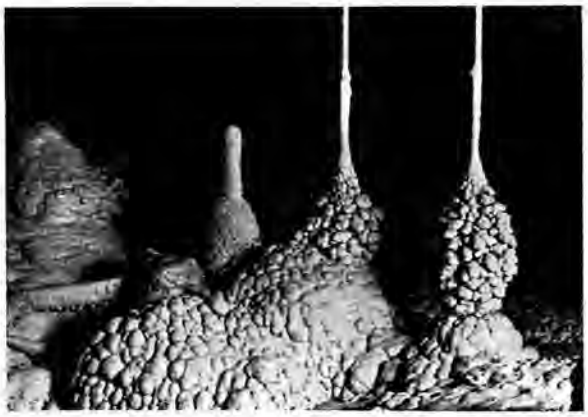
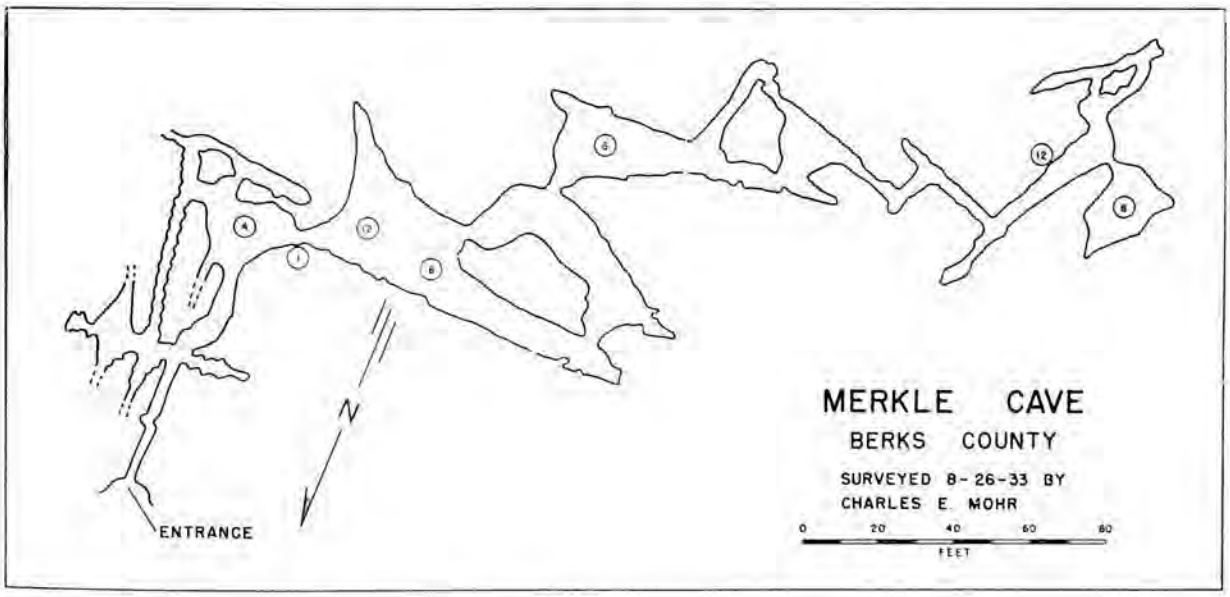


Photo by C. E. Mohr

Fig. 4—Remarkable stalagmite columns in Merkle Cave, Berks County.



MOHRSVILLE CAVE

(See Centerport Cave)

MONTELLO CAVE

[redacted] **Wernersville Quadrangle**

[redacted] there is a small, old limestone quarry on the north side of the road on the property of Earl Weitzel of Montello. This is in the Conococheague-Elbrook strata of Canadian age. A narrow, headhigh entrance gives access to two crevices described by Shaffner in 1932.

"One crevice follows along a joint plane. It averages 2 feet in width and 6 feet in height, and is inclined at an angle about 30° from vertical. This can be traversed with difficulty for about 75 feet. Flowstone covers portions of the footwall, and slender stalactites 2 to 10 inches long occur at places on the roof. The other crevice, at a right angle from the former, is about 20 inches in diameter. It follows what appears to be a fault surface. The writer squeezed into this and found a room about 5 feet in diameter and 3 feet in height with a pool of water about 18 inches deep."

D. Graham Foster, Jr., Swarthmore, in January 1950, wrote: "The level of a pool of water terminating one of the three short passages had sunk about 3 feet, revealing a small room that exhibits more extensive formations than any of the other much larger non-commercial caves in the county."

On July 13, 1952, Craig and the writer found the cave to be as described by Shaffner, with the addition that the crevice along a joint extends to the right of the entrance about 20 feet, and the floor of the other crevice beyond the joint covered with several inches of water.

MORGAN CAVE

[redacted] **Honeybrook Quadrangle**

A cave in which Colonel Morgan is said to have quartered soldiers during the Revolutionary War seems inadequate for such use. Situated [redacted] the entrance in vertical-bedded Conococheague-Elbrook limestone is only 3 feet wide and high enough to walk in. Water nearly fills the cave in winter. Exploration in summer is reported to have been unproductive. On the other hand, it seems that there must be some substance to the oft-repeated and well-established accounts of a cave in or near Morgantown. An areal reconnaissance by Parker and Rowley gave some indication of an underground passage extending from the King Farm entrance for ½ mile directly into Morgantown and terminating directly behind the firehouse. An opening into the firehouse cellar is said to have existed formerly. Charles Zenser, Sr., has compiled a large amount of historical lore concerning the reputed use of this cave. (Mohr)

NOECKER CAVE

[redacted] **Reading Quadrangle**

The Noecker Cave is in Bern Township, [redacted] The entrance to the cave has been purposely closed by dumping rock into the quarry. The following description written by Barnsley in 1932, was confirmed in 1952 by an elderly neighbor who knows the cave well. It probably is in Ordovician Leesport limestone.

"The entrance is at the west end of a quarry once worked for agricultural lime. This limestone is brought to the surface by an anticline which exposes sandy limestone, calcareous shale, and limestone conglomerate in or underlying the yellow Martinsburg shale.

"The entrance is so small that one must lie down and wriggle through it about 12 feet to reach a low, inclined room, the floor of which is heaped with blocks dropped from the roof. Small passages lead off down the dip, one to a depth of 20 feet. The largest passage leads N.15°E. for 27 feet through beautifully weathered limestone conglomerate. The limy pebbles have been dissolved back 2 inches from the face of the rock, leaving the thin sandy clay matrix as a fragile network of partitions.

"This passage turns sharply to the left 27 feet from the room and goes 40 feet N.80°W. along the strike. The channel is straight and narrow but very low at first; toward the rear, however, the ceiling rises to about 12 feet, and at the far end is a room about 8 by 12 feet, which is partly filled with dropped blocks.

"The cave is interesting because it has been excavated in rock very low in lime. Even the most limy looking material is so sandy that half or more of it by volume is quartz grains. The presence of weathered quartz veins, as in Dragon and other caves in this belt, is unusual." (Barnsley, Stone)

PHILLIPS CAVE (See Seaman Cave)

PICNIC GROVE CAVE

[redacted] **Reading Quadrangle**

[redacted] It is in the Martinsburg shale of Ordovician age. Long known, originally on the Daniel Phillips farm, it is on property now owned by Grant Phillips of Reading. It is possible to advance only about 20 feet. Mr. Phillips says he once dug his way into a room, turned at a right angle where he could stand upright and into another room with water on the floor. No dimensions were given. Sink holes on the surface follow the apparent course of the cave, starting about 150 feet from the entrance.

PINNACLE CAVES

[redacted] **Hamburg Quadrangle**

On the nose of a prominent spur of Kittatinny Mountain at a place called the Pinnacle are some interesting passages in the rock. They are developed in hard quartzite by rock movement and not eroded from soluble limestone.

These peculiar cavities are not unique in Pennsylvania, being reported as existing at several places in the north and central part of the State. Near Eagles Mere and Warrensville the same condition may be seen in the Pocono sandstone. In nearly all cases the openings along joint planes are formed by frost action and gravity working on flat-lying beds supported by some incompetent rock, as a soft shale.

At the Pinnacle, the Tuscarora quartzite is very massive and, being the surface rock, is well jointed. Underneath is the Martinsburg shale which is relatively softer, and at the east side of the Pinnacle where the talus slope is steep it has permitted the quartzite to slump a bit and widen already existing joints and fractures. Frost action to a minor extent has split apart the blocks and widened cracks, and no doubt the large pieces on the talus are slowly being broken down by this means.

The largest cave is T-shaped, and leads inward past a narrow entrance and over an irregular floor for 80 or 90 feet, where it joins at a right angle another perpendicular passage that leads 25 feet to the right, and continues to the left for 175 feet until it narrows too much for further progress. The farthest part of this passage was very difficult to traverse because narrow, and because it was quite wet when visited by Mohr, Barnsley, and Shaffner during a January thaw.

The roof is formed by large blocks fallen into the top of the passage. Some of these blocks look as if they were on the verge of falling onto the explorer. Light seeps in between some of the blocks—in the large grotto it is seen over 35 feet above the floor—so one does not have the absolute darkness typical in limestone caves. (Barnsley)

POPLAR NECK

[redacted] **Reading Quadrangle**

Scarcely 2 miles south of Reading, within a loop of the Schuylkill River known as Poplar Neck, are two large rock shelters. Both the Indian Hollow Shelter, overlooking the east loop of the river, and the Raudenbush Rock Shelter, 50 feet above the river, facing west, have been excavated by workers from the Reading Museum. The latter shelter is formed in a high Triassic conglomerate ledge. Solution of the limy matrix has developed several small passages, but the site is notable rather for excavations of Indian artifacts and fossils of animal life beneath the main overhanging ledge, 12 feet deep and 80 feet wide. Indian skulls were found years ago at both sites by pot hunters, but there is now no record of them. The report of the survey by Earle L. Poole of the Reading Musum provides a fine outline for study of other promising cave sites. (Mohr)

SCHOENFELD CAVE

[redacted] **Boyertown Quadrangle**

[redacted]

Sometime before that Dr. Schoenfeld, a prominent Reading geologist of that day, is said to have been stuck in this cave, necessitating the removal of some rock to extricate him. A very large column described as resembling a human form, was said to be the most prominent feature of the cave.

The accessible portion of the cave is now only about 15 feet across and about as deep; the descending floor is filled with earth and loose rock. Walls richly covered with flowstone and pebbly speleothem suggest that excavation of the fill might be worthwhile. Highly contorted strata in the quarry wall close to the cave are particularly interesting. (Mohr)

SCHOFER CAVE

[redacted] **Hamburg Quadrangle**

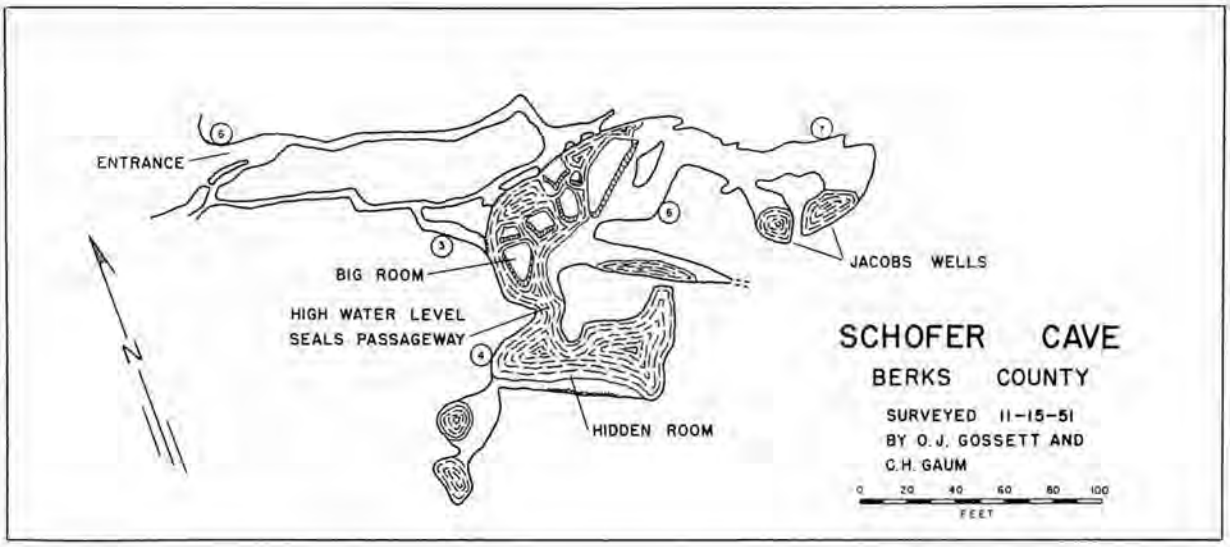
For its contributions to science this is one of the most notable Pennsylvania caves though by no means one of the largest. Here in 1932 the first banding of cave bats in America was carried out by Mohr. Later, in 1946, the Philadelphia Grotto was organized immediately after an expedition to this cave by a party from the Academy of Natural Sciences. Several Trenton members of that Grotto carried on a two-year study of the cave, culminating in a detailed report on the hydrologic and atmospheric studies by Gaum. This paper by Gaum describes the cave in detail and forms the basis for this abbreviated description.

These recent studies were carried out with the cooperation of the Pennsylvania Game Commission on whose land the cave is situated. Barographs, thermographs, psychrometers, anemometers, and other equipment on loan from the Office of Naval Research were used.

An archeological investigation at the cave entrance in 1952, by the University of Pennsylvania Museum, revealed nothing of interest.

Schofer Cave is [redacted]

The cave is in the lower part of the Martinsburg formation of Ordovician age in a belt of limestone that includes Crystal, Dreibilbis, Dragon, and Onyx



caves. According to Barnsley the country rock of Schofer Cave is variable and very impure. Some beds are limestone conglomerate, others are sandy limestone, while much of the rock, especially in the interior, is shaly limestone or, locally, true shale. The cave has developed by solution along joints and bedding planes and also in fractures caused by local faulting. Evidence of faulting is seen in the entrance and in the cliff nearby.

The entrance is shaped like an inverted V and descends as a crawlway over small blocks fallen from the ceiling. This passage swells to a small, low room 23 feet from the surface. By crawling through a small opening 12 feet beyond one can follow a head-high corridor that widens and narrows for 80 feet, to where the ceiling lowers sharply to about 18 inches above the floor. Here one wriggles through an opening for 10 feet, then goes on hands and knees past several sharp turns and across the bedding to the Big Room.

This room is 40 to 60 feet across and about 15 feet high. Large fallen blocks are scattered everywhere. As they are surrounded by water, care is necessary in climbing over them. Continuing east up over smaller breakdown and then down grade, one comes to two passages, each leading to one of Jacob's Wells. These latter are two deep pools connected below water level. This is easily demonstrated by shining a powerful flashlight downward into the pool. The light can be seen deep in the pool by a person in the second passageway.

South of the Big Room is another part of the cave that can be reached only during periods of very low water. Its dimensions are approximately 40 by 80 feet and its height is about 12 feet. It can be entered by crawling under a low overhang. This is called the Hidden Room because it is usually inaccessible. It contains flowstone and many anthodites or cave flowers. It was discovered in 1947 when members of the Philadelphia Grotto ducked underwater to reach it.

West of the Big Room are narrow crawlways called the Catacombs which connect with the outside, near the main entrance.

Flowstone covers the wall of the entrance passage in many places and occurs elsewhere in the cave. Stalactites are lacking. A large broken stalagmite was found in the Catacombs.

SEAMAN (PHILLIPS) CAVE

[redacted] **Wernersville Quadrangle**

A cave earlier reported to be on the former Henry K. Phillips farm [redacted]

The cave is in the smaller of two quarries in the Ordovician Leesport cement rock. The larger is used for trash disposal and the smaller one is nearly concealed by brush and weeds. Both are near the top of a ridge. The entrance requires one to stoop and climb down over flowstone but it opens at

Photo by C. E. Mohr

Fig. 5—Lake Room in Schofer Cave, Berks County. Water level at this stage cuts off Hidden Room.

once to a room 20 feet wide extending downward to the left for 70 feet and with a ceiling 8 to 14 feet high. Four or five large stalagmites, up to 4 feet in diameter and 3 feet high were noted—one shattered. From the upper end of this room and to the right of the entrance is a crawlway at least 20 feet long. (Craig, Stone)

SHEARER CAVE

[redacted] **Reading Quadrangle**

Along the south bank of Laurel Run [redacted], named for Christopher Shearer, a well-known Reading artist who had explored it prior to 1900. It was closed about 1915 by dumping several wagonloads of earth over the entrance from the top of the quarry.

In 1935 a group from the Reading Museum dug in the quarry on several occasions, finally succeeding in locating the entrance at the base of the quarry wall. The cave has two rooms and extends about 150 feet from the entrance. A lower level passage passes beneath the first room. In 1953 the cave was again found to be closed. (Mohr)

SINKING SPRING CAVE

[redacted] **Wernersville Quadrangle**

This cave is in an abandoned quarry in Beekmantown (?) limestone along the Reading Railway tracks just south of the village of Sinking Springs. The entrance has been blocked with rubbish for two decades or more.

About 1930 a watchman at a near-by grade crossing told Shaffner that, as a boy, about 1890, he went into this cave many times and explored it for great distances, but never thoroughly because of many branching passages. He said that the trend is south under the railroad and that once he emerged from the cave on a farm a quarter-mile from the entrance. An attempt by Swarthmore college students to dig through the rubbish in 1950 was unsuccessful.

SLATE CAVE (See Coon Cave)

SOUTH TEMPLE CAVE

[redacted] **Reading Quadrangle**

The cave at South Temple is in a limestone cliff [redacted]

The cave is in massive, nearly flat-lying Conococheague limestone of Cambro-Ordovician age.

The entrance is about 9 feet high and 4 feet wide except the lower third that is only 2 feet wide. A smaller entrance 2 to 3 feet high is 40 feet to the left. The larger hole goes in S.38°W. on an incline, with an average width of 3 feet and height of 15 feet for 25 feet, where it widens and makes a sharp left turn. Near this turn a low, narrow, twisting passage leads steeply up to the right for 50 feet.

A low, wide opening near the base of the entrance passage at the turn continues straight ahead for 33 feet, then curves gently to the right for 22 feet as a belly crawl. A pit 10 feet deep and connecting a lower level is 10 feet from the start of this passage. The crawlway opens to a gallery 88 feet long, with a 9-foot drop overlooking a section 30 feet high.

From the turn near the entrance the main passage descends steeply for 37 feet over a hard clay fill into which 12 steps have been cut. The roof maintains its level so that at the bottom of the steps it is 25 feet above the floor. At the bottom of this incline low passages open to the left and straight ahead. A low pocket to the left leads up 20 feet over fallen blocks and opens to the quarry face. The low area straight ahead extends 16 feet and turns right, connecting with a room 56 feet long, up to 32 feet wide, and 3 to 8 feet high. Several short passages lead to the left from this room and large pendants hang from the ceiling.

A hole in the floor near the bottom of the clay steps connects to a lower level that runs under the entrance passages and joins the 88-foot gallery. Also near the base of the clay steps, the main passage of the cave winds southwest then southeast for 242 feet over large clay mounds. This passage is 8 to 20 feet high, with an average width of 10 feet. It ends in a curved room 48 feet long and 12 feet high, the floor of which is mud, produced by constant dripping. From this Mud Room a low passage heads N.70°E. for 84 feet.

About half-way between the entrance and the Mud Room a crawlway averaging 4 feet high leads west, then southwest for 117 feet over gummy clay slopes to intersect a northwest-southeast fissure. This fissure is narrow, 151 feet long, and up to 18 feet high. The floor at the far end is covered with water several inches deep. (Barnsley, Smeltzer)

STONE CAVE HILL

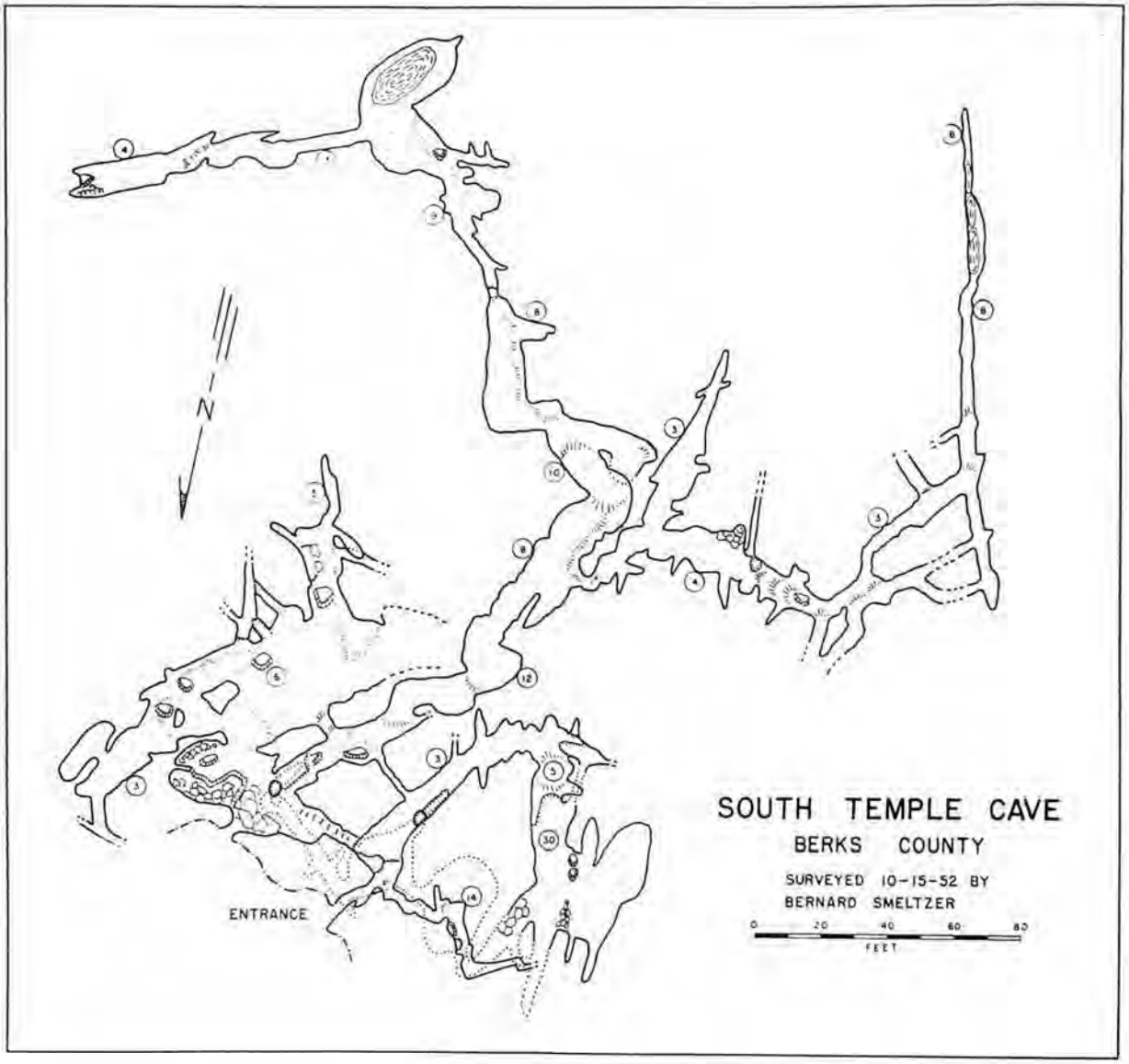
[redacted] **Boyertown Quadrangle**

Because this name is on the west edge of the Boyertown Quadrangle map north of Earlville, this mention is made of a rock shelter on the left bank of Manatawny Creek about [redacted] The opening about 40 feet above the road is 15 feet high and 10 feet deep, in shale under Hardyston quartzite, according to Hans Wilkins of Reading.

TUCKERTON CAVE

[redacted] **Reading Quadrangle**

[redacted] are two narrow solution channels roughly parallel to each other. They have been thoroughly explored and are too small to warrant description here. **They are considered dangerous.**



WEST READING CAVES

[redacted] **Reading Quadrangle**

Along the Schuylkill at West Reading, just inside the fence on the property of the Metropolitan Edison Company, there were formerly two small caves in an outcrop of Conococheague limestone. By stooping and crawling one could go about 50 feet in a crevice about 3 feet in diameter in the smaller cave. The longer cave was said to terminate in the cellar of a house several hundred feet away.

Both entrances are now closed. Another small cave is reported along the river just north of Route 422.

BLAIR COUNTY

ARCH SPRING (TYTOONA) CAVE

[redacted] **Tyrone Quadrangle**

On a branch of Sinking Run about [redacted]

[redacted] The ceiling of this cave descends well below pool level about 30 feet back from the face of the inner ledge. This is the lower end of Arch Spring Cave, completing a single underground stream channel about ¼ mile long, only the up-stream quarter of which is known to be traversible.

Photo by C. E. Mohr

Fig. 6—Entrance to Arch Spring Cave, Blair County.

The open, upper entrance to Arch Spring Cave, about a mile from the arch, marks the end of a ravine, just below the road. It is in massive beds of Trenton limestone dipping southeast about 15° and is a wedge-shaped opening 40 feet across the bottom and 12 feet high on the left side. When the stream is at normal height it flows on the right side of the cave. At such times one can enter about 175 feet before progress is blocked by water covering the floor. By some wading one can continue for 300 yards or more from the mouth to where the roof approaches or goes below water. That anyone ever went all the way through is doubted, since swimming for 300 feet revealed no passage beyond that point.

The cave extends up the left slope 40 feet or more and at the upper side a gallery along the bedding extends south for several yards. The floor of the upper part of the cave is wet, slippery clay. Dripstone formations are rare. The traversible part of the cave averages about 40 feet wide and 10 feet high.

The cave was opened to visitors on a commercial basis in July 1947 by installation of walks and electric lights, and advertised as Tytoona Cave, a name derived from Tyrone and Altoona. Since the cave lacks speleothems, and spring freshets recurrently wash in debris and wash out installations, the venture was short-lived. (Stone, Devitt)

It is reported that 250 yards downstream from Arch Spring the stream enters a cave, turns right, makes an underground pool, and invades large rooms and extensive passages. This is yet to be confirmed in 1953.

CHIMNEY ROCK CAVE

[redacted] **Hollidaysburg Quadrangle**

Along the road in the gap over the ridge [redacted]

[redacted] It is only 2 feet square and opens into a room that blasting has made unsafe to explore. Off this room a small chamber to the right 5 feet high has crystal facing on the rock; and to the left the room ends in two widely separated small alcoves. It was visited in August 1949. (Hoffmaster)

FRANKSTOWN CAVE

[redacted] **Hollidaysburg Quadrangle**

[redacted]

In the dirt on the floor of the cave many fossil bones were found and later collected by the Carnegie Museum.

In the Helderberg limestone which here dips SE.27° are joints enlarged by solution to holes big enough for a man to enter, and some small caves. The cave in which the bones were found was about 40 feet long, 7 feet wide, and up to 12 feet high. The floor, about 30 feet below the surface, was covered with two feet of red earth, mixed with organic material, fallen blocks of limestone, and cave onyx. In this earth is where the bones were found.

At the surface there was no evidence of the cave beneath, but the face of the quarry when it cut through the cave showed the upper part of the cave filled with blocks of limestone cemented together with cave onyx. The hole through which the animals entered the cave must subsequently have become clogged and filled.

Many of the bones were broken by falling rock, and no articulated skeletons were found. Nevertheless it was possible to identify parts of the skeletons or teeth of birds, snakes, frogs, bats, wolves, bear, bison, small rodents, deer, musk-ox, peccary, tapir, sloth, and mastodon.

Continued quarry operations completely removed the walls of the cave. Its location is believed to have been not far from the east end of the upper quarry.

GROMILLER CAVE

[redacted] **Hollidaysburg Quadrangle**

In Blair County, [redacted]

[redacted]

REDACTED

The Gromiller cave is a steeply plunging nearly straight passage about 160 feet long, 15 feet wide, and 10 to 25 feet high. It has a N.25°E. course in Helderberg limestone beds that strike N.30°E. and dip NW.70°; and a smaller passage that branches off to the left about 25 feet from the entrance and has a nearly direct course N.12°E. for nearly 100 feet to a 6-foot drop to a shelf in the lower passage. The lower passage is only 3 feet high at the lower end but a narrow crooked chimney rises above it. There is a small cave above the far end of the main cave.

It will be noticed from the description that the main passage diverges 5° from the strike and the tributary 18°. Two striking features are a dripstone bridge near the inner end of the left passage; and, near the lower end of the main passage, a 10-foot high barricade directly across the passage which is suggestive of dropped roof blocks smoothed over with dripstone, for it has a rounded upper surface and seen from the far side is hollow beneath.

HOLLIDAYSBURG CAVE

REDACTED **Hollidaysburg Quadrangle**

On the former location of Route 22 one mile east of the Court House at Hollidaysburg, a small quarry at the end of a highway cut is in Helderberg limestone dipping SE.20°. Along one of the nearly vertical joints a natural "keyhole" opening is just high and wide enough for a man to walk along it. There is a steady up grade for about 150 feet, where further progress is blocked by decrease in the size of the passage and by a dripstone column.

KEYSTONE ZINC MINE CAVE

REDACTED **Tyrone Quadrangle**

Caves in Trenton limestone along a fault zone one mile west of Birmingham appear to have been the source of lead and zinc ore mined during the Revolutionary War. Man-made shafts and tunnels, and natural passages were accessible on the property of the New Jersey Zinc Company in 1952.

The main shaft looks like a natural sink hole cave. Four tunnels 40 feet below the surface run in different directions. They may be partly natural and partly artificial. A 40-foot deep hole leads to a lower level composed of a 300-foot adit and several short tunnels. About 300 feet south of this shaft are two holes, one a steep shaft and the other a shallow sloping hole with a wide low entrance at the bottom. One can walk around on breakdown in the entrance room. Two small winding passages lead from it to other parts of the mine.

The passage to the south descends steeply, then levels off. It is nowhere more than 3½ feet high and 4 feet wide. Beyond a low crawl, one enters a room about 20 feet long, 10 feet wide, and 15 feet high that looks like a cave. It shows some evidence of selective mining.

The passage to the north winds around and up and down and intersects a cave passage about 2 feet wide and 4 feet high that descends a 40° slope for more than 80 feet, diminishing until it is impassable. Galena and sphalerite occur in fissures in the cave walls and roof. (Devitt)

LOGAN CAVE

REDACTED **Altoona Quadrangle**

REDACTED

an opening 4 feet wide and 9 feet long that gives access to the cave floor 6 feet below. The cave extends 30 feet back under the cliff, is 6 feet wide and 15 feet high, with a floor of broken rock sloping in at 20°. High in the back wall is a 2 by 3-foot oval hole, now blocked with clay. Local residents say there are more rooms.

It is called Logan Cave because an Indian known as Chief Logan lived at Logan Spring, one mile northeast of Bellwood in the summer and in this cave in the winter.

TYTOONA CAVE (See Arch Spring Cave)

OTHER CAVES

Hollidaysburg Quadrangle

On the property of the D. M. Bare Paper Co. at Roaring Spring a keyhole crawlway in Beekmantown limestone has been closed since 1938 by filling with rock.

About two miles west of Martinsburg is a small quarry south of Route 164 on the Wayne Drake farm; a narrow fissure leads in 8 feet to a drop of about 10 feet below which is a high passage leading in two directions. This has not been explored in 1953. (Smeltzer)

BUCKS COUNTY

DEAN CAVE

REDACTED **Doylestown Quadrangle**

On the topographic map of the Doylestown Quadrangle, in Plainfield Township, two miles northwest of Point Pleasant, appears the name Dean Cave. The location is in the loop of Tohickon Creek where the Locatong formation of Triassic age is exposed. Dean B. McLaughlin of the University of Michigan, and Bradford Willard of Lehigh University, both of whom have studied the geology of the vicinity, say there is no cave, only a rockhouse or shelter under an overhanging rock.

DURHAM CAVE

[redacted] **Easton Quadrangle**

Durham Cave is located along Delaware River in Bucks County less than a [redacted]

The earliest mention of Durham Cave is found on Schull's map of the province of Pennsylvania published in 1770, and thus makes this the first cave of which we have a printed record. The first written description appeared in 1828 in Hazards' "Register of Pennsylvania."

The entrance to the cave then was only about 6 feet across and the interior consisted of three large rooms, each about 90 feet long, of varying width up to 40 feet, and 20 feet high. The total length of the cave at that time was 300 feet, the latter 20 feet of which was filled with water prohibiting further exploration. According to the late Dr. Henry C. Mercer in an article entitled "An Exploration of Durham Cave, Bucks County, Pennsylvania, in 1893" the subterranean chamber had been reduced by quarrying operations to 175 feet, and since then it has been further reduced about 50 feet until now only part of the last large chamber remains.

This cave might now be described as a great rockhouse. It is an opening about 20 feet high and 40 feet wide extending underground 75 to 100 feet, with decreasing dimensions and descending floor. Inverted pits the size of peck and bushel measures occur in the roof.

An interesting collection of bones was made in this cave by H. D. Rogers, State Geologist, about 1856. Twenty different species of animals were found in this collection.

Dr. Mercer investigated this cave in 1893 and reported nearly two dozen additional animals, of which several are now extinct in this part of Pennsylvania and one, the peccary, is not known to have inhabited this region in historic time. Charles Laubach also described the cave. This cave is in Elbrook limestone of Cambrian age. (Barnsley)

CENTRE COUNTY

BOALSBURG CAVE

[redacted] **Bellefonte Quadrangle**

Boalsburg cave is in Beekmantown limestone [redacted]. It is a small cave, mostly a crawlway, having a remarkable development of right-angled passages along joints. A pool 50 feet inside the entrance may hinder further exploration. (Devitt, Smeltzer, Zeller)

BRUCKERHOFF CAVE

[redacted] **Centre Hall Quadrangle**

[redacted] A cave in Trenton limestone is entered in a small sink 100 feet south of the barn. From the bottom of a 10-foot ladder in the sink one descends a steep talus slope about 40 feet to the muddy floor of the cave, which is a fissure 5 to 10 feet wide, with a nearly level ceiling 30 feet high.

The winding course of the cave is more than 170 feet from the foot of the talus slope to deep water where the pipe to the farm well is located. The fissure is said to continue another 50 feet but normally water is as much as 10 feet deep. The water surface is 60 feet below the floor of the pump at the farmhouse. There are several elaborate flowstone speleothems 20-25 feet long. (Devitt, Stone)

Photo by C. E. Mohr

Fig. 7—Thirty-foot speleothems decorate several sections of narrow passage in Bruckerhoff Cave, Centre County.

BUFFALO RUN CAVE

[redacted] **Bellefonte Quadrangle**

The entrance to Buffalo Run Cave is in a wooded sink hole 100 yards northeast of a [redacted]

The cave is in vertical beds of Rodman or Trenton limestone. The entrance is about 25 feet

wide and 6 feet high; descends at an angle of about 15° and flattens, decreasing to about 15 feet wide and 4 to 5 feet high. The cave runs in a southwest direction and is said to end just under the school, but is blocked by mud about 100 feet from the entrance. The sink hole is used as a trash dump. The cave is on the Bickel farm.

DEER BONE CAVE

[redacted]" **Centre Hall Quadrangle**

On the John Ellenberger farm [redacted]. A 4-foot square, vertical hole opens into a cavity 12 feet long, 5 feet wide, and 15 feet deep. A fissure at the bottom heading east pinches out in 10 feet. A rounded hole 5 by 7 feet slopes down to the north for 18 feet and ends in breakdown. Many bones of deer were on the floor in November 1951. The area is underlain by Trenton limestone. (Devitt)

FRY CAVE

[redacted] **Allensville Quadrangle**

In [redacted]. On one side of the spring and 3 feet higher are two entrances to a small cave. The larger one is 9 feet wide, 6 feet high, tapers and pinches out at about 25 feet. The other entrance, 28 inches wide, leads to a 3-foot high crossover to the main entrance, and to the left into a small room 2 to 3 feet high that pinches down at the back to a hole a woodchuck could enter.

This cave was reported by Shoemaker and a note on it was published by Lohman.

MADISONBURG CAVE

[redacted] **Centre Hall Quadrangle**

[redacted]. In 1932, Mohr reported that he descended about 25 feet into a room 40 by 13 feet, and up to 10 feet high. Several short passages lead off from this room. The cave, he said, is completely submerged at times. It is in Trenton limestone.

Professor Frost wrote in June 1943: "The cave is not extensive but has several small rooms and is difficult to travel as there is much hard climbing.

There are no formations. The limestone is of a peculiar dark formation with deep holes apparently due to the action of water. This cave is very muddy and must be filled with water during rainy seasons. The farmer says the whole sink is then filled and it takes several days for the water to subside. I found some insect life here, especially beetles."

On May 30, 1946, the author learned that four days earlier the sink was full and water had flowed over the road to the south. When observed, the water level had subsided to about 15 feet below the overflow level.

Devitt reported in 1950, "The cave does not continue more than 50 feet due to filling of the passages with washed-in debris."

MILLER CAVES

[redacted] **Allensville Quadrangle**

[redacted]. In the bottom is a cave in which cheese was once stored by the agricultural laboratories, Pennsylvania State College, for experiments in keeping and ripening. The entrance, 5 feet high, leads to a room 15 feet wide and 7 feet high. Two small passages on the far side of the room join and continue as a crevice 3 feet high and 100 feet long to flowing water that probably emerges at Fry Cave.

Also in the bottom of this sink, 30 feet north of the previously mentioned entrance is a shaft and slope leading down 24 feet to a main passage 12 to 15 feet high with a pool at the far end. A short crawl on the left leads to a short parallel crevice about 20 feet high. Here is a hole that may lead to a lower level.

About 200 yards northeast of the Miller farm house, at the north end of a wooded slope, there is a small cave in a minor quarry opening. It is shaped like an elbow, wrist, and fist and is 4 feet high and 25 feet long. Block breakdown at the inner end has several stalagmites a foot high and brown dripstone. (Devitt, Smeltzer, Stone)

MILLHEIM CAVE

[redacted] **Millheim Quadrangle**

A cave at the south end of the village of Millheim has long been known locally. It is on the hosiery mill property of Herbert Stover and Lloyd Boob, on the west bank of a tributary of Elk Creek. The entrance is at the base of a quarry cliff of low-dipping Trenton limestone. Men are said to have followed the cave until they reached a point under the mill, 75 yards away.

The entrance to the cave is a walk-in, but fallen roof blocks now close the passage, if any, to the south toward the mill. In August 1951, an access to passages on the north was found by wriggling between fallen blocks into a passage that goes northwest fairly directly for 80 feet. A branch on the right ends in a pit 8 feet deep. A branch on the left heads south, then veers southwest through a room and joins another passage 120 feet long at mid-length. This passage curves and parallels the first one and its left branch.

The passages follow joints going in various directions. They are mostly 3 to 4 feet wide, 5 to 15 or more feet high, rarely so low as 2 feet, and well ornamented with stalactites ranging from brown to

near white. Water was dripping from many of them. Large fallen blocks are numerous. No evidence was seen that these passages had been explored previously.

Two blocks away on the east bank of Elk Creek at the end of a footbridge, there is a very small cave in Trenton limestone just above creek level. A crawl hole opens into a room several feet across, with fallen rock on the floor and standing water on the far side. **A large slab of rock about 1 foot from the ceiling appears dangerous, and the hole should be closed to keep children out.** From front to back of the cave is about 50 feet. (Devitt, Smeltzer, Stone)

MINE CAVE

[redacted] **Centre Hall Quadrangle**

A cave two miles northeast of Pleasant Gap and WSW. of the Bellefonte Airport was named by the Nittany Grotto for its proximity to the mine that began producing in 1951 from the Lowville limestone of Ordovician age.

The entrance is in the west end of a 100-foot long, 20-foot wide, shallow sink underlain by Trenton (?) limestone. It is about 300 yards northwest of the mine portal. This cave has long been open but little known because the entrance is a small, sloping, tortuous crawlway, with loose chunks of rock and trash on the floor. One can stand erect in about one-fourth of the cave; the rest is either crawlway or wormway.

The cave extends 220 feet in a southwest direction. The zigzag, low passage leads down into a horizontal opening 60 feet long, 12 feet wide, and 6 feet high. A stream enters the eastern end of the room, flows under one side, follows a 3-foot channel for 80 feet, and disappears under a low roof.

Speleothems are common in the main room, which has a sloping, muddy floor. A hole in the ceiling leads to a small room containing many broken stalactites. (Devitt)

NOLL CAVE

[redacted] **Centre Hall Quadrangle**

This cave is named by the Nittany Grotto for Mr. Ray Noll, president of White Rock Quarries and owner of the land, who explored this and other caves in the early 1920s. The location is [redacted]

Members of the Nittany Grotto spent more than 300 man-hours digging and timbering a shaft in fill on the east bank of the run and reached a fissure

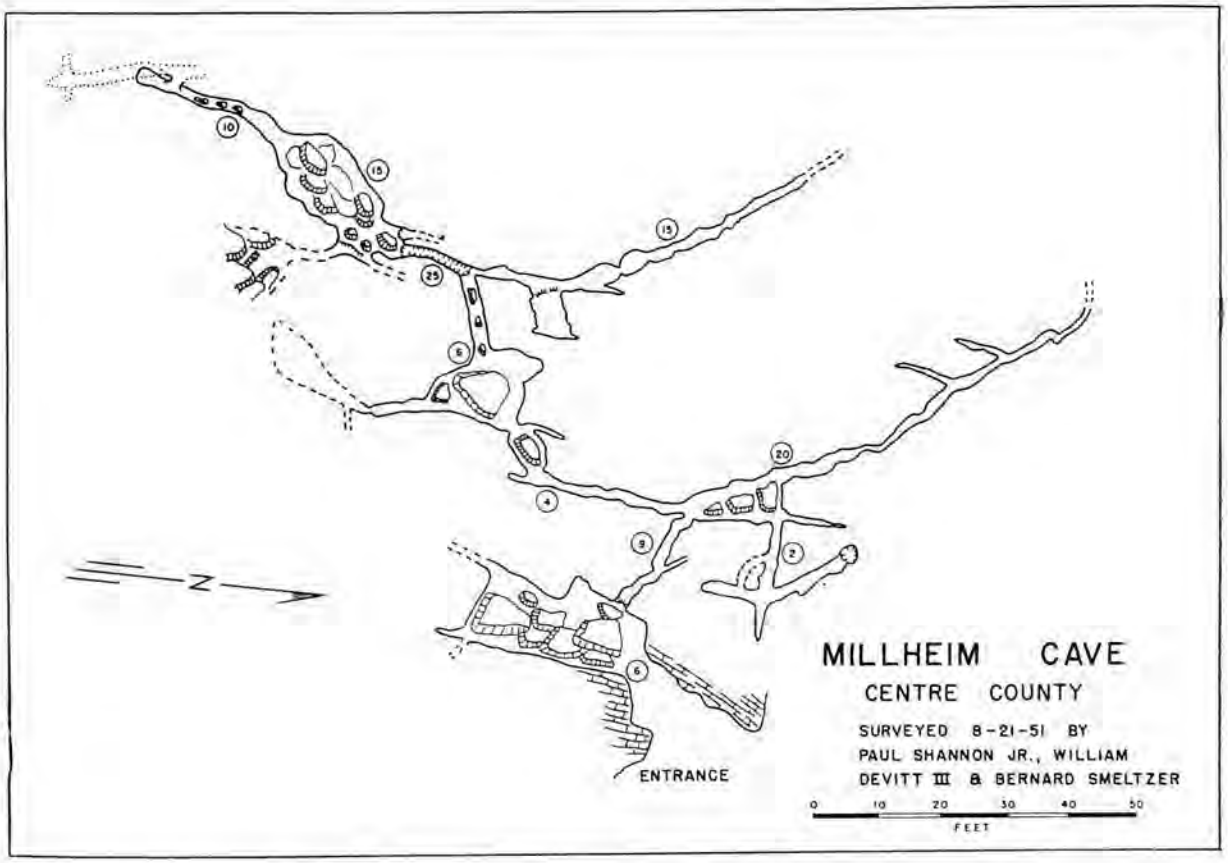


Photo by C. E. Mohr

Fig. 8—Balloon-shaped speleothem in Millheim Cave, Centre County.

descending steeply into the cave. The cave is floored with damp silt and is cold during winter months due to air blowing into it. The passages are generally 4 feet wide, 3 to 10 feet high, and developed along the joint system of the gently dipping limestone beds. The cave has about 420 feet of passages, extending in both directions from the bottom of the entrance fissure. To the north a short crawlway leads to a long keyhole passage, at each end of which are fissures leading up to a higher level. One fissure heads back toward the entrance and is clogged with trash. To the southeast of the entrance exists the portion of the cave which was tunneled into after 50 man-hours of work by Nittany Grotto members. Short fissures along north-south joints connect three parallel rooms along east-west joints. There are several small stalactites; the floors are of wet clay and breakdown. From the eastern end of the largest room, 30 feet long and 12 feet wide, a slanting narrow fissure leads down a sandy slope to a small pool, 50 feet from the room. Several fissure passages in the cave are filled with stream boulders from the bed of an intermittant stream nearby on the surface. The wind blowing into the cave appears either to enter these boulder-filled passages or the high narrow fissures above most of the cave. Mr. Noll says there is a lower level and a large pool, as yet undiscovered in 1952.

An old resident reported that 50 years ago, some 100 feet upstream from Noll's Cave, a hole appeared in the stream bed exposing a cave. Two boys spent an afternoon exploring it. Next day water from a storm filled the hole with boulders. The spot cannot be located in 1952. It has been named "One-day Cave".

Downstream 75 feet from Noll's Cave the stream pours into a 1-foot square hole in a limestone ledge exposed beneath loose boulders. At the bottom of the sheer face where the stream runs in during high water, there must be a large cave to receive so much water.

Still farther downstream and 12 feet above the floor of the sink there is a keyhole cave, locally called Indian Cave. A clay fill stops progress about 30 feet from the entrance. A local resident says that in 1937 this passage lead down into a cave several hundred feet long beneath the quarry floor. (Devitt)

OAK HALL CAVE

[redacted] **Bellefonte Quadrangle**

This cave is ½ mile north of Oak Hall. It has two entrances on a level with Spring Creek. A stream flows from one of them. The cave extends under a road and a quarry in Trenton limestone. To explore it one has to crawl through mud and water 200 feet to where the quarry floor has broken down into the cave. The room is 12 to 35 feet wide and 16 inches to 4½ feet high. (Devitt, Smeltzer)

PENNS SHELTER CAVE

[redacted] **Centre Hall Quadrangle**

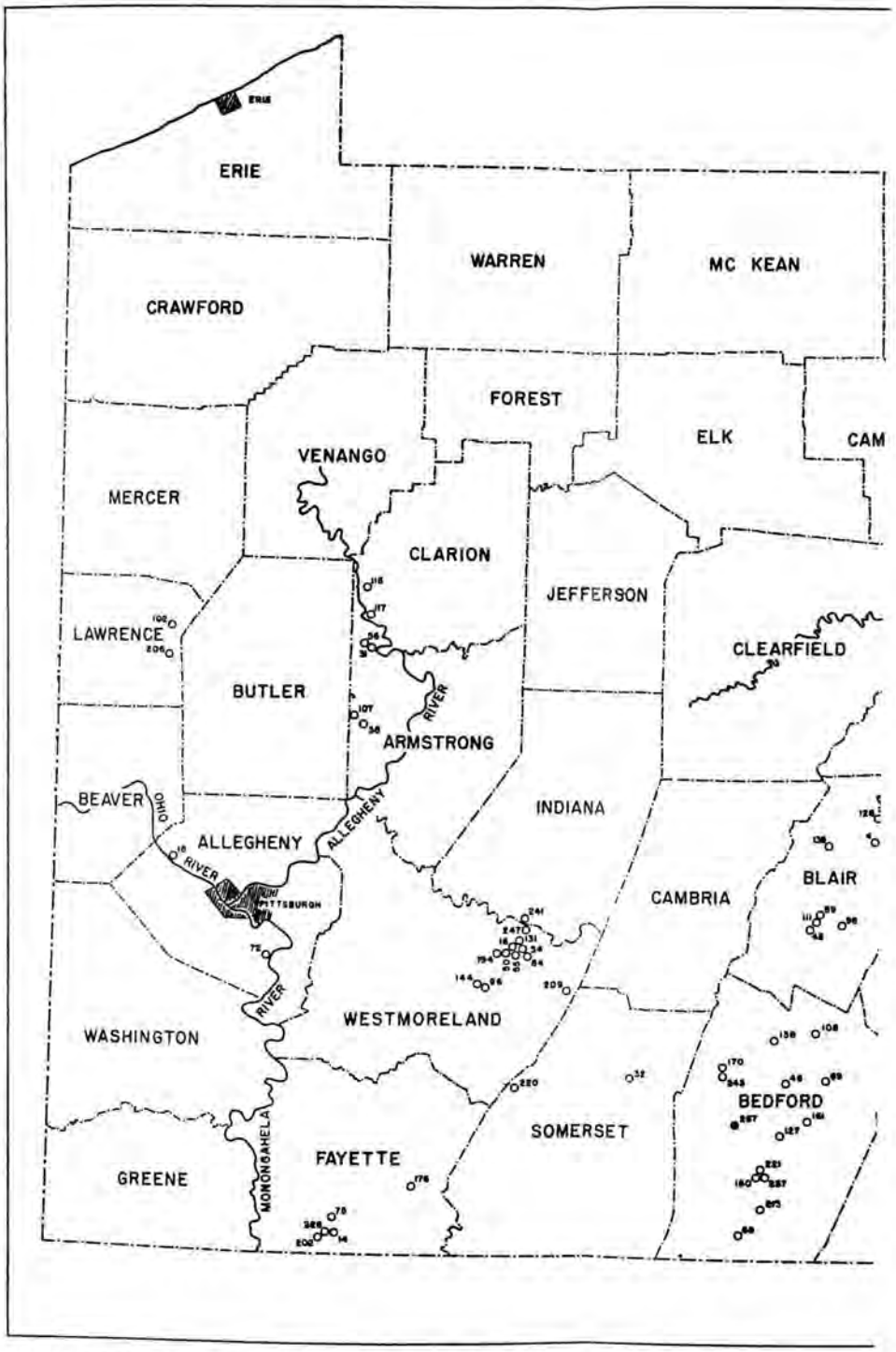
In the same large sink in which the well-known entrance to the commercialized Penns Cave is located is another much smaller cave. The large shelter-like entrance, 35 feet wide, is reached by a pathway and is about 125 feet SW. of the boat dock in the commercial cave. A walkable, sinuous passage leads SE. through breakdown, parelleling Penns Cave, and ends after about 40 feet.

An even larger and deeper sink ¼ mile SW. of Penns Cave has a high cliff at the deepest point. However, any cave entrance that may exist is buried by a large pile of trash dumped into the sink. (Devitt)

Caves of Pennsylvania

Names in capitals are those of commercial caves; numerals at the right refer to page on which description occurs; numerals at the left are keyed to the map.

1. Aitkin Cave, Mifflin Co. 113
2. ALEXANDER CAVERNS, Mifflin Co. .40
3. Allensville Cave, Mifflin Co. 115
4. Arch Spring (Tytoona) Cave, Blair Co. 67
5. Arnold Cave, Snyder Co. 128
6. Arnt Cave, Perry Co. 126
7. Auchenbaugh Cave, Franklin Co. ...91
8. BAKER CAVERNS, Franklin Co. 40
9. Baker Cave No. 2, Franklin Co. 91
10. Baker Cave No. 3, Franklin Co. 91
11. Bally (Henry) Cave, Berks Co. 57
12. Bard Caves, Huntingdon Co. 100
13. Barrville Cave, Mifflin Co. 115
14. Barton Cave, Fayette Co. 88
15. Bear Cave, Perry Co. 126
16. Bear Cave, Westmoreland Co. 132
17. Beavertown Cave, Snyder Co. 128
18. Bellrock Caves, Allegheny Co. 53
19. Bertolet Cave, Berks Co. 58
20. Blain Cave, Perry Co. 126
21. Blessing Mountain Wells, Lycoming Co. 112
22. Blue Hill Cave, Union Co. 131
23. Blue Spring Cave, Franklin Co. 92
24. Blue Springs Cave, Mifflin Co. 115
25. Boalsburg Cave, Centre Co. 69
26. Boiling Springs Caves, Cumberland Co. .80
27. Bootlegger Sink, York Co. 135
28. Bowmansdale Cave, Cumberland Co. ...80
29. Boyer Cave No. 1, Snyder Co. 128
30. Boyer Cave No. 2, Snyder Co. 129
31. Bradys Bend Cave, Armstrong Co. ...53
32. Breastwork Cave, Somerset Co. 130
33. Breckbiel Cave, Franklin Co. 91
34. Brownstone Cave, Dauphin Co. 87
35. Brubaker (Mc Nitt) Cave, Mifflin Co. .115
36. Bruckerhoff Cave, Centre Co. 69
37. Buchanan Cave, Franklin Co. 92
38. Buffalo Creek Cave, Armstrong Co. ...53
39. Buffalo Run Cave, Centre Co. 69
40. Carnegie Cave, Cumberland Co. 80
41. Carpenter Cave, Northampton Co. 123
42. Castle Rock, Delaware Co. 87
43. Centerport (Mohrsville) Cave, Berks Co. 58
44. Centreville Cave, Cumberland Co. 81
45. Chimney Rock Cave, Blair Co. 67
46. Claycomb Sink, Bedford Co. 54
47. Cleversburg Sink, Cumberland Co. 82
48. Cochlin Farm Cave, Cumberland Co....82
49. Cold Air, Northampton Co. 124
50. Con Cave, Westmoreland Co. 133
51. Conodoguinet Cave, Cumberland Co. ..82
52. Conodoguinet Rock House, C'b'land Co. 82
53. Coon (Slate) Cave, Berks Co. 58
54. Coon Cave, Westmoreland Co. 133
55. Copperhead Cave, Westmoreland Co. ..134
56. Cove Run Cave, Armstrong Co. 54
57. Coy Cave, Cumberland Co. 83
58. Craighead Cave, Cumberland Co. 83
59. CRYSTAL CAVE, Berks Co. 41
60. Crystal Pit Cave, York Co. 135
61. Curfman Cave, Huntingdon Co. 100
62. Dales Cave, Union Co. 131
63. Dean Cave, Bucks Co. 68
64. Deer Bone Cave, Centre Co. 70
65. Deerdorff, Franklin Co. 92
66. Devil's Den, Cumberland Co. 83
67. Dietrich Cave, Berks Co. 58
68. Donahoe Cave, Bedford Co. 54
69. Donaldson Cave, Bedford Co. 54
70. Dougherty Cave, Lycoming Co. 112
71. Dragon Cave, Berks Co. 58
72. Dravosburg Cave, Allegheny Co. 53
73. Dreiblbis Cave, Berks Co. 59
74. Duffield Cave, Franklin Co. 93
75. Dulany Cave, Fayette Co. 88
76. Dump Cave, Mifflin Co. 116
77. Durham Cave, Bucks Co. 69
78. Eastville Cave, Clinton Co. 79
79. East York Cave, York Co. 135
80. Elswert Cave, Lycoming Co. 112
81. Elswert Cave No. 2, Lycoming Co. 113
82. Elimsport Cave, Lycoming Co. 113
83. Emig Cave, York Co. 135
84. Evac Cave, Westmoreland Co. 134
85. Fleming Caves, Huntingdon Co. 101
86. Flemington Cellar, Clinton Co. 79
87. Flood Farm Cave, Huntingdon Co. ..102
88. Fossil Cave, Huntingdon Co. 102
89. Frankstown Cave, Blair Co. 67
90. Freeburg Cave, Snyder Co. 129
91. Fry Cave, Centre Co. 70
92. Gable Cave, Lancaster Co. 107
93. Girty's, Perry Co. 126
94. Goods Cave, Franklin Co. 93
95. Goss Cave, Mifflin Co. 116
96. Greenbrier Cave, Westmoreland Co. ..134
97. Greshville Cave, Berks Co. 60
98. Gromiller Cave, Blair Co. 67
99. Guthsville Caves, Lehigh Co. 112
100. Haas Cave, Snyder Co. 129
101. Hall Cave, Huntingdon Co. 102
102. Harlansburg Cave, Lawrence Co. 110
103. Hartman Cave, Monroe Co. 122
104. Hershey Cave, Cumberland Co. 83
105. Hesston Cave, Huntingdon Co. 102
106. Highland Park Cave, Mifflin Co. 116
107. Hineman Cave, Armstrong Co. 54
108. Hipple Cave, Bedford Co. 54
109. HISTORIC INDIAN CAVE, Hunt'd'n Co. 42
110. Hobo Cave, Berks Co. 60
111. Hollidaysburg Cave, Blair Co. 68
112. Horsebone Cave, Huntingdon Co. 103



113. Host Cave, Berks Co. 61
114. Ickesburg Cave, Perry Co. 126
115. Indian, Dauphin 87
116. Indian Cave, Clarion Co. 79
117. Indian Cave, Clarion Co. 79
118. Indian Cave, Northampton Co. 125
119. Indian Caves, Fulton Co. 100
120. INDIAN ECHO CAVE, Dauphin Co. ..43
121. Johnson Caves, Mifflin Co. 117
122. Keefer Cave, Franklin Co. 94
123. Keener Cave, Lebanon Co. 111
124. Kelly Farm Cave, Cumberland Co. 84
125. Kelly Hole, Franklin Co. 94
126. Keystone Zinc Mine Cave, Blair Co. ..68
127. Knisley Farm Cave, Bedford Co. 55
128. Kooken Cave, Huntingdon Co. 103
129. Kreider Cave, Lebanon Co. 111
130. Lampeter Cave, Lancaster Co. 107
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132. Lemoyne Cave, Cumberland Co. 84
133. Light's Fort, Lebanon Co. 111
134. Lime Sink Caves, Mifflin Co. 117
135. LINCOLN CAVERNS, Huntingdon Co. .44
136. Lisburn Cave, York Co. 136
137. Little Aitkin Cave, Mifflin Co. 118
138. Lockard Cave, Bedford Co. 55
139. Logan Cave, Blair Co. 68
140. Logan Mills Cave, Clinton Co. 79
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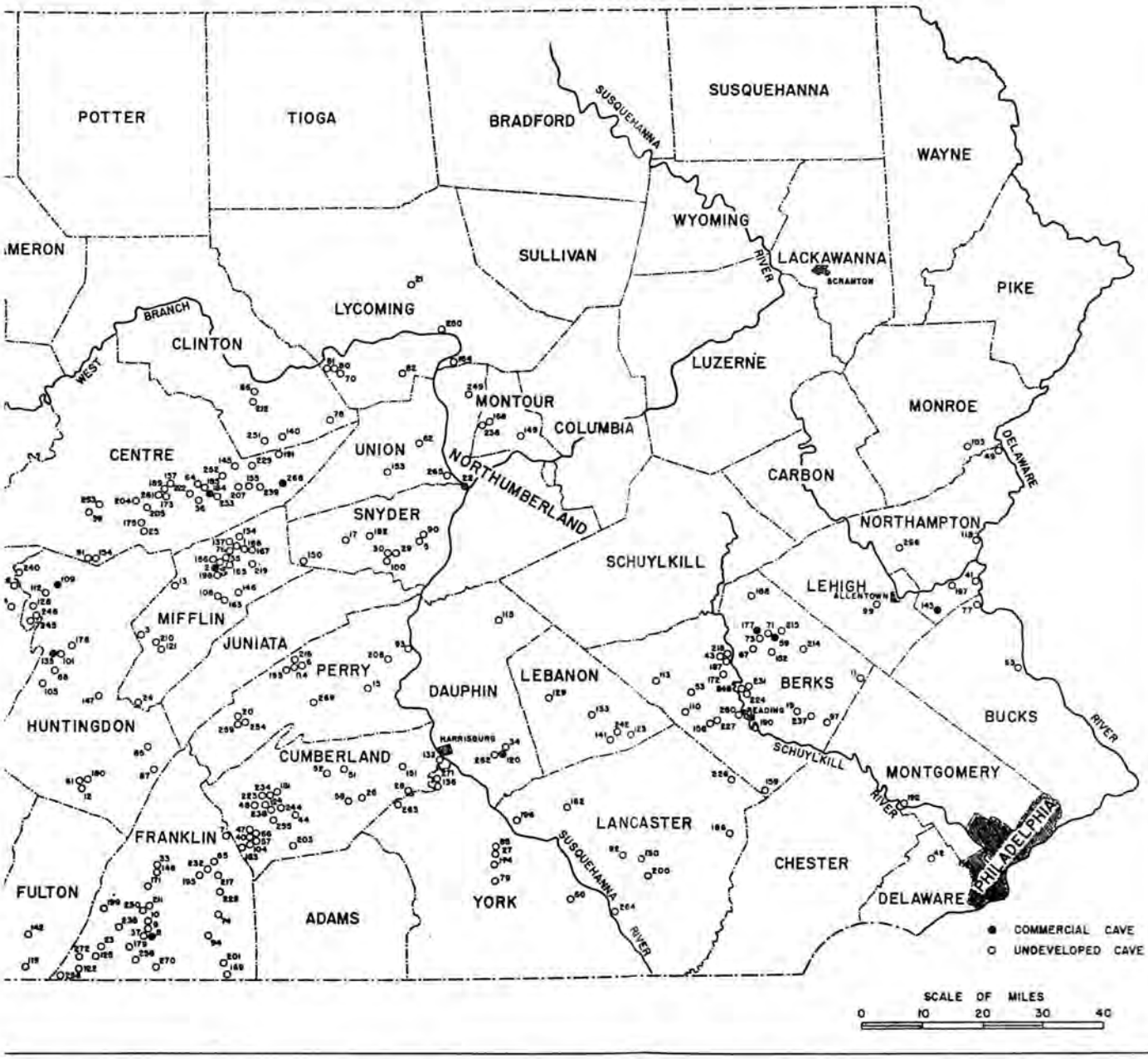
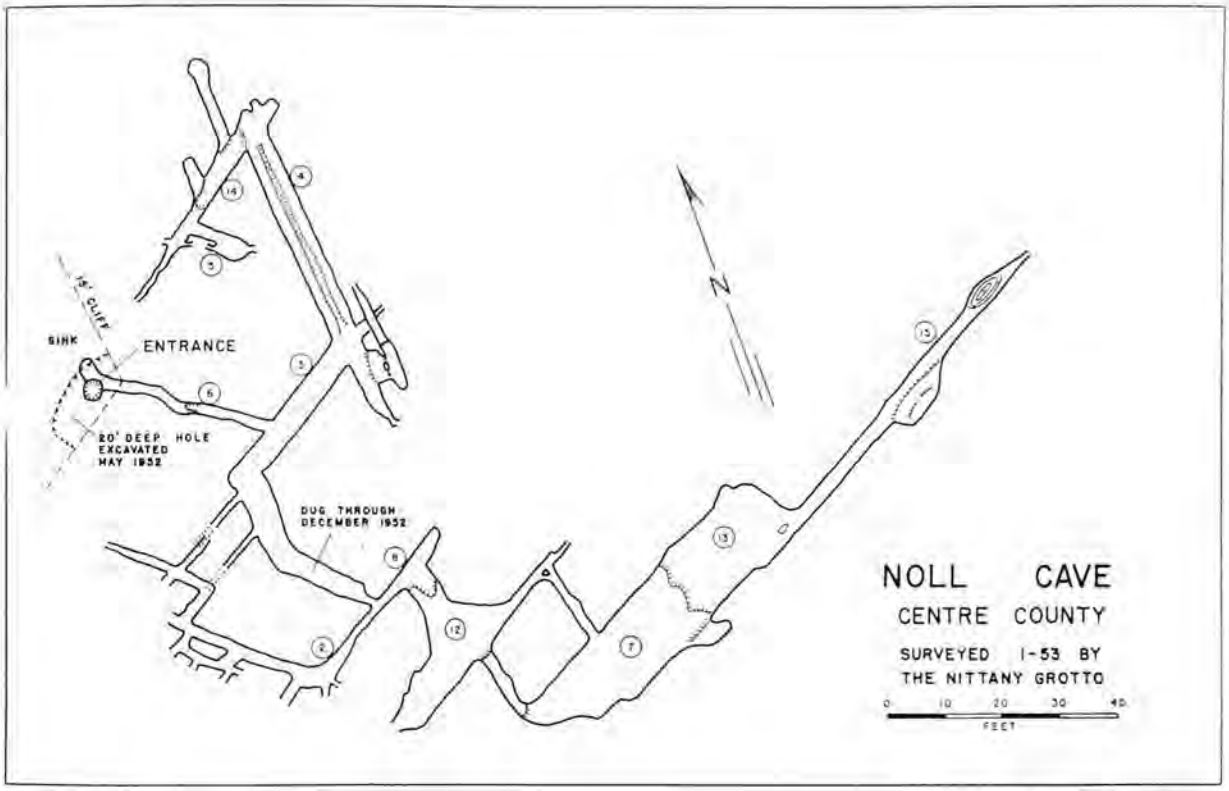
142. Long Quarry Cave, Fulton Co. 100
143. LOST RIVER CAVERNS, North. Co. ..45
144. Loyalhanna Caves, Westmoreland Co. .134
145. Madisonburg Cave, Centre Co. 70
146. Maitland Cave, Mifflin Co. 118
147. Mapleton Depot Cave, Huntingdon Co. 104
148. Martin Cave, Franklin Co. 94
149. Mausdale Cave, Montour Co. 123
150. Mc Clure Cave, Snyder Co. 129
151. Mechanicsburg Cave, Cumberland Co. .85
152. Merkle Cave, Berks Co. 61
153. Mifflinburg Caves, Union Co. 132
154. Miller Caves, Centre Co. 70
155. Millheim Cave, Centre Co. 70
156. Milroy Caves, Mifflin Co. 118
157. Mine Cave, Centre Co. 71
158. Montello Cave, Berks Co. 62
159. Morgan Cave, Berks Co. 62
160. Morgart Farm Cave, Bedford Co. 55
161. Mt. Dallas Cave, Bedford Co. 55
162. Mt. Joy Caves, Lancaster Co. 108
163. Mt. Rock Cave, Mifflin Co. 119
164. Muncy Hill Cave, Lycoming Co. 113
165. Naginey Cave, Mifflin Co. 119
166. Nail No. 1 Cave, Mifflin Co. 120
167. Nail No. 2 Cave, Mifflin Co. 120
168. Narehood Cave, Montour Co. 123
169. Needy Cave, Franklin Co. 94
170. New Paris Caves, Bedford Co. 56
171. Niewander Cave, Franklin Co. 94
172. Noecker Cave, Berks Co. 62
173. Noll Cave, Centre Co. 71
174. North York Cave, York Co. 137
175. Oak Hall Cave, Centre Co. 72
176. Ohiopyle Cave, Fayette Co. 90



177. ONYX CAVE, Berks Co. 46
178. Oriskany Sandstone Cave, Hunt'd'n Co. 105
179. Overcash Caves, Franklin Co. ...94
180. Park Caves, Huntingdon Co. 105
181. Parker Cave, Cumberland Co. 85
182. Paxtonville Cave, Snyder Co. 130
183. Pelper Cave, Cumberland Co. 85
184. PENN'S CAVE, Centre Co. 47
185. Penns Shelter Cave, Centre Co. 72
186. Pequa Church Caves, Lancaster Co. ..108
187. Picnic Grove Cave, Berks Co. 62
188. Pinnacle Caves, Berks Co. 63
189. Pleasant Gap Caves, Centre Co. 73
190. Poplar Neck, Berks Co. 63
191. Porterfield Fissure, Centre Co. 73
192. Port Kennedy Caves, Montgomery Co. 123
193. Quilliams Rock Cave, Perry Co. 127
194. Rattlesnake Cave, Westmoreland Co. ..134
195. Red Bridge Cave, Franklin Co. 96
196. Red Hill Cave, Lancaster Co. 108
197. Redington Caves, Northampton Co. ..125
198. Reedsville Cave, Mifflin Co. 121
199. Reese Cave, Franklin Co. 96
200. Refton Cave, Lancaster Co. 108
201. Reichard Cave, Franklin Co. 97
202. Rhodes Cave, Fayette Co. 90
203. Robber Lewis Rocks, Cumberland Co. ..85
204. Rock Cave, Centre Co. 73
205. Rockview Cave, Centre Co. 74
206. Rose Point Cave, Lawrence Co. 110
207. Rossman Caves, Centre Co. 74
208. Route 22 Cave, Perry Co. 127
209. Rudder Cave, Westmoreland Co. 134
210. Rupert Cave, Mifflin Co. 121
211. St. Thomas Sinks, Franklin Co. 97
212. Salona Cave, Clinton Co. 79
213. Saltpetre Cave, Bedford Co. 56
214. Schoenfeld Cave, Berks Co. 63
215. Schofer Cave, Berks Co. 63
216. Schull Cave, Perry Co. 127
217. Scotland Cave, Franklin Co. 97
218. Seaman (Phillips) Cave, Berks Co. ..64
219. Seawra Cave, Mifflin Co. 122
220. Shafer Run Cave, Somerset Co. 130
221. Shaffer Farm Cave, Bedford Co. 56
222. Sharer Cave, Centre Co. 75
223. Sharp Farm Cave, Cumberland Co. ...86
224. Shearer Cave, Berks Co. 65
225. Shively Cave, Franklin Co. 97
226. Silver Hill Cave, Lancaster Co. 109
227. Sinking Spring Cave, Berks Co. 65
228. Smith's Ladder Cave, Fayette Co. 91
229. Smullton Caves, Centre Co. 75
230. Snider Cave, Franklin Co. 98
231. South Temple Cave, Berks Co. 65
232. Spider Cave, Franklin Co. 98
233. Spring Mills Cave, Centre Co. 75
234. Springside Farm Cave, Cumberland Co. 86
235. Stalper Cave, Franklin Co. 98
236. Stamm Cave, Montour Co. 123
237. Stone Cave Hill, Berks Co. 65
238. Stoughstown Cave, Cumberland Co. 86
239. Stover Cave, Centre Co. 76
240. Stover Quarry Cave, Huntingdon Co. ..105
241. Strangford Cave, Indiana Co. 106
242. Swanger Cave, Lebanon Co. 112
243. Taylor Cave, Bedford Co. 57
244. Thrush Farm Cave, Cumberland Co. ..86
245. Tippery Cave, Huntingdon Co. 106
246. Tippery Cave No. 2, Huntingdon Co. ..106
247. Torrance Cave, Westmoreland Co. ...135
248. Tuckerton Cave, Berks Co. 65
249. Turbotville Cave, Northumberland Co. 126
250. Twin Hills Cave, Lycoming Co. 113
251. Tylersville Caves, Clinton Co. 79
252. Veiled Lady Cave, Centre Co. 77
253. Waddle Cave, Centre Co. 78
254. Wallace Cave, Perry Co. 127
255. Walnut Bottom Cave, Cumberland Co. .86
256. Warren Point Cave, Franklin Co. 98
257. Weidlein Farm Caves, Bedford Co. ..57
258. Welsh Run Cave, Franklin Co. 98
259. Wentz Cave, Perry Co. 127
260. West Reading Caves, Berks Co. 66
261. White Rock Quarry Cave, Centre Co. .78
262. Wildcat Cave, Dauphin Co. 87
263. Williams Grove Cave, York Co. 137
264. Wind (Cold) Cave, Lancaster Co. 109
265. Winfield Cave, Union Co. 132
266. Wolf Cave, Northampton Co. 125
267. WONDERLAND CAVERNS, Bedf'd, Co. 48
268. WOODWARD CAVE, Centre Co. 49
269. Woomer Cave, Perry Co. 127
270. Worleytown Cave, Franklin Co. 99
271. Yellow Breeches Cave, York Co. 137
272. Zimmerman Cave, Franklin Co. 99



PLEASANT GAP CAVES

[redacted] **Centre Hall Quadrangle**

One-half mile east of Pleasant Gap, where Gap Run goes underground, there is a large abandoned quarry in Trenton limestone. Six present or former caves can be counted here. Some lack names.

About one-third of the way up the south quarry face there is a hole 4 feet high and 20 feet wide that young boys called Mammoth Cave. This leads to five connected rooms, one a dome and one a pit 25 feet deep.

High on the face near the southwest corner of the quarry is a crawlway 30 feet long. Two other crawlways have not been explored. Solution passages and chimneys are exposed on the quarry face nearby.

In the sloping north wall of this quarry, near a workman's shack, and 6 feet above the level of the quarry road, an oval slit 2 feet wide and 5 feet high admits one to a cave. There is an 8-foot drop into a smooth-walled room 30 feet long, 12 feet wide, and 9 feet high. Quarrying operations have collapsed the inner end of this room, blocking a reported continuation.

Somewhere on the quarry floor 50 years ago a small vertical hole was uncovered that went down to water. It was covered with a large flat stone and its location forgotten.

Other caves are between the west end of the abandoned quarry and the road, along the channel of Gap Run. Three caves here have been buried for 25 years by rock and soil washed in. One of them, Noll's Cave, has been uncovered. (Devitt)

PORTERFIELD FISSURE

[redacted] **Millheim Quadrangle**

A small cave [redacted] possibly in Trenton limestone, is entered through a very small hole beneath some large rocks in a sink in the woods at the end of a dry stream channel. A fissure along joints makes a tortuous passage down several short drops to a horizontal passage 6 feet high. By crawling one can continue to a point about 90 feet from the entrance. (Devitt)

ROCK CAVE

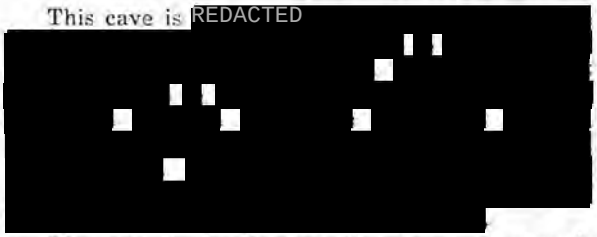
[redacted] **Bellefonte Quadrangle**

Rock Cave gets its name from a cliff or outcrop of rock on the west bank of Spring Creek just below the mouth of Big Hollow. This location is [redacted] It is merely a fissure 65 feet long, 4 feet high at the front and 6 inches high at the rear, in Cambro-Ordovician limestone. (Devitt)

ROCKVIEW CAVE

REDACTED **Bellefonte Quadrangle**

This cave is REDACTED



The cave is in Trenton limestone. A rope is needed because of a 25-foot drop in the bottom of the sink. A narrow fissure leads down to a ledge overlooking a room 60 feet long, 12 feet wide, and 20 feet high. To the right the room is wide but only 3 feet high. On the north are two rooms, each about 10 by 20 feet and 4 feet high, and a fissure 25 feet long and 10 feet high. From the 60-foot room a fissure 3 feet wide and 25 feet high goes south 50 feet. A low room has sparkling flowstone. A hole in the center of the floor is too small to enter. Small bones are embedded in the clay and flowstone at either end of the lowest level. (Devitt)

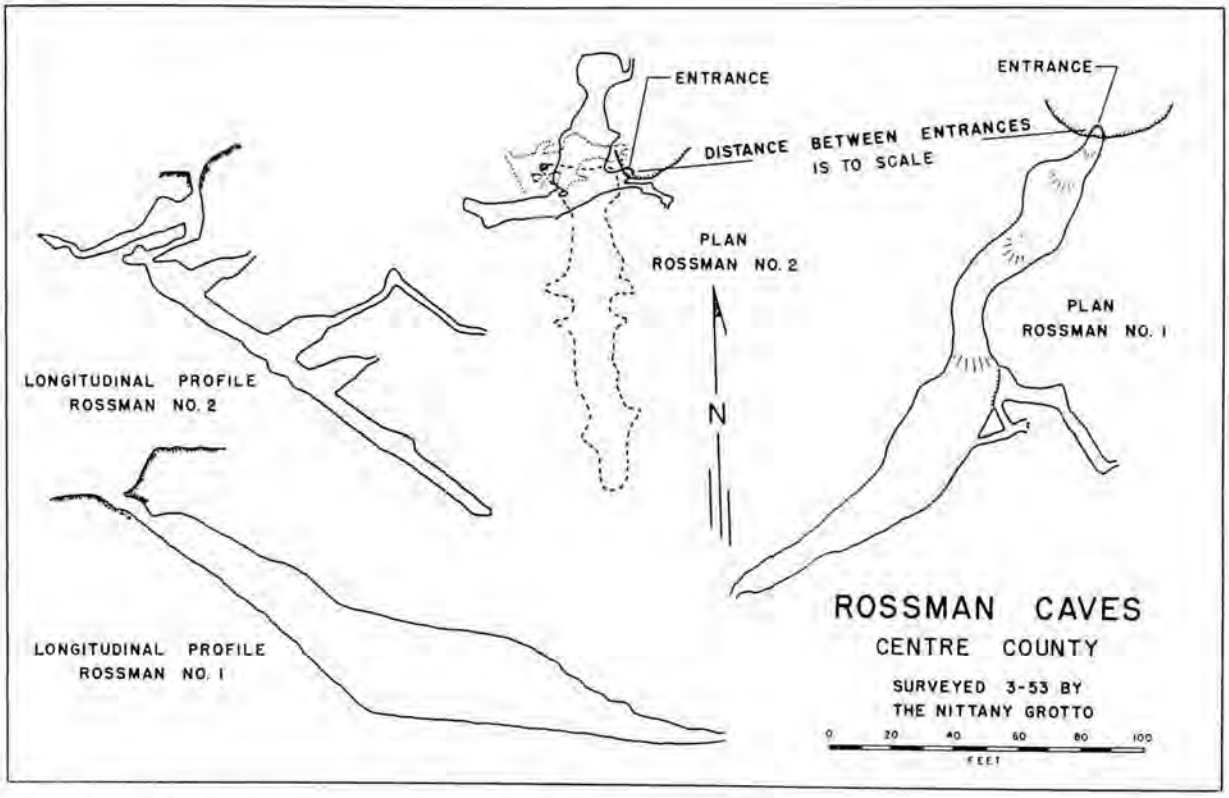
ROSSMAN CAVES

REDACTED **Centre Hall Quadrangle**

Both Rossman Caves are located on the Ralph Alters (formerly Rossman) Farm exactly REDACTED

The two entrances, 150 feet apart, are in shallow field quarries 1000 feet south of Alters' barn.

The entrance to Rossman No. 1 is a 3-foot high duckway descending on a 35° angle over a talus slope of small, loose rock and trash. Eight feet beyond the entranceway the passage opens into a spacious tunnel-like room, the floor of which continues downslope on the same angle for 100 feet. From there a hard clay floor slopes very gently down for another 80 feet to a point where the room pinches to a gopher-sized tunnel. At the end of the talus slope, two minor side passages extend out on the east side of the cave. The smaller one, 12 feet long, doubles back into the main room. The other continues about 35 feet before it pinches out. The cave has few speleothems. Water level marks found about 40 feet above the cave's lowest point account for the layer of mud on everything below that point.



The entrance to Rossman No. 2 is a 6-foot vertical shaft reopened in February 1953 through field stone dumped into the depression 15 years earlier. It leads into a room 15 feet by 25 feet by 10 feet. A small crawlway 25 feet west of the entrance leads down to the second level. A low passage to the right ends in breakdown. Six feet to the left, a short vertical drop leads to the third and lowest level, a spacious passage descending downslope 35° over rock rubble which has been cemented together by flowstone. The passage ends in a mud plug 150 feet below the drop. Three chimneys ascend at angles of about 50°. At the top of the middle chimney a small sinuous passage continues

Photo by C. E. Mohr

Fig. 9—Rich variety of speleothems are found in rarely-entered Rossman No. 2 Cave, Centre County.

upslope to a small chamber and then plunges down 35° in the opposite direction. The lower chimney has a continuation but is too small to follow. The upper chimney seems to continue but has not been explored. Speleothems are abundant in Rossman No. 2.

Both caves are in the Trenton limestone which strikes N.67°E. and dips 37°S. The chimneys are joint controlled; the slopes in Rossman No. 1 and in the 3rd level in No. 2 are bedding controlled. (Hussey)

SHARER CAVE

REDACTED **Centre Hall Quadrangle**

On the Ray Sharer farm 2.1 miles east of Centre Hall a small mountain stream flows through a curving sink 130 feet long and goes underground at the base of a 35-foot shear cliff. This sink is 1200 feet north of Route 95 and 1800 feet NNE. of Sharer's house. A field lane from the highway passes very close to the sink.

This cave is remarkable in having seven different levels, each slightly offset from the one above, and connected by narrow pits or by sloping passages of crawlway dimensions. The upper two levels are mainly dry and floored with clay or fallen blocks. They represent all that was known of the cave until 1950. All of the several ways to reach the lower levels are inconspicuous, **rather dangerous descents,** through breakdown or down the sides of deep pits. The lower levels usually are rather wet and muddy. Although there are numerous rooms where one can walk erect, there are twice as many crawlways and wormways connecting these rooms. On the sixth level a horizontal passage leading west intersects the main stream passage beneath a dangerous breakdown room. Another smaller stream flows through passages along the east side of the cave, uniting with stray rivulets before forming a shallow pool on the seventh level, backed up by a gravel-filled tunnel.

Although the lowest point in the cave is probably at least 100 feet below the surface, even in wet seasons water does not accumulate but flows away to still lower levels. Several low unexplored passages lead off from both upper and lower levels. Speleothems occur in the upper level. A colony of bats frequents the larger and dryer passages. Over 1200 feet of passages have been mapped by the Nittany Grotto.

In the woods 200 yards and 350 yards east of Sharer Cave are crevices in sink holes. In a long sink 200 feet further east, north of a farm house, a crevice goes in 30 feet and one can hear water rushing far below. (Devitt)

SMULLTON CAVES

REDACTED **Millheim Quadrangle**

In Brush Valley about 3 miles north of Millheim a small cave can be seen at REDACTED The entrance is just big enough in which to crawl. The passage is shaped like a key hole, is dry, about 40 feet long, and has some small dripstone formations near the inner end where the passage nearly pinches shut. A flat bench is along one side.

Also in this area one mile east of the north end of the gap through Brush Mountain at Spring Bank and along the road 1,000 feet southwest of the Smullton Cave, there are two deep sinks separated by a 50-foot land bridge over which a farm lane passes. A creek flows through the bottom of these sinks and in the western sink is a triangular opening 6 feet wide and 3 feet high above water level. This leads into an all-water cave that extends down stream 110 feet to where the ceiling nearly submerges. A log-jam halts progress here. (Devitt)

SPRING MILLS CAVE

REDACTED **Centre Hall Quadrangle**

This small cave is located in a sink REDACTED The sink, near the NW. crest of a hill is at the end of a line of five pine trees, clearly visible, and consists of a wide fissure, three sides vertical rock and the other a dirt slope. Thirty feet below the sur-

face is a room 15-feet square. A difficult climb up a log placed for that purpose enables one to enter a hole high on the east wall. A constricted passage leads 10 feet to a small room. A continuing fissure is too narrow to enter. (Devitt, Mohr)

STOVER CAVE

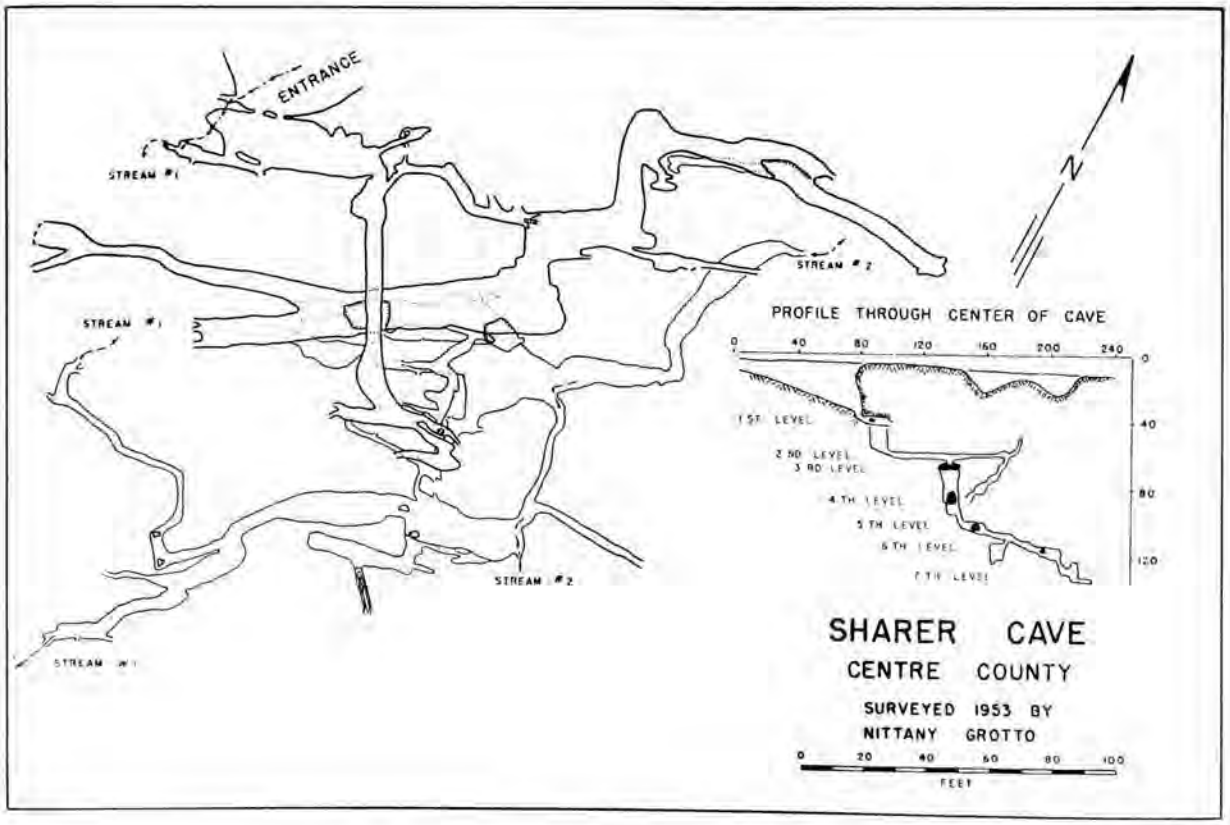
[redacted] **Millheim Quadrangle**

Two miles east of Coburn, [redacted] lies Stover Cave. Until about 1935 the cave entrance was surrounded by a fairly large tract of magnificent hemlocks. A mighty specimen rose directly above the entrance and a luxurious mat of walking fern covered the rocks. The interesting ferns still grow around the entrance, but only a few small trees survived the lumbering. The cave itself also has seen better days.

According to the folk-lore of Central Pennsylvania Caves, so studiously gathered by Shoemaker, beginning in the 1890s, Stover Cave was well known to the young people of Penn's Valley during the last years of the 18th Century. Since dancing was forbidden by the pioneer churchmen of that post-Revolutionary period, the young people built a dance floor in the cave's spacious "amphitheatre" and gathered there secretly every Saturday night. Here they danced "to the strains of the dulcimore, the dudelsok and the geik". There was only one drawback, the chance that a few of the Indians who still lived in the deeper coves of the mountain might drop in, being ardent music lovers. Their presence was tolerated for fear that they might betray the secret of the dancing.

The dancers entered the cave by ladder in those days but subsequent caving-in of the entrance has provided a steep, nearly 40° access to the cave, at the same time burying the site of the dance floor. As Stone reported in 1932, a door, stairway, and platform were installed during the present century in an unsuccessful attempt to use the cave for storage of butter and eggs. All have disappeared except for the ramshackle remains of the platform, which, along with leaves and slippery clay make it almost impossible for the visitor to keep his footing on the steep slope.

As this is one of the most important bat caves in the State, visits have been made each winter since 1931 and the cave, rumored to be a quarter mile long, has been zealously explored. For some years the known extent of the cave was about 100 feet, terminating at a point where the flowstone-decorated roof descended within a few inches of the speleothem-covered floor. Half-way down the slope, on the right, are several quite small, heavily decorated chambers. On the left side of the cave an extensive low chamber pinches out to the north and west. The main room, about 25 feet at the



highest, and about 20 feet wide, is well enough illuminated by the midafternoon sun to enable one to grope about without a light.

About 1940 a passage was discovered under the massive breakdown near the bottom and close to the north wall. Twisting, and rising gradually, the rough crawlway among the breakdown extends about 100 feet and seems to be directly under or slightly beyond the cave entrance. The cave is in Trenton limestone. For short periods, ground water levels rise and flood the lower portion of the cave under ten or more feet of water. In winter there usually are shallow pools at the lowest point in the cave. (Mohr)

VEILED LADY CAVE

REDACTED **Centre Hall Quadrangle**

Many small streams descending Nittany Mountain into Brush Valley disappear underground.

REDACTED

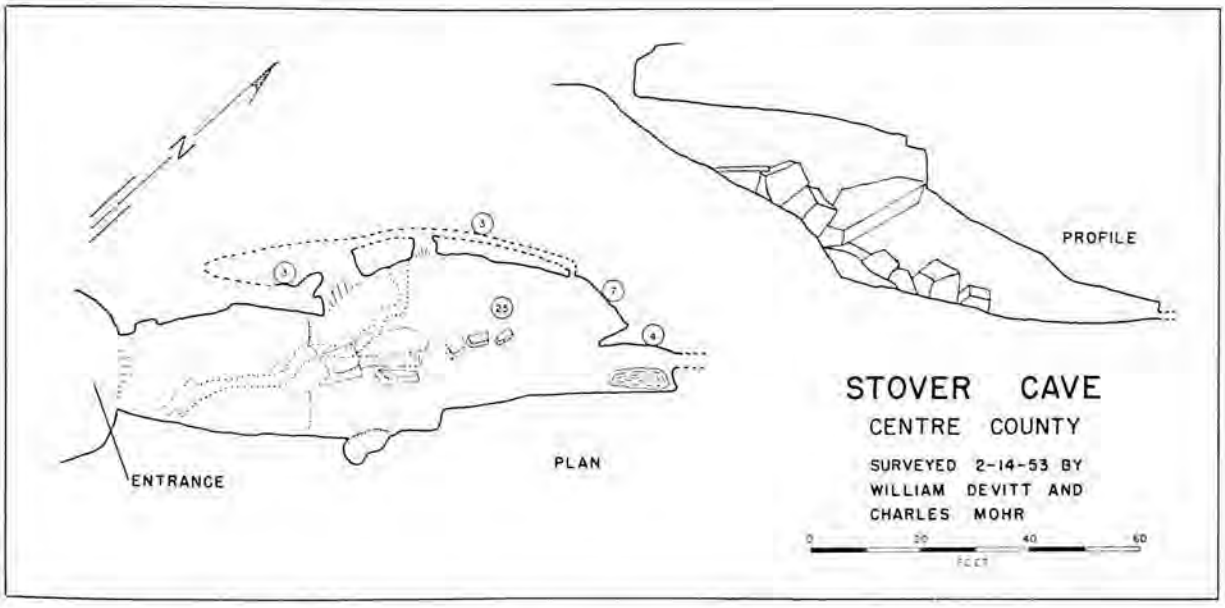
This is the entrance to Veiled Lady Cave.

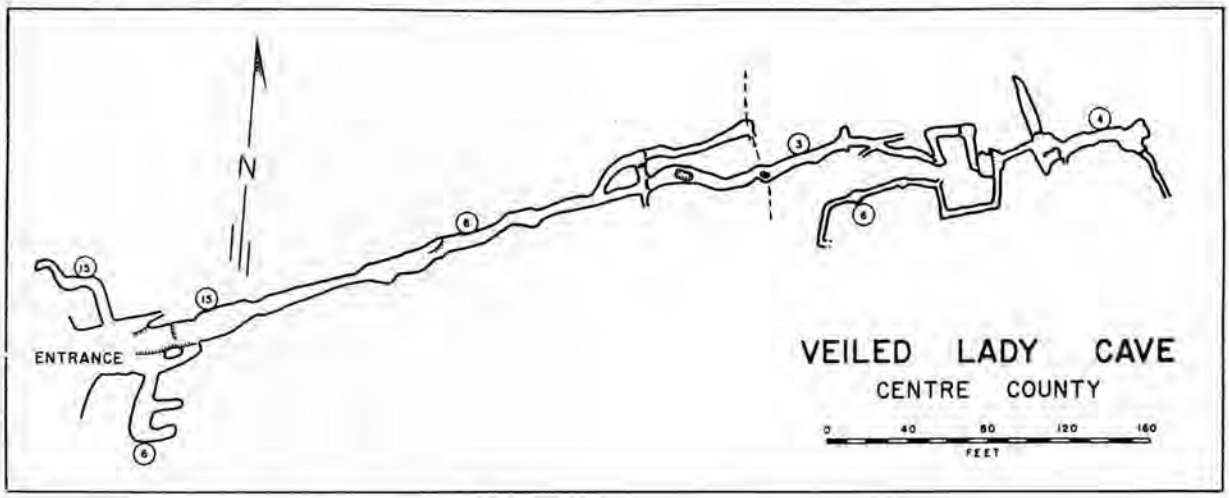
In 1928 G. Edward Haupt of Bellefonte bought the F. P. Duck farm on which the cave is located, installed electric lights and concrete walks in the cave, and operated it commercially for nearly ten years until high water destroyed the improvements.

The cave entrance is about 15 feet high and wide and continues with these dimensions for 50 feet. Just inside, high on the left, is a white drip-stone deposit fancifully resembling a seated woman that gives the cave its name. Minor passages branch on left and right. The lone main passage descends

Photo by C. E. Mohr

Fig. 10—A disappearing stream leads into one of the most interesting series of passages found in any Pennsylvania Cave. Sharer Cave, Centre County.





gradually in a straight line for 400 feet, with an average width of 4 feet and height of 2 to 15 feet or more. It follows a joint in the limestone beds that dip southeast at a low angle.

About 150 feet from the entrance a chimney suggests a passage at a higher level, and at 250 feet there is a hole in the floor and a narrow passage 80 feet long on the left. At 300 feet, when the cave is dry, running water is 15 feet below the floor. Farther from the entrance the crevice is narrower, in places only 1½ feet high, and turns right and left at sharp angles for 200 feet, ending in a squeeze down 10 feet to water. A passage on the right about 400 feet from the entrance turns back west with angular course for 100 feet.

In September 1949 when the cave was mapped by Devitt, Smeltzer, et al., the main passage 125 feet from the entrance was filled to within two feet of the ceiling with boulders. It was impossible to follow the main passage beyond 400 feet, but on a higher level, by crawling 200 feet, one could drop down to what seems to be the main passage and arrive high over a pool, perhaps the reputed Hidden Lake.

The cave measures 550 feet from end to end in a straight line and has 1030 feet of passages. There may be a higher passage at the inner end. (Stone, Devitt, Smeltzer)

WADDLE CAVE

[redacted] **Bellefonte Quadrangle**

A cave one-half mile north of Waddle, on the road to Julien, is reported by Earl Myers, who lives in the neighborhood, to have been entered by a small hole that lead to a passage and rooms with stalactites and stalagmites. This probably is in vertical beds of Trenton or Rodman limestone. The mouth of the cave was closed by a land slip.

WHITE ROCK QUARRY CAVE

[redacted] **Centre Hall Quadrangle**

Beside the dirt road leading down into the east end of the easternmost quarry being operated in 1952 by White Rock Quarries there is a 6-foot round vertical hole 25 feet deep. This gives access to a cave in the north wall of the quarry, in Trenton limestone. The cave is essentially a steeply sloping room 15 feet wide, from the bottom of which three passages radiate. Each is about 20 feet long. One goes east-southeast, the other two west-northwest. Most of the stalactites have been broken by blasting.

Just south of the mouth of this cave and 4 feet above road level, a small passage extends into the limestone about 25 feet. (Devitt)

OTHER CAVES

About 1935, a shallow sink appeared in a field on the Musik farm [redacted]. A ten-inch crevice in solid limestone revealed a vertical drop of about 40 feet, walls covered with flowstone, and what appeared to be a series of rooms.

When Route 45 was being graded, about ½ mile east of Aaronsburg, a cave in Trenton limestone was uncovered. It is reported that it seemed to extend toward the north. As it was in the right-of-way, the opening naturally was closed.

On the former H. P. Weaver farm just north of Coburn on Elk Creek, a large conspicuous spring issues from a Trenton limestone ledge west of the road. A dam across the opening backs the water up underground. During low water in 1952, Bluestein swam through a tent-shaped opening over deep water for 40 feet to a point where scarcely any head room was left above the surface.

CLARION COUNTY

INDIAN CAVE

[redacted] **Foxburg Quadrangle**

The cave, [redacted] The cave lies in a 30-foot outcropping of light limestone about 300 yards north of the road.

Indian cave is a single passage 35′ long extending westward from the entrance which is no more than 3′ high. The first 10′ of the cave permits standing; the remainder, with the exception of a 15-foot chimney at the very end, requires crawling over broken stone. Access to the narrow chimney in which 2 bats were seen is nearly blocked by a large rock. Water emerges from an old rusty pipe 15′ below the cave entrance. A few feet below this is a coal seam which is being mined in the vicinity. (Dunn)

INDIAN CAVE

[redacted] **Foxburg Quadrangle**

The cave is located in an outcropping of sandstone [redacted]

The entrance to the cave is about 10 feet high and 4 feet wide and situated at the base of a huge sandstone block, part of which forms a ledge overhanging the entrance. To the right of the entrance is a small "cave" 20 feet long, 4 feet high, and 2 to 3 feet wide with a rectangular cross section and open at both ends. The floor of the cave is composed of broken rock cemented together by a dark, loamy soil and for the first 12 feet of the cave is about 6 to 8 feet below the vaulted ceiling. From here the floor approaches the ceiling quite rapidly and the passages attenuate into small cracks. The cave is situated in Pottsville sandstone and contains no travertine. It is said that many bats inhabit the cave during the fall and winter months. (Dunn)

CLEARFIELD COUNTY

According to Shoemaker, there is a cave in a canyon of Mosquito Creek 8 or 9 miles from Karthaus, containing bones. It is said to be hard to find because screened by rhododendron. This may be a rock shelter or a crevice in Pottsville sandstone.

CLINTON COUNTY

EASTVILLE CAVE

[redacted] **Williamsport Quadrangle**

Eastville Cave in Greene Township is [redacted], on the property of T. O. Miller. It was reported by Forest Ranger E. H. Geisewite. The hole between two rocks is a triangular opening just large enough to enter. A rope is needed for the 50-foot crooked, in part vertical, descent to the floor, which is on a level with Big Fishing Creek. This lower part can be entered in summer when the creek flows underground.

The cave is in Trenton limestone. A vertical passage 47 feet long and 15 feet high widens from 2 or 3 to 5 feet. Several crevices lead off from the inner wide part. Some lead to large openings and other crevices; some are too small to enter. The cave has more than 200 feet of passages. The farthest point reached is 160 feet from the entrance. The cave has been ravaged of most of its stalactites.

A little cave in a quarry 150 yards west soon pinches out. (Devitt)

FLEMINGTON CELLAR

[redacted] **Lock Haven Quadrangle**

A "cave with stalactites" at Flemington, proved to be a hillside cellar excavated in shale about 100 years ago for storage of beer at The Peffer Brewery. It was lined with limestone blocks, hence the stalactites. The brewery burned many years ago and in 1951 the site on Fourth Street is a concrete-mixing plant. The arched roof of the cellar has many "soda straw" stalactites up to one foot long. Elderly women recalled that the stalactites were there 60 years ago.

LOGAN MILLS CAVE

[redacted] **Lock Haven Quadrangle**

[redacted] according to State College students, there is a sink hole into which a small stream trickles. A vertical hole more than 30 feet deep is choked with tangled sticks but cold air issuing from it suggests the likelihood of a cave. It has not been explored in November 1952. The area is underlain by Trenton limestone.

A small cave is reported near Greenburr.

SALONA CAVE

[redacted] **Lock Haven Quadrangle**

A cave reported to be in a limestone quarry at Salona has either been partly blasted away or buried in rubble. It was near the quarry floor and contained dripstone, evidence of which is a stalagmite 3 feet high in a neighboring lawn.

TYLERSVILLE CAVES

[redacted] **Millheim Quadrangle**

Members of the Nittany Grotto have found two caves at Tylersville in Sugar Valley. Both are on the north side of Fishing Creek, between it and the road. One is in a quarry and the other below the quarry at stream level. The upper one is a descend-

ing crawlway that needs digging out to permit exploration. A farmer says that when the creek is low and no water issues from the lower cave it is possible to go in toward the upper cave.

The cave at creek level extends about 200 feet back under the quarry as an irregular series of passages and rooms. Two rooms are 20 feet high and large enough to seat 20 people comfortably. (Devitt)

CUMBERLAND COUNTY

BOILING SPRINGS CAVES

REDACTED **Carlisle Quadrangle**

There is an abandoned limestone quarry at Boiling Springs about 350 feet north of the intersection of the roads to Carlisle and Mechanicsburg. There are two small caves close to the quarry floor and one 60 feet above it. One cave is at the north end, about 5 feet up the side. The second and smallest is at the south end, and the third is vertically above the second.

Entrance to the first cave is through a 1½ by 2 foot hole. The cave consists of two steeply sloping chambers 30 feet long, 10 to 15 feet wide, and 6 feet from floor to roof. One chamber lies below the other and is separated from it by a 2-foot bed of limestone. They are connected by two small irregular holes in the sloping floor of the upper chamber. The floors of both chambers are covered with dripstone and flowstone. The walls and ceilings show where blocks of limestone have broken away to form the debris on the floors.

The other two caves extend along the strike of the limestone. The second hole is a crawlway, not explored. The third cave, above the quarry, is 140 feet long, slopes gently toward the rear, varies in width from 5 to 15 feet, and is mostly less than 4 feet high. The entrance is only 2 feet across. A rimstone pool is in a side fissure 50 feet from the mouth. At 80 feet the floor is travertine; helictites occur in a gallery 100 feet in on the right. (Hickok, Smeltzer)

BOWMANSDALE CAVE

REDACTED **New Cumberland Quadrangle**

A cave in the limestone quarry at the west end of Bowmansdale and on the east side of the road from Shepherdstown has been known at least since 1880. The cave is a crooked crevice along one or more joints in Jacksonburg limestone of Ordovician age that strikes N. 70° E. and dips S. 20°. The course of the cave is about north-south. It is said that many years ago boys entered this cave at the quarry and came out through a hole in the bluff above the road along the creek. This would be a distance of 200 yards or more.

The crevice is only 1½ to 2 feet wide, but from 10 to 30 feet high or deep. In August 1951 the entrance to the cave was covered by blasted rock. When this is removed, access should be made by rope or ladder, for the entrance is about 10 feet above the floor of the crevice. The walls are rather smooth and coated with flowstone. Stalactites and stalagmites have been broken off but the stumps show their former presence. Differential solution of the limestone has left irregular projections and points in the ceiling.

CARNEGIE CAVE

REDACTED **Newville Quadrangle**

REDACTED

The quarry is in the Elbrook limestone of Cambro-Ordovician age. The beds are nearly horizontal and the cave openings are along vertical joints. The floor of the cave is generally level but the galleries are just wide enough for one person. One can walk erect in some parts. Some of the stalactites and flowstone in the inner recesses are very white, and crystal faces sparkle with reflected light.

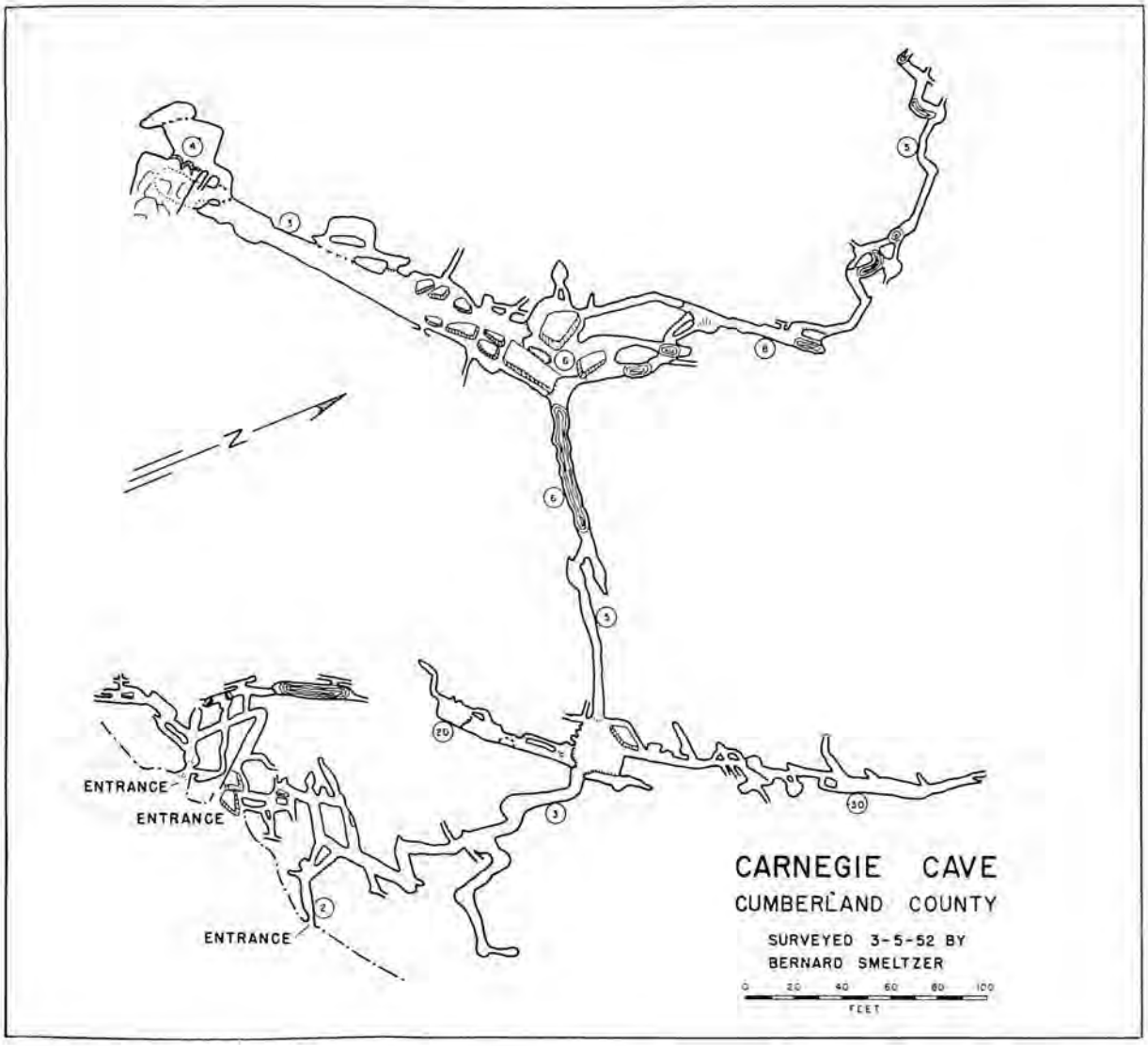
The main entrance is 3 feet high and marked by fallen blocks. It gives access to a passage 5 to 6 feet high trending generally northeast for 80 feet, and north 90 feet with a 3 to 5 foot ceiling to a room 20 by 30 feet in diameter and 6 to 12 feet high. From this room a fissure leads northeast 150 feet with a ceiling ranging from 2 to 30 feet, and another goes southwest 75 feet with a ceiling 8 to 20 feet, and flowstone on the wall.

From the far side of this room the main passage goes nearly west and straight for 140 feet, except for one short offset. It is narrow and 3 to 12 feet high. Part of the floor is flooded where there are travertine shelves with stalagmites up to 3 feet high. This passage enters near the northeast end of a second room that is about 170 feet long, 15 to 35 feet wide, and 1 to 15 feet high. Its course is NE-SW. Large blocks of limestone on the floor are partly covered with flowstone and bear stalagmites and columns up to 3 feet high, attesting the great lapse of time since the blocks fell from the ceiling.

At the far end of this room a short low crevice opens into an irregular room 20 by 30 feet in diameter but only 3 feet high in the middle and tapering to the sides. The southeast end of this room widens to a passage filled with breakdown. Slopes lead to two higher levels.

At the northeast end of this second room a narrow, low, crooked passage extends northeast 100 feet, then generally northwest with an irregular course for 125 feet. This farthest branch has rimstone dams and pools, and the floor of the inner half at times is covered with water.

An opening to the left of the main entrance leads into two parallel passages connected by squeeze fissures. The inner passage is 80 feet long, up to 30 feet high, and has a pool at the northeast end. (Smeltzer)



Just over the fence bordering the woods east of Carnegie Cave, in an anticlinal knob overlooking Burd Run, a large rock is wedged in and partly hides a cave entrance. A crawlway leads down slope about 30 feet to a room about 6 feet in diameter and not over 3 feet high. (Smeltzer)

CENTREVILLE CAVE

[redacted] **Newville Quadrangle**

[redacted] there is a small cave back of the first house on the left of the road to Longsdorf.

It is in flat-bedded Elbrook limestone of Cambrian age, and developed along joints N. 52°E., N. 83°E., and N. 40° W.

Fig. 11—Scene in Carnegie Cave, Cumberland County.

The entrance in a low outcrop is 3 feet high and 9 feet wide and opens into a room 30 feet long, 6 feet high, and 8 to 10 feet wide, running N. 52° E. The ceiling is irregular and pitted. Two small passages lead north from this room but beyond 10 feet are too low to follow.

At the far end of this room a winding passage leads east for 34 feet, ending at a clay fill. It tapers from 7 feet wide and 6 feet high to 3 feet wide and high. Ten feet from its inner end this passage is crossed by a fissure 5 feet high developed along a strong NE. joint. On the left this fissure extends 5 feet as a triangular opening bridged 2 feet above the floor by travertine 2 inches thick. "Bacon rind" sheets line the wall. Dark flowstone covers the right wall.

In a small alcove on the right at the start of this passage a narrow ledge of travertine projects from the wall 3 feet above the floor. A tiny tube in the ceiling of the alcove extends to the middle section of the entrance room.

Local people say that this small cave on the property of Mrs. Mary Miller of Mechanicsburg, extends to an opening (now closed) near a church ¼ mile away.

In an abandoned quarry just south of this cave are several small solution openings. (Smeltzer)

CLEVERSBURG SINK

[redacted] **Newville Quadrangle**

Between Shippensburg and Cleversburg and [redacted], there is a sink hole near the top of a ridge. It is within a wire fence in the edge of woods close to the corner of a field. Descent through the bottom of the sinkhole gives access to a cave about 500 feet long.

Water level in the cave fluctuates from 30 to 50 feet. The cave has been found full of water in the spring, but water was seen only at the lowest level in late fall. When dry it is possible to enter the first two rooms without aid, but about 75 feet from the entrance, there is a 12-foot vertical rock face requiring the use of a ladder or rope. With 150 feet of rope tied to a tree one can reach the lower part of the cave. Getting back up is not easy.

This cave, like others in the vicinity, is in the Elbrook limestone of Cambro-Ordovician age. The bedding seems to dip about N.70° and the cave is developed along the bedding. The general course is rather straight, nearly west. The width of the cave ranges from 5 to 20 feet or more and the ceiling mostly is high, up to 50 feet. Clay covers the lower walls and floor in many places. The explorer's route is along a wet and slippery clay slope with unplumbed depth below. Walking is difficult and dangerous.

Fantastic forms produced by solution of the limestone include pendant slabs and erect ridges of odd shape. Dripstone deposits are not common in this cave, and most of the stalactites are clay-colored. Thin parallel ridges projecting from the walls are composed of fine-grained quartz sand and are residual from sandy layers in the limestone.

According to Smeltzer, water filled all but the first room August 17 and November 19, 1952.

COCHLIN FARM CAVE

[redacted] **Newville Quadrangle**

On the Robert Cochlin farm in Newton Township halfway between Green Spring and Oakville there is a small cave developed along vertical bedding planes in the Stones River limestone. It can be found by [redacted]. It is a pit 9 feet deep and 4 feet across, and is under a large grapevine.

From the base of the pit a fissure leads southeast only 5 feet. A passage 7 feet high and 3 feet wide goes northeast 17 feet, and a crooked one with an average height of 7 feet goes southwest 40 feet. At two places this passage widens to small rooms. The base of the wall of the second room is undercut by a broad but low opening extending northeast 19 feet toward the entrance. (Smeltzer)

CONODOGUINET CAVE

[redacted] **Carlisle Quadrangle**

In the bank of Conodoguinet Creek 1½ miles north of the square in Carlisle and above a mill dam is a cave that has long been open and often visited. The entrance is at the base of a limestone cliff called Cave Hill, and is so close to creek level that flood waters enter the cave. The Pennsylvania Turnpike passes directly over the cave.

This cave near Carlisle may well be called Conodoguinet for that Indian word is said to mean "for a long way nothing but bends", which is descriptive of the cave as well as the creek. The semi-circular arched entrance is 7 or more feet high and 10 feet wide. This large, head-high passage turns to the right and then to the left 100 feet from the entrance and is not so wide. At 200 feet it turns right at an acute angle for 60 feet and is narrower, ending abruptly in a left branch 40 feet long.

The cave is all on one general level. Most of the walls are devoid of cave onyx. There is some massive dripstone but no stalactites. It is in Beekmantown limestone of Ordovician age which here strikes east-west; the bedding is vertical.

CONODOGUINET ROCK HOUSE

[redacted] **Carlisle Quadrangle**

This description of a rock house is included because it has been called a cave and is more than 4 miles from the reported location.

In 1897, Dr. Henry C. Mercer, author and financier of Doylestown, employed William H. Witte to explore caves and sink holes in the Susquehanna Valley. Mercer wrote:

"Witte went to what he calls Carlisle Cave No. 2, which is 2½ to 3 miles northeast of

Carlisle. The cave is a single room, 11 feet above water level near a creek. High water never enters. The entrance is 5 feet high and 20 feet wide. The length is 27 feet, the width 21 feet, the inner height is 11 to 16 feet high. The owner, Mr. Eppley, said that Professor Baird dug in this dry cave and got some bones. The entrance is 42 feet (horizontally) from the creek edge. There is a little mound of debris fallen from the face of the rock in the entrance. The general slope of the floor of the cave and land outside is toward the creek. The hill above the cave is perhaps 75 feet high. The cave was extensively dug by Witte and resulted in the finding of about 200 specimens of animal bones and teeth. An old fire level was found 3½ feet below the floor in which a Revolutionary War soldier's scabbard —14½ inches long and rust-incrusted, was found."

This description fits perfectly a rock house on the land of Paul Snyder, 3 miles **west** of the Court House at Carlisle in the bank of Conodoguinet Creek below Hay's bridge. It is in Ordovician limestone and is believed to be the place of which J. M. Weakley wrote, November 28, 1891, as being "near Hays bridge near Conodoguinet Creek 3 miles northeast of Carlisle in limestone; is 51 by 15 feet with a roof something like a dome". Cattle find relief from sun and storm in this shelter.

COY CAVE

REDACTED **Newville Quadrangle**

REDACTED

a 30-inch hole under a sloping ledge gives access to a cave.

According to Smeltzer, the entrance hole descends steeply 10 feet to a passage 10 to 15 feet wide and 85 feet long that is intersected 50 feet from the entrance by a similar passage 65 feet long. The greatest height is 8 feet at the intersection. Several large fallen blocks and patches of flowstone were noted. The limestone beds dip about 20°.

CRAIGHEAD CAVE

REDACTED **Carlisle Quadrangle**

REDACTED

known as "Bear Hole". It is supposed to have been a retreat for wild animals in frontier days. The Elbrook limestone of Cambrian age outcrops almost under the highway and has small passages along joints and a low room at the end. The creek floods these passages frequently. Trash covers the main entrance. (Smeltzer)

DEVIL'S DEN

REDACTED **Newville Quadrangle**

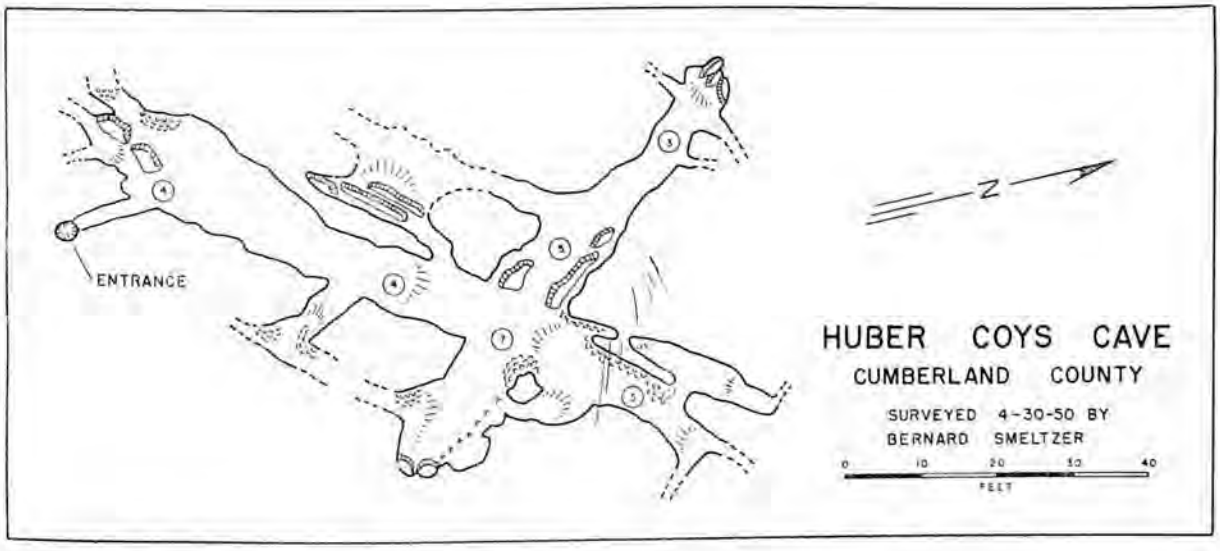
A cave locally called Devil's Den is situated between Carnegie Cave and Cleversburg Sink. Rope is needed for descent as the entrance is a 10-foot vertical drop. The cave is supposed to be extensive but exploration was blocked by water 75 feet from the entrance July 4, 1949 and again in 1951. This may be another entrance to the Cleversburg Sink cave system. (Smeltzer)

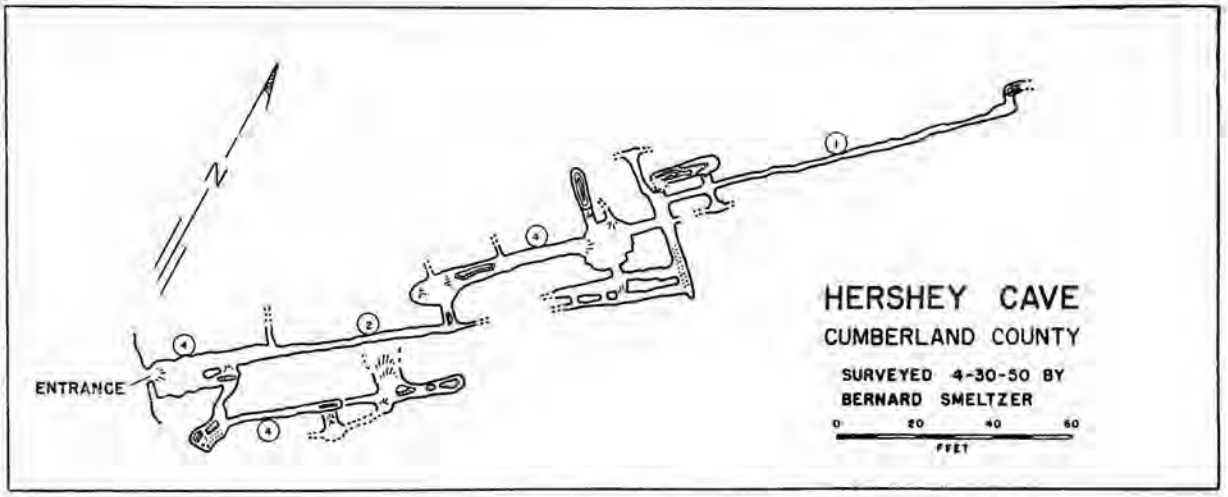
HERSHEY CAVE

REDACTED **Newville Quadrangle**

Within gunshot of the house of Huber Coy is a cave on the Hershey farm. It is reached by going up a short lane to the stone house and following the limestone ledge west about 200 yards. The opening, in the base of the ledge and slightly lower than the field, is 3 feet high and 7 feet wide, becoming larger inside.

The cave is in Elbrook limestone of Cambro-Ordovician age and seems to be in horizontal beds. However, exploration underground shows double folds with beds vertical to overturned, along the main passage, flanked on both sides by horizontal





Editor's Note: Stone says this cave is known to be much more extensive than shown.

beds that are warped up to 45°SE. dip at the northwest and down 35°SE. in the passages on the extreme right.

The passages for the most part follow parallel joints. Only 40 feet from the entrance is a typical "sewer" passage with key hole cross section and rock floor. On the right of the entrance, by crawling 15 feet one enters a passage 65 feet long parallel to the main passage. Conspicuous horizontal fins of less soluble limestone project as much as 12 inches from the walls. On the south side of this passage, 25 feet from the end, several low openings lead 4 or 5 yards to a room 23 feet long, 3 feet wide, and 15 feet high, with a ceiling bristling with stalactites. On the south side a 15-inch opening in the bedding leads in 3 yards to a smaller parallel fissure with light tan drapery folds and a massive stalactite 2 feet long.

By enlarging a small hole, digging through sand cemented with calcite, and scooping out a trench through sand for 30 feet or more, a network of new passages was entered Thanksgiving Day, 1952. The larger passages in this labyrinth run NE.-SW., parallel to the main cave. The longest is where the dip changes from horizontal to SE.35°. The most notable formations here are a 3-foot column surrounded by long stalactites and a shield 50 inches high fringed with stalactites.

Straight in from the entrance 80 feet, and offset 10 feet, is a parallel passage that continues with slight offset for 170 feet to a syphon end.

About 160 feet from the entrance are three pools in alcoves on the left. A low gallery between these pools extends northwest 60 feet, then at a right angle 80 feet northeast, and veres off to another parallel passage at a higher level as a crawlway where the beds dip SE.45°. This is nearly 400 feet from the entrance. This farthest passage has a 10-foot ceiling, and from its opening extends 45 feet southwest and 15 feet northeast to an obstruction of fallen rocks, beyond which one can see but not go farther.

The possibility of entering the northwest portion was suggested by a student at Shippensburg State Teachers College. (Smeltzer)

KELLY FARM CAVE

[redacted] **Newville Quadrangle**

On the George Willis farm 1 mile east of Oakville and 1½ miles west of Big Spring there was still standing in 1952 the north end of what was once a large stone house on the Kelly farm. The house was built many years ago over the entrance of a cave having a running stream. The cave entrance collapsed, carrying with it the south end of the house and completely closing access to the cave. Mr. Kelly says the cave is about 150 feet long and has a high arched ceiling. This area is underlain by Chambersburg or Stones River limestone of Ordovician age. (Smeltzer)

LEMOYNE CAVE

[redacted] **New Cumberland Quadrangle**

A small cave at the east end of Lemoyne is in a Beekmantown limestone ledge along the bank of the Susquehanna River a few rods south of the Reading Railway bridge and the Pennsylvania Power and Light Company plant and close to the Pennsylvania Railroad. A hole about 5 feet by 6 feet goes directly into the cliff 8 feet on a S.20°W. joint, then turns nearly at a right angle and follows a S.35°E. joint for about 50 feet. The crevice descends rapidly and seems to end abruptly at water, at or near river level. Only small persons can go more than 30 feet because the passage at that distance is narrow. It enlarges below, however, to a few feet wide and high enough for one to stand erect. Dripstone coats the roof and walls in places but is very black, probably with soot from locomotive smoke.

MECHANICSBURG CAVE

[redacted] **Carlisle Quadrangle**

A cave near the northeast corner of Mechanicsburg is on what was formerly the Hummel farm and in 1953 is owned by the Kohler Estate and occupied by Mrs. Cora Kraly and family. The entrance is a hole under a pile of old railroad ties in the barnyard. Many years ago 32 stone steps were built on the steep slope leading underground for convenience in cooling and storing milk in the cave. This staircase is in a passage several feet wide and more than head high. It terminates a few feet below the surface in a room about 25 by 40 feet.

One side of the hip roof of this room is a steeply dipping limestone bed, and the other side is an irregular face broken across the beds, and not on any distinct joint. The peak of the roof is 10 to 12 feet above the floor, which is built up with washed-in clay.

A passage on the far side of the room cannot be entered because choked with clay but is said to lead north and was explored many years ago for a reputed several hundred yards.

PARKER CAVE

[redacted] **Newville Quadrangle**

On the Parker farm on the west side of Spring Creek just south of Newville there is a stone house by a concrete bridge. In a shallow gully in a pasture, near the edge of the woods about ¼ mile west of this house is a man-hole-like cave entrance. The land is owned by the Cloverdale Company of Newville. Just inside the entrance a passage to the right leads down a talus slope to a room 20 by 30 feet high. The main passage goes straight ahead down a similar talus for 20 feet and turns left for 80 feet with a ceiling up to 20 feet high. This cave is in vertical Chambersburg or Stones River limestone, fairly roomy, and with considerable loose rock. (Smeltzer)

PEIPER CAVE

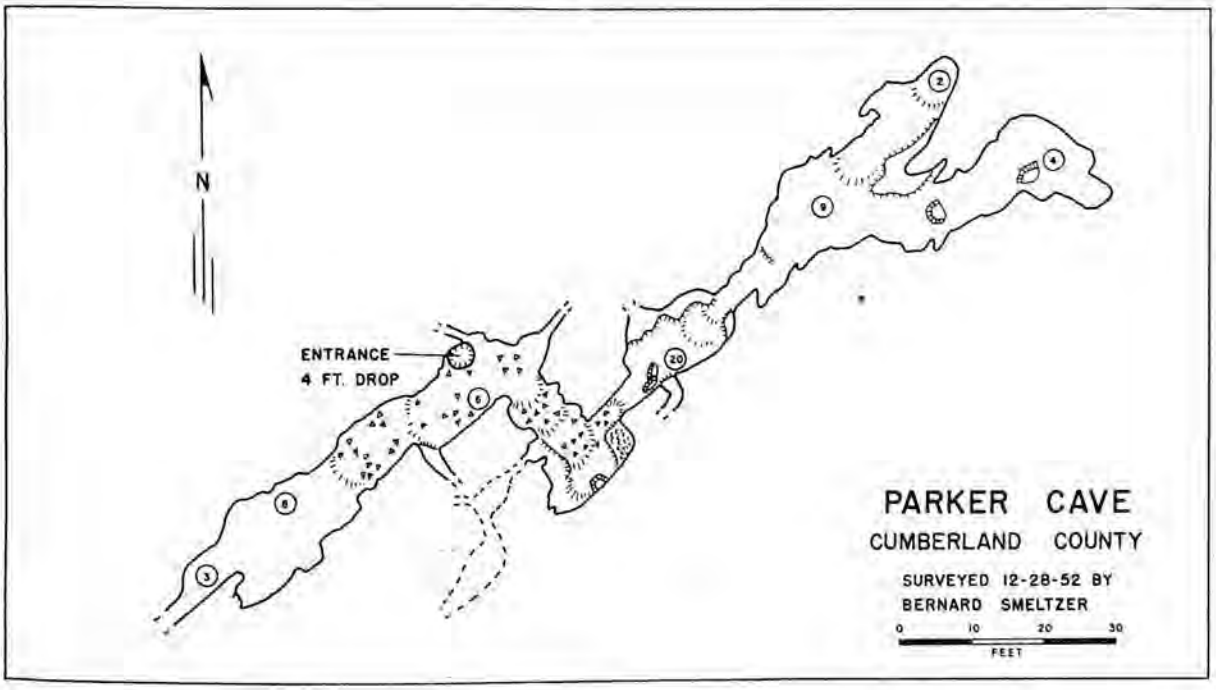
[redacted] **Shippensburg Quadrangle**

Peiper Cave is [redacted] It is in Conococheague limestone. The high, narrow entrance leads in 50 feet to a room 40 feet long and 15 to 20 feet wide. This room is partly filled with blocks dropped from the ceiling. Long, narrow passages diverge from this room to other rooms. The cave has 1650 feet of galleries. The greatest length of the cave, in a northeast-southwest direction, is about 400 feet; crossways 100 feet. There are two main levels. The display of white dripstone formations on the lower level is remarkable. (Smeltzer)

ROBBER LEWIS ROCKS

[redacted] **Newville Quadrangle**

In 1893, several specimens of cave rats were sent to Witmer Stone at the Academy of Natural Sciences of Philadelphia. They had been collected at "Lewis Cave Rocks" near Pine Grove. Oddly



enough, they were the first of these "pack-rats" discovered in the Northeast and were promptly described by Stone as a new species.

The site is not a cave, but a large sandstone outcrop, eroded along joints into rather striking canyons that roughly parallel each other. The location is 2½ miles northwest of Pine Grove Furnace, near the head of Toms Run. (Mohr)

SHARP FARM CAVE

[redacted] **Newville Quadrangle**

A small cave on the Sharp farm in Newton Township is in the bank of Bulls Head Branch of Green Spring Creek, [redacted]. The entrance is in a niche in a ledge of Chambersburg limestone, below a dirt road. The strata dip steeply at one side and flatten at the other side of the cave, which is in a small synclinal fold. A more massive bed forms the roof of the cave.

Passing through a shallow pool, 5 by 8 feet, it is possible to crawl along a mud bank for 60 feet or more in a passage 12 feet wide and 2 feet high, through a deeper pool to another low room, and through a hole in the ceiling to a higher level. (Stone, Smeltzer)

with loose talus that blocks branching passages. The walls are light tan and have some flowstone. This cave is ¼ mile southwest of the Parker Cave.

STOUGHSTOWN CAVE

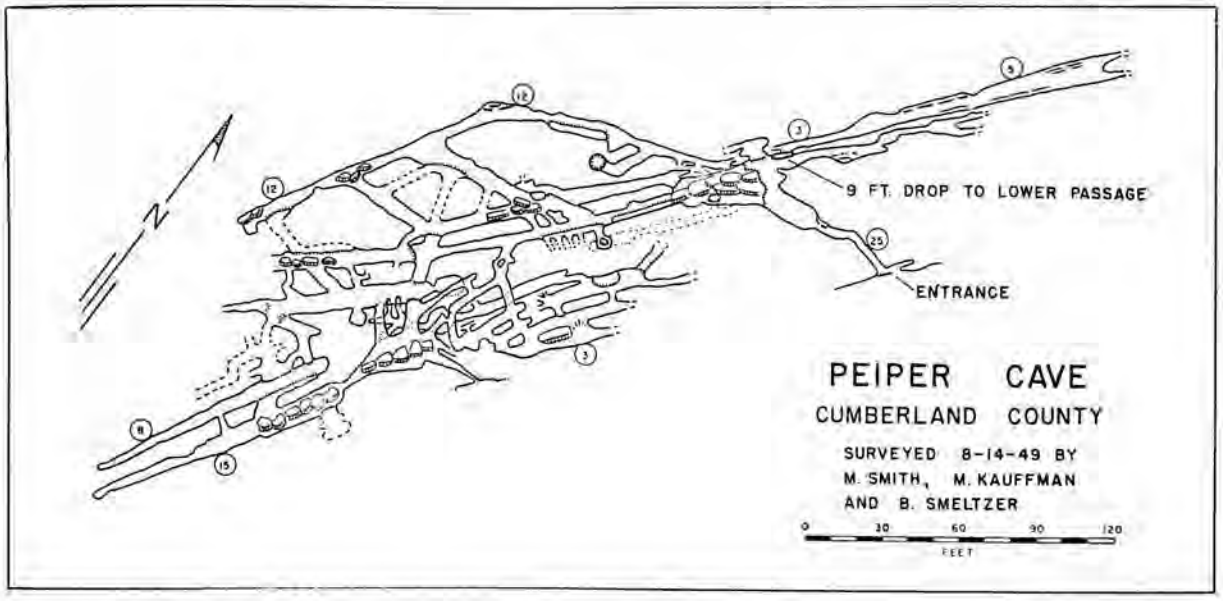
[redacted] **Newville Quadrangle**

In the sink nearest the schoolhouse on the north side of the road [redacted] there is a fissure cave about 30 feet long and up to 10 feet high. Impassable branches seem to lead to a larger parallel passage. (Smeltzer)

THRUSH FARM CAVE

[redacted] **Newville Quadrangle**

On the Edward B. Thrush farm [redacted] there is a sink hole a few rods east of the brick farm house and about the same distance south of Route 11. The sink, marked by large locust trees, is 230 feet long, with an average width of 18 feet. The massive Beekmantown limestone in the bottom of the sink has six holes where one can go underground. Holes 40 and 60 feet from the east end of the sink show a room 10 feet below. The main entrance to the cave, 8 feet wide and vertical, is at the east end. A rope or ladder is helpful in descending to the top of a very steep slope that continues to the floor 30 feet below the entrance. A passage beneath an arch goes 50 feet to a clay fill. (Smeltzer)



SPRINGSIDE FARM CAVE

[redacted] **Newville Quadrangle**

A cave on the Springside Farm [redacted]. The cave is in Conococheague or Elbrook limestone of Cambrian age. The entrance in a patch of trees is an 8-foot drop that leads to a room 30 feet long, 10 feet high, and 5 to 8 feet wide. The floor is covered

WALNUT BOTTOM CAVE

[redacted] **Newville Quadrangle**

Half a mile north of Walnut Bottom (also known as Jacksonville), a small cave on the Harry Forney farm has been known for many years but

is now completely filled. In 1930, according to newspaper accounts, M. J. Wyrick of Shippensburg bought the farm and started to develop the cave.

In August 1930, excavation work had made accessible about 400 feet of passages, most of them so narrow and low that one had to turn sideways and crouch to get through.

The cave is at the foot of a hill, on the edge of level fields, in limestone beds that strike E.-W. and dip N.15°. The passageways are along NE. and NW. joints. The cave entrance, formerly about 8 by 10 feet, opened into a small chamber, from which the principal fissure lead east. This fissure was so small that adults traversed it with difficulty, although some blasting had been done, clay removed, and broken rock piled out of the way. The cave galleries contained very little dripstone in any form. Some of the walls looked as if the rock had broken, fallen, and lodged in an insecure position.

When visited in 1951 the entrance beside a lane was 10 feet wide and 3 feet high but diminished in a few feet to 2 feet high, beyond which the passage appeared to be filled and no longer accessible.

OTHER CAVES

A few hundred yards west of Cleversburg Sink, near the base of a hill, a triangular hole 1½ feet high opens, 6 feet inside, onto a slope that leads down over fallen rocks to a room 30 feet long, 10 feet wide, and up to 10 feet high. This room is developed along bedding planes and its cross section is a scalene triangle. The floor is covered with fallen blocks.

A cliff farther west and above a prominent bend in Burd Run has an opening that leads down 8 feet to a passage running east 6 feet and meeting a fissure running northwest for 15 feet. The walls of this passage are concavely rounded.

The rolling farm land ¼ mile north of these caves on Burd Run and south of Route 33 is pitted with deep sinks. Most of them have rock outcrops at the bottom and vertical fissures that emit cool air. In an elongated sink just west of a lane leading to Route 33 are two openings. The larger leads to a steep clay bank running into a fissure about 40 feet long and 20 feet deep. Just inside the other opening is a vertical drop to a lower passage in line with the fissure to explore which rope is needed. (Smeltzer)

DAUPHIN COUNTY

BROWNSTONE CAVE

[redacted] **Hummelstown Quadrangle**

At the east end of Hummelstown, [redacted] in Beekmantown limestone is a good-sized cave, now closed by waste rock from the construction of the Hummelstown bypass. The name Brownstone is from a former Reading Railway station nearby.

The opening was large, about 15 feet wide and the height increasing from 4 to 10 feet. These dimensions continued straight underground for 150 feet to a 15 foot crawlway, beyond which the passage widens for 40 feet and the ceiling rises to 30 feet. The inner part of the cave has flowstone on the south wall and several massive stalagmites and one pretty column a yard high far up near the ceiling. Knobs of stalagmites stick through the clay floor. The cave ends in solid limestone about 200 feet from the entrance. This cave is roughly in line with the east canyon in Indian Echo Cave.

INDIAN

[redacted] **Lykens Quadrangle**

At Lykens in the northern part of the county, the massive Pocono sandstone makes a cliff along the creek just above the recreation park and swimming pool. From the road along the opposite bank a conspicuous hole is seen in the base of the cliff. It is 5 feet in diameter and extends back about 40 feet. This is called Indian Cave because of its unknown origin and supposed antiquity; also called Pewee Cave because small.

That it is not a cave, i.e., not a natural hole in the ground, is evidenced by the dump of rock waste below the entrance. It seems to be a prospector's adit driven on a thin seam of carbonaceous shale, possibly with the hope that it might make coal under cover.

WILDCAT CAVE

[redacted] **Hummelstown Quadrangle**

In the bank of Swatara Creek [redacted] is the entrance to a small underground passage known locally as Wildcat Cave. The entrance is on a path 25 feet above the creek in Beekmantown limestone that strikes N. 55°E. and dips SE.20°. A single slightly crooked passage 3 to 5 feet wide is 50 feet long. The ceiling is 6 to 10 feet high in the first half and 4 feet or less in the inner half of the cave. The cross section changes rapidly beyond the entrance. (Smeltzer)

DELAWARE COUNTY

CASTLE ROCK

[redacted] **Lansdowne 7½′ Quadrangle**

James Fitzpatrick, a Revolutionary Army deserter known as Sandy Flash, who was hanged in Philadelphia in 1778, is said to have used Castle Rock Cave as a hideout. It was 2 miles west of Newtown Square on the West Chester Pike. Charles H. Zensen, reported in October 1951 that the company operating the trolley line from Upper Darby to West Chester purchased the land including the cave. The rock was quarried for ballast on the road bed and thus the cave was lost. Probably this was not a true cave but a shelter under huge blocks of the local gabbro or gneiss.

FAYETTE COUNTY

BARTON CAVE

[redacted] **Uniontown Quadrangle**

Barton Cave is situated on Chestnut Ridge in the hollow of a tributary of Quebec Run on state-owned land, [redacted]. As it is in a steep, wooded hillside with no road or path near, one may need a guide to find it.

Chestnut Ridge is an anticline and the Loyalhanna limestone underlies both the east and west slopes in this vicinity. The limestone at Barton Cave strikes N.40°E. and dips SE.15°-20°, or opposite to the dip in Dulany Cave on the other side of the ridge.

Local residents report that the cave was discovered about 100 years ago and was used by moonshiners during the prohibition era. The name is derived from Joseph Barton, the former owner of the land.

The low entrance in the natural outcrop opens into a large main passage which proceeds in a northeasterly direction some 400 feet. The main room, about 150 feet back, is 50 feet in diameter and up to 15 feet high, and contains some bulbous formations, rimstone pools, and various small formations. Another room, 80 feet long, 25 feet wide, and about 10 feet high is about 300 feet from the entrance, and from here a side passage proceeds northwestward 500 feet, inclining upward along the dip and being generally around 10 feet wide and 5 feet high but narrowing toward the end. Directly above the beginning of the side passage is the entrance to the attic, a broad, low, sandy room 70 feet long. Several small streams run through the cave and flow together into a main stream which later disappears into a crack just inside the entrance and finally emerges as a spring about 150 feet down the hill. The cave is relatively dry but a few spots are often slightly muddy.

Amphipods, cave rats, crickets, spiders, harvestmen, and a few bats have been seen, mostly near the entrance. (Taylor)

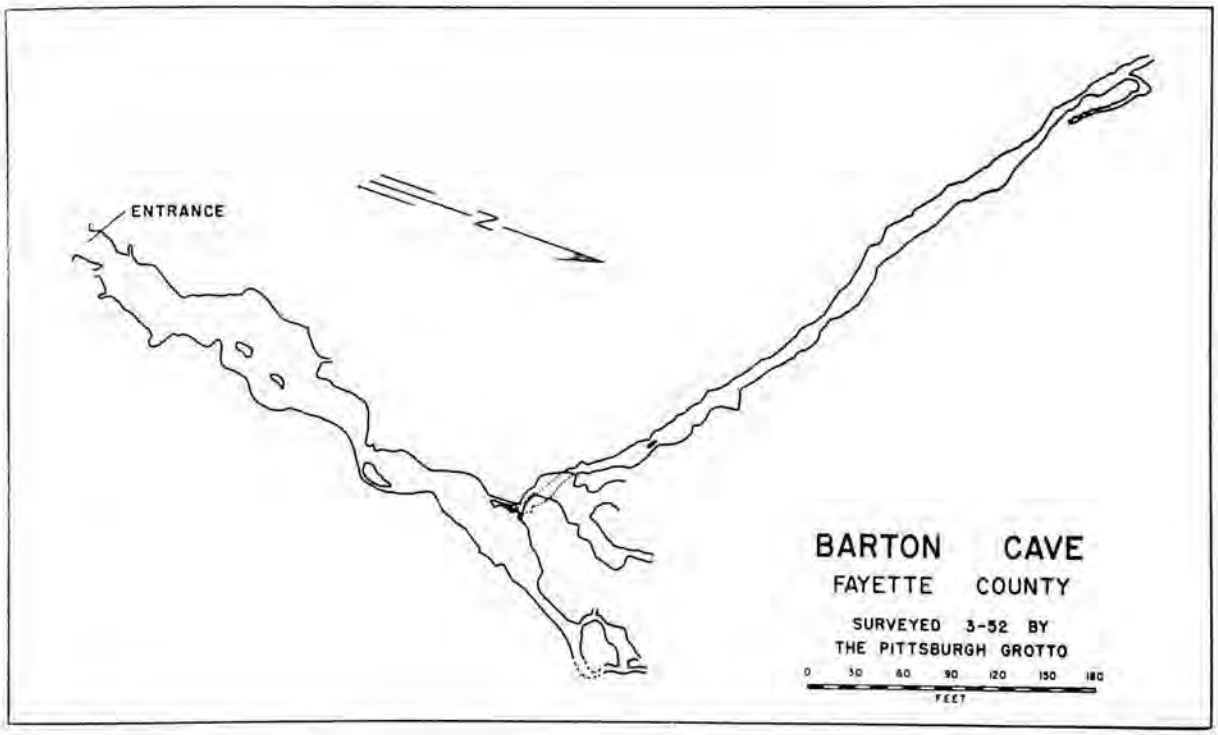
DULANY CAVE

[redacted] **Uniontown Quadrangle**

Seven miles south of Uniontown and [redacted] is Dulany Cave. The cave was named for Thomas Dulany who owned the land under which it lies. Other spellings are De Laney, Delany, Delaney and Dulaney.

There are two entrances, one just large enough for a man to wriggle through and the other so big that horses once could enter it. In fact, this cave is said to have been used many years ago by a band of robbers who secreted themselves and their steeds in this underground shelter. The larger hole is the one commonly entered.

Dulany Cave is in the Loyalhanna or Siliceous limestone, commonly called "blue stone", that outcrops for many miles along Chestnut Ridge and Laurel Hill. At the cave this limestone dips NW.15°, or more or less parallel with the face of the moun-



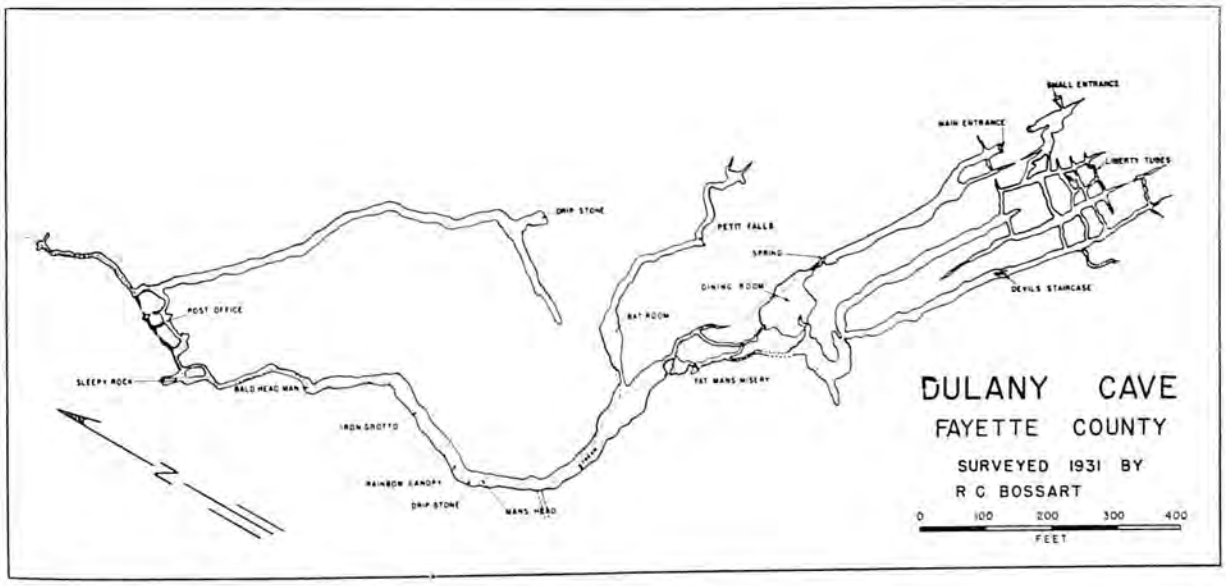
tain. The limestone has a system of nearly vertical joints, some of which trend N.40-60°W., and others nearly at right angles to this course. The main passage is a solution channel along one of the NW. joints and extends in a nearly direct course about 430 feet from the surface to a room at least 75 feet in diameter. For much of the way this passage is 10 to 20 feet wide, but about 400 feet in, or just before entering the large room, it narrows to about 3 feet, and above one's head pinches to less than a foot.

The room measuring about 75 by 100 feet was formed apparently by solution along a bedding plane, and followed by dropping and removal of roof blocks and eventually the falling of larger blocks from the domed ceiling. These now cover part of the floor of the room. Behind these blocks small crevices and passages lead to greater depths. One to the right descends to a choked channel through which water flows. On the left a crawlway leads to a dip slope room 100 feet long and 60 feet wide but mostly not over 10 feet high. By skirting this room to the left one is led up the slope to the Devil's Staircase, a narrow vertical slit rising about 30 feet and leading to the small entrance mentioned above, or one may follow other passages and ascend gradually to the same small entrance.

From the same large chamber, the Dining Room, a third passage conducts one to the more remote parts of the cave, a measured distance of 2,000 feet from the main entrance. This passage is entered behind large fallen blocks on the far side of the room. A small hole leads to a descending crawlway which emerges in a sizable room that is only the beginning of a large and roomy passage extending down the mountain side.

Having passed through The Flue, as this part of the cave is called, one enters the upper end of a large room, known as the Ball Room and clambering down over blocks of limestone, reaches a stream. Here the cavern roof is about 25 feet high and most irregular, with pendant points, cones, slabs, and cornices of the limestone projecting into space. The walls are 30 to 50 feet apart and devoid of regularity. Cross-bedding typical of the Loyalhanna limestone is well displayed here. A passage more than 400 feet long and with a stream along its

Fig. 12—Passage from Fossil Room to the Devil's Staircase, Dulany Cave, Fayette County.



whole length enters the Ball Room from the right or east. This stream here joins others and follows the main passage 1200 feet to the lower end of the cave, there to disappear.

On the lower side of this room the walls are constricted to a passage ranging from a few feet to 25 feet wide, but continuing down grade more or less directly for 1,000 feet. Here and there great blocks fallen from the roof intercept the passage and must be climbed over.

Upstream one traverses for 600 feet a steep passage mostly 15 to 20 feet wide with a ceiling as high or higher and comes at the upper end to a room with more or less dripstone formation. The presence of bats in this part of the cave suggests an outlet near by.

Stalactites and other forms of dripstone deposit are generally lacking in Dulany Cave, although here and there some form of this deposit may be found.

In 1931, Mr. R. C. Bossart, a civil engineer of Braddock, camped at the cave from May 20 to September 7 and registered 1780 people who entered the cave. Assisted by Claude Hollar of Uniontown he explored and mapped the cave.

Probably the earliest recorded exploration of Dulany Cave was by John A. Paxton of Philadelphia. On September 11, 1816, with five other men, Paxton tried all passages, even those so small that they had to crawl or wriggle to get through. Of the last or farthest and largest room he wrote, "This we found to be very spacious, being from 20 to 30 feet wide, from 30 to 80 feet from the floor to the roof, and 1200 feet in length, with a stream sufficient to turn a grist-mill running its whole length. We measured with a line the extreme distance we had been in, and found it to be three thousand six hundred feet, but we must have traveled altogether upwards of two miles."

Dulany Cave is owned by Mr. and Mrs. Norman E. Cale, of Uniontown.

OHIOPYLE CAVE

[redacted] **Confluence Quadrangle**

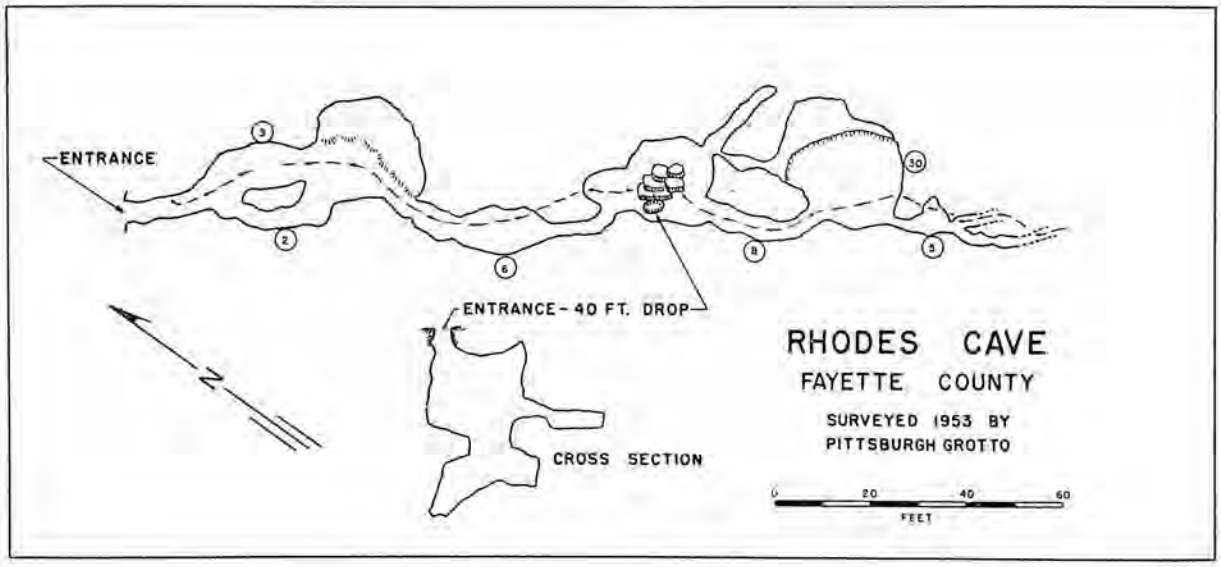
In the east bank of Youghiogheny River 100 yards below the falls at Ohiopyle a shallow niche 40 feet long in the Pottsville sandstone cliff is the site of a cave. The entrance is 50 feet north of a stone wall over a culvert on Route 381.

A hole 4 feet wide and 3 feet high goes in 6 feet, then turns right parallel with the face of the cliff. According to S. W. Frost, the passage is 100 feet long. A crevice at the back of the cave may be worth exploring.

RHODES CAVE

[redacted] **Masontown Quadrangle**

The cave is situated 4.2 mi. S. of Fairchance in a small quarry on the property of Paul Rhodes. It may be reached by following the cinder road leading from the Free Methodist Church 0.8 mi. S. of Haydentown and bearing left for 1.6 mi. to the home of George Smith. The cave is 0.3 mi. SW. of the house and 12 yds. NE. of the road.



The cave is a single passage extending 150 feet along a prominent joint striking N30°W. Entrance to the cave may be made through a low horizontal slit at the base of the quarry wall or by descending from a small opening in the hillside above the quarry into the Hourglass Room. Water issuing from the breakdown at the rear extremity of the cave forms a shallow stream which runs the length of the cave, disappearing a few feet from the lower entrance. This stream resurges at a nearby spring

beside the road. Proceeding from the quarry entrance is a very low crawlway with broken stone and water on the floor. At a distance of 60 feet the ceiling rises to standing height and the passage narrows quickly and verges to the right. Along this passage there are a few embryo stalactites and a short stubby column forming a peep-hole with the wall. At 110 feet from the entrance this passage leads to a large room, 20 feet in diameter and 35 feet high, with a cross-section resembling an hourglass. The floor of the lower section is covered with a mound of fallen rock which reaches to the aperature of the hourglass. From the upper section a treacherous climb of 20 feet reaches to a 2-foot crevice connecting with the surface. Opposite this climb is a short tunnel leading in at 100°. Twenty-five feet from the Hourglass Room is another room, circular in shape with a diameter of 20 feet and height of 30 feet. The far end of the room is closed by an extensive breakdown except for a 30-foot crawlway leading to a small waterfall at the source of the stream. Spiders, crickets and harvestmen can be found throughout the cave. During the winter months, the cave is inhabited by a small number of bats. According to Smith, the cave was first entered about 1939 when he opened the quarry. (Dunn, Taylor)

SMITH'S LADDER CAVE

REDACTED **Uniontown Quadrangle**

The cave is 2½ mi. SE. of Haydentown near Rhodes Cave. It may be reached REDACTED The cave is on the property of Paul Rhodes.

It is a shallow sink hole offset by several narrow passages totaling 80 feet in length. From the base of a small oval-shaped sink, a wooden ladder, constructed by Smith 20 years ago, descends 10 feet to the first level from which a narrow crack 10 feet high extends 25 feet to a surface-fill choke. The walls here are jagged from water erosion and have thin layers of insoluble rock projecting from them. A cave rat has been seen at the end of this passage. A second ladder descends from this level 8 feet to the bottom of the sink which connects with a low tunnel, bow-shaped about 40 feet long. Water carving is lacking at this level. The cave lies in the Loyalhanna limestone. (Dunn, Taylor)

FRANKLIN COUNTY

AUCHENBAUGH CAVE

REDACTED **Shippensburg Quadrangle**

A cave on the former Auchenbaugh farm, owned and occupied in 1952 by James Watson, is 1¼ miles from Route 11, and ¼ mile from Route REDACTED

The cave is developed on right-angle joints in horizontal beds of Beekmantown or Chambersburg limestone that form a ledge on the west bank about 30 yards from the creek.

Three openings lead into a labyrinth of narrow passages, about 300 feet long. Additional passages are accessible to thin persons. One such passage has a travertine bridge, another a lower channel, and two have intermittent pools. The fissures are 3 to 10 feet high. Other passages can be entered through a small hole 20 feet farther north along the ledge. Most formations are "dead". (Smeltzer)

BAKER CAVE No. 2

REDACTED **Mercersburg Quadrangle**

In a field about 300 yards north of Baker Caverns, close to a power line pole with heavy insulators, a collapsed cave roof exposes a shallow cave. The collapse has produced two vertical-walled sinks 40 feet apart and 4 to 9 feet deep. The south sink is 30 feet long and 10 feet wide, with a gentle slope leading to it at a break in the east wall. The north sink is 5 x 7 feet in diameter.

Baker Cave No. 2 is in Stones River limestone which strikes N. 24°E. The bedding is vertical. The cave is developed along joints trending N. 55°E. and N. 6° W. and along the bedding.

From the north side of the larger sink an opening 15 feet wide leads into a passage with an average height of 6 feet, width of 10 feet, and running N.24°E. for 60 feet. The smaller sink opens in the roof of this passage 15 feet from the far end. The floor is partly covered with loose rock from the fields. "Cave coral" covers the east wall.

At the south side of the larger sink the cave continues as a passage mostly 6 feet high and 8 to 15 feet wide trending S. 24°W. for 90 feet. About 25 feet from the entrance, a low wide passage leads to a small chamber almost filled with thick columns. About 50 feet from the entrance the cave is offset to the left about 8 feet. Here the passage is 15 feet wide, with a silt bank on the left. This passage ends in breakdown. (Smeltzer)

BAKER CAVE No. 3

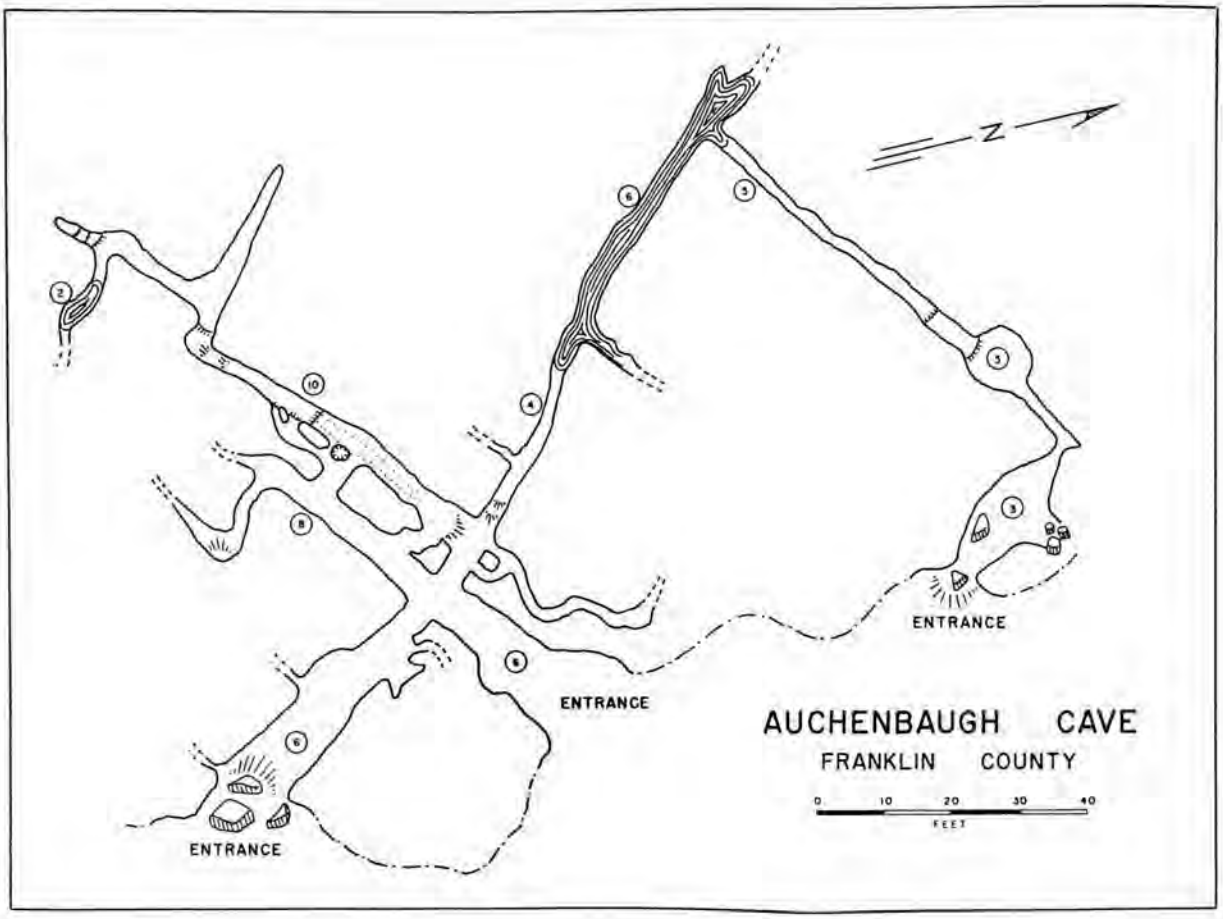
REDACTED **Mercersburg Quadrangle**

Less than a mile south of Williamson, in the steep bank between Route 995 and Conococheague Creek, a small cave goes down at a sharp angle to water, then up and down again. It is in Chambersburg limestone on the property of M. L. Burgan, but in recent years has been closed.

BRECKBIEL CAVE

REDACTED **Mercersburg Quadrangle**

On the Breckbiel farm one mile up Dennis Creek from Freys there is a cave in Stones River limestone in the northernmost of several sink holes. This sink is REDACTED



To enter the cave one must crawl through an automobile body. The cave floor is about 11 feet below the surface. A passage about 8 feet high and 3 feet wide goes left 25 feet to a fissure 10 inches wide and at least 20 feet long. These openings are on joints in the sandy and fossiliferous limestone that dips 65° SE. An underground stream is exposed in the bottom of several sinks in this vicinity. A small stream flows through a crevice near the entrance to Breckbiel Cave. (Smeltzer)

BLUE SPRING CAVE

[redacted] **Mercersburg Quadrangle**

At Blue Spring on Blue Spring Creek, 2.8 miles southwest of Mercersburg, an underground stream emerges from a low arch in the Chambersburg limestone. The extent of the cave has not been determined. (Taylor)

BUCHANAN CAVE

[redacted] **Mercersburg Quadrangle**

Almost [redacted], members of the Pittsburgh Grotto discovered and mapped a small cave in April 1950. It is on the land of Dan Buchanan, leased to J. W. Shives.

An outcrop of Chambersburg or Stones River limestone of Ordovician age 200 yards west of the farm house can be seen from the road. The entrance is in a small sink hole surrounded by small hemlocks a few feet from the edge of a field. The cave is about 100 feet long and 20 feet wide. Breakdown and narrow crevices at the south end stop progress in that direction, but a slippery mud slope leads to a room about 15 feet wide that slants to the north and narrows, ending in a pool under the main room. (Hoffmaster, Taylor)

DEERDORFF CAVE

[redacted] **Chambersburg Quadrangle**

On the Frank Deerdorff farm 0.8 mile northeast of Green Village several sinkholes are near the south end of a wooded area. Three large sinks and a vertical shaft apparently are related to the same cave system. The larger sink has an opening eight feet high and 2 feet wide leading down a slope to a head-high room about 15 feet in diameter. A 15-foot shaft at the northeast corner of this room

opens to the surface. A crawlway near the base of the shaft continues southeast over slippery clay banks for an unknown distance. There is an unexplored opening in a sink just west of the shaft.

The cave and sinks are in the Beekmantown limestone which dips SE.70°. (Smeltzer)

DUFFIELD CAVE

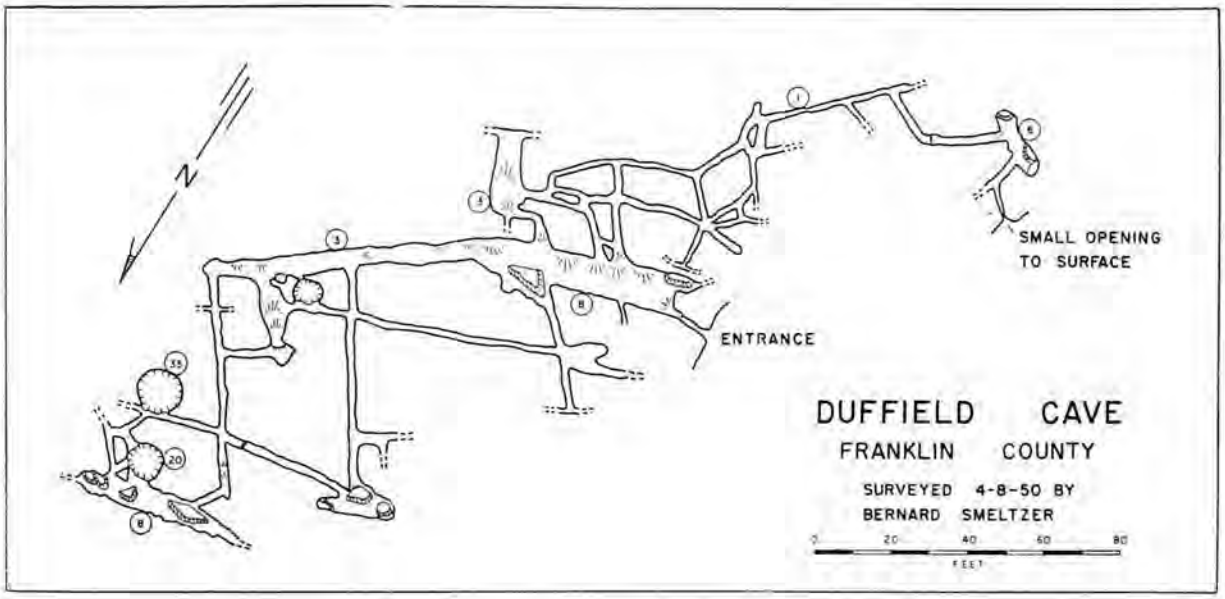
[redacted] **Chambersburg Quadrangle**

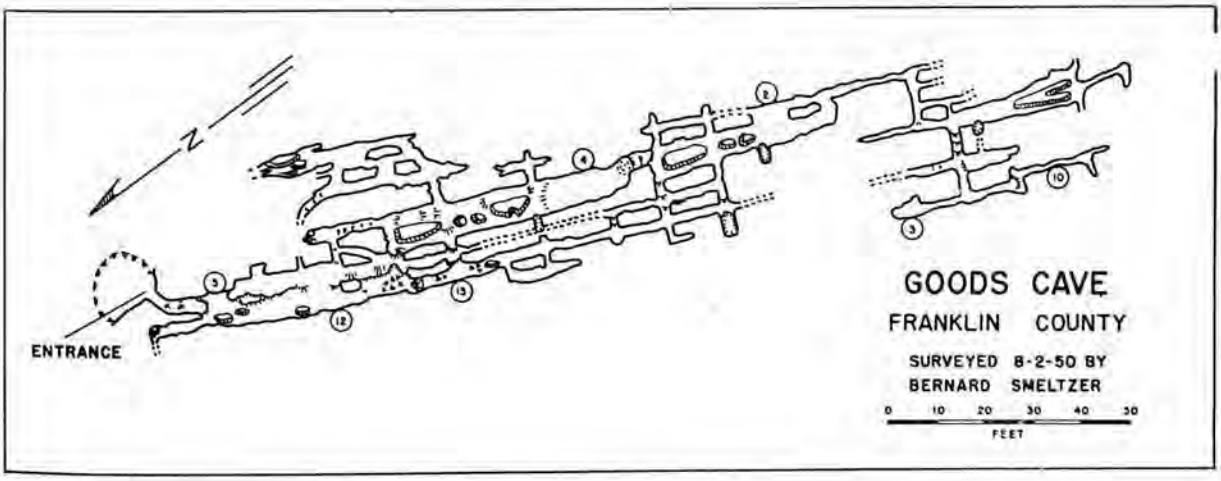
One mile southwest of Duffield in an abandoned limestone quarry owned by Mr. Brackbill is an excellent example of a fissure cave. Except for the entrance chamber the galleries are extremely narrow, fairly high on the north side and low on the south side of the cave. Dripstone is lacking but small calcite nodules are numerous and annoying in some of the tight fissures. Enlarged joints in the flat-lying Chambersburg limestone, can be followed for about 700 feet. Wells at the junction of several passages are a unique feature of this cave. The largest of these circular pits is 33 feet deep. (Smeltzer)

GOODS CAVE

[redacted] **Chambersburg Quadrangle**

This cave, originally on the Frederick place, later the Aaron B. Goods farm, is [redacted]. The cave entrance, in a field close to the top of a low ridge, is a small hole in a sink exposing Elbrook limestone. A crawlway leads down into the main





passage. This leads into a series of four or more parallel passages along the strike of the beds with crevices developed along parallel cross joints. They give access to channels on and over the crest of an anticline and down the steep west flank. Low on the flank, where the beds dip 70°, passages are high and narrow. On the crest they are broad but not so high, with large fallen blocks on the floor.

About 30 feet from the entrance two channels, one above the other, are separated by rock bridges. The lower channel is 10 to 15 feet high and continues in a straight course for 120 feet. At this point, instead of the five channels at different levels found 60 feet from the entrance, there is one large opening parallel with the bedding, rising at 70° up and over the crest of the arch. The far end of the cave is 200 feet from the entrance.

KEEFER CAVE

REDACTED **Needmore Quadrangle**

A small cave on the Yule Keefer farm ¾ mile southeast of Sylvan has a low entrance that leads to a little room up to 5 feet high. In this room is a pool, the water from which emerges just below the entrance to the cave as Little Cave Run. (Smeltzer)

KELLY HOLE

REDACTED **Mercersburg Quadrangle**

Exactly 4.8 miles southwest of Mercersburg on the property of Elizabeth Metcalfe, there is a small cave. A 2-foot hole between the house and Licking Creek leads to a 5-foot room and two short passages containing formations and a small pool. (Taylor)

MARTIN CAVE

REDACTED **Mercersburg Quadrangle**

On the Martin farm half way between Frays and Sandy Hook and 2¾ miles northeast of Edenville, the entrance to a small cave in the side of a shallow sink is a small shaft 10 feet deep. The cave is on a fault with steeply-dipping Chambersburg (?) limestone beds on the south side and horizontal beds on the north. It is 70 feet long, 5 to 15 feet wide, with ceiling 2 to 6 feet high, and clay banks on the south side. A narrow passage branches off on the right or west side behind fallen blocks. (Smeltzer)

Across the road a short distance a passage 10 feet in diameter at the entrance is about 30 feet long but narrows shortly and is choked with loose debris at the inner end. (Taylor)

NEEDY CAVE

REDACTED **Hagerstown Quadrangle**

In the northern end of a ridge of Cambro-Ordovician limestone, possibly Tomstown, REDACTED there is a cave that is named for the Needy family that owned the land for several generations. The cave is ¾ mile from the Waynesboro-Emmittsburg highway and directly across the road from a house owned by John Downin.

The limestone at the entrance strikes S.50°W. and dips SE.60°. In the depths of the cave the beds are nearly vertical or several degrees steeper than at the entrance. The hole in the hillside is only three feet wide but it gives immediate access to a room about 20 by 50 feet, and 15 or more feet high. From the far side of this room a small passage leads to the right a few feet and down 3 or 4 feet more into another room about 15 feet wide and 30 feet long. This is the beginning of a long straight passage which pinches and swells and has a ceiling of varying height. About 150 feet from the entrance the floor is covered with water several inches deep, but one can get past by climbing up a few feet. About 35 feet beyond, further progress can be made only by bridging the water-filled crevice at the well and climbing higher.

By climbing about 20 feet above floor level one can advance fairly easily for the next 200 feet, the average width of the cave being 15 feet. After passing three so-called rooms and a water-filled cleft, crawling through a porthole and roping up to a small shelf and down a 45° slope, one is stopped at a lake unless the water level is low. Here the cave divides longitudinally. If one works up the left cleft and follows the back of the cave 15 or 20 feet, further advance is stopped by collapse of the roof. The lake is about 500 feet beyond the Well.

Dripstone is not common in this cave but flowstone has accumulated at several places on walls and floor. Bats and mosquitoes have been seen in the cave. (Stone, Stephenson)

NICEWANDER CAVE

REDACTED **Mercersburg Quadrangle**

On the E. J. Nicewander farm 1½ miles north of St. Thomas is a large sink in the midst of a meadow across the road from the house at a right angle turn of the road. This sink, not visible from the road, is used for the disposal of field stone. The entrance to a cave in Chambersburg limestone is in the south wall.

The cave is a single passage extending south 260 feet in a straight line. One wall appears to be a high-angle joint. Much of the passage is 5 feet or more wide, the ceiling is 3 to 10 feet high, and the floor is rather level. About 75 feet from the entrance a large bulbous stalactite is directly over a stalagmitic mound and rimstone. A flowstone mound nearly 15 feet high nearly closes the passage 60 feet farther in. Between 160 and 220 feet from the entrance there is a discontinuous upper channel. Near the far end the roof comes down to one foot above the floor. Beyond this crawl the roof shoots up to 8 feet but comes down shortly almost to the surface of a pool. Stalactites hang over the pool. (Smeltzer)

OVERCASH CAVES

REDACTED **Mercersburg Quadrangle**

Four caves, three small and one large, have openings in the cliff on the north side of the West

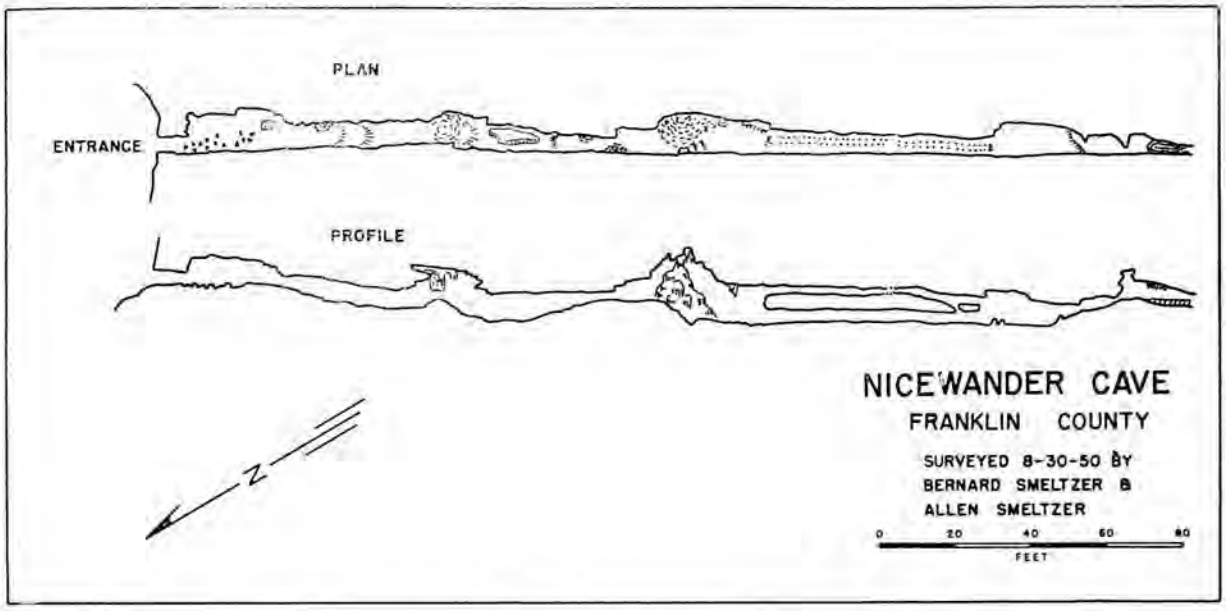


Photo by B. L. Smeltzer

Fig. 13—Flowstone mound 15-feet high in Nicewander Cave, Franklin County.

Branch of Conococheague Creek [redacted]. To find the tiny entrance to the large cave it is necessary to identify the three small ones.

The first Overcash cave is [redacted]. A shelter-like opening 9 feet wide, 5 feet high, and 12 feet long has two crawlways at the far end that extend 6 feet to a room 13 feet long, 10 feet wide, and 4 feet high running N.20°E. A shallow pit at the west side of the room reveals a pool under the room. A very low crawlway continues east 10 feet to a stream passage 2 feet wide and 3 feet high. This stream emerges 15 feet east of the cave entrance.

The entrance to the second cave is upstream, [redacted]. It is a crawlway 2 feet high and wide that opens to a room 16 feet long, 8 feet wide, and 6 feet high. At the south end of the room light enters through a crevice 7 feet above the cave entrance. Many cave crickets were in this room in July 1953.

A crawlway 12 feet long and 2 to 3 feet high is 24 feet west of the entrance to the second cave.

The third cave is at [redacted]. A hole 16 inches in diameter leads in 4 feet to a passage 2 to 4 feet wide and 9 feet high that runs N.30°E. for 33 feet. A low opening at the base of the east wall of this passage leads to another and parallel one 3 feet high and 15 feet long running southwest.

The entrance to the large cave, locally known as Hidden Lake Cave, is [redacted]. A tiny hole opens to a wide passage sloping down to a ledge overlooking a large room. This room is 75 feet long, 35 feet wide, and 10 feet high and trends N.24°E. Most of the floor is wet mud or covered by water. The "lake" is inhabited by crayfish and salamanders. A rock island in the middle of the lake is 40 feet long.

Ponderous stalactites decorate the ceiling and are reflected in the water. A massive column 20 feet from the entrance is 5 feet wide. A tan stalactite 38 feet from the entrance is 3 feet long and 16 inches thick. Near it are similar ones up to 34 inches long. A 42-inch stalactite hangs 21 feet from the far end of the room. Passages on both sides of the room can be reached only by wading in deep water or crawling on slippery mud.

A small passage at the far end of the room leads through breakdown to another room 30 feet long, 15 feet wide, and 6 feet high that is nearly divided by a rock pillar.

As the water in the creek fluctuates greatly owing to the operations of a near by dam, and the water in the cave rises and falls with that in the creek, **caution should be taken in exploring "Hidden Lake Cave." The water may rise three feet or more in a few hours.** Boys have swum under water from the cave to the creek.

The Overcash caves are in the Chambersburg limestone where it strikes N.24°E. and dips NW. 35°. The large cave is developed along bedding planes and the extent of the small ones is controlled mainly by joints.

These caves were explored in July 1953. (Smeltzer)

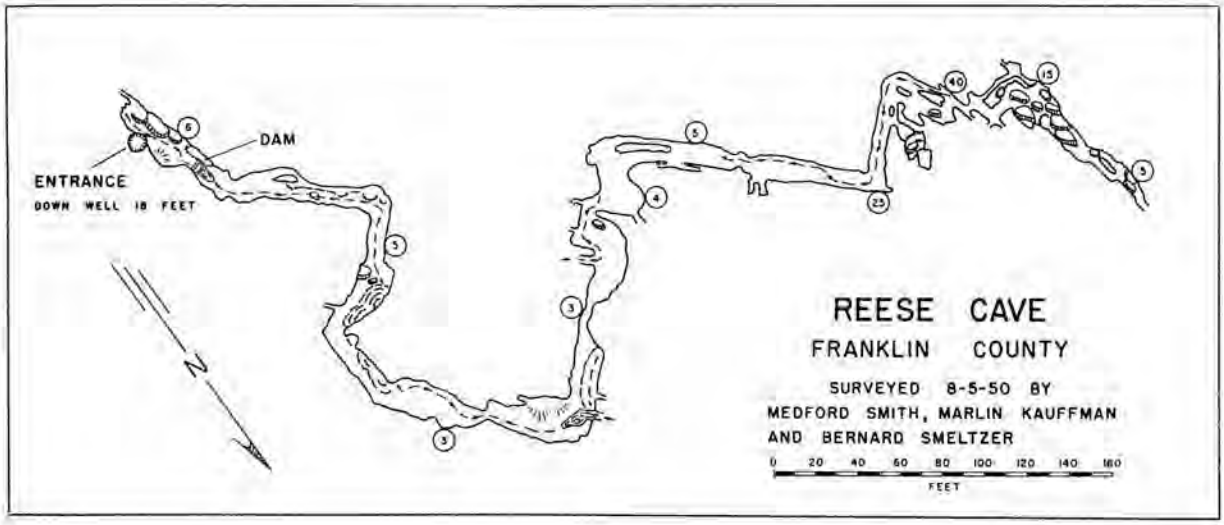
REESE CAVE

[redacted] **Mercersburg Quadrangle**

A cave at Dutchtown, 2 miles southwest of Fort Louden, was discovered in 1832 by a man named Reese in digging a well. At a depth of 20 feet below the surface the well broke into a cavern in which there was a running stream. This has been

Photo by C. E. Mohr

Fig. 14—Speleothem undercut by stream in Reese Cave, Franklin County.



RED BRIDGE CAVE

[redacted] **Chambersburg Quadrangle**

[redacted] there is a cave in the cliff 30 feet east of the bridge. It is in vertical beds of the Stones River limestone. Located in a niche in the cliff, it consists of a vertical hole or chimney 20 feet deep. It ends in a short horizontal passage a few feet above creek level. (Smeltzer)

the source of the domestic water supply since that date, as is also the spring where it emerges close by.

The property, known as the Shultz place, is owned by Frank Mellott. It is the southernmost house in the little settlement. Some of the larger stalactities were removed years ago but few people have entered it in recent decades because access is possible only by going down the well.

A low concrete dam in the cave covers the floor with several inches of water for a few yards. Throughout most of the length of the cave some

part of the floor is occupied by the stream. The course of the cave upstream from the well is crooked, but generally northwest for 700 feet. For 200 feet from the well there is plenty of room to walk upright and the gallery is 5 to 15 feet wide, but beyond this distance the roof is lower and travel beyond the cross gallery at about 250 feet is mostly on hands and knees. Here too, although at floor level the gallery may be 30 to 40 feet wide, at shoulder height it may be less than 5 feet wide. The cave ends in breakdown.

In some parts of the cave the ceiling is covered with myriads of stalactites 1 to 3 inches long and less than a quarter of an inch in diameter. Each has a white tip bearing a drop of water. About 150 feet from the well a shelf of cave onyx projects 6 feet from the wall and supports a column several inches in diameter. At the next sharp bend the dripstone has built a series of small terraces, like a Philippine hillside with its rice paddies in miniature. Here on the one stretch of dry floor are rimstone fringes of former pools.

At the junction of a cross passage is a natural bridge, and 500 feet from the well, where the underground stream enters the gallery, a crawlway leads off to the left.

The gallery by the well appears to be along the strike, which is N.5°E., but beyond the first bend the main gallery seems to be across the bedding, probably in part along a NW. joint. Bedding in this Cambro-Ordovician limestone appears to dip W. 70°. The cross gallery is on the bedding but the strike here is N.40°E. Wide development at floor level far back in the cave may be along a horizontal joint.

REICHARD CAVE

[redacted] **Chambersburg Quadrangle**

A cave that received much local publicity following its recent discovery beneath the Valley View Orchards, owned by D. Lloyd Reichard is located [redacted].

The cave was discovered in October 1951 by Mr. D. L. Reichard while digging in his orchard. The floor of his excavation dropped in. The first descent was made by Reichard and James Benn, mineralogist of the U. S. National Museum, shortly afterward; the second April 20, and the third May 10, 1952, by members of the Philadelphia Grotto and others, by means of a winch equipped with ½-inch steel cable.

The area is underlain by the Waynesboro formation of Cambrian age, consisting of dark sandy shale and sandstone and white limestone and marble. The upper part of the cave is in dark dolomite and the lower part in white marble. The beds strike N.7°W. and dip NE.63°. Dripstone and flowstone formations are lacking.

Entering the cave through a "manhole" under the winch there is a vertical drop of 50 feet to standing room on a steep talus slope of rocks spalled from the walls and jammed across the fissure where it is nearly 4 feet wide. A large boulder lodged in the fissure above the talus looks insecure. Horizontal passages high above this level are unexplored in May 1952.

Below the top of the talus the fissure slopes steeply, including a 3-foot and a 7-foot drop. About 70 feet below the winch the maximum width of the fissure is 10 inches, and 80 feet below the surface is the brink of a vertical fissure 48 feet deep with fallen blocks at the bottom. A small hole in the floor shows a cavity 3 to 5 feet wide with water 6 feet below the roof. A plumb struck bottom at 11 feet but the fissure may slope so the water may be deeper. This may be water table level. (Parker, Lipman)

ST. THOMAS SINKS

Mercersburg Quadrangle

A road running southwest from St. Thomas crosses Campbell Run and ascends a hill. Here, 1 mile south of St. Thomas, on the east side of the road in a small sink is an opening 5 feet high that is choked with debris 30 feet from the entrance. Farther south, on the west side of the road, a large opening in a sink is choked with earth only 15 feet from the entrance. Two miles south of St. Thomas at the site of a school large sinks are on both sides of the road. A local resident says that a large cave once opened from a 50-foot deep sink west of the road. East of the road and ¼ mile farther south there is a narrow recent sink at the junction of three fields. In it an opening to a passage 4 feet high is blocked by a pool overhung with stalactites.

These sinks are in Stones River limestone and may be tributary to a large cave or series of passages. (Smeltzer)

On the property of C. D. Martin, 1.2 miles south of St. Thomas, a small sinkhole in an open field leads to a room 20 by 10 feet, and 8 feet high. Two small short passages lead from this room.

SCOTLAND CAVE

[redacted] **Chambersburg Quadrangle**

A cave on the Keefer farm ¼ mile east of Scotland is in the Conococheague limestone. It is entered by crawling 10 feet into a room about 30 by 10 feet and about 5 feet high. A passage to the left is blocked after 30 feet by water and low roof. The cave is said to be dry in summer. Crawfish, salamanders, crickets, and a few bats have been seen. (Smeltzer)

SHIVELY CAVE

[redacted] **Chambersburg Quadrangle**

On the Shively farm, [redacted], there is a cave in a field 500 feet east of the farm house occupied in 1952 by Raymond Eberly. The entrance, 16 feet wide and 3 feet high, is in an old contorted Conococheague limestone prospect partly filled with trash. A passage 3 to 6 feet high and

up to 25 feet wide leads S.20°W. down over a pile of rocks for 30 feet, turns to the right and continues for 50 feet in a S.80°W. direction. At this point the passage is only 3 feet high but 11 feet wide, and is offset to the left at the rear, pinching out at a lower level. The entrance passage is on the flank and the rest of the cave on the crest of an anticline. (Smeltzer)

SNIDER CAVE

REDACTED **Mercersburg Quadrangle**

On the property of Frank H. Snider, 2.2 miles south of St. Thomas, a cave in a sink hole back of the house consists of one room 15 feet in diameter, from which a passage with a large breakdown extends about 40 feet. (Taylor)

SPIDER CAVE

REDACTED **Chambersburg Quadrangle**

A cave inhabited in July 1953 by large numbers of the common cave spider, **Meta menardii**, is one mile southwest of Green Village on the west bank of Conococheague Creek about 100 feet down stream from a bridge.

Several openings in a rocky knoll peter out within a few yards though they all may connect through tiny fissures. The largest opening, six feet above the creek, only 16 inches high and 25 inches wide, increases in a few feet to a winding passage six feet high and two feet wide running southwest parallel to the creek for about 20 feet. A narrow fissure at this point runs southeast and opens near the creek, but on the right a hole two feet high and wide leads into a keyhole passage 10 feet high running northwest for about 25 feet. An unexplored crawlway continues northeast.

Spider Cave is in the Beekmantown limestone where it has a gentle dip to the southeast. The walls of the passages are light grey and very smooth. Tiny cavities are lined with calcite crystals. (Smeltzer)

STALIPER CAVE

REDACTED **Mercersburg Quadrangle**

A cave 1.4 mile northeast of Mercersburg on the William Staliper farm is in the base of a 40-foot cliff on the west bank of the West Branch of Conococheague Creek, 500 feet southeast of the farm house.

The entrance is 15 feet wide and 6 feet high and divided by a rock pillar. It opens into a shelter 20 feet long, 12 feet wide, and 8 feet high, at the rear of which several crawlways on two levels extend a short distance.

The cave is in the Beekmantown limestone dipping N.30°. (Smeltzer)

WARREN POINT CAVE

REDACTED **Hancock Quadrangle**

Near Warren Point in the extreme southwest corner of Franklin County and 3 miles southwest of Sylvan there is a cave on the north bank of Licking Creek. It is ½ mile upstream from a bridge on Route 456 and 10 feet above the stream.

The cave in Tonoloway limestone follows the strike of the strata, about N. 30°E., and is roughly wedge-shaped in cross section, being higher on the left or up dip side.

The entrance is 5 feet high and 8 feet wide. The single passage is 130 feet long, up to 7 feet high, and averages 15 feet wide. The ceiling has hexagonal fossil mud cracks. Large slabs and thin plates of rock are on the floor. During daylight other illumination is not needed. A small opening at the inner end would permit a dog to exit. (Smeltzer, Ruhoff)

WELSH RUN CAVE

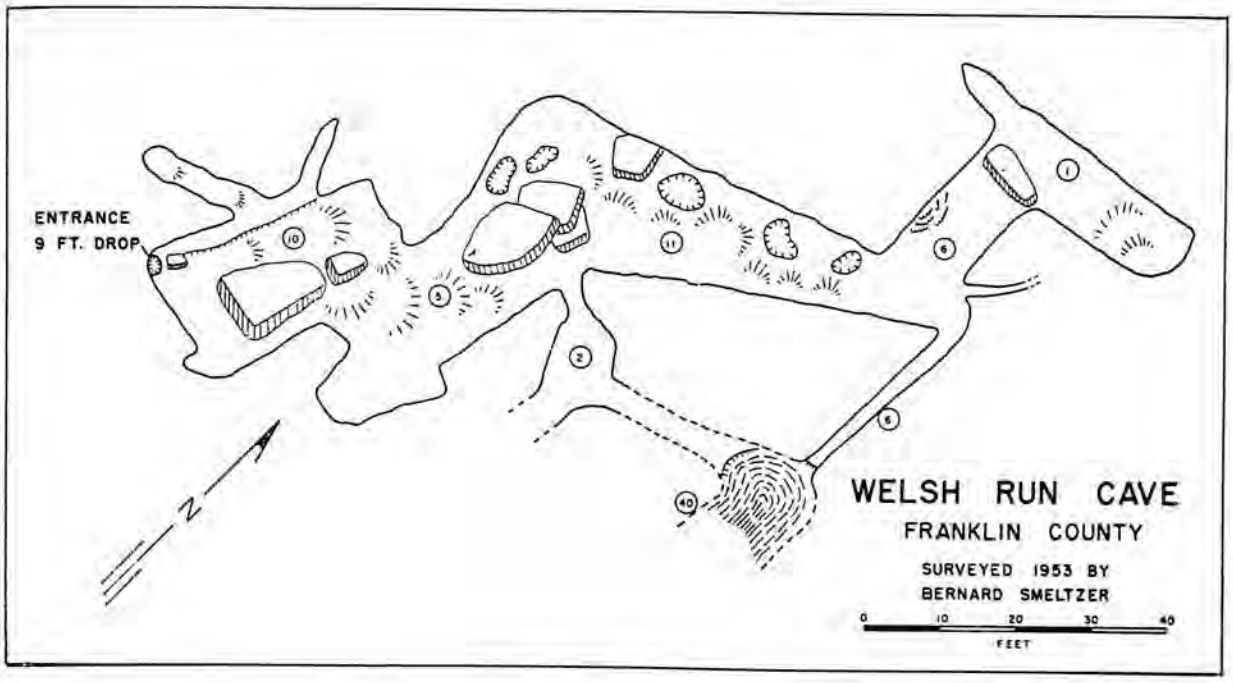
REDACTED **Mercersburg Quadrangle**

This cave is REDACTED . The entrance is a vertical cleft in rocks 45 yards northeast of a fork on a gravel road.

The opening drops 9 feet to the floor of a chamber 30 feet long, 17 feet wide, and 12 feet high. Breakdown covers part of the floor that slopes gently down toward the north end of the chamber. At the northeast side of this chamber a broad passage opens to the east into a large corridor extending north, then northeast for 60 feet. This corridor is 10 to 20 feet wide and up to 20

Photo by B. L. Smeltzer

Fig. 15—Scene in Welsh Run Cave, Franklin County.



feet high. In it are the largest travertine speleothems yet found in a Franklin County cave. Here are huge stalactites and draperies, some like great chandeliers; massive stalagmites up to 6 feet high with equally large stalactites above them; and a slender column near the west wall is 7 feet high and only a few inches in diameter. Breakdown covers much of the floor and deep funnel-shaped pits containing water are along the north wall.

At the far end of the corridor a passage 6 feet high and 10 feet wide heads due north for 20 feet. It also is decorated with beautiful speleothems. A 6-foot column resembling organ pipes stands in the center of the passage and a large flowstone cascade is on the west wall. The ceiling is a bristling mass of stalactites.

The north end of this passage gives access to a room 30 feet long, 9 feet wide and 9 feet high. At the south end of the passage a crevice 6 feet high leads southeast for 24 feet to a high ledge overlooking a pool.

Welsh Run Cave is developed along the bedding planes in Stones River limestone where it strikes N.18°E. and the dip is vertical.

This cave was discovered, explored, and mapped in August 1953. (Smeltzer)

WORLEYTOWN CAVE

REDACTED **Mercersburg Quadrangle**

A small cave on the Berr property REDACTED. The entrance, 10 feet wide and 5 feet high, admits to two short parallel passages. The larger one, 6 feet high and 4 feet wide, leads northeast for 26 feet to a spring. The other passage is 10 feet long, has a low ceiling, and in July 1953 the floor was covered with water.

This cave is in shaly Chambersburg limestone near the Martinsburg shale boundary. It is developed along vertical bedding planes. (Smeltzer)

ZIMMERMAN CAVE

REDACTED **Needmore Quadrangle**

On the Zimmerman farm 1½ miles northeast of Sylvan, there is a large outcrop of Helderberg (?) limestone 30 feet above the road along Cove Creek. In the southern end of this outcrop is the entrance to a fissure cave that is about 70 feet long and up to 15 feet high. A short passage 40 feet from the entrance is on a joint. The cave is dry and has no dripstone. (Smeltzer)

FULTON COUNTY

INDIAN CAVES

[redacted] **Hancock, Needmore Quadrangles**

At Warfordsburg in Bethel Township, on the line between the Hancock and Needmore quadrangles, small openings in the Helderberg limestone are known locally as the Indian caves.

Ruffing describes them as on the east bank of Tonoloway Creek 500 yards south from the new quarry, visible from the road, and consisting of two passages 5 feet high and only 15 feet long, connected by a short crawlway 2 feet in diameter. Chippings indicate Indian use of chert inclusions in the limestone for making arrowheads.

LONG QUARRY CAVE

[redacted] **Needmore Quadrangle**

This cave is on the property of William A. Long, [redacted]. The cave entrance is [redacted].

The cave was discovered by Henry Garland during quarry operations in the early 1930's. Exploration was forbidden and was considered dangerous due to the position of a few large blocks just within the entrance. (These blocks are not loose and have probably been in this position long before blasting was done in the quarry.) The cave was thought to be even more dangerous after a few local men became lost in the cave. Only recently (1953) lengthy exploration was carried on by experienced cavers.

A narrow band of Helderberg limestone enters southern Fulton County from Maryland, extending as far north as Needmore; then bends abruptly and continues south into Maryland again. The cave occurs on the west limb of a large anticline. It is developed in the lower part of the Keyser limestone, near and possibly extending into the Tonoloway formation. The limestone is bluish-black and gnarly with occassional shaley beds. Fossils occur at places, projecting from the parent rock. Brachiopods, crinoids, and hydroids are most numerous. The beds dip 45° N.W. and strike N. 26° E. The cave is developed mainly along a vertical master joint following the strike, with short dead end passages along subordinate joints intersecting at right angles. Some sections are patterns along the sloping bedding planes; others are high galleries along a vertical joint plane. Chimneys are numerous. The ceiling and walls of the entire cave are very irregular and jagged. A great quantity of very wet plastic clay covers much of the cave floor. Mud flows enter many of the chimneys.

The cave is primarily an alternation of rooms and galleries connected by crawlways extending N. 26° E. for over 400 feet. The entrance 10′ high and 8′ wide, in the west end of a quarry, leads into a small room decorated with flowstone. A low opening leads on from the far end of the room over breakdown and continues N.E. as very narrow for 45′. At this point the passage widens to 10′ and the ceiling is 15′ high for 45′. On the left a broad opening slopes down dip to a room 20′ below. Twisting fissures up to 10′ high and with a narrow squeeze overlooking a 10′ drop, extend for 70′. A steep clay slope leads down to a gallery 90′ long and up to 40′ high. At the far end of the gallery a slippery clay bank leads up 15′ to a series of crawlways which open into a room 100′ long, 12′ to 15′ high, and up to 20′ wide. The floor of the room is covered with breakdown. The walls and ceiling at places are matted with delicate branching forms of white crystals. A low crawl at the end of the room enters a passage 6′ high and wide, which continues for an unknown distance. (Smeltzer)

The late George M. Burhans explored this cave in the spring of 1953 and reported a stream on the second level with a flow of approximately 15 gallons per minute; that the main passage is 520 feet long; and the cave has a total length of 712 feet of passages.

HUNTINGDON COUNTY

BARD CAVES

[redacted] **Orbisonia Quadrangle**

A cave on the Charles Bard farm 1.2 miles southwest of Three Springs has long been known and frequently explored by local people. The vertical opening to the cave is under a large tree 200 feet east of the barn, but has been filled with trash and dirt. It is said to open into a large chamber with a single passage leading southwest along the strike an unknown distance. Speleothems are reported abundant.

The hill ¼ mile southwest of the Charles Bard farm has several small limestone prospects. In one of them behind the abandoned lime kiln an opening nearly blocked by a large rock extends S. 24° W. 48 feet. This passage is 3 to 5 feet wide, up to 5 feet high, and slopes steeply down dip. Several passages choked with clay intersect it at right angles. At the base of the slope the cave extends to the left a few yards, ending in a small chimney. As in Curfman cave, hydroid fossils project from ceiling and walls.

At the base of the slope the cave extends to the left a few yards, ending in a small chimney. As in Curfman cave, hydroid fossils project from ceiling and walls.

A cave consisting of three rooms is said formerly to have been accessible from a prospect near the kiln and one man claims to have gone through to an opening in the quarry face near Curfman Cave.

CURFMAN CAVE

[redacted] **Broad Top Quadrangle**

Curfman Cave is 1½ miles south of Saltillo, and the same distance southwest of Three Springs, on Route 76 at the western end of a ridge known as Cave Hill. It is in the top level of an abandoned limestone quarry on the Raymond Curfman property. Quarry operations were suspended about 1940.

The cave is in the Keyser member of the Helderberg limestone where it strikes N.14°W. and dips W.40°. It is developed across the strike and along the bedding, guided by a N.80W. joint.

The cave entrance, in the southeast side of the quarry, is an opening 8 feet wide and 4 feet high leading southeast as a crawlway 8 feet to a room 35 feet long, 30 feet wide, and up to 10 feet high. The floor of the room is heaped with large rocks broken loose during quarrying, and in places the ceiling looks insecure. Near the entrance to the room, narrow fissures ending in deep pits are on both sides.

The ceiling of the southwest side of the room contains curly masses of corals. The more soluble part has been dissolved, leaving silicated concentric layers projecting. These are up to 9 inches in diameter.

A low opening on the east side of the room leads up dip 17 feet, intersects a short passage on a NE.-SW. joint, and 12 feet farther up, over fallen slabs, enters a second large room. This room, 50 feet long and up to 20 feet wide, is along a strong S.80°E. joint. The ceiling height is from 6 to 15 feet. The steep wet mud floor is more than 20 feet higher at the far end of the room.

Near the entrance to this room a row of stubby stalagmites extends toward the north wall. Here a short passage connects to a narrow fissure with a pit 18 inches wide, 6 feet long, and more than 20 feet deep. Three similar pits of unknown depth are in the floor just east of this one. A mass of calcite pellets on delicate stems covers some of the wall near the pits. The pellets reverberate musically when stroked with the hand. A small vestibule in the south wall opposite the "chime pellets" is decorated with helictites and anthodites, some of which cover hydroid projections.

Near the center of the room where the ceiling is 20 feet high, there are yard-long streamers and stalactites. Under the streamers is a white stalagmite beside a flowstone formation 3½ feet high. A dome pit 10 feet high is in the ceiling of a short passage south of the far end of the room. Here also is a terraced stalagmite and nearby a white flowstone cascade. A wide ledge with clay banks 10 feet above the floor opens above this passage and may connect with the dome pit.

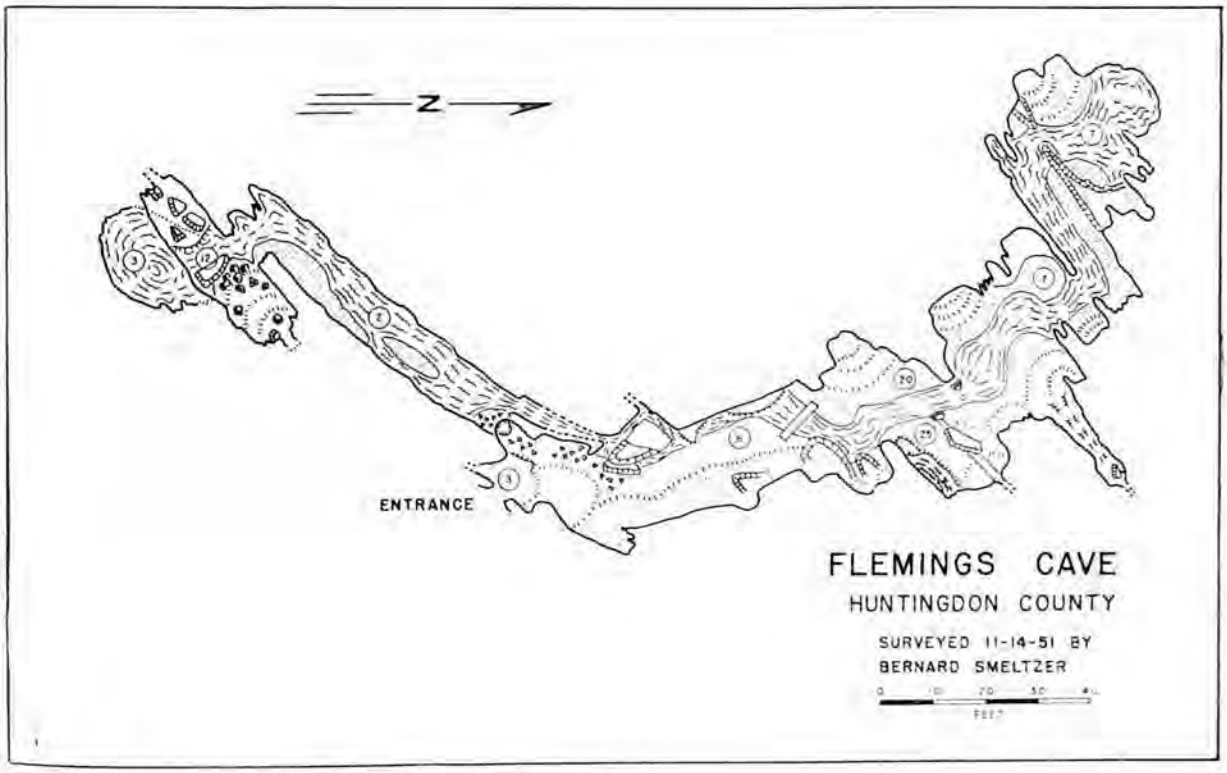
On the north or left side of the far end of this big room are two passages 20 feet long and several feet wide. One has many large blocks of breakdown on the floor. Here is a stalagmite covered with pellets. At the end of the room the massive, fine-grained limestone in which the cave is developed, can be seen under the fossiliferous beds.

Another cave, exposed by quarry operations about 1938, is near the top of the same quarry face and can be reached by descending from the top on a rope or ladder. (Smeltzer)

FLEMING CAVES

[redacted] **Mount Union Quadrangle**

The Fleming farm is in [redacted]



[redacted] The caves are [redacted], by a big oak tree.

The caves are mostly in steeply dipping to vertical beds of Helderberg limestone of Devonian age. The northern half of the larger cave is developed across the strike of the beds, and the southern half, and the smaller cave, along the strike.

The entrance to the large cave is in the bottom of a steep-sided sinkhole and midway of a single passage 220 feet long. A shallow stream flows the length of the cave. Deep pools are at both ends. The height to the right of the entrance is 6 to 7 feet except in the high room, where it is 25 feet, and the width is 10 to 30 feet. East of the entrance the roof is 2 to 3 feet above the water and the width about 10 feet. Silica sand washed in from Shade Mountain covers the floor and makes banks above normal stream level. Heavy breakdown at the south end of the cave is near the bottom of the sinkhole. Flowstone and stalagmites are seen on a ledge in the high room and over the pool at the south end are clusters of stalactites.

The entrance to a smaller cave is at Trough Spring, 73 yards N. 39°W. from the entrance to the main cave. The trough-like bottom of the cave gave the spring its name. This cave is 85 feet long and 5 to 10 feet wide. One enters the cave by wading in water 2 feet deep. It is necessary to stoop since the ceiling is only 2 feet above the stream that covers the floor the whole length of the cave. At the inner end the ceiling meets the water. (Smeltzer, Stone)

FLOOD FARM CAVE

[redacted] **Orbisonia Quadrangle**

One summer night in 1931 a large sink opened in a meadow on the Maude Flood farm 4¾ miles northeast of Neelyton. Haying had been done in the meadow a few hours earlier. The bottom of the sink revealed a vertical cleft in the limestone. A man lowered on a hay rope reported that the crevice was about 100 feet deep. The site is on the ridge half a mile east of Tuscarora Creek along the old stage road from Burnt Cabins to East Waterford. The ridge is made by the Helderberg limestone and Oriskany sandstone.

The sink has been used so long for disposal of tree limbs and other trash and so much earth has washed in that the opening to the crevice is closed.

FOSSIL CAVE

[redacted] **Huntingdon Quadrangle**

A quarry in Helderberg limestone on [redacted], is the site of a cave found November 15, 1952 by James Walczak and other members of the Nittany Grotto. They named it for the abundant fossil brachiopod shells and crinoid stems weathered from the walls and scattered over the floors.

Midway up the larger quarry face is an opening about 10 feet wide and 4 feet high that leads to a room 35 by 40 feet with a ceiling ranging from a few inches to 18 feet above the dirt and flowstone floor. The roof is a layer of limestone sloping inward. Large stalagmites are buried in the floor.

After squeezing through a hole and crawling over large breakdown blocks in a small room one comes to another room about 15 by 20 feet and 10 feet high where bats hibernate and where a large pile of gravel contains many fossils weathered from the limestone. The crawlway terminates in breakdown 120 feet from the entrance. (Walczak)

HALL CAVE

[redacted] **Huntingdon Quadrangle**

On the crest of Warrior Ridge in the scrub brush [redacted] is a small cave in the Helderberg limestone. From the entrance, which is a hole 20 inches in diameter under a stump, the descent is very steep for 50 feet. The course then veers around into a straight crevice not over 200 feet long and descending to a depth of 50-60 feet below the entrance. This passage ranges from 3 to 10 feet wide, with fairly smooth, vertical walls, and a greatest clear height of about 35 feet. The limestone dips east at a low angle and the roof appears to be a smooth flat layer not much jointed. The cave is along a vertical joint bearing S.80°E. At the inner end the cave terminates in a dripstone-lined chimney about one foot in diameter.

Very little dripstone is present, and most of that is very dark or bluish black.

To find this cave follow Hartlog Valley road about 300 yards beyond crest of ridge, passing an orchard and deer fence. Just beyond deer fence enter woods at extreme right hand corner of small field. Follow a draw and woods road about 500 feet and turn right up the side of a hillock. Cave entrance is in a small sink near the top. (White, Stone)

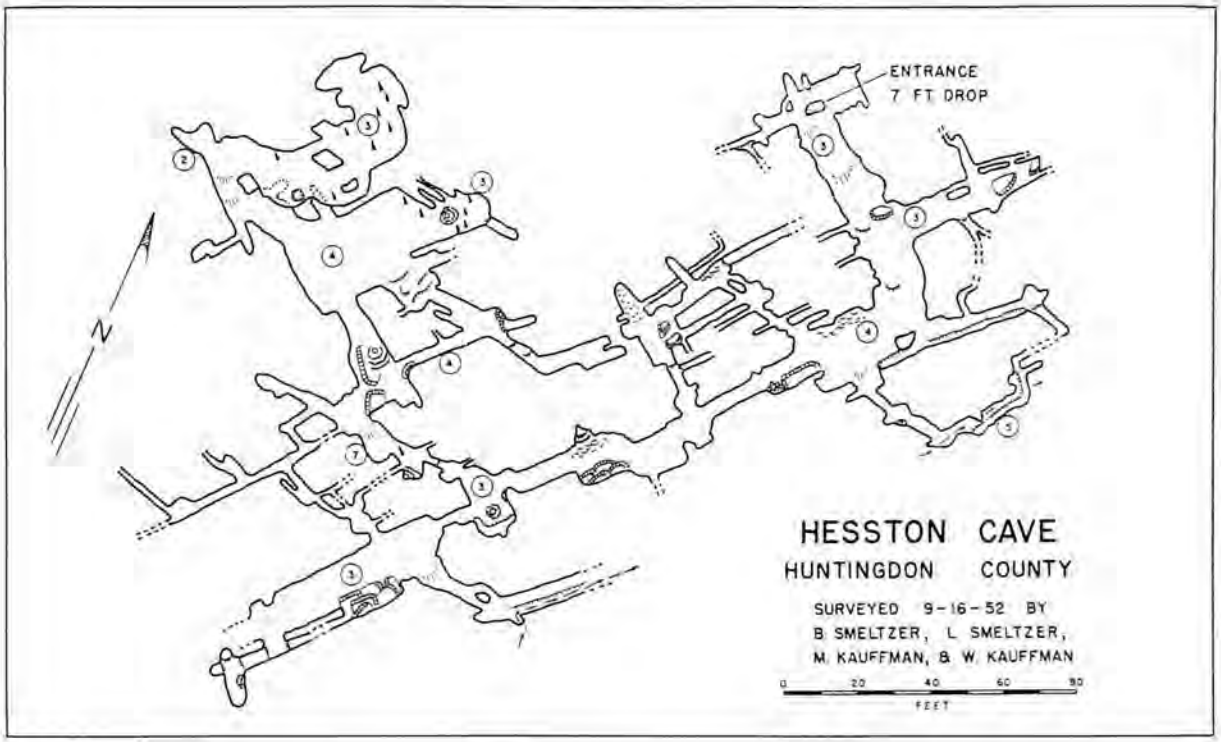
HESSTON CAVE

[redacted] **Huntingdon Quadrangle**

Hesston Cave is on [redacted]

The cave is in the nodular Keyser member of the Helderberg limestone where it strikes N.40° E. and dips 35° SE. The passages are along joints trending N.52°W. and N.78°W. and along the bedding. The whole cave slopes 20° to 30° along the bedding planes. The highest room is possibly 30 feet higher than the cave entrance, and 60 feet higher than the stream in the lowest passage.

The entrance is a hole 18 inches square at the bottom of a shallow pit. It opens below to a passage 12 feet wide and about 3 feet high that heads S.52°E. down a 30° slope for 60 feet, and joins the main passage that runs S.40°W. along the strike



for 200 feet. This passage is wedge-shaped, ranges in width from 4 to 16 feet, and has an average height of 4 feet. Fissures on the west or right side form a rectangular maze.

At a distance of 128 feet from the base of the entrance slope, the main passage widens into a small room 12 feet high. In the center of this room is a stalagmite 3 feet thick and almost 4 feet high. Irregular fissures here lead up slope 64 feet to a room 44 feet long, 20 feet wide, and averaging 4 feet high. Up slope 23 feet farther is another room 32 feet long and 16 feet wide. Three small holes in the north end of this room lead to the uppermost chamber, which is 30 by 15 feet.

At two places along the main passage low openings lead down steeply 24 feet to a tiny stream that can be followed only a short distance.

Deep domes and channels in the ceiling are common. Stalactites up to 3 feet long hang in some of the domes. All the large rooms in the upper part of the cave have white to cream-colored stalactites, stalagmites, and columns and calcite beads, and white, translucent "bacon-rind" drapes. Speleothems in the lower passages are dark brown and broken. Rimstone pools with concretions are in the main passage near the base of the entrance slope.

Large slabs scaled from the bedding litter the floor of the entrance slope and of much of the large rooms. Blocks of breakdown occur along the east wall of the main passage below high fissures. Although this cave is fairly large and complex and about 1,000 feet of passages have been mapped, the average height is only 4 feet. (Smeltzer, White)

HORSEBONE CAVE

[redacted] **Tyrone Quadrangle**

A cave with two entrances 300 feet apart is on [redacted]. The entrance is in a cleft halfway up the steep hillside and above a culvert. The cave is in Trenton limestone of Ordovician age and trends S.45°W. It is a crawlway for about 150 feet, then branches three ways. Here are dripstone speleothems.

The right branch is only about 40 feet long. The left branch is a very narrow wormway 2 feet high that continues a direct course southwest to a point beneath a sink in a field. The middle branch, not so straight but 4 feet wide and ranging in height from 1 to 6 feet, extends 100 feet to a trash dump through which students from The Pennsylvania State College excavated a second entrance.

Disarticulated bones of a horse in the small passages, some encrusted with dripstone, came from a sink on top of the hill into which the horse fell years ago. Subsequently the sink collapsed further. (Devitt)

KOOKEN CAVE

[redacted] **Tyrone Quadrangle**

On the Robert Kooken farm [redacted], the entrance to a cave in a wide, shallow depression in the fields is marked by a pile of

flattened limestone. The site is northeast of the Kooken farmhouse and southeast of the former Oakland School now converted to a residence.

The cave is in Rodman or Lowville limestone of Ordovician age.

A 3 by 3-foot timbered shaft 10 feet deep leads into a nearly vertical chimney with short offset ladders to a depth of approximately 75 feet, below which is a steep chute that is a snug fit for anyone weighing more than 150 pounds. About 120 feet below the surface this 2-foot chimney ends in the roof of a large room. Here a rope is needed for the descent over a 40° rock slope to the bottom, 190 feet below the surface. (See article entitled "Kooken—Pennsylvania's Toughest Cave", by Wm. Devitt III, elsewhere in this Bulletin for further description of this cave.)

Photo by C. H. Gaum

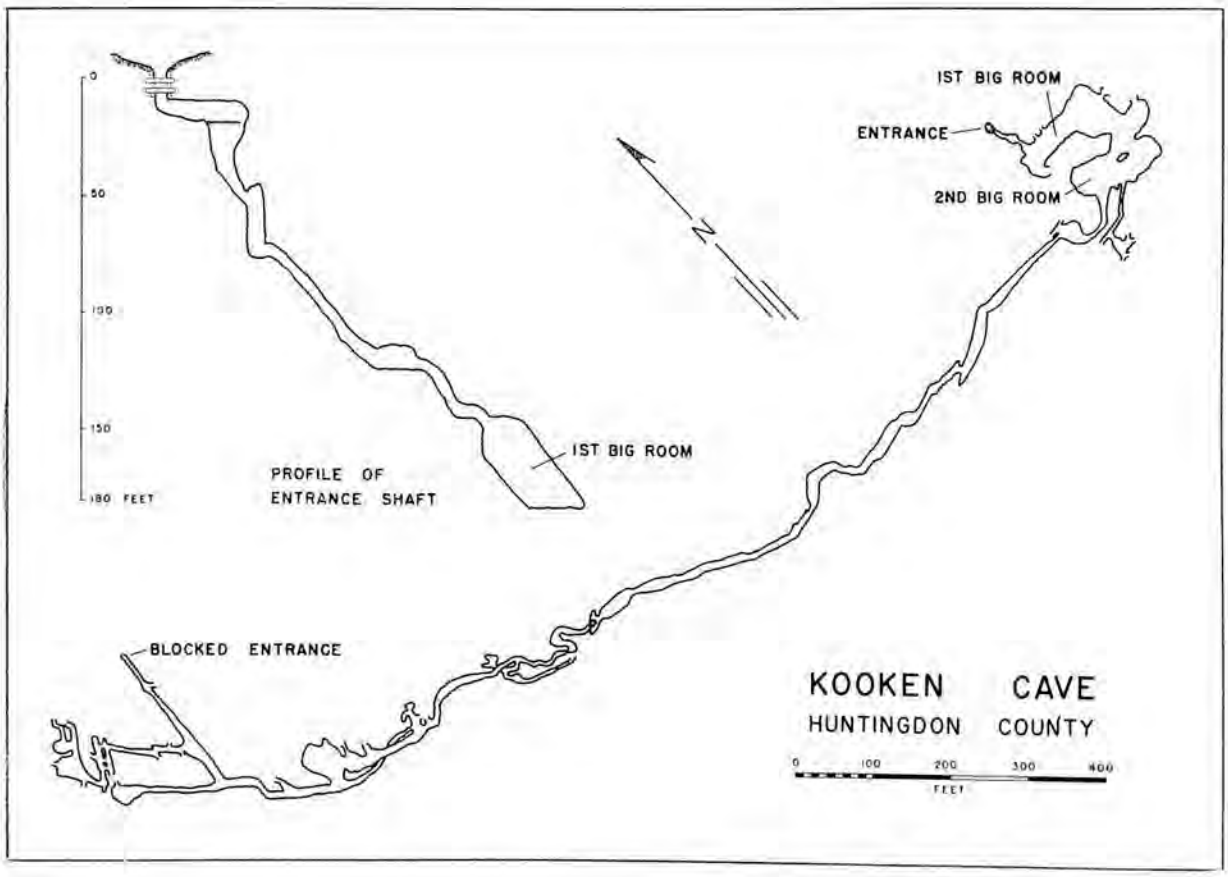
Fig. 16—Dangerous deep clay pits in Kooken Cave, Huntingdon County, are bridged by slippery, mud-encrusted ladders.

MAPLETON DEPOT CAVE

[redacted] **Mount Union Quadrangle**

The cave in the Tonoloway member of the Helderberg limestone on the north bank of Juniata River at the end of the bridge at Mapleton Depot has been obliterated by quarrying. It was described as being more than 1500 feet long, about 12 feet wide, and so regular and straight that it gave the impression of a tunnel.

The quarry was worked in two sections. A small opening at the northeast end is believed to be the upper extremity of the former cave. The left side of a ridge 500 feet southwest contains a small cave that can be entered for 30 feet. This passage has



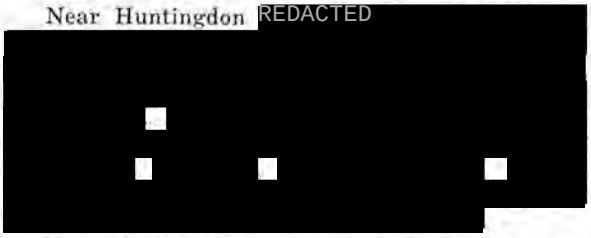
some small stalactites that seem to have grown since quarry operations ceased; also some older flowstone. At the southwest end of the quarry, high on the bank, is a room 10 feet long and 5 feet square. The dripstone deposit below it contains bead speleothem or globules.

These three openings almost in a straight line are believed to be all that is left of the Mapleton Depot cave. (Smeltzer, White)

ORISKANY SANDSTONE CAVE

[redacted] **Tyrone Quadrangle**

Near Huntingdon [redacted]



The entrance is a vertical joint crevice about 10 feet high that goes in 5 feet and then drops 15 feet to a floor of wet sand. This much was seen in August 1951. It is understood that the rest of the cave has been sealed off for safety. According to men who entered it years ago, a small hole leads into a few feet of passage, at the end of which another 1-foot hole leads into a room. Some say there are four rooms. The sandstone bears the imprint of fossil shells. Bats have frequented the cave.

A map of this cave made by A. W. Shively, now of Franklin and Marshall College, Lancaster, shows a passage trending 280° N. with extensions on the south side. From the first small room a crawlhole leads to a second small room, from which another crawlhole brings one to a room that drops away on the right for about 15 paces. Beyond it, through another hole, is the beginning of the big room. There is a branch 9 paces long on the right, and 7 paces beyond it a parting of the way. The main stem continues to a pool of water 10 paces long at the end of a recess. The right fork encircles a large mass of sandstone and at its lowest and farthest extent ends in a low, water-filled room.

In 1929 when the map was made, this cave was known to college students as "Susie".

PARK CAVES

[redacted] **Orbisonia Quadrangle**

Two small caves on the Clay Park farm at Three Springs are at the base of a high cliff on the bank of Three Springs Creek near the ball park. They are in the Keyser member of the Helderberg limestone, which here strikes S.38°W. and dips SE.30°. The caves are developed along the bedding planes and north-south and southwest joints.

The larger of the two caves opens from the rear of a wide recess in the cliff. The entrance is a crawlway 3 feet high and 5 feet wide sloping south that leads in 12 feet to a passage 5 feet high and 6 feet wide on a S.38°W. joint. Several small holes at this junction connect with lower crawlways on this joint.

On the east wall of the passage 15 feet from the junction is a dome pit 3 feet in diameter and 7 feet high. The cave extends a short distance beyond this joint as a series of crawlways. Fossil corals are seen in the ceiling near the entrance.

The second cave, 40 feet northeast along the cliff, consists of short crawlways, with one crevice 3 feet wide and 6 to 18 feet high running southwest for 20 feet. Flowstone decorates the west wall and clusters of tan fossil crinoids project from the 18-foot ceiling.

A head-high opening 15 feet farther east along the cliff and near the creek is on a joint trending southwest toward the second cave but is too small to enter. (Smeltzer)

STOVER QUARRY CAVE

[redacted] **Tyrone Quadrangle**

On Logan Spring Run at Stover in Warriorsmark Township, [redacted] there is a cave in the large active quarry of the Tyrone Lime and Stone Company. It is in Trenton limestone beds that strike northeast and dip 80° southeast. The cave generally follows the bedding but in places cuts across the strata.

The triangular entrance about one-third of the distance up the steep face of the quarry in 1952 was nearly concealed at the top of a pile of broken rock. Continued operation will remove this rock and advance of the quarry face eventually will obliterate part of the cave. For about 70 feet the cave is 20 feet wide, 12 feet high, with smoothly rounded walls and uneven clay floor. Then, for 100 feet it is 10 feet wide and 4 feet high, with flowstone floor and dry rimstone basins from several inches to 2½ feet deep.

At about 175 feet from the mouth the roof comes down to one foot above the floor. Beyond this "squeeze" and about 20 feet in, one enters a room 6 feet high that has white "soda straw" stalactites 2 feet long, small pure white stalagmites, and ½-inch helictites. Beyond this room a low, wide passage 10 feet long enters another room only 4 feet high. Dry rimstone basins cover the floor. Another 10-foot crawl over flowstone floor brings one to a room with an unusual development of calcite crystallization, dogtooth spar. Several rimstone pools at least 1 foot deep are lined with the sharp, yellow-orange crystals. Here also are slender stalactites tipped with a 3-inch growth of these crystals.

Beyond this room is a 4-foot deep, blue pool, a passage 10 feet wide and 2 feet high, a mass of clean sand and gravel, another squeeze, and a low room about 40 feet long that seems to end in washed-in earth. In this room are rimstone basins containing calcite flakes. Exploration stopped here, about 400 feet from the mouth of the cave.

The cave is generally level, and of the rounded tunnel type, and may not long endure if operation of the quarry continues. (Devitt)

TIPPERY CAVE

REDACTED **Tyrone Quadrangle**

Tippery Cave in Morris Township is reached by REDACTED

Three sides of the sink hole are vertical walls of limestone 40 to 50 feet high, and the fourth side is a slope so steep that a rope is helpful in getting down to and up from the bottom. At the base of the cliff on the south side are two entrances to a cave. The first hole opens onto a balcony overlooking a deep pool of water. Less than 100 feet inside the second hole the floor slopes down steeply to a lower level and water. This is the opposite side of the pool seen from the first entrance. The cavern extends about 200 feet farther, or close to the bluff where the stream emerges. No dripstone was noted.

This cave is believed to be close to a fault between the Bellefonte and Nittany dolomites.

Photo by C. E. Mohr

Fig. 17 — Vertical-sided sinkhole leads to two entrances to Tippery Cave, Huntingdon County.

TIPPERY CAVE No. 2

REDACTED **Tyrone Quadrangle**

About 100 yards northeast of Tippery Cave on the far side of a shallow sink a fissure in limestone is open at the surface. It was entered August 13, 1951 by use of a rope ladder. It descends 15 feet to a small pile of dirt, washed in. A short crawlway leads into a room 6 feet square partly filled with breakdown. (Devitt)

OTHER CAVES

About 150 yards northwest of Hesston Cave and high on the timbered hillside directly behind the Isett Ranch barn in a ledge of gnarly limestone is an opening 5 feet high and 8 feet wide. Only 11 feet from the surface the passage is 1½ feet high and 4 feet wide but it continues for 32 feet in a S.38°W. direction with a 35° dip. There the passage is offset slightly to the right and continues for at least 20 feet but only 6 inches high. The far end of the cave is in limestone composed of crinoids.

In the ridge a few hundred feet northeast of Isett Ranch No. 2 and at the same altitude as Hesston Cave there is the entrance to a room 10 feet long, 6 feet wide, and 2 to 3 feet high. A passage on the left is blocked by breakdown. Halfway up the face of an abandoned quarry opposite the Isett Ranch house, a 4 by 6 foot hole may be the entrance to a cave yet to be explored. (Smeltzer)

INDIANA COUNTY

Near Bethel Church between Clyde and New Florence in the extreme southern end of Indiana County, a hole on Brown's land is said to be 10 feet in all three dimensions and too small to qualify as a cave. A hole reported to be near the schoolhouse on Route 22 west of Clyde also is too small.

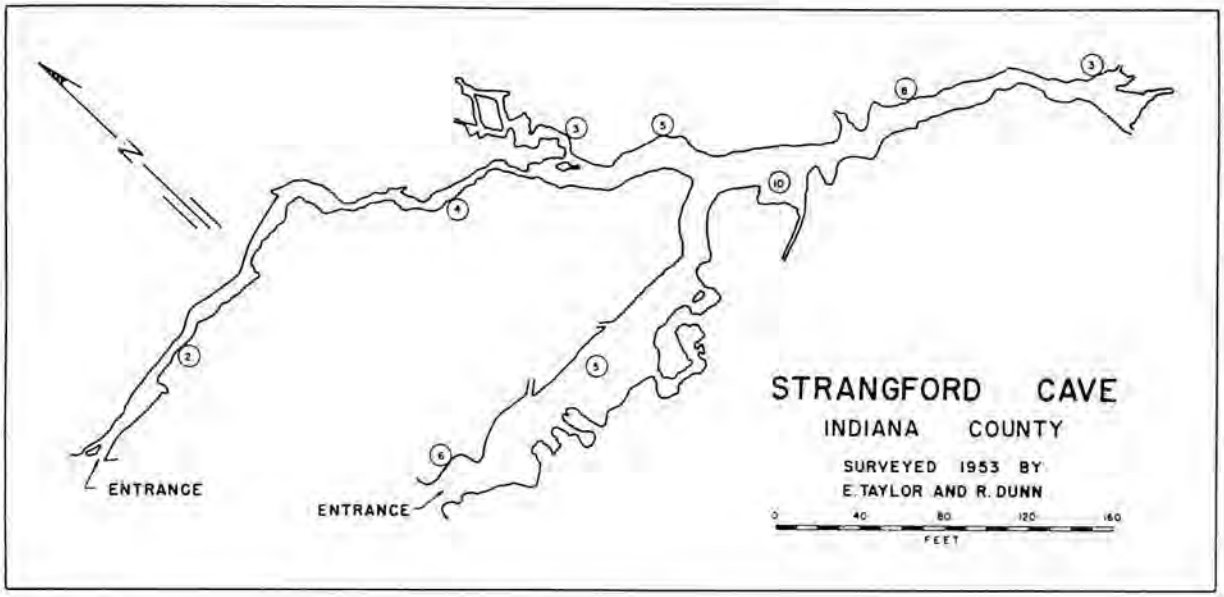
STRANGFORD CAVE

REDACTED **New Florence Quadrangle**

Blasting in the Blairsville Bluestone Quarries at Strangford in October 1930 disclosed a cave in the Loyalhanna limestone. The site is REDACTED This is the same limestone formation that contains Bear, Coon, Barton, and Dulany caves on the west slope of Chestnut Ridge, in Fayette and Westmoreland Counties.

Strangford Cave was described by George Risler and Al Misley of the Cleveland Grotto in N.S.S. Bulletin 8, pp. 86-87, after exploring it August 8, 1945. According to them, the entrance is reached by climbing over loose debris halfway up a 75-foot cliff and cannot be seen from the quarry floor. The opening is about 6 feet high and 7 feet wide and the passage turns left about 35° within a few feet. A mud slope on the right runs from floor to ceiling, which slopes the same way.

About 90 feet from the entrance a short passage on the right leads to a room about 20 feet by 12 feet and 5 feet high, off which is a little vestibule.



The main passage leads to a room 50 by 20 feet and 7 feet high. About 30 feet beyond this room is another room about 30 feet long and 6 feet high, beyond which the main passage continues about 200 feet to a breakdown and mud block. Water issues here and flows along the main passage to the inner room. A passage on the left 8 feet high and 10 feet wide has a 7-foot drop about 75 feet in, and vestibules, potholes and chimneys in the next hundred feet. The stream follows this passage, which has a down grade, and can be followed farther.

According to Dunn and Hoffmaster, this passage becomes a tunnel, curves to the left, and continuing at times as a crawlway, opens onto the cliff face.

Bats, isopods, and gypsum crystals are reported from this cave.

JUNIATA COUNTY

An ice cave mentioned in Pennsylvania Geological Survey, vol. 1, 1858, p. 479, as occurring one mile from Perryville (now Port Royal) and described as a natural well 25 feet deep, seems to have been filled.

A so-called cave on the Sam Woodward farm ½ mile northeast of Reeds Gap in a wooded limestone ridge, the entrance to which Smeltzer found closed in 1950, is believed to be underground workings on a deposit of wavellite, mined for phosphate.

LANCASTER COUNTY

COLD CAVE (See Wind Cave)

GABLE CAVE

REDACTED **Lancaster Quadrangle**

Situated on the east side of Conestoga Creek 200 yards upstream from a limestone quarry, along the creek road from Lancaster to Millersville, this cave is developed along the crest of a narrow arch in the Conestoga limestone that here is closely folded. The course of the cave is N.75°E. for 75 feet.

The entrance is 10 feet high and 6 feet wide. Just inside, the roof descends, leaving a passage 12 feet wide and 3 feet high. At 60 feet from the entrance two small channels reunite at a hole 2 feet in diameter, beyond which the floor rises to a small room. The cave appears to connect with the surface through a small chimney 20 feet farther on. There are no speleothems. (Hickok, Smeltzer)

LAMPETER CAVE

REDACTED **Lancaster Quadrangle**

A cave in West Lampeter Township is REDACTED . Originally discovered while quarrying limestone, the entrance was closed with dirt and rock fill about 1915. Encouraged by Dr. Herbert Beck of Lancaster, local farmers uncovered the entrance October 21, 1953.

A narrow cleft with 4-foot drop gives access to an opening about 20 feet long, 5 feet wide, and 2 to 4 feet high. It is said that when originally opened one could walk from this first room along a passage with large formations. Further digging is being done (November 1953) to uncover this passage.

The cave is developed along nearly vertical bedding in dark blue, argilaceous, thin-bedded Conestoga limestone of Ordovician age. (Smeltzer)

MOUNT JOY CAVES

[redacted] **Middletown Quadrangle**

In a cliff at the south side of a pasture south of the water pumping and filtering plant on Little Chickies Creek 1 mile north of Mt. Joy, are two small caves in Beekmantown limestone which strikes east-west and dips 15° south. The caves are merely long narrow passages which gradually close at the inner ends so that a man can advance no farther. One of these is now closed; the other is 30 feet long and 3 feet high.

PEQUEA CHURCH CAVES

[redacted] **Honeybrook Quadrangle**

Pequea Church is in [redacted]. In the western of two small quarries in a brecciated zone of Ledger dolomite 200 yards north of the church, Hickok found three small openings in 1930. One went down at a steep angle for 30 feet, then flattened and was a crawlway for 60 feet farther. Another was a 2-foot diameter hole that led to a room 5 by 20 feet and 8 feet high. Entrance to the third opening was blocked by dropped rocks.

Smeltzer reported in 1951 that huge quantities of trash dumped in the quarries leave no sign of an opening anywhere.

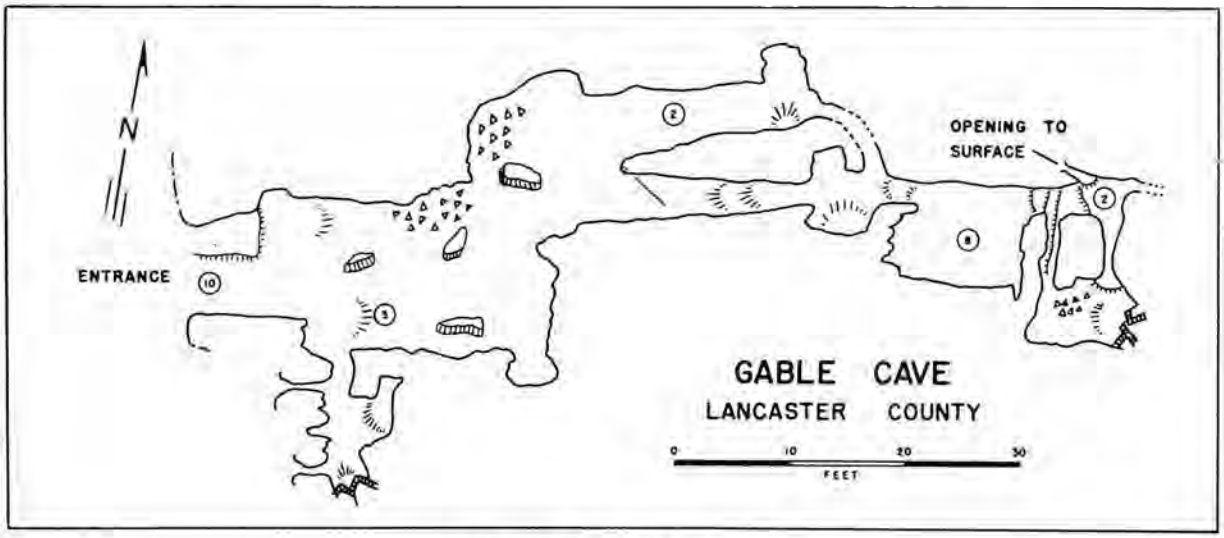
The entrance about 25 feet wide and 7 feet high is roughly wedge-shaped and 3 feet high on the east side. It is behind a tall poplar tree and a large block of rock. The cave decreases in width from 15 to 10 to 8 feet at the rear and in height from 6 to 4 feet. The total length is 60 feet. The cave has calcite beads and a few dead stalactites. The floor is clay. (Smeltzer)

REFTON CAVE

[redacted] **Quarryville Quadrangle**

This cave can be located by [redacted]. The cave is in a sink which can be located by the largest of a row of five hemlocks. The funnel-like sink leads steeply to a vertical drop of 25 feet, necessitating a ladder or a rope. Debris which has fallen into the sink has formed a pile 10 to 15 feet high. Excavations of the debris have revealed bones of many kinds, none of them old enough to be considered fossils.

The cave in Ordovician limestone, consists of one large chamber 125 x 60 feet, the whole southern half occupied by a lake of very clear water. The arched ceiling, 20 to 30 feet high is divided to the north by a large pendant. The water level is



Surveyed by Bernard L. Smeltzer

RED HILL CAVE

[redacted] **Middletown Quadrangle**

Half a mile east of Bainbridge in the knob where the road forks there is a small cave on the property of William Renninger. It is called Red Hill because of the color of the Triassic limestone conglomerate, known as Potomac marble, that makes the hill. The cave is developed along the bedding of strata that strike N.38°E. and dip SE.40°.

believed to be in equilibrium with Pequea Creek. Wood frogs were observed here in winter but evidently live quite comfortably the year round finding food that like themselves has fallen into the cave. The pond has a large population of aquatic life, isopods, amphipods, and planarians being quite common.

Hickock reports finding that, beneath the mud and debris on the cave floor, there is Antietam schist striking N.60°W. and dipping 45°SW. The

Photo by C. E. Mohr

Fig. 18—Entrance to Refton Cave, Lancaster County, is possible only by rope or ladder.

rest of the cave is in Conestoga limestone. He believed that the cave had been formed through solution of the limestone lying above the contact by water trickling down the contact. Absence of dripstone he attributed to the probability that all the water entering the cave came through sinkholes or along the schist-limestone contact and so had little opportunity to dissolve much calcium carbonate. (Mohr, Smeltzer)

SILVER HILL CAVE

[redacted] **Honeybrook Quadrangle**

Silver Hill in the eastern end of Brecknock Township is a topographic feature reached from [redacted] The hill owes its eminence to an intrusion of igneous rock in Triassic sediments.

Half a mile north of the school a large outcrop of diabase, commonly called trap rock or black granite, is composed of huge dornicks 10 to 20 feet in dimensions. Silver Hill cave is an opening between these blocks. The principal entrance is about 3 feet wide and more than head high. A few feet under cover, by climbing up 4 feet one can stoop or crawl through about 40 feet of passage and exit on the far side of the outcrop. Because daylight penetrates to the inner part, some would say this is not a true cave.

WIND (COLD) CAVE

[redacted] **McCalls Ferry Quadrangle**

Wind Cave is high on the east bank of Susquehanna River a mile south of the mouth of Pequea Creek. It is reached by [redacted]

Wind Cave differs from other Pennsylvania caves in the nature of the rock in which it is located. Commonly a cave is formed by water dissolving passages and rooms in limestone. Wind Cave is in pre-Cambrian Peters Creek schist, an insoluble rock composed largely of mica flakes, and was formed by the settling of the walls of the Susquehanna gorge. This settling formed fissures by splitting apart the walls of three or more systems of nearly vertical joints. Two or more main joints have a N.50°W. course, another is at a right angle to these, and the third set of joints is nearly N.-S.

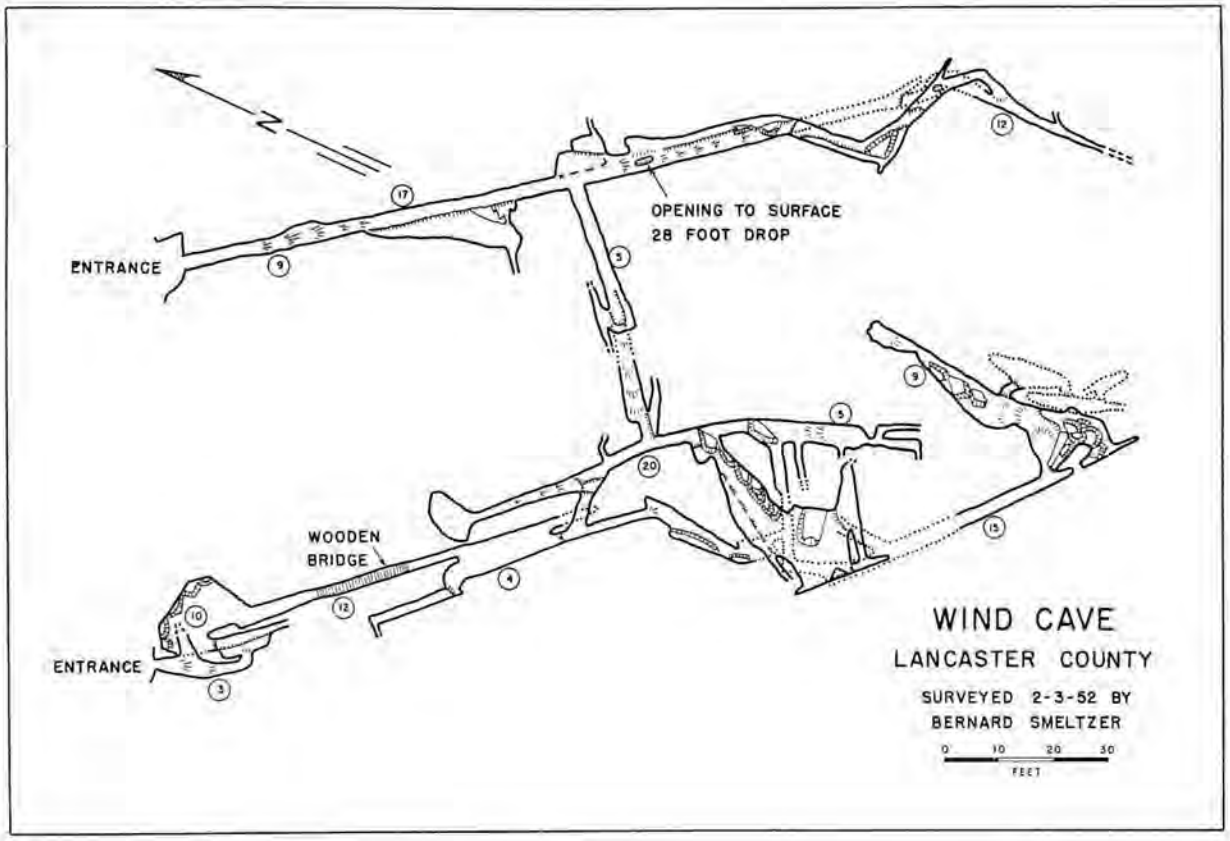
The name Wind Cave is derived from the fact that a current of cool air comes from its depths. This air emerges in summer cooler than the external air and in the winter, warmer. As the cave is usually visited in summer, locally it is often called Cold Cave.

There are two entrances about 75 feet apart. The first entrance reached by the path is a nearly vertical cleft 2 to 3 feet wide and 8 feet high that goes straight under the hill for 150 feet without a bend. The floor descends and the ceiling is 15 to 20 feet high. About 90 feet from the entrance the cleft splits and reunites on a N.-S. course, and 175 feet in it becomes too narrow for further progress.

A cross joint 75 feet from the entrance makes a right angle passage 50 feet long and 3 feet wide with 5 foot ceiling that connects with another NW.-SE. passage 90 feet long at a lower level. Shorter cross passages connect it with a third more or less parallel passage that is reached also from the second entrance. It is offset to the right, is more than 150 feet long, and at the inner end has a prong 40 feet long, 9 to 12 feet high, with large breakdown, and N.-S. course.

The fissures are bridged above by rock slabs that did not move when the fissures opened. Most of the passages are 6 to 10 feet high; in a few places are 20 to 25 foot ceilings. In some places fallen blocks leave only crawlways. The width of the passages varies between 2 and 10 feet, usually being about 4 feet. The walls are rough. The length of the passages traversed in this cave is about 650 feet.

Cave rats are reported as still nesting in the cave, as they have been known to do for 50 years. (Hickok, Smeltzer)



LAWRENCE COUNTY

HARLANSBURG CAVE

[redacted] **Mercer Quadrangle**

Blasting [redacted] resulted in the discovery of an extensive cave in the flat-lying Vanport limestone of Carboniferous age. Nation-wide attention was called to the cave by the rescue of three young men lost in it for 12 hours October 22, 1950. Mr. C. N. Bruce, of Bruce Electrical Supply Co., Inc., New Castle, Pa., leased the land underlain by the cave with the idea of possible commercial development.

The cave is described as consisting of several parallel and cross passages nearly at right angles, developed by solution along joints. Access to the cave is a hole beside the road. According to John A. Shakely, Butler, rock near the entrance is much shattered by blasting and mud is deep there but decreases in depth farther back in the cave. "There are no very large rooms but many irregularly-shaped rooms or wide places in the passages that range up to 30 by 50 feet with very uneven floors and ceilings. Farther back in the cave are many high, narrow passages that branch and cross each other. Water occurs in many places but not deep enough to hamper exploration. Stalactites and stalagmites are rare, none more than 18 inches long. Fossils are profuse, including many crinoid stems, Cordaites, Calamites, Sigillaria, and Lepidodendron."

Large numbers of bats use the cave in winter. Temperature within the cave seems to remain constant at 57° to 58°F."

In an article in NSS NEWS, November 1951, p. 4, Betty A. Yoe described a visit by the Cleveland Grotto and others, September 29-30, 1951, and called this cave "Fossil Caverns" because of the abundant remains of Carboniferous plants in the roof.

To the description by Mr. Shakely, Edward C. Nolte of New Castle adds: "Length of formations increases as the cave is explored further. Intricacy of the intersecting passages is not stressed enough. Expeditions of eight and nine hours have failed to find an exit. Temperatures read at all seasons are 50°F. for the air and 49°F. for water."

ROSE POINT CAVE

[redacted] **Zelienople Quadrangle**

According to a letter by Edward Nolte of New Castle written February 11, 1953, a cave at Rose Point about nine miles east of New Castle is in an old quarry in Vanport limestone on the south side of Route 422. A dirt road leads to the quarry.

Photo by C. E. Mohr

Fig. 19—Wind Cave, Lancaster County, formed by fault-slipping of large rock masses.

The limestone lies nearly level and the cave is developed along numerous joints. The principal joints and passages run north-south and are intersected at approximately right angles by an unlimited number running east-west. The cave is thus an extensive labyrinth. The extent is so great that it has not as yet been completely explored. Some passages are muddy; some parts of the cave can be reached only by crawling. The southwest part has large rooms and numerous beautiful dripstone formations. In fact the cave has an abundance of stalactites and flowstone, and an occasional helectite. A stalagmite has not yet been found because the floor is covered with mud. The largest stalactite is 4½ feet long and 7 to 9 inches in diameter.

Crinoids are the only fossils noted because the overlying sandstone bearing fossil plants is not exposed in the cave.

The owner of the cave, C. N. Bruce of New Castle, has begun cleaning it for public inspection.

LEBANON COUNTY

KEENER CAVE

REDACTED **Lebanon Quadrangle**

On the Keener property about ¼ mile south of Schaefferstown a cave in a small quarry has been closed by a rock fall. Flowstone covers the quarry wall in places and a large stalagmite stands on a travertine shelf. (Smeltzer)

KREIDER CAVE

REDACTED **Hummelstown 15′ Quadrangle**

Indiantown Gap 7½′ Quadrangle

A cave of unknown dimensions is on land belonging to the Andrew Kreider estate 4 miles north of Annville and 1 mile north of Bellegrove. The farm is occupied in 1953 by Chester Hummer. The cave is 1000 feet north of the farm buildings and a less distance west of a small cemetery on Route 934 near the hilltop. The entrance is in a small old quarry marked by a clump of trees.

A hole about 1 by 2 feet in limestone beds in the Martinsburg formation of Ordovician age shows a dirt slope inside so steep that the use of a rope is suggested for safety in entering. A passage 4 feet wide and high leads S. 48° E. down a scarp 22 feet, where it joins a chamber 21 feet long, 10 feet wide, and 3 feet high. The south end of this chamber is nearly 20 feet lower than the entrance to the cave. On the west a low opening leads into another chamber 22 feet long, 13 feet wide, and 6 feet high, running southwest. Bedding planes form shelves on the north side of this chamber and tiny white aragonite "needles" dot the ceiling along crevices. To the north another low passage leads into the last chamber, which is 20 feet long, 10 feet wide, and up to 3 feet high. Breakdown blocks the north side of this passage.

Kreider cave is in the Martinsburg shale where it strikes N. 75° E. and dips 35° SE. Passages are along the bedding planes and on joints N. 24° E. and N. 46° W. The middle chamber shows limestone beds but all other passages are in thin-bedded black shale. (Smeltzer, Stone)

LIGHT'S FORT

Rev. J. G. Francis of Lebanon writes (November 1951) that before the French and Indian war, John Light built a limestone house at what is now 11th and Maple Streets. It became known as Light's Fort because, tradition says, as many as 60 families were sheltered here. This was possible because the cellar opened into a cave that extended to the Court House at 8th and Cumberland Streets. Because a boy was once lost in the cave and presumably to prevent a recurrence the entrance was walled up. No trace of a cave is now visible in the cellar.

LONGENECKER CAVE

[redacted] **Lebanon Quadrangle**

On the Longenecker farm [redacted] there is a small hole on the south side of a low ridge along a branch of Hammer Creek. Worming through the opening one finds a passage 10 feet long, 4 feet high, and 3 feet wide, in Elbrook (?) limestone. A low crevice with sloping floor extends straight ahead. On the right a crawlway under overhang runs parallel to the crevice for about 50 feet and has some dead dripstone. Evidently small animals frequent the cave. (Smeltzer)

SWANGER CAVE

[redacted] **Lebanon Quadrangle**

At the Swanger poultry farm 2½ miles west of Schaefferstown there is a cave in argillaceous Elbrook (?) limestone. The entrance is dangerous because of loose overhanging rock. The opening leads down a steep slope of loose material to a passage across the nearly vertical strata for 20 feet. White flowstone is present. (Smeltzer)

LEHIGH COUNTY

Helfrich Cave, 1½ miles north of Allentown in a loop of Jordan Creek, once had a board walk and electric lights, and in times of high water a large stream flowed from it. The cave is described as fairly large but the building of a dam on Jordan Creek has flooded it.

GUTHSVILLE CAVES

[redacted] **Allentown West Quadrangle**

There are two small caves at Guthsville, Lehigh County, about one mile south of Siegersville. [redacted]

Guthsville No. 1 is a small cave consisting of a wide low walk-in passage that narrows to a fissure 28 feet from the entrance. This fissure reaches water table and fish were seen in the water. Above and to the left of the fissure the main room opens up into a chimney which leads to a second grotto very close to the surface. The cave is shaly limestone with shale inclusions and lenses, the latter causing breakdown along shale cleavage planes.

Guthsville No. 2 is a small muddy cave of little importance. (Parker)

LYCOMING COUNTY

BLESSING MOUNTAIN WELLS

[redacted] **Warrensville Quadrangle**

Four caves or wells are near the top of Blessing Mountain in the woods [redacted]

They are called wells because the surface holes lead directly down. One is called "The Big Hole" and another "The Funnel Well". Names are not mentioned for the other two. All are within a few rods of each other and lead into crevices in the massive Pocono sandstone which underlies the top of the mountain. The crevices evidently are due to the opening of joints by settling and slight tilting of the rocks. In many places recesses and spurs on opposite walls correspond perfectly.

Although there is a considerable network of crevices, at only four places is there a breakthrough to the surface. In other words the settling had a deep origin and the crevices are bridged at the top by the surface sandstone which for the most part resisted opening of its joints.

The crevices are 2 to 4 feet wide and average about 20 feet vertically, but are offset. By descending one and then another the daring explorer can go horizontally about 200 feet from the entrance and 50 to 75 feet below the surface.

The walls are slightly irregular and are broken by ledges only a few inches wide along which one makes his way. Moving along a crevice only 2 feet wide, on a ledge only 3 inches wide, with 15 feet of chasm below and loose rocks above, is obviously hazardous and exploration here is not encouraged. Many places look to be unsafe because of rocks that have fallen, lodged, and seem to need only a jar to send them crashing down.

DOUGHERTY CAVE

[redacted] **Williamsport Quadrangle**

A cave on the W. I. Dougherty farm in the Nippenose Valley 1¼ miles west of Oval that suddenly developed in the bottom of a sink hole one summer day in 1928 is no longer accessible. The sink has been filled and plowed over. According to a man who was lowered on a rope in July 1928, he saw a chamber about 75 feet long and 40 feet high lined with stalactites. The walls probably were about 8 feet apart.

EISWERT CAVE

[redacted] **Williamsport Quadrangle**

Nippenose Valley is underlain by Trenton limestone. Surface streams are rare since drainage is almost wholly subsurface except during periods of heavy rains. Underground channels must be extensive but only one is known to be accessible. It is called Eiswert cave (100 yards east of the Eiswert quarry and lime kilns.) The location is ⅛ mile south of Route 44, ⅓ mile west of Ecktown School,

and 1 mile north of Oriole. The entrance is in a sink in the generally dry bed of Nippenose Creek. Water usually flows 20 feet below the surface.

The sink exposes a 10-foot vertical face of blue limestone that strikes N.80°W. and dips 8° north. Under this ledge a hole with 5-foot clearance leads into a room 15 to 20 feet wide, the floor of which is covered with boulders of sandstone and limestone washed in by the surface stream in flood. When explored and mapped by members of the Pittsburgh Grotto, water covered the floor of most of the cave; when mapped by Devitt, September 5, 1948, more than 250 feet of the floor was dry; and when the Cornell Grotto visited Eiswert cave, February 1, 1951, a canoe was used.

Upstream from the entrance the cave is 200 feet long with a NS. course to where the roof meets the water in a room 2 x 4 x 6 feet. Downstream the course is N.50°W. for 240 feet, then east of north for 80 feet. The width ranges from 15 to 30 feet and the height from 2 to 7 feet. So far as observed, the upper 150 feet and lower 80 feet are pools. In times of high water the cave must be completely flooded.

While the roof and sides of this cave are worn and polished as if scoured by running water, inverted potholes and other features ascribed to quiet water solution suggest this latter type of origin. The present stream is merely enlarging the cave. (Devitt, Stone)

EISWERT CAVE No. 2

[redacted] **Williamsport Quadrangle**

[redacted]

another cave extends 50 feet into a cliff of Trenton limestone. One can walk in 13 feet, then crawl 25 feet and look into two passages too small to enter. The crevice goes down about 15 feet.

ELIMSPORT CAVE

[redacted] **Williamsport Quadrangle**

In Washington Township 2 miles northeast of Elimsport there are two quarries in Helderberg limestone on the north side of a ridge facing Route 554. In the northeast corner of the northeast quarry at floor level is a crawlway 85 feet long. To go farther would require much enlarging of small holes. This low cave has stalactites, stalagmites, flowstone, and rim pool speleothem. (Devitt)

MUNCY HILL CAVE

[redacted] **Milton Quadrangle**

In a ravine along the bluff on south bank of Susquehanna River [redacted] there is a very small cave in the flat-lying Helderberg limestone. It parallels the cliff face and is 15 by 4 by 5 feet. A natural bridge 15 by 8 feet is along the base of the limestone cliff. (Devitt)

TWIN HILLS CAVE

[redacted] **Milton Quadrangle**

[redacted]

The cave entrance is at the east end of the quarry half way up the 20-foot face. The entrance, 3 feet high by 4 feet wide is obscured by a large fallen rock.

According to Harry Wormelsdorf, who explored the cave shortly after it was revealed in 1916 during quarrying for the original concrete highway, the cave was very beautiful. The scarred remnants of rather massive formation can still be seen to the very entrance. Spectacular breakdown is found, including a stubby stalagmite one foot in diameter, broken by a fallen slab of rock. (Mohr)

OTHER CAVES

[redacted] **Williamsport Quadrangle**

Attention should be called to a large stream that goes under ground in a sink hole 1 mile west of Oriole. Under a limestone ledge in the east side of the sink a small cave goes in 22 feet to where small size and accumulated trash stop further progress. About 75 feet east and 15 feet higher are two vertical holes that, if enlarged to permit entry, might give access to a sizeable cave. A draft of warm air from the larger hole has been noted on a cold day. (Devitt)

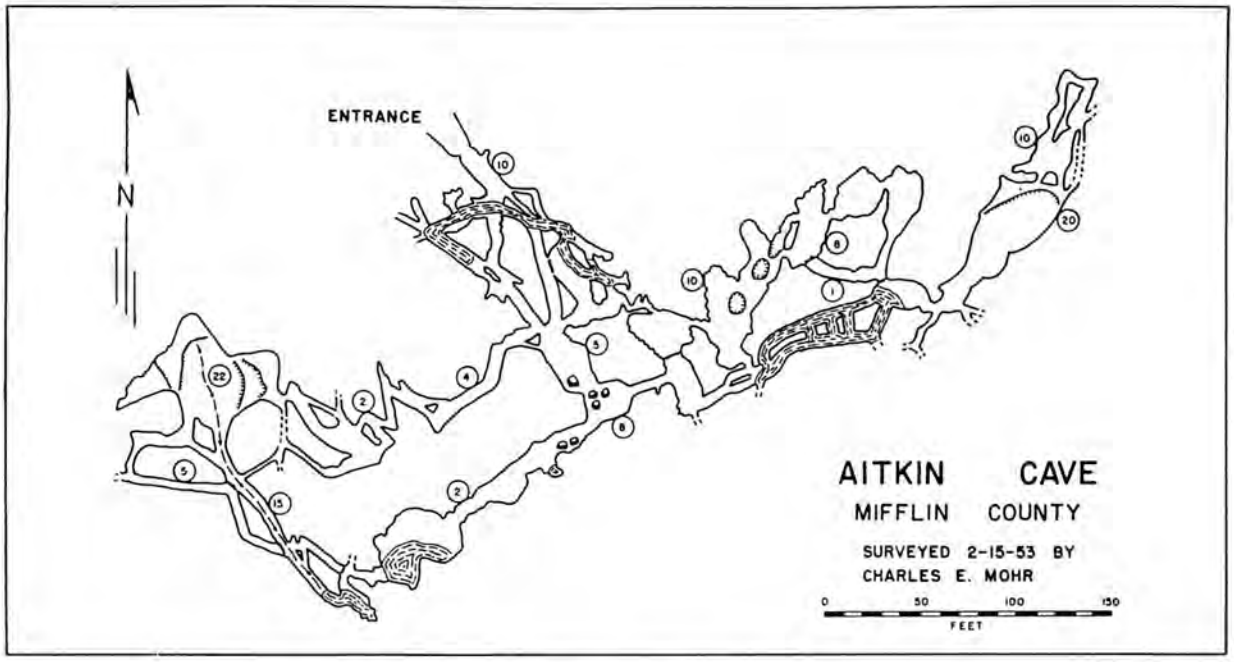
MIFFLIN COUNTY

AITKIN CAVE

[redacted] **Lewistown Quadrangle**

This is one of the best known caves in Central Pennsylvania. It is the largest of several on or adjoining the Ralph R. Aitkin farm, [redacted] It is notable for having a bat population once numbering about 5,000 and still the largest in the State. This wintering colony has been the subject of bat banding studies since 1932 (see article entitled "Deluge Underground", by Donald R. Griffin, elsewhere in this Bulletin). All explorers should be careful to avoid disturbing the bats.

The cave is nine-tenths of a mile airline distance from the main intersection at Siglerville. It is one-third of a mile southwest of the Aitkin farm buildings which are situated across Treaster Creek from a cliff, at a sharp bend where the dirt road crosses a concrete bridge. One can park near the Aitkin farmhouse and from the bridge, walk down the opposite side of the creek to the far side of a dense hemlock woods containing many sinkholes. Or, when the creek is low, one can park along the dirt road one-half mile southwest of the Aitkin farm, cross the creek beside the road and follow the base of the north side of this ridge westward about 150 yards. The entrance, about 8 feet wide and 4 feet



high, is at the foot of the ridge, below a small cliff. It formerly had a wooden door.

This cave contains one of the longest series of passages found anywhere in Pennsylvania—about 2000 feet—and at times of low water offers to explorers an extensive circuit of crawlways, mazes, and good-sized rooms. The ground water level fluctuates greatly and can be gauged immediately upon entering the cave because a canyon-like water course blocks the route just 20 feet inside the entrance. A crude wooden bridge spans it. In winter there may be from a few feet to 15 feet of water which may rise so much as to fill the cave to the roof, and rapidly. During the November 25-26, 1950 storm, a party of scientists led by Donald Griffin, working in the cave, was nearly trapped by rising water. In winter, a stream flows the full length of the cave, along the south side, making that portion of the circuit impassable.

The cave is in an anticlinal fold in Trenton limestone of Ordovician age. The dip of the beds ranges from low to steep angles. One narrow passage has a good display of fossil shells; white quartz veins protrude from the walls in a number of places.

The passages are floored with hard mud, very seldom wet except after high water. About three-quarters of the cave is walkable; but most of the rooms are connected by tight crawlways. Some picturesque fissures are 15 to 30 feet high but barely wide enough to walk through. Except for some fine speleothems in the passages opening into the "bat room", there is little that is decorative. Dripstone is not abundant. Mostly the ceiling and walls are undulating gray limestone. No special equipment is needed for exploration but a number of interesting interconnecting passages can be traversed only by chimneying. Loose rock in the easternmost "bat room" makes exploration there hazardous. Westernmost portion of the cave is the "barn room".

Photo by C. E. Mohr

Fig. 20—Surveying the Barn Room in Aitkin Cave, Mifflin County.

It is possible that several of the caves, within a few hundred yards, are connected beneath the water table. These include Nail No. 1, and Nail No. 2, and Little Aitkin Cave. (Mohr)

ALLENSVILLE CAVE

REDACTED **Allensville Quadrangle**

At Allensville, REDACTED, the roof of an underground stream in Trenton limestone has been carried away for a few rods, exposing the stream in the bottom of the sink. Where the stream emerges one may enter the keyhole passage and proceed 50 feet or more with no difficulty, and it is said, 300 to 400 feet by creeping part way. This necessarily would be during a low stage of water.

The outer part of the passage is several feet wide at the bottom, narrowing upward irregularly to a small inverted channel that gives head room. The walls are smoothly rounded and the stream is partly to one side of the main passage under a very low roof. Dripstone was not seen.

Where the stream disappears at the far side of the sink the roof is too low for a person to enter.

This location is near the crest of an anticline and the bedding here is nearly flat.

BARRVILLE CAVE

REDACTED **Lewistown Quadrangle**

On the farm of A. Reed Hayes, Jr., two miles west of Barrville, there is a small but interesting cave, from the naturalist's standpoint. It was first reported by Professor Frost. The entrance is at the bottom of a wide sink, about 30 feet deep. It opens into a room about 50 by 20 feet. One passage turns at a right angle and continues on a slight downward incline for about 100 feet. Within the cave there is much plant debris, insects, and some hibernating bats. It is possible to climb down a very narrow hole near the entrance for about 50 feet. While there is no stream in the cave, a creek disappears just before reaching the entrance. There is abundant evidence that the cave is nearly or completely flooded at times. Despite this, hibernating bats were found in the cave 24 hours after such a flood. (Mohr)

BLUE SPRINGS CAVE

REDACTED **Mt. Union Quadrangle**

REDACTED a cave on the Morrison property, formerly owned by Lige McVey, is reached by a well-defined steep trail. This trail is REDACTED The trail ends at the entrance to the cave in a large ledge of massive Helderberg limestone about 200 feet above the road. The beds strike N.32°E. and dip NW. about 45°.

The entrance, 40 inches high and 30 inches wide, is a tunnel 25 feet long that ends at a massive stalagmite about 2 feet high. The walls are covered with rather dirty flowstone. At the inner end up dip is an opening 11 feet wide and 3 feet high that diminishes to a chimney; down dip on the left an opening 10 feet wide and 2 feet high gives immediate access to a room parallel with the entrance tunnel that is 50 feet long and 15 feet wide and about 8 feet high. The floor is mostly breakdown; one block is 13 feet long. From the opening at the NE. end of this room it is 24 feet to an exit through a wide opening down 4 feet to the floor of a passage in beds slightly higher stratigraphically.

This passage developed along the bedding of strata dipping 30°-40° ranges in width from one to several feet and extends up dip 20 feet or more. In places only a thin person can pass, in others one can walk upright. Some short thick dripstone formations occur well up the dip, and flowstone is abundant. The secondary deposit is dark, possibly with manganese oxide, except for some small white, dripping stalactites far back in the cave.

A second room somewhat smaller than the first is in the same strata as the first and northeast of it. The cave extends an unknown distance beyond this room. The cave is dry. (Smeltzer, Stone, White)

BRUBAKER (McNITT) CAVE

REDACTED **Lewistown Quadrangle**

In Armagh Township midway between Milroy and Siglerville, about 1935, Mohr found this cave, located in a sink at the base of a limestone cliff 300 yards southeast of the macadam road, Route 983 on the McNitt property. It was a dry summer and he explored several hundred feet of underground stream and a considerable length of gallery. Subsequent efforts at exploration were blocked by high water. By 1952 the entrance was almost completely blocked by wrecked automobiles and other debris but access was possible because of a low water table.

The east wall of the sink looks like the face of a small quarry. A hole 6 feet across at the bottom of the wall, recently blasted through the trash by the present owner, Mr. Earl Brubaker, gives access to the cave. There is an 8-foot drop to a talus slope 30 feet high in a large room with running water at the bottom. Of three passages on the far side of a deep pool, the smallest leads up only a few feet from a clay bank on the south side; the largest, heading northeast, has a rolling clay floor 4 feet above the water; the stream flows through the third passage, which makes a short semi-circle before joining the large passage which then turns southeast for 100 feet. From here the cave is on two distinct levels connected in places by 30-foot vertical pits. The lower level, containing a 6-foot deep stream during low water, trends southeast for 200 feet as a series of small rooms and jagged passages, further unexplored. The level above has been explored for 300 feet. The passage ranges from 3 to 12 feet high and 4 to 18 feet wide. Several branches lead off near the explored limit, where an area of giant breakdown blocks is encountered. A large sloping room with a 12-foot ceiling has pits in the floor, possibly connecting with the stream below.

Halfway up the north side of the talus, a crawlway leads down to water in a straight passage 6 feet wide and 35 feet high that extends northeast for about 200 feet. Near the top of the talus slope another low hole enters a walkable passage with a wet clay floor that continues 100 feet to a deep pit with water at the bottom. Past this pit the tunnel turns sharp left 90 feet and leads under a low ceiling to a room 20 feet high. From this room two passages lead north 50 feet, then unite. Beyond the junction a slippery clay passage leads left to another room, beyond which a crawlway turns right for 30 feet and ends in a deep, flooded fissure.

Beyond the fissure a passage 8 to 20 feet wide and 6 to 20 feet high goes straight along the northeast strike for 250 feet and contains a stream 2 feet deep. At the far end a small gallery turns sharp left for 50 feet. This is more than 600 feet from the entrance.

Stalactites are rare. The floor is sticky mud. This cave can be explored farthest when the water table is lowest. A 40-foot rise in the water table has been observed, and at times the sink and cave are completely flooded. (Devitt)

DUMP CAVE

[redacted] **Lewistown Quadrangle**

South of Siglerville [redacted]

A small hole amid wood debris in the floor of a shallow sink at the east end of this channel gives access to a 6-foot wide and 3-foot high solution cave that extends toward the dump for 80 feet. Here is a 10-foot diameter room from which another passage leads downslope 30 feet, ending in water. A chimney through loose dirt leads up from the room for 15 feet and emerges on the surface directly beneath the spreading roots of a large tree. Several other small passages nearby are blocked with clay or debris. (Devitt)

GOSS CAVE

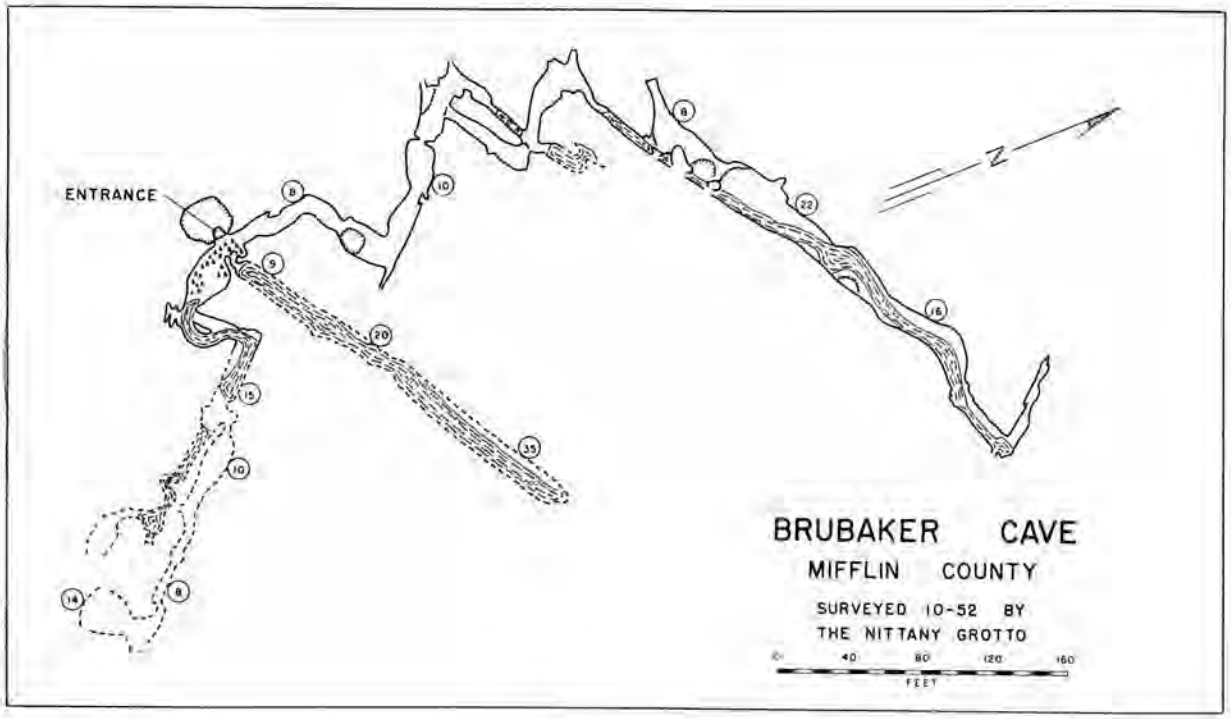
[redacted] **Lewistown Quadrangle**

Laurel Creek sinks into a cave in a large sink beside the barn of Mr. Goss, ½ mile northwest of the crushers of the Bethlehem Steel limestone quarries at Naginey and just south of the Milroy-Naginey road. Goss reports that in 1935 a large cave, similar to Alexander Caverns, further downstream, could be traversed for several hundred feet. In 1950 one could crawl 120 feet; in 1952 trash had filled the entrance. (Devitt)

HIGHLAND PARK CAVE

[redacted] **Lewistown Quadrangle**

In the woods near the top of a Helderberg limestone ridge [redacted]. Just inside is a steep slope and drop of 20 feet to the floor of a room about 70 feet long, 35 feet wide, and 50 feet high. A rope is needed to enter. Breakdown and organic matter covering the floor conceal any passage that may lead from the room. (Devitt, Smeltzer)



JOHNSON CAVES

[redacted] **East Waterford Quadrangle**

The Johnson Caves are on the Dr. C. M. Johnson farm at the south end of and across Messer Run from McVeytown. They are in nearly vertical beds of Helderberg limestone that strike N.50°E. and make a ridge 300 or 400 yards west of U. S. highway 22.

In a quarry on the north end of the ridge and about 40 feet above the run there are two openings. The upper, larger, is 12 feet wide and 7 feet high at the back of the quarry. It admits to a passage 15 to 20 feet high and 10 to 12 feet wide that follows the strike of the limestone beds. It slopes downward steeply for 50 feet. Here further progress is blocked at times by a pool of water the full width of the passage, but in August 1951 this cave was nearly dry and one could go 60 feet farther underground to a point where the passage was too narrow to traverse. An abundance of nearly pure white dripstone and flowstone is in this passage.

The second entrance is a hole 2½ by 3 feet near the south edge of the quarry floor. It opens into a steep passage slightly smaller than the first, leading directly to an underground lake 2 to 5 feet deep. The passage has one major travertine projection that nearly blocks the large room. The pool deepens about 75 feet beyond and the cave ceiling descends below water level.

Even at times of lowest water level the passage appears to continue under water at least 20 feet. (Hickok, Mohr)

Photo by C. E. Mohr

Fig. 21—Large flowstone speleothem and lake in Lower Johnson Cave, Mifflin County.

Photo by C. E. Mohr

Fig. 22—Only entrance in winter to Lime Sink Caves, Mifflin County, is at top of talus slope to left of center.

LIME SINK CAVES

[redacted] **Milheim Quadrangle**

[redacted] Except during a very dry summer or early fall, water to a depth of 10 feet blocks the entrance. A great pile of logs and other driftwood also serves as a barrier.

Entering in summer one finds the passage about 10 to 20 feet wide, up to 30 feet high, terminating after 280 feet in dangerous breakdown. At the rear of the cave a strong air current blowing through the crevices in the breakdown indicates a connection with the surface 50 feet above or with additional cave corridors.

When the entrance is flooded, one can climb a talus slope to a hole 20 feet up on the cliff, and enter at the level of the roof of the main passage. Another talus slope descends sharply to the floor, generally under water.

During near-zero weather in 1941, one daring explorer, finding the deeply flooded passage covered with a double layer of ice, traveled over it 250 feet to the back of the cave.

A mountain stream that in summer flows into the almost dry lake bed in front of the cliff, pours down a small hole about 100 feet from the cave entrance. Inside it is seen again in a flooded passage, 20 feet deep, in the middle of the cave.

Higher on the cliff to the north are two more holes, the lower quite tunnel-like. A fist-sized opening in the ceiling looks into a larger chamber above. This upper room is about 20 by 50 feet, half of it too low to stand in. It can be entered from the cliff face through a low squeezeway, and connects with the surface above through a sink hole. Badly fractured, loose rock make exploration hazardous. (Mohr, Devitt)

LITTLE AITKIN CAVE

[redacted] **Lewistown Quadrangle**

This cave is located [redacted]. A 2 by 3-foot vertical hole leads down 15 feet to a low gallery overlooking a lower, slanting, wide fissure room paralleling the limestone outcrop. Several short upper passages lead into breakdown. At floor level in the eastern end of this room is a crawlway leading under the north wall into a low stream passage. Clayfills block passages leading from two small rooms. Numerous bats hibernate in this cave and should not be disturbed as they are studied from time to time.

MAITLAND CAVE

[redacted] **Lewistown Quadrangle**

[redacted] J. A. Goss, miller and owner, in 1945, related that the mill dam was built in 1803; that people used to go into the cave by boat about 1000 feet, but that a great rock fall about the time of the Civil War put a stop to boating. A passage 300 feet long and just above water was excavated some years ago. In 1950 progress was blocked by breakdown at little more than 100 feet. On both sides of the main, breakdown room, water is met. Many large blocks of rock hang precariously over the entrance. **Visitors are warned to proceed cautiously.** (Mohr)

McNITT CAVE (See Brubaker Cave)

MILROY CAVES

[redacted] **Lewistown Quadrangle**

An extensive cave system totaling over 3000 feet of passages exists [redacted]. The system is composed of two caves which possibly connect. An apparently extensive system of passageways has recently been discovered between Milroy No. 1 and No. 2.

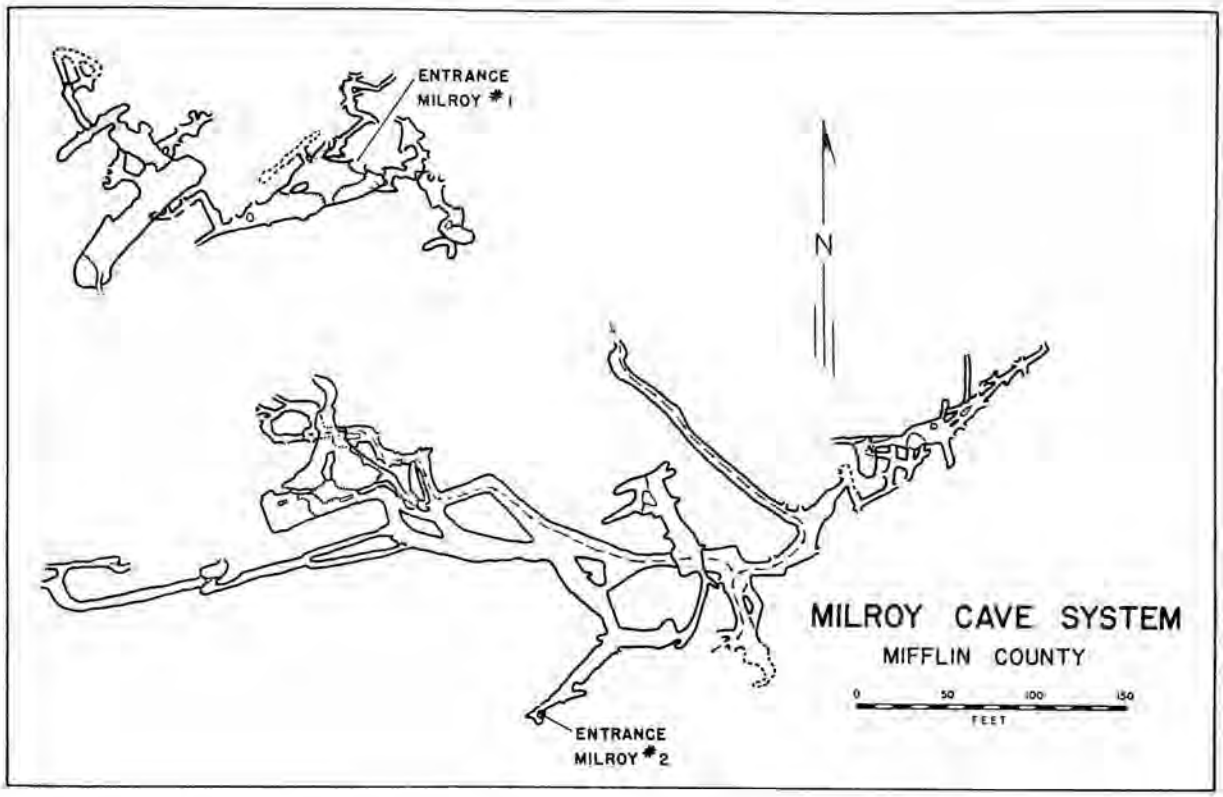
The entrance to Milroy Cave No. 1 is a 6x8-foot hole halfway up the cliff, 250 feet southwest of the concrete bridge over Laurel Creek at the south end of Milroy. The entrance room, containing considerable breakdown, is 20x20x90 feet. Four passages lead from this room. Two of these wind through breakdown, one under the flat sink facing the entrance; the other paralleling the cliff toward the east.

Another fissure passage leads inward to a second large room, past which extends a tunnel passage ending in a 20-foot deep pool, not far from beneath the owner's back yard. Nittany Grotto members first dug into this section in 1951 as well as being the first to discover and explore the fourth passage from the entrance room. A small hole in the floor leads into 1500 feet of passage, including six large rooms, one being 90 feet long, 30 feet high and 40 feet wide.

Unfortunately, the water table fills the narrow siphon to this portion of the cave system most of the year. Therefore efforts have been made to find another way in through numerous clefts in the cliff and in the many surface sinks, many of which emit warm air during the winter from the cavern below. To date no other entrance has been found and only seven people have seen this most interesting "cave within a cave". In general the cave walls are smooth, grey Trenton limestone; speleothems (stalactites) are in small, scattered groups; floors consist of damp clay, breakdown, or loose gravel.

Photo by C. E. Mohr

Fig. 23—Dangerous breakdown at entrance to Maitland Cave, Mifflin County.



About 500 feet SSE. of the entrance to Milroy No. 1 is a wide terrace halfway up a similar limestone cliff. Below an offset in the cliff at the rear of the terrace is a hole 4 feet wide and 10 feet deep leading down into Milroy No. 2 Cave. Fifty feet in is a room from which lead two passages, the easternmost a fissure leading upgrade into a large room with a deep pit in the floor. The other passage leads northward to a stream passage. The stream is probably a continuation of the stream which flows through portions of Milroy No. 1 and formed by inflow from the creek, which butts against the cliff below the bridge.

The stream passage, accessible only in dry weather, extends into a dangerous breakdown area just past a 40-foot wide but low room at a higher level reached through a paralleling passage. Downstream one reaches a junction of two streams which then flow southward. Further to the northeast is a system of high fissures following joints. The cave is generally on two levels, one about 15 feet above the stream, having a number of rooms and clay floors, and the lower level floored with fine gravel and containing the streams.

The entire cave system appears to be developed in a gentle anticline, plunging slightly to the west. The stream appears to follow a horseshoe shaped path, seemingly following a bedding horizon where it intersects the water table. The entire surrounding area appears to be quite cavernous, indicative that more cave is yet to be discovered. (Devitt)

MT. ROCK CAVE

[redacted] **Lewistown Quadrangle**

On the east bank of Honey Creek halfway between Burnham and Lewistown, ¾ mile northeast of Mt. Rock (North Lewistown) there are two abandoned quarries in the Helderberg limestone. Entrance to Mt. Rock Cave is at road level in the northernmost of the two quarries.

The cave follows the bedding in a N.60°E. course for 400 feet. It is a series of long narrow rooms connected end to end by crawlways. It ranges in width from 30 inches to 10 feet and in height from 1 to 12 feet. One can stand in the first half but most of the channel is less than 4 feet high. A side passage leads east but rejoins the cave farther in. Large fallen blocks are 50, 65, 125, and 200 feet from the entrance. (Devitt, Smeltzer)

NAGINEY CAVE

[redacted] **Lewistown Quadrangle**

In the latter part of the 19th century a cave in Trenton limestone at Naginey, 2 miles east of Milroy, was visited by many people. In quarrying this limestone for flux to use in the steel industry, the Bethlehem Mines Corporation has obliterated this cave. Its position was about 300 yards west of a crusher and washing plant.

The abundance of sink holes in the valley of Honey Creek between Naginey and Reedsville indicates the soluble character of the underlying limestone and suggests the presence of caverns as yet undiscovered.

NAIL No. 1

[redacted] **Lewistown Quadrangle**

An inconspicuous hole in the woods on the Walter Nail farm, which adjoins the Aitkin farm was discovered by R. W. Stone and explored by J. S. Petrie and others September 29, 1946. It proved to be the entrance to a cave that Parker describes as "740 feet from entrance of Aitkin Cave at 351° magnetic." Parker's vivid description of the exploration of this cave by members of the Philadelphia Grotto was published in NSS Bulletin 12.

The cave is in Trenton limestone striking about N.80°E. and dipping N.70° at the entrance, but as it is on the crest of an anticline the dip is reversed in some parts.

The entrance is a squeeze barely a foot wide between a clay slope and the limestone wall. A ladder or rope is essential as most of the descent to the stony bed of a stream, 45 feet below, is vertical.

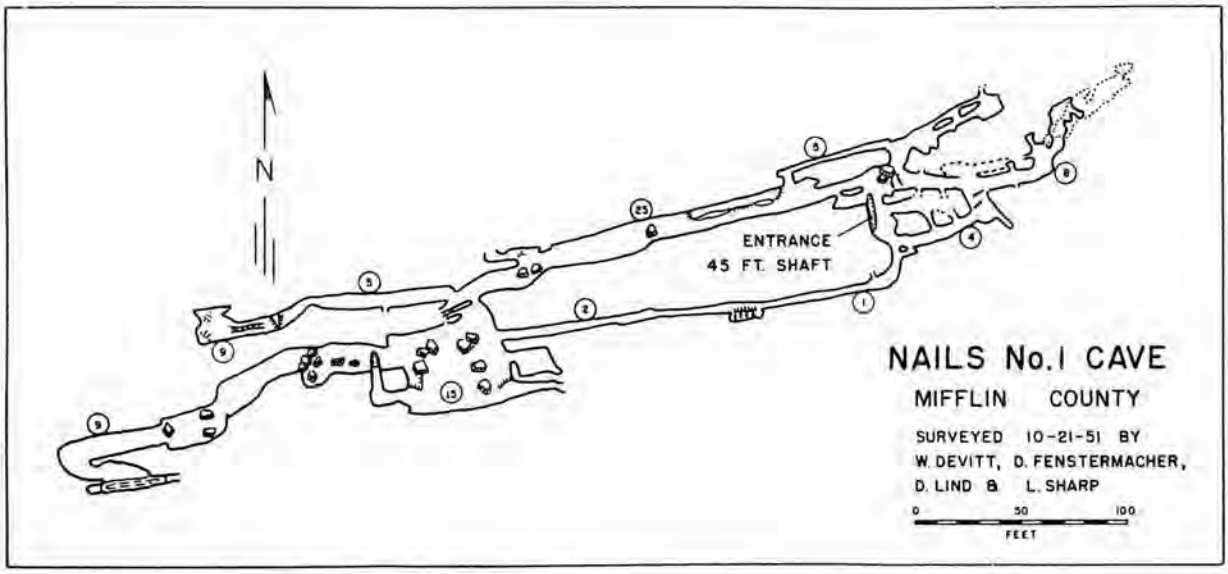


Photo by J. Walczak

Fig. 24—Scene in Nail No. 1 Cave, Mifflin County.

The cave has two long passages on two levels, totaling 1300 feet. The main galleries are smooth-walled, rounded, about 12 feet wide and 10 feet high. The short eastern end of the cave is in breakdown 100 feet from the entrance. The western end, 300 feet from the entrance, has much solid clay fill. A high, sloping room, 30 by 50 feet, contains large fallen blocks and much clay. A wide gallery with breakdown that goes 150 feet beyond this room ends at deep water below its level. A 200-foot crawlway extends from the big room to the entrance shaft. The upper level has a few stalactites.

The stream may be 1 to 4 feet deep in winter and spring, but at other times the channel may be dry except for two pools below the level of the westernmost gallery. (Devitt, Stone)

NAIL No. 2

[redacted] **Lewistown Quadrangle**

About 400 feet east of Nail No. 1, across the creek and just below the Aitkin farm is this second cave. On top of a knoll and just above an old lime kiln, an opening the size of a manhole appeared suddenly about 1939. It gives access to a cave that is hazardous to explore without the aid of a rope. Just below the surface, a steep gallery with insecure ceiling overlooks a roughly circular room

about 30 feet across. By searching between fallen blocks one can descend to 80 feet below the surface into a maze of irregular passages at or below the level of Treaster Run. (Devitt, Smeltzer)

REEDSVILLE CAVE

[redacted] **Lewistown Quadrangle**

A cave on the Williamson Taylor farm is reached by [redacted]

The steep descent 35 feet to the 4 by 5-foot opening in the Trenton limestone, then 40 feet more down a steep slope suggests the use of a rope for safety. One finds footing on a narrow ledge before coming to a roughly oval room 75 by 30 feet, with a ceiling sloping from 12 feet to floor level. This cavern is about 100 feet below the surface. No traversable passages lead away from this room, though a stream flows through it. The cave seemed very dangerous because of fractured overhanging rock. An estimated 8 to 10 feet of clay fill has been deposited on the floor since 1932, washing into the sinkhole from the surrounding field. (Mohr)

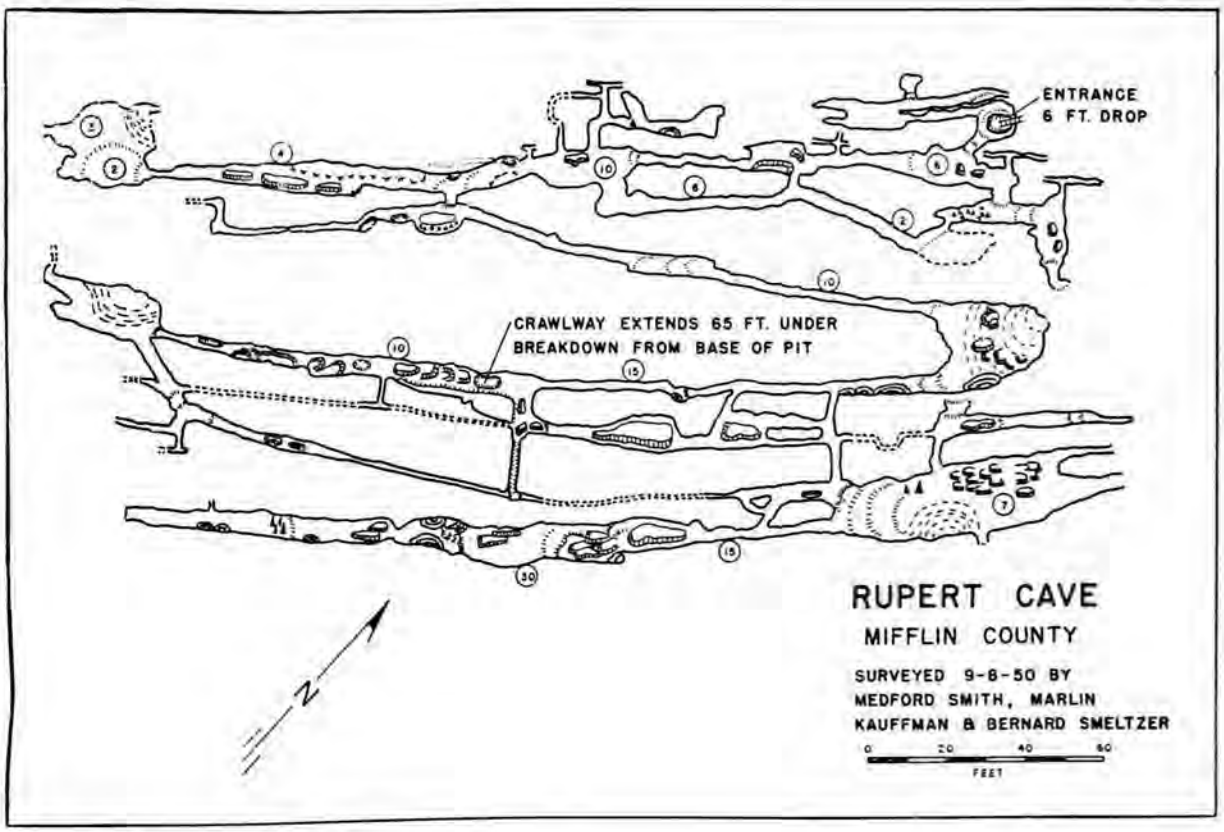
RUPERT CAVE

[redacted] **Allensville Quadrangle**

A cave with about 1500 feet of traversed passages can be found [redacted] The cave is in a ridge of Helderberg limestone about 300 yards southwest from the farm house. The entrance is an inconspicuous hole 4 feet in diameter in a gently sloping pasture and close to a steeper timbered slope.

An anticline brings the limestone to the surface with the overlying Oriskany sandstone cropping out on both sides. The strike of the rocks is NE. and the dip is slight. The cave seems to be developed on six more or less direct and parallel joints with a greatest traversable length of 275 feet each. Cross joints and running together of main joints produce a somewhat intricate pattern.

The passages are mostly from 2 to 5 feet wide, rarely 10 feet, and from 1 to 15 feet high, mostly 4 to 6 feet, and in one place 30 feet. A 6-foot drop at the entrance is awkward without a ladder or rope. Fallen roof blocks and short slopes are common; dripstone speleothems are rare. Rimstone occurs in the northernmost passage and flowstone covers a breakdown and a clay mound in the southern passage. Stalagmites 4 feet high and small stalactites are in western end of the southern passage near small pools. (Smeltzer, Stone)



SEAWRA CAVE

[redacted] **Mifflintown Quadrangle**

A cave 12 miles northeast of Lewistown and 4 miles from Alfarata on the north side of a low ridge parallel to Jacks Mountain was developed in 1928 and operated commercially for about ten years by Messrs. Searer and Wray of Lewistown. The name is a combination of the first three letters of their names. Insufficient patronage forced the closing of the cave. The iron gates and railings were stolen during World War II, and subsequent vandalism of formations has been extensive. The cave is in Helderberg limestone that strikes N.75°E. and dips 55°. A path leads from the former picnic ground 200 feet down to the concrete portal.

The part of the cave formerly shown to visitors is 615 feet long, a nearly straight passage along one bedding plane. Nowhere is the cave more than a few yards wide but fine stalactites and stalagmites were once abundant. From the path along which tourists were taken, a lower passage or rooms could be glimpsed 50 to 75 feet below, and also beyond the end of the path. The Cave is mostly dry, with no standing water. Temperature is 57°. **Explorers are cautioned that the wooden bridges are unsafe.**

OTHER CAVES

Northeast of Mt. Rock Cave, 1½ miles, on the north side of the same limestone ridge, and 1½ miles south of Vera, there are two caves. Both have small, nearly vertical entrances in small sinks halfway up the ridge. One has a wooden ladder. (Devitt, Smeltzer)

Photo by B. L. Smeltzer

Fig. 25—Columns in Seawra Cave, Mifflin County.

MONROE COUNTY

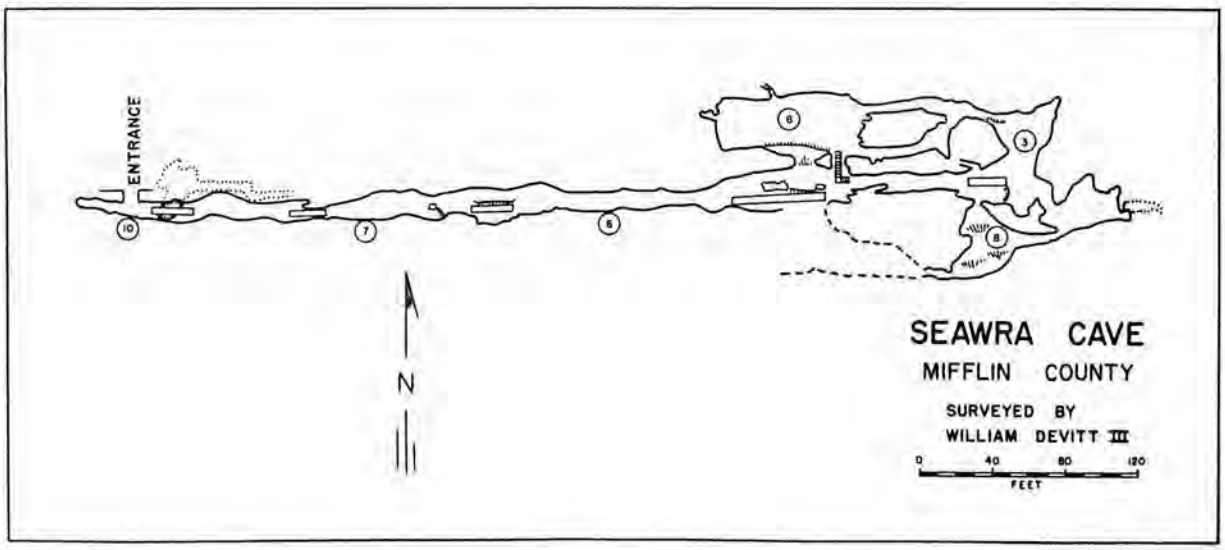
HARTMAN CAVE

[redacted] **Delaware Water Gap Quadrangle**

Near the top of Godfrey Ridge, 2½ miles southwest of Stroudsburg, there is a cave in which bones and teeth of many animals, some extinct, have been excavated.

[redacted]

The entrance is at the base of a prominent, 20-foot cliff in the woods at the upper end of an open field. The cave can be reached also from the Hartman Cave Farm, ½ mile farther on the same road from Stroudsburg, and from Stormville.



The entrance is of particular interest as it lies along the crest of an anticlinal arch in Coeyman's limestone.

The width of the cave averages 20 feet throughout the length of 225 feet but the height decreases from 10 feet at the entrance to less than 6 feet in the small room at the far end. The cave runs in an EW direction and is perfectly straight. The floor is nearly level, the latter part consisting of a trench excavated during the search for the fossils. A noticeable spoils bank can be seen outside the cave. Dripstone speleothems are lacking. (Mohr, Barnsley)

MONTGOMERY COUNTY

PORT KENNEDY CAVES

REDACTED **Norristown Quadrangle**

At Port Kennedy on the Schuylkill River just below Valley Forge, there was formerly a cave which is mentioned in geologic literature as a place of much interest because of the remains of extinct animals found in it. Cope, Mercer, Leidy, and others have described four species of giant sloth, two horses, a tapir, three peccaries, a mastodon, five cats, including two species of saber tooth and a bear larger than a grizzly, in a total of fifty-four mammals, forty-one of which are now extinct. Any of the cave that remains has been filled with the waste lime sludge from the plant of the Ehret Magnesia Manufacturing Company. (Fowler, Parker)

OTHER CAVES

Two small caves were found on the edge of a partially-filled quarry in Cambrian limestone a mile southwest of Port Kennedy. One is a "storm sewer" cave into which a great quantity of water pours during heavy rains. Less than 75 feet from the surface it is blocked by washed-in surface debris.

The second cave extends about 200 feet in a westerly direction in alternating shale and limestone strata. The beds dip about 45°. The entrance has been closed because of danger from rock falls. (Fowler)

In Valley Forge National Park in a long abandoned limestone quarry densely overgrown, a small inconspicuous hole 20 feet up on the quarry face give access to a fairly large, steeply sloping room. A single passage east from this room parallels the quarry face and ends in a steep upturn about 80 feet from the room. The cave is traversed with great difficulty because of low roof, tight "squeezes", and the floor is covered with breakdown. The cave has little or no dripstone, and is clean and dry, in summer at least. (Dick Connolly, Ardmore)

MONTOUR COUNTY

MAUSDALE CAVE

REDACTED **Shamokin Quadrangle**

On the north margin of the Shamokin Quadrangle one mile north of Mausdale is a Helderberg limestone quarry that is easily seen from the roads in the area. It is a mile northwest of the Sunnybrook Amusement Park and 2½ miles north of Danville. Along the SW. quarry wall, halfway up the steep side of a deep narrow channel that drains the quarry, is a hole 12 feet wide and 7 feet high. This is the entrance to a cave that extends with a level floor for about 100 feet. Inside dimensions are 22 feet wide and 15 feet high. The roof comes down sharply to the clay floor. (Devitt)

NAREHOOD CAVE

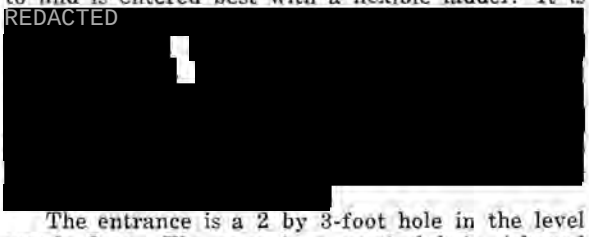
REDACTED **Hughesville Quadrangle**

The Narehood Cave described in 1932 has been obliterated by quarrying but another, entered through a lone sink in the center of a field atop Limestone Ridge south of abandoned lime kilns and 1/3 mile west of Narehood Brothers' Quarry, takes the same name. This cave, 1 mile southeast of Limestoneville, in 1950 is a sizeable room 80 feet high and 40 feet wide but no accessible passages lead from it. Two openings high on one side are out of reach. Trash and dirt in the bottom cover any side passages there, and in a few years the entrance may be filled with trash. Doubtless there are extensive caverns in the Helderberg limestone under the immediate area but no known entrances. (Devitt)

STAMM CAVE

REDACTED **Milton Quadrangle**

A cave not worth a visit, little known and hard to find is entered best with a flexible ladder. It is REDACTED



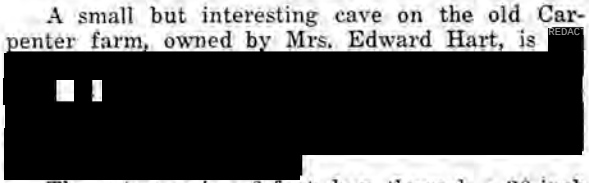
The entrance is a 2 by 3-foot hole in the level woods floor. The cave is a vertical hole (shaped like a milk bottle) 45 feet deep in beds of fractured Helderberg limestone. Short passages at the bottom all end in solid rock. (Devitt)

NORTHAMPTON COUNTY

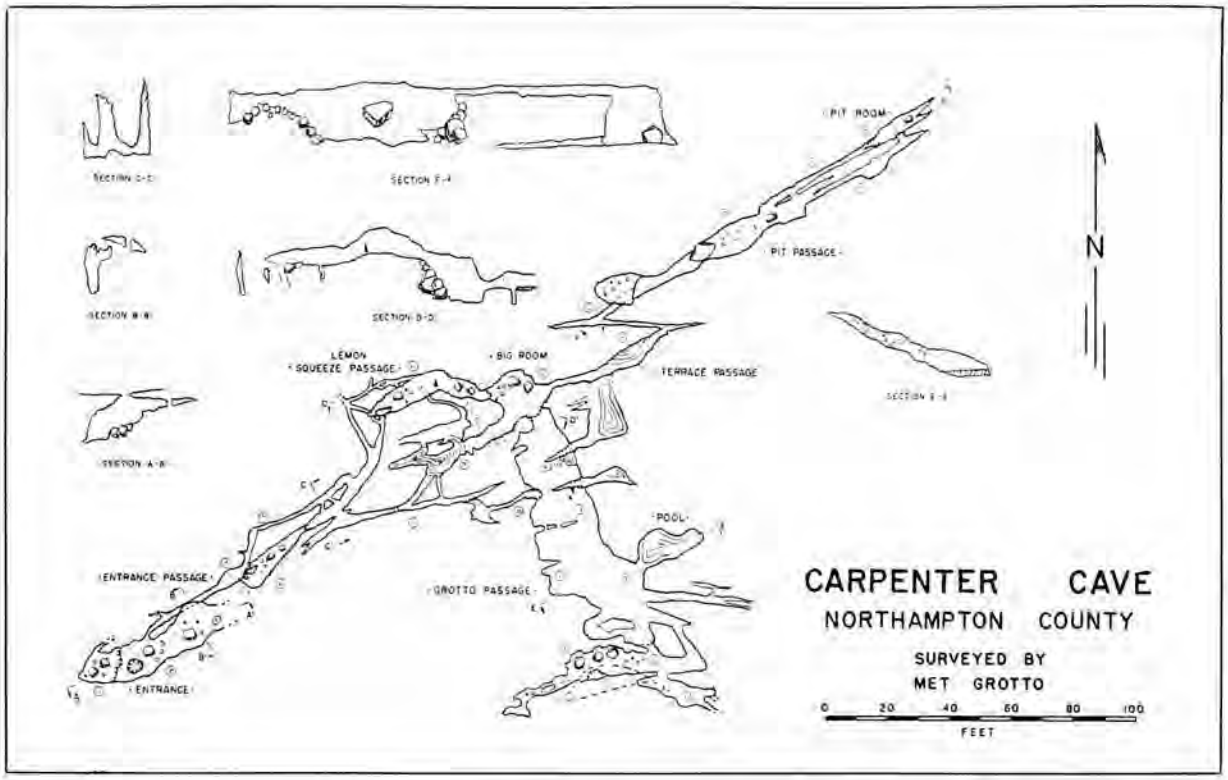
CARPENTER CAVE

REDACTED **Easton Quadrangle**

A small but interesting cave on the old Carpenter farm, owned by Mrs. Edward Hart, is REDAC



The entrance is a 6-foot drop through a 30-inch hole at the base of a small bluff. Following narrow, low crevices and ducking under a rock ledge one gets into the main passage, which is not more



than 3 feet wide but is 6 to 15 feet high. It pinches out 100 feet from the entrance but a sharp left turn through a tight squeeze brings one to the Big Room, about 15 feet in diameter. Both passages appear to be developed along faults.

At the entrance to the Big Room, under a 12-foot ceiling, is a notable pipe-organ formation. This is about 150 feet from the mouth of the cave. Beyond this formation a mass of small dripstone speleothems is seen through an opening about 4 feet above the floor. By keeping to the left it is possible to crawl past these for 15 feet under a 12 to 18-inch roof and enter an extension of the cave that is about 15 feet wide, 100 feet long, and mostly less than 3 feet high and along the bedding. It is of considerable interest as it has several columns about 6 inches in diameter and two ravines, each running across and into a small room at a lower level, usually filled with water. It is difficult but possible to crawl to the far end of this low room where there are large fallen blocks and a beautiful helictite display. The room also contains small and colorful stalactites and dripstone curtains; the pools have cave pearls.

The main passage continues beyond the Big Room for 150 feet. In the first 50 feet a pool and dripstone terraces are under a 15-foot ceiling. Between the two sharp angles of a 20-foot offset of the passage is a natural bridge and a fishhook stalactite. Beyond a large hanging block and pit near the far end of the cave is one of its most interesting features. The passage splits, one branch going down, the other up. The upper one becomes a ledge 15 feet up and ending at the top of a small room, access to which is by rope or ladder. An alternate and difficult exit is via the so-called Torpedo Tube.

Carpenter Cave offers spelunkers a good degree of difficulty with a minimum of danger. (Sloane)

COLD AIR

[redacted] **Delaware Water Gap Quadrangle**

In the west bank of Delaware River above Slateford and close to the east entrance to Delaware Water Gap, a sign board calls attention to Cold Air cave, which, with the lunch stand that conceals it, belongs to Mrs. Myrtle Williams of Slateford. An enclosed covered passageway connects the lunch stand with the cave. It was closed during the winter of 1952-53.

This is not a true cave. The mountainside here is covered with a talus or floe of large blocks of Tuscarora sandstone that have drifted down from the outcrops above. A broad flat slab of this sandstone resting on a large chunky block at the foot of the talus, roofs over a space only a few feet square. Voids between other blocks at the back of this space are large enough for a man to crawl into them for a few feet. A thermometer in one of these cavities registers 38° F.

This cold air, which received its low temperature from the frosts of the previous winter, is stored by Nature in the voids of the rock floe. Cold air tends to settle, and, being held in the floe by the cover of soil and vegetation, it moves slowly down grade through the spaces between the blocks and emerges noticeably in summer at this opening.

INDIAN CAVE

[redacted] **Easton Quadrangle**

In the bluff of Delaware River [redacted] at the head of Indian rift and foot of Sandts Eddy, is the so-called Indian Cave. It is opposite the Riverside Service Station.

The cave is in Trenton limestone about 30 feet above Route 611 on land owned by Mrs. George West, R. D. 1, Easton. The entrance is wide and headhigh so one can walk in, then stooping a bit through a short passage and turning left, one may walk upright to about 90 feet from the entrance. Here a hole in the floor leads to a slightly lower room, in the bottom of which is a depression filled with trash. This is said to be the blocked entrance to a still lower passage.

The floor of the cave is partly buried in clay. The site and suitability of the cave suggest that it may have been used by Indians for shelter and watching the river trail. The view from the entrance is extensive because of the bend in the river.

The cave shows traces of dripstone but the roof is everywhere within arm's reach and all calcite speleothem has been removed.

At the back of the first room is an iron gate. Its presence is explained by the fact that about 80 years ago Adam Iop in quarrying stone for his lime kiln broke into the upper and outer room. He took out a license to sell beer and other drinks, charged 10 cents admission, and perhaps stored his bottled goods in the cave, for the temperature is said to be about 48° F. the year round.

A second and smaller opening just north of the main entrance leads into a room about 10 by 12 feet in size, from which continues a low 3-foot passage parallel to the face of the ledge for about 40 feet. At this distance it is too low or choked with stone for further progress.

The limestone beds seem to lie nearly flat and jointing is more closely spaced at the main opening than elsewhere in the exposed ledge.

REDINGTON CAVES

[redacted] **Allentown Quadrangle**

Redington No. 1, in the Tomstown limestone, is situated at the far end of one of the three abandoned limestone quarries of the Bethlehem Mines Corporation at Redington which are along the Lehigh River about 5 miles east of Bethlehem. This quarry is not visible from the road but is located near the rear of the other two. Part of the cave has been quarried away, and now the entrance is through a narrow passage and down over a steep slippery talus slope of fallen blocks into a large room that is roughly circular in floor plan and measures about 70 feet in diameter. Its height is about 40 feet. One long passageway extends up to the left for 250 feet in a straight line. The floor rises rapidly and the width decreases until finally there is just enough room for a small person to squeeze between three blocks and enter a low vaulted room. A passage in the opposite wall leads to a lower room which contains some lovely formations. A manhole-type opening at the end of the far room leads to a well which reveals a further small passage extending in the direction of Redington No. 2.

Parallel to this main channel and a few yards northeast of it is another crevice but this is only 2 feet wide and progress is soon blocked. A light will show that it continues on for a hundred feet or more.

The roof throughout practically its entire extent was once covered with pencil-like stalactites of aragonite, most of which have been destroyed. Another interesting type of deposit is the arborescent calcite crystals that are here well developed. These curious little aggregates of calcite crystals sometimes grow to be an inch high with overlapping branches and stubby base. The minerals from this cave were deposited in the Academy of Natural Sciences of Philadelphia and have since been distributed to institutions throughout the world.

In the ceiling near the back and at the right side of the large room is a small crevice along a bedding plane and up about 15 feet from the floor is a layer of travertine that evidently at one time rested on clay filling but subsequently the clay has been removed. There are evidences that the cave was formed in standing water. An erosion shelf shows water deposits in several places.

During heavy rains a small stream flows across the floor of the main room into a sump at the left wall. A fissure in the wall gives access to a vertical solution maze that terminates in a small room which receives this water through a small passage in the wall of the main room. (Parker)

Redington No. 2 is in the east wall of the westernmost of the three quarries of the Bethlehem Mines Corporation. This is probably an extension of Redington No. 1. The main room has been partially laid bare by quarrying thus forming an entrance large enough to admit a locomotive. The cave soon narrows, however, and there are many evidences of breakdown. At the far end of the room a narrow passage extends in the direction of Redington No. 1, but is blocked by breakdown. At this point it is close to the surface and soundings have been made from the surface which seem to indicate that this passage continues. In 1946 members of the Philadelphia Grotto removed many unexploded shells from this passage. The Bethlehem Steel Company used the cave for the test firing of artillery projectiles in 1918. This caused the breakdown of the entire rear end of the cave. When digging in this cave the utmost care should be taken not to detonate unexploded buried projectiles. (Parker)

WOLF CAVE

[redacted] **Allentown Quadrangle**

George J. Spangler of Bath wrote to the Geological Survey in 1942 about a cave in East Allen Township about 1 mile due east of Seemsville, on south side of the road to Bath. His description indicates a deep sink hole in which is an opening 8 feet square in slate that leads in 25 feet to a chamber about 50 feet long, 30 feet wide, and 15 feet high. This chamber is about 100 feet below the surface. Another 8-foot square passage, 25 feet long, leads from it to another chamber almost as big. In 1942 the cave could be entered for about 300 feet, but in 1950 the inner choked end of the cave was about 170 feet from the bottom of the sink hole. The cave is on contact between slate and limestone.

In March 1952, Howard N. Sloane found this cave to be on the farm of Mrs. Lilly Muffley at Seemsville. He described the location as about 100 yards from a back road in a sink hole faced by a shaly limestone cliff 20 feet high. The entrance was plugged with dirt washed in, and digging for four hours did not break through. Three local men interrogated independently by Sloane agreed that a 10-foot crawlway under the cliff opens into a room about 10 feet wide, 60 feet long, and ceiling at least 20 feet high. One or more passages continue down grade to about 350 feet from the entrance. Here the ceiling descends to a crawlway of unknown length.

OTHER CAVES

A cave under the Sun Inn in Bethlehem once gave access to the creek and later was used for sewage disposal, but the entrance to the cave was closed or filled many years ago and nothing can be learned of it now.

NORTHUMBERLAND COUNTY

TURBOTVILLE CAVE

REDACTED **Milton Quadrangle**

In the deeper of two quarries in Helderberg limestone ¾ mile west of the west end of Turbotville, five passages extend underground 10 to 40 feet. They end in dry clay. The only speleothems are a few beads.

A small cave is located near a city dump in one of two quarries ½ mile southwest of Turbotville. (Devitt)

PERRY COUNTY

ARNT CAVE

REDACTED **Loysville Quadrangle**

On the William Arnt farm 1.1 mile northeast of Ickesburg there is a cave in a small quarry at the southwest end of a prominent ridge.

It is in the Helderberg limestone where it strikes N.68°E. and dips SE.10°. The galleries are developed along vertical joint planes trending N.68°E., N.22°W. and N.6°W. Just east of the cave the bedding bends into a syncline, then an anticline, and then rises at an angle of 45°.

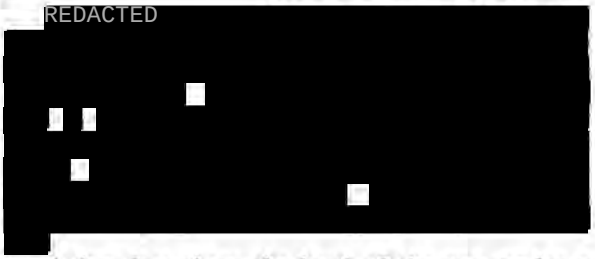
Two openings in the quarry face are 55 feet apart. The larger and south entrance opens into a corridor resembling a mine tunnel 6 to 12 feet wide and 6 to 10 feet high, following the strike. The ceiling is mostly flat and an excellent example of a bed of sun-dried mud solidified into limestone with polygonal cracks. On the north wall near the rear of the corridor are unique calcite beads in that each has a tiny pointed barb on the tip.

The corridor continues straight ahead as a crawlway and ends 80 feet from the entrance. The last 30 feet is a steep slope. A passage with a N.22°W. course branches off from the corridor 45 feet from the entrance. It is 2 to 6 feet high and 4 to 8 feet wide and leads to a room 18 feet long, 10 feet wide, and up to 15 feet high. A crawlway bordered with gravel banks leads northeast 15 feet. Flowstone covers the west wall of the room above a shallow pit.

Beyond the pit, a 3-foot drop, and under a flowstone canopy a narrow but lofty fissure twists to the northwest for 30 feet. Traversing it is treacherous because of 6 to 15-foot drops. A dome pit is 25 feet high, and walls 40 feet high are covered with massive flowstone cascades. A strong air current blows through this fissure. At the far end, under a flowstone bridge, the fissure ends in a room 10 feet in diameter, with a 20-foot ceiling, and encased in orange-colored dripstone. A narrow slot on the southwest side opens to the quarry face. (Smeltzer)

BEAR CAVE

REDACTED **New Bloomfield Quadrangle**



A few feet above the level of the run, under a slight overhang, is room to shelter three men, and from it a fissure parallel with the cliff and about 20 feet long is too narrow to enter except the first few feet. This crevice is about 6 feet high, seems to be the result of settling of the cliff face, and is reputed to have been occupied by a hibernating bear.

BLAIN CAVE

REDACTED **East Waterford Quadrangle**

A fissure cave on the east limb of a syncline in the Helderberg limestone is mentioned because it is reported that small boys have explored an extensive maze in it. The site is a quarry in a small rounded hill, 0.4 mile northwest of Blain. The cave is a fissure 1 to 2 feet wide and 8 to 10 feet high on a northeast joint. At 25 feet from the entrance the fissure narrows so that only thin persons or children can go farther. (Smeltzer)

GIRTY'S

REDACTED **Millersburg Quadrangle**

Widening and straightening the highway along the west bank of Susquehanna River five miles south of Liverpool in 1951 ended the existence of Girty's Cave. It was about 150 feet above the river at a sharp bend in the highway in a bluff of Devonian sandstone beds.

The cave is described on page 116 of Bull. G3, Pa. Geol. Survey.

ICKESBURG CAVE

REDACTED **Loysville Quadrangle**

On the H. C. Boyden (Boden?) farm ½ mile east of Ickesburg in a Helderberg (Keyser) limestone quarry a narrow crevice about 100 feet long

connects two openings in the quarry face. Two rooms, 20 feet in diameter and 30 feet high are developed at the ends of the passage. The south opening is 10 feet high and wide and extends 80 feet into the hill. The strata are nearly horizontal but much broken by flexure. Flowstone is common. Columnar jointing is well developed and extends throughout the strata, and small slabs frequently drop from the ceiling. (Davies)

QUILLIAMS ROCK CAVE

REDACTED **Loysville Quadrangle**

A cave in sandstone on the slope of Tuscarora Mountain 1½ miles west of Ickesburg is reported to be several fissures that Boy Scouts explore.

ROUTE 22 CAVE

REDACTED **New Bloomfield Quadrangle**

On the north bank of Juniata River 6.3 miles below the bridge at Newport, nearly on a REDACTED there is a small cave. A passage extends east 20 feet and northeast 25 feet. It might be called a walk-in room and three possible crawlways.

There are no caves in the limestone cliff 200 feet above and the larger quarry 400 feet southeast. (Devitt)

SCHULL CAVE

REDACTED **Loysville Quadrangle**

East of Route 17 and about ½ mile northeast of Ickesburg in the abandoned James Schull quarry in Helderberg limestone, massive flowstone covers part of the quarry face. The quarry is 0.6 mile northwest of Arnt Cave. The entrance to the cave is overhung by dangerously loose rocks. Speleothems can be seen in a passage leading southwest. (Smeltzer)

WALLACE CAVE

REDACTED **East Waterford Quadrangle**

An underground opening that does not go to total darkness is mentioned because it is one of the few in the Oriskany sandstone. The beds are horizontal and near the Helderberg limestone contact. The cave is 1.2 mile southeast of Blain on the Merrill Wallace farm on the west bank of Bull Run. The entrance about 4 feet square leads to a crawlway 18 feet long headed west, then southwest. (Smeltzer)

WENTZ CAVE

REDACTED **East Waterford Quadrangle**

On a former Wentz farm, now owned and occupied by the Lawrence family, 0.85 mile south of Blain on a hard-surfaced road, a small opening is in the creek bank where flat-lying sandstone crops out. It is reached by going up the farm lane, stopping 150 feet short of the barn, and down the bank. The opening is 7 feet wide with arched roof 3 feet high and about 4 feet high inside. The channel turns left as a crawlway and at 15-18 feet appears a solid rock wall but there may be a turn to the right. There may be a choked passage straight ahead from the entrance. Men say that as boys they walked in to where they could hear the stomp of horses' feet in the barn overhead. A small mound on the flood plain in front of the entrance suggests that this may be not properly a cave.

WOOMER CAVE

REDACTED **Loysville Quadrangle**

A cave on the William Woomer farm 3 miles northeast of Landisburg and about the same distance southwest of Elliottsburg was operated commercially many years ago by J. W. Sheibley. An iron door controlled entrance. Hundreds of people picnicked there and paid 10 cents admission to the cave. The farm is owned and occupied in 1951 by Harper Fortenbaugh.

The entrance to the cave was blocked in 1951 by a quarry blast but cold air can be felt coming through the stones. Devitt and Smeltzer made an unsuccessful attempt to dig through it July 1949. The writer entered this cave about 1930 for about 500 feet and found it to consist of crevices opened along joints in the Helderberg limestone. The passages are narrow and mostly over 6 feet high, but in some places less than 3 feet high. The strike of the rocks is nearly east-west and the dip is 20°N. The over-all length of the cave is 700 feet, but a map made by William E. Davies, and attorney Frank Tressler, of New Bloomfield, September 1, 1940, shows more than 1600 feet of passages and 8 rooms. The main course of the cave is slightly north of east but it is offset four times for 50 feet or more to the south, intersected by crevices at various angles, and has parallel passages. At the rear several shafts slope downwards for 60 feet. Dripstone is present but not abundant.

PHILADELPHIA COUNTY

The Strawberry Mansion cave behind that mansion in Fairmount Park was filled some years ago by the city after a boy was stuck in it. It is a fault fissure in the Wissahickon schist running northeast from the Schuylkill about 100 feet.

Cave of the Wissahickon, in the west bank of Wissahickon Creek a few hundred yards above its confluence with the Schuylkill, originally was a fault fissure. It was enlarged to a shelter cave, however, according to a well-substantiated story, by hermit monks in the late 17th century.

In the late 18th century a family lived in a cave at the northeast corner of South York Road and Erie Avenue, Philadelphia. This is now a built-up area with no sign of a cave. (Parker)

SNYDER COUNTY

ARNOLD CAVE

[redacted] **Sunbury Quadrangle**

[redacted]

It consists of vertical winding passages in Helderberg limestone that dips south into the ridge at an angle of about 30°. It has stalactites and cascades of flowstone.

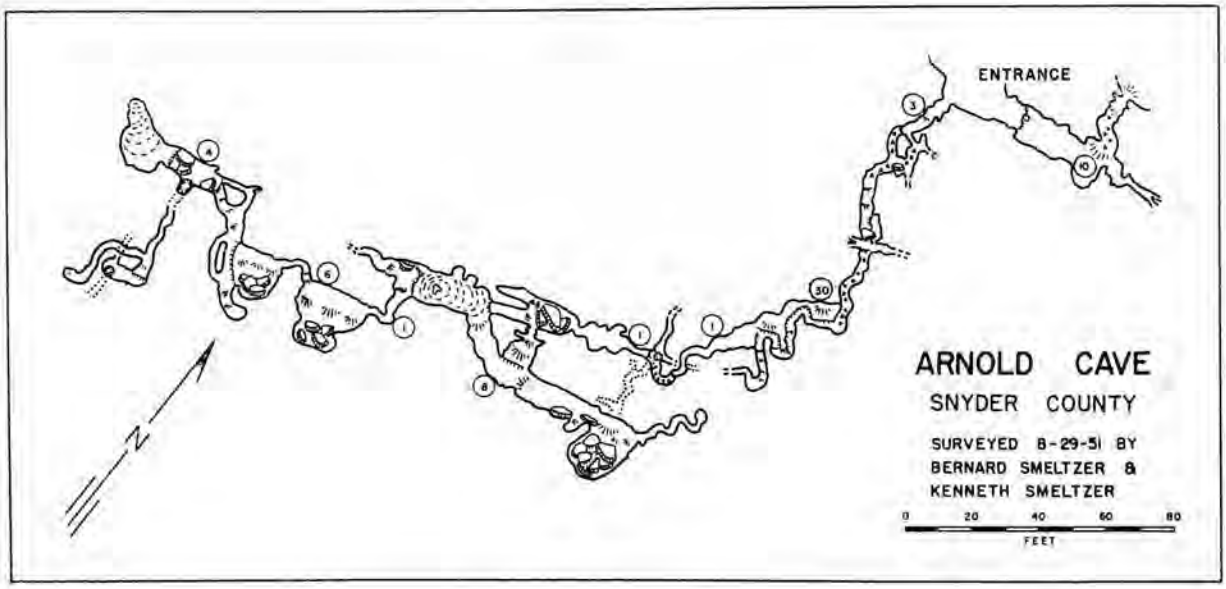
The entrance is a smooth-walled, slightly-winding fissure 2 to 8 feet wide and 10 to 25 feet high with a steep floor of dry talus. At 75 feet the cave turns west along the bedding as a series of low rooms connected by difficult crawlways and narrow fissures. Here the floor is clay and breakdown. Three rooms are 20 and 30 feet wide, with breakdown on the lower side. Three pits in the western part of the cave appear to lead to lower levels, but a rope or ladder is needed for exploring them. (Devitt)

BOYER CAVE No. 1

[redacted] **Millerstown Quadrangle**

In the limestone quarry of Irving Boyer about ¼ mile northwest of Freemont (Mt. Pleasant Mills P. O.) there is a cave that was uncovered by quarrying prior to 1900. The cave is [redacted]. This ridge is composed of Helderberg limestone which strikes east-west and dips 45°S. The main joint planes are nearly at right angles to the bedding and dip N.40°. As a result the cross section of the cave in places is like the roof of a house. One travels along a ridge with the cavern sloping down on both sides, one side developed along a soluble bed and the other along a joint.

Four quarries have broken into the western half, a low room with 2 to 8 feet clearance and up to 70 feet wide but sloping away from the median ridge. Pits near the west end admit to rooms at a lower level. Stalagmite and gypsum occur in this room. This western half, about 450 feet long, will collapse when the supporting wall is shot.



BEAVERTOWN CAVE

[redacted] **Mifflinburg Quadrangle**

Near the top of a narrow limestone ridge about one mile northwest of Beavertown there is a tiny cave on the north slope in a small prospect. The opening is 10 feet wide and 3 feet high, but within a few feet the height is so reduced that one must lie prone to enter. It is just a short crawlway.

Another small opening is 15 feet east and higher. It leads to a passage too narrow to enter. (Smeltzer)

The eastern half of the cave, about 230 feet long but having nearly 400 feet of passages, mostly along the main joint, has a general slope to the east so that the east end is 65 feet lower than the central entrance. Dripstone speleothems are fairly common and include helictites. Ceiling heights range from 2 to 15 feet. Midway of this eastern section two pits go down 6 feet to a lower room. Several hundred bats hibernate in this section. (Stone, Devitt)

Photo by C. E. Mohr

Fig. 26—Miniature grotto in Boyer No. 1 Cave, Snyder County.

BOYER CAVE No. 2

[redacted] **Millerstown Quadrangle**

In the same ridge as Boyer Cave No. 1 but 4 quarries or 400 yards farther west, with the original entrance quarried away; when 25 more feet of the quarry face is removed, the main part of the cave, 125 feet deep, will be exposed. To enter in 1951 it was necessary to climb up talus 20 feet above the quarry floor to a level passage 30 feet long that leads to the main part of the cave. Because of the steep slopes on the joint and on the bedding explorers need a rope in places, and also for the vertical drop into lower rooms. Traversing this cave is like working along two sides of a steep roof. The tapering end about 150 feet in a straight line from the entrance is more than 100 feet lower. Pits lead to passages at still lower levels. There are many stalactites, stalagmites, calcite beads, and much flowstone that will be destroyed as quarrying progresses. Two other caves are reported in Lime Ridge. (Devitt)

FREEBURG CAVE

[redacted] **Sunbury Quadrangle**

Half a mile southeast of Freeburg and the same distance east of Route 35 there are several small quarries in Helderberg limestone along an abandoned road that served them. At the west end of one of these small quarries an underground passage about 3 feet wide and 10 feet high winds southwest about 40 feet to where an unexplored crawlway several feet above the floor continues in the same direction. Only thin flowstone was seen. (Devitt)

HAAS CAVE

[redacted] **Millerstown Quadrangle**

Halfway between Mount Pleasant Mills and Richfield on the ridge south of Route 35 there is an old lime kiln and quarry on the land of F. H. Mengle, adjacent to the Albert Shellenberger farm. In this quarry two holes a few feet apart and just large enough for a man to crawl into give access to a cave in the nearly flat-lying Helderberg limestone. Mr. Mengle lives on the north side of the road nearby.

The left or east passage is nowhere over 3 feet wide or 5 feet high and either closes or is choked with dirt about 25 feet from the entrance. The west passage descends over a pile of dirt washed in from the surface and about 25 feet from the quarry face the roof is 15 feet above a nearly level floor. Shortly the roof descends to 8 feet and continues more than head-high nearly to the end of the passage. This channel is 4 to 5 feet wide and 100 feet long. The floor of the inner half rises to the end, where the channel in the limestone appears to be closed by dirt washed in through a hole in the roof.

McCLURE CAVE

[redacted] **Mifflintown Quadrangle**

The cave is in a quarry in Helderberg limestone between the edge of town and U. S. highway 522. The entrance is an inconspicuous hole 2 by 3 feet halfway up the quarry face, reached by a footpath. This small opening leads down slope to a room about 100 by 100 feet with a ceiling up to 30 feet high. All speleothems are confined to this room. These include one large stalagmite near its center, others on the north and south margin, abundant flowstone, and "soda-straw" stalactites lining a low passage at the west side of the room. The floor slopes away from the entrance, at 30° on the north side. Ancient breakdown covers the floor of this room.

From the entrance to the far end of the cave in a straight line is 630 feet, but the somewhat crooked course of the main passage in a westerly direction measures more than 700 feet. Its height ranges from 2 to 8 feet and averages about 5 feet. Four small passages on the south side are at a higher level. Two on the north at a lower level are intermittently partly flooded with water 1 to 4 feet deep, flowing slowly westward. This large branch is about 350 feet long and the total length of all passages is 1650 feet. The passages have smooth walls and are floored with 1½ feet of orange-colored clay.

Photo by C. E. Mohr

Fig. 27—Prominent stalagmite in Main Room, McClure Cave, Snyder County.

Heaps of flaky particles of calcium carbonate resembling isinglass lie in the dry water channels. Helictites have formed along the walls of some passages and fossil shells can be seen protruding from the ceiling in several places. (Devitt, Smeltzer)

PAXTONVILLE CAVE

[redacted] **Mifflinburg Quadrangle**

At the road fork 1½ miles west of Paxtonville there is a limestone quarry and crusher operated by National Limestone Quarry, Middleburg. About 50 yards north of the road fork and 150 yards east of the quarry a hole about four feet square at the base of the limestone bluff gives entrance to a passage 2 feet wide and 3 feet high leading steeply down to a small room almost high enough to stand in. Slab breakdown hides any possible continuation.

The so-called cave in Crosscut Ridge south of Paxtonville is old iron ore working. (Devitt)

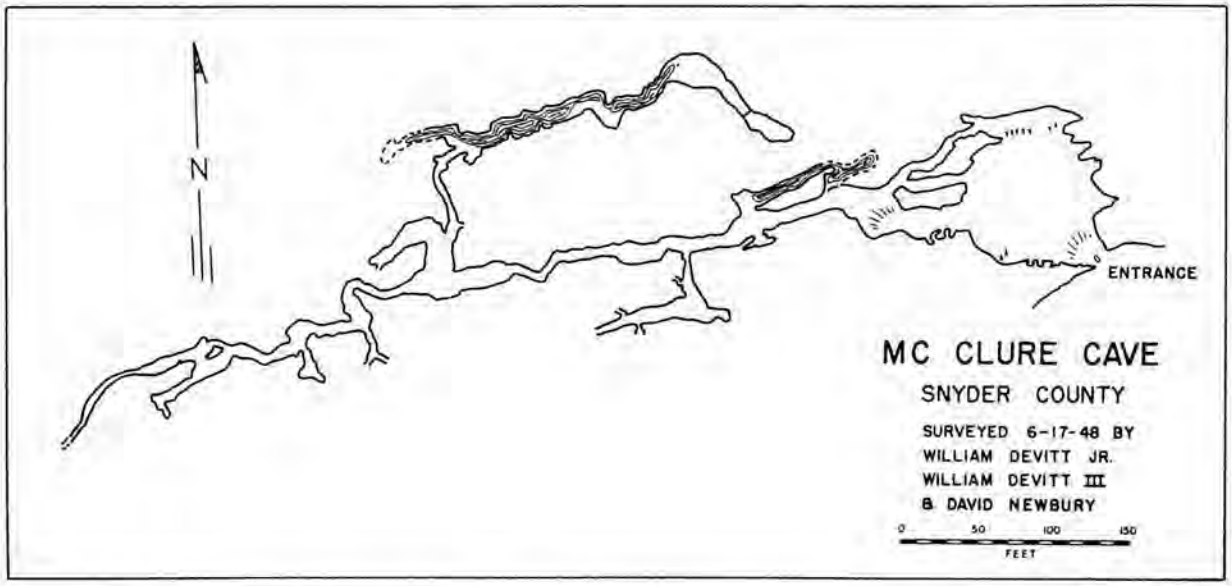
fallen from the ledge. That was years ago. This location is yet to be investigated by N.S.S. members. The geologic map indicates this cave may be in the Kittanning sandstone. If so, it should be a fissure on a joint.

SHAFER RUN CAVE

[redacted] **Somerset Quadrangle**

A cave on Shafer Run in Jefferson Township 9 miles northwest of Somerset was visited by A. B. Cleaves, R. M. Tomb, and J. M. Gorman, geologists on the Pennsylvania Turnpike Commission in July 1938 and explored and mapped March 24, 1939. It is 2.8 miles NNW. of Bakersville on the Shaulis Mountain Farm.

The cave is reached by [redacted] The cave is S. 60°



SOMERSET COUNTY

BREASTWORK CAVE

[redacted] **Windber Quadrangle**

Dr. Felix Robinson, Oakland, W. Va., has in his possession a scrapbook made by William Henry Welfrey of Somerset many years ago that contains a clipping from the Johnstown Tribune headed BREASTWORK FARM.

According to this story there is a 25-foot waterfall on Oven Run about 3¼ miles east of Stoyestown. This would be near Breastwork shown on the topographic map. About ¼ mile south of the waterfall is a 40-foot ledge high above the ruins of a grist mill. Here is a cave said to be about 300 feet deep, but the mouth is almost closed by boulders

W. 500 feet from the beech tree and 30 feet above road level in a Loyalhanna limestone ledge 8 feet high and 20 feet long.

The cave consists of narrow, roughly parallel passages along joints that trend N.25°-48°W. The passages are one to 10 feet wide, 2½ to 10 feet high, and cover a linear distance of approximately 1,100 feet. One straight passage is 750 feet long. Several passages have dead ends apparently blocked by caved material and clayey sand. Movement of ground water, now an underground stream, seems to have been the major factor in the origin and development of the cave. The stream, which is 2 to 4 inches deep and 1 to 2 feet wide, flows along the entire length of the main passage. Stalactites and stalagmites are lacking.

See Penna. Acad. Sci. Proc., vol. XIII, pp. 150-152, 1939 and Mo. Bull. Penna. Dept. Internal Affairs, vol. 10, no. 4, p. 15, March 1942

UNION COUNTY

BLUE HILL CAVE

[redacted] **Sunbury Quadrangle**

In the extreme southeast tip of Union Township, on the gently sloping side of Blue Hill, on the west bank of Susquehanna River almost opposite the bridge over West Branch at Northampton, a small cave is in an area mapped as Catskill formation of Devonian age. The 3 by 4-foot entrance slopes in and down for about 25 feet. Further exploration was stopped by a foot of water at the back. Indians are supposed to have used this cave as a shelter.

Another cave at railroad level is almost directly below. (Devitt)

DALES CAVE

[redacted] **Sunbury Quadrangle**

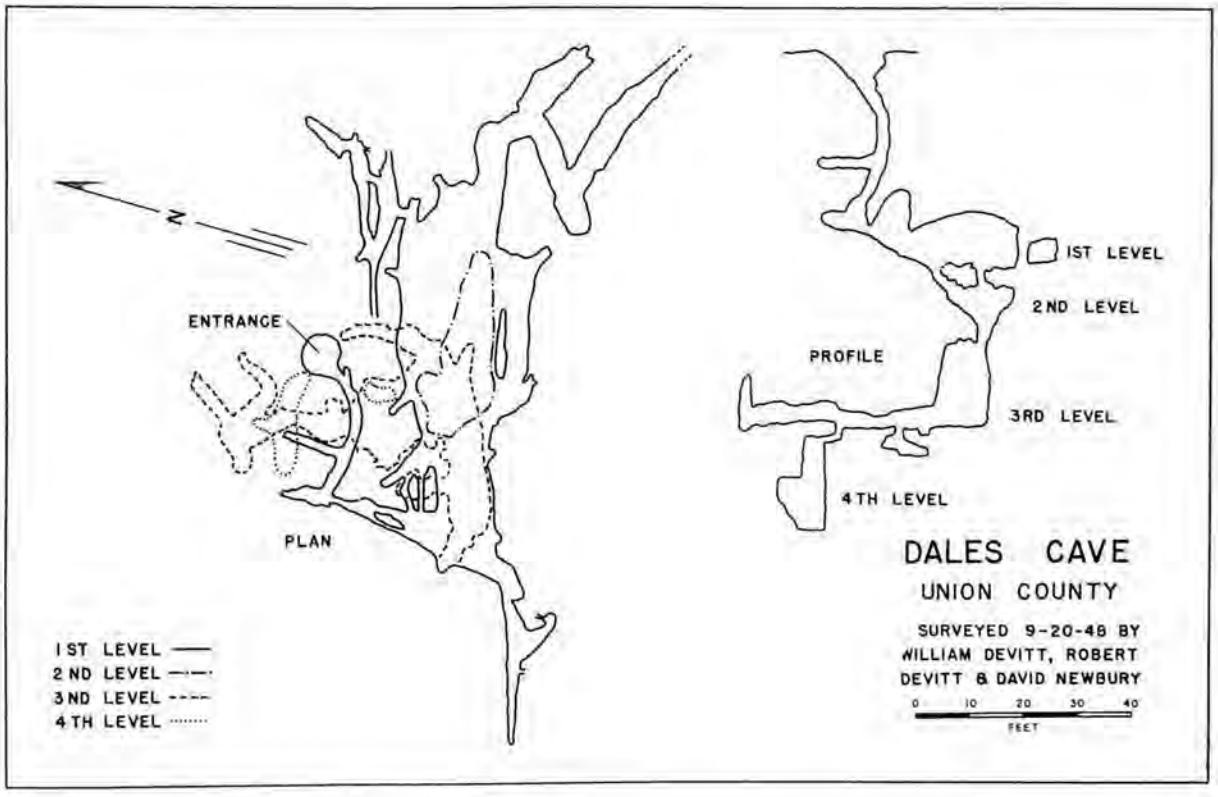
Dales Cave, named after the ridge on which it is located, is 3 miles WNW. of Lewisburg on the Bower farm. It is near [redacted]

This cave is in flat-lying Helderberg limestone. The entrance is in the bottom of a small sink hole and goes down very steeply N.15°W. for 25 feet where a narrow intersecting passage goes 20 feet to the right. As the angle of descent is 50° or more and there are vertical drops of 5 to 7 feet, a rope is desirable. Down the slope 32 feet the passage turns left and continues to descend. Most of the wall rock is lined with flowstone, some of which is dripping. Eight feet over from this point, which is 32 feet below the entrance, is an oval room 4 to 5 feet wide and about 20 feet high, the walls of which are covered with "live" dripstone. The cave continues through a narrow 8-foot tunnel into a room 25 feet long having a 15-foot ceiling, with crevices going much higher.

A deep, irregular hole 8 feet across and 15 feet long is in the floor. Turning left at a 6-inch column takes one into the main part of the cave that extends east 100 feet as an irregular room 30 feet across and 10 feet high. Two passages on the far side, one lower than 3 feet and the other a high fissure, both terminate in clay fills after 40 feet. By carefully crawling around the deep pit on a narrow ledge one gains access to another winding passage. This 3 by 4-foot tunnel ends in a room 8 feet across.

Beyond the 12-foot drop by rope, the cave goes N.20°E. to a dome pit 20 feet high and 8 feet across. From here two 5-foot drops lead down to an irregular floor that is the last major level of the cave. A small pool 2 feet deep midway along the north wall is formed by drippage. A rotten wooden ladder and 70-year-old dates scratched on rocks in the large room above, indicate that the cave was well known long ago. Doubtless it has been visited by hundreds of students from Bucknell University.

Although the walls of this last passage have chert fragments and siliceous fossils weathered out



in relief, they are generally smooth limestone. Some potholes along the sides are filled with clay 4 feet thick. A fissure about 18 inches wide and 10 feet high is filled with varved clay.

In August 1949 Devitt dug through the north side of the bottom level about 25 feet from the end and broke into a new passage 50 feet long with several short side passages, one with a 6-foot pool of water 1 foot deep. Rimstone pools are nearly filled with a coral-like formation. By enlarging an impassable crawlway Devitt reached the top of a 22-foot wall, roped to the bottom, and found a room 10 feet wide and 20 feet high. A few short passages off from this room all end in clay fill, one probably connecting with the lowest point of the major level above. (Barnsley, Devitt)

MIFFLINBURG CAVES

REDACTED **Mifflinburg Quadrangle**

Two caves have been disclosed in a Helderberg limestone quarry about three blocks south of the west end of Middleburg. One has been temporarily blasted shut (1951) and the other is a 100-foot walkable winding passage in the northeast side of the quarry. (Devitt)

WINFIELD CAVE

REDACTED **Sunbury Quadrangle**

In a big quarry developed along the strike of the Helderberg limestone half a mile south of Winfield, several cavities have been found in the south or hanging wall side, where a cavernous bed parallels the long face of the quarry. The beds strike N.80°E. and dip S.45°.

At the east end of the quarry near the kilns, a small hole leads into a straight cavern with two parallel passages. Both passages are so small that one must stoop and in places crawl. About 200 feet from the entrance the passages are so constricted that further progress would be difficult. Dripstone is abundant in both passages. It is reported that boys have forced their way through and come out in a room which was broken into 400 feet west along the quarry face.

This room is about 40 feet long and 12 feet high with crevices along the strike of the beds at both ends that are just too small for a man to wriggle through. The south side of this room is a dip slope and its base is 35 feet from the breakthrough in the quarry wall.

About 100 yards farther west in the quarry is another and larger entrance into a room in the same cavernous beds, and 50 yards farther west a hole higher in the quarry gives access to a small room.

It is noticeable that calcite veins are more abundant in the limestone at or over these three openings. They probably fill fractures and these lines of weakness may be the explanation of the rooms at these points.

OTHER CAVES

On the west side of West Branch half way between Lewisburg and Winfield, or 1.5 miles south of Bucknell University, there is a small cave about 25 feet above the railroad. It is in fractured, 2-inch layers of flat-lying limestone, of Devonian age, possibly Tonoloway, and consists of a gallery 27 feet long and parallel to and 6 feet in from the cliff face. Five holes that let in light qualify this as a rock house or rock shelter rather than a cave.

Another cave is reported near. (Devitt)

WESTMORELAND COUNTY

BEAR CAVE

REDACTED **New Florence Quadrangle**

Bear Cave is on the west flank of Chestnut Ridge about 1½ miles east of Hillside and may be reached by following a blazed and well-worn trail from the quarry above Hillside, or an old lumber road up to a ledge of cross-bedded siliceous limestone known locally as bluestone and to geologists

Photo by R. Ruffing

Fig. 28—Entrance to Bear Cave, Westmoreland County.

as Loyalhanna limestone. The limestone dips north 15° and the cave is developed along several parallel main joints and minor cross joints, and along bedding planes. One large hole and two small ones lead into the cave. In wet weather a small stream enters one of the small holes. This cave has long been known to local people and is a favorite goal for hikers.

In 1936 the cave was mapped by Mr. and Mrs. R. J. Brahm, R. J. Merten, and W. Remoinger. This map shows a maze of about 4000 feet of narrow passages and a few rooms. Many of the principal courses are west of north and the far end is about 750 feet almost due north of the entrance. One could get lost, even with a map in hand. It was mapped again in 1945 by members of the Pittsburgh Grotto.

The cave contains a meagre amount of flowstone; stalactites and stalagmites occur in one of the left passages 300 feet from the entrance. A waterfall 6 feet high and 4 feet wide flows over white calcite near the far end. The cave ends 80 feet beyond the fall where water and ceiling meet.

Long-tailed salamanders have been seen about 600 feet in from the entrance and the nest of a cave rat.

The entrance to the cave is said to be on State land and is open at all times. (Stone, Hoffmaster)

CON CAVE

[redacted] **New Florence Quadrangle**

Con Cave was discovered in the spring of 1950 by Hoffmaster and Matanin in the Loyalhanna limestone quarry on [redacted] Its name is for its position in the concave face of the quarry. It is located 25 feet above the floor of the Hillside Quarry. The entrance is under a rock block and is about 2½ feet in diameter, irregular in shape.

The crawl from the entrance is level over large rocks for 19 feet. Then one must chimney down 14 feet to the almost level floor of an inward sloping hall about 25 feet high and 2 feet wide. Forty feet from this drop is located a large rock with small stalagmites on its surface. The narrow passage continues for 57 feet to a breakdown where one must work around several large rocks and drop 6 feet to a lower level.

Small dry rimstone pools are found in the narrow passage past the drop. Speleothems and flowstone of all types are found at the end of the straight passage. The passage makes a sharp 10-foot offset to the left then continues to a room 65 feet beyond. The room is about 10 by 15 feet and about 4 feet high, covered with small speleothems. A sharp right turn takes one through a narrow passage about 15 feet high. Water runs at certain times during the year in this section. About 5 feet beyond the speleothem room is the Rotunda Room, 15 feet in diameter with a ledge about 7 feet above the floor. A small hole at the top, 30 feet above the floor, can be reached by an upper passage.

After leaving the Rotunda Room by the only entrance, there is a 10-foot crawl in mud with about one foot clearance, leading to the second of the two main parallel passages. This passage is 150 feet long and contains flowstone and rimstone pools on the floor. About 100 feet up the gentle slope there are massive formations on the wall. This passage too, contains intermittent pools of water. At the end of the straight section it is necessary to walk around a large rock. This is the point for the 30-foot climb to the upper passage. The largest speleothem in the upper passage is a column 8 feet high and 2 feet in diameter. This section is filled with stalagmites and flowstone. The lower passage continues beyond the climb and contains 14 rimstone pools, some of which are 8 feet deep; all are about 3 feet in diameter. This leads to the end of the cave—a small crawlway that pinches out after about 15 feet. (Ruffing)

Photo by R. Ruffing

Fig. 29—Large stalagmite in Upper Passage, Con Cave, Westmoreland County.

COON CAVE

[redacted] **New Florence Quadrangle**

Coon Cave, so-named because frequented by racoons, is on the west side of the crest of Chestnut Ridge at an elevation of about 2300 feet. It is reached from the quarry above Hillside or by following up Bear Pond Hollow, 2½ miles south of Bolivar. It is in the Loyalhanna limestone.

The cave was discovered in September 1946 by Carl Huttenstine and William Cellich and reported to Dr. E. R. Eller, paleontologist, Carnegie Museum, Pittsburgh. It was explored by a Museum party, the story of the trip appearing in the **Pittsburgh Sun Telegraph**, October 19, 1946. The discoverers found no evidence that the cave had been entered previously by man.

The cave is developed along bedding planes for about one-half mile. The passages are mostly dry and walkable, ranging from 6 to 12 feet high and 2 to 8 feet wide. To enter one must crawl about 20 feet. There may be 1 to 2 feet of water in this entrance passage during wet weather as a small stream issues from the cave. About 200 feet from the entrance is the only large room, about 30 by 70 feet and 25 feet high. A passage extending 200 feet farther ends in breakdown.

A striking feature of Coon Cave is "bacon strips" ½ to 1 inch thick, 3 to 4 feet long, hanging 3 feet wide, and touching the floor in places. Some small speleothems can be seen 300 yards from the entrance.

Crayfish and salamanders have been found all along the stream, leopard frogs 200 feet from the entrance, crickets and moths. (Devitt, Hoffmaster, Ruffing)

Photo by R. Ruffing

Fig. 30—Main room, Coon Cave, Westmoreland County.

COPPERHEAD CAVE

[redacted] **New Florence Quadrangle**

This cave is found by [redacted]. The entrance is a 50-foot drop that requires good rigging.

The cave is one very long passage, about ¾ mile, with some branches. It is wet and muddy, with very little speleothems. A 15-foot drop about one-third of the way through the cave can be climbed without rope. A strong flow of air is observed in the tunnel 3 feet in diameter at the half-way point. This cave is in Loyalhanna limestone. (Ruffing)

EVAC CAVE

[redacted] **New Florence Quadrangle**

A cave discovered about 1950 near Coon Cave on Chestnut Ridge has been explored 125 feet. The passage in Loyalhanna limestone is 3 feet wide and about 50 feet high. (Hoffmaster)

GREENBRIER CAVE

[redacted] **Latrobe Quadrangle**

In the Loyalhanna gorge through Chestnut Ridge about ¾ mile upstream from Kingston there is a small cave in the Greenbrier limestone. The passage is straight, narrow, and low and could be followed back about 30 feet with a stream flowing through the entire length. The limestone is about 4 feet thick here and this is the only known Pennsylvania cave in this formation. (Edmund Taylor)

LEMON HOLE

[redacted] **New Florence Quadrangle**

Lemon Hole has been known for decades. The earliest date on the walls is 1876, yet it has been rarely visited until rediscovered by Harry R. Horne, Roger W. Hager, Dr. Ronald J. Hagatus, and John R. Ross of the Johnstown Whitehall Lunch Club in August 1952 and reported by them to the National Speleological Society. The Pittsburgh Grotto visited it November 9, 1952 and the Cleveland Grotto in 1953.

This cave on the old Lemon estate may be reached [redacted]

The cave has about ½ mile of passages. In most places the floor is covered with mud or wet gravel. Two parallel passages make up the cave. The lower passage is entered through a 30-foot drop that may be climbed without a rope. With the possible exception of Con Cave, Lemon Hole has the most visible flowstone of caves in the area. It is in the Loyalhanna limestone. (Dunn, Ruffing, Yoe)

LOYALHANNA CAVES

[redacted] **Latrobe Quadrangle**

Near the downstream edge of an abandoned quarry ¾ mile upstream from Kingstown is a rock crevice that is reported to be the entrance to a large cave. It is filled with washed-in earth and an attempt by the Pittsburgh Grotto to dig in was unsuccessful. (Taylor)

[redacted] **Latrobe Quadrangle**

On Chestnut Ridge ¼ mile from the bridge at Kingston and above the dam at Loyalhanna Gorge, there is a cave in a small abandoned quarry in Loyalhanna limestone. The cave is about 100 feet long and is traversed mostly by stooping and crawling. A stream emerges from it. The fossiliferous Greenbrier limestone is overhead. (Hoffmaster)

RATTLESNAKE CAVE

[redacted] **New Florence Quadrangle**

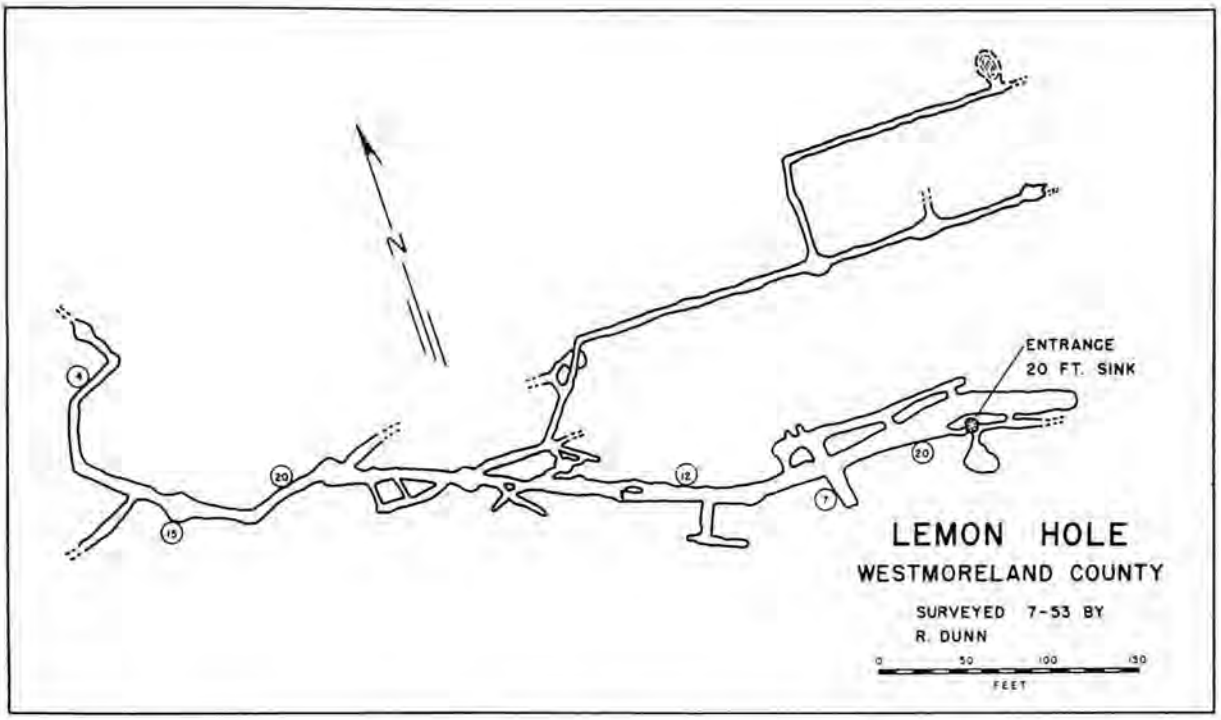
As described by James Beard in 1942—To reach Rattlesnake Cave, [redacted] Known also as "Rattlesnake Den", the sink drops 35 feet; to the right a passage goes 40 feet to an 8-foot drop, then drops 12 feet to the end, where there is a deer skeleton.

This description seems to locate the cave east of Hillside between the Bear Cave and Con Cave and the quarry.

RUDDER CAVE

[redacted] **New Florence Quadrangle**

On the Mellon property, [redacted], and



about 10 miles west of Johnstown, there is a sandstone cave consisting of large interconnecting joints in the rock. Total length of passages perhaps 100 feet. (Edmund Taylor)

TORRANCE CAVE

[redacted] **New Florence Quadrangle**

This cave may be reached by following the road from Torrance toward the river. The cave entrance is in the quarry face that overlooks Packsaddle. The cave is one room about 20 feet in diameter, with a dirt floor. (Ruffing)

YORK COUNTY

BOOTLEGGER SINK

[redacted] **Middletown Quadrangle**

[redacted] is the entrance to a cave that is reputed to have been the rendevous of bootleggers years ago. A 30-foot ladder is needed since the drop is a vertical one. The cave is in Vintage dolomite of Cambrian age. Below the shaft into the main chamber is a large pile of debris, including several dead calves, in 1951. Three short passages run east and larger rooms are supposed to be west of the main chamber but a stream has choked the passage.

A large accumulation of bones, partially cemented together, can be seen in the ceiling of one passage, nearly below the entrance. They have been estimated to be several hundred years old, but are definitely not prehistoric. The deposit evidently represents a water-mixed accumulation of bones and clay, partly consolidated, and later undercut by flood waters. On the floor of several small passages are snail shells and small mammal bones, with thin coatings of travertine. (Smeltzer, Mohr)

CRYSTAL PIT CAVE

[redacted] **McCalls Ferry Quadrangle**

[redacted] there is a cave close by the road in Conestoga (?) limestone of Ordovician age. The entrance is a low crawlway. There is one irregular room 40 feet long and 6 feet high, with much fallen rock. About 25 feet from the entrance a passage leads south 10 feet to a large pool. The cave has delicate crystals and bead formation. Spiders and centipedes, a weasel, and a little brown bat have been seen here. (Smeltzer)

EAST YORK CAVE

[redacted] **York Quadrangle**

Behind the Glen Gery Shale Brick Corporation plant at the east end of Boundary Avenue 1.4 miles southeast of the square in York are two small openings in the contorted Conestoga limestone. They are connecting crawlways little over 40 feet long. The beds at the entrance dip 75° E. (Smeltzer)

EMIG CAVE

[redacted] **Middletown Quadrangle**

[redacted] in Vintage dolomite of Cambrian age, a small entrance gives access to

Photo by C. E. Mohr

Fig. 31—Fossils of recent age have been found in Bootlegger Sink, York County, which can be entered only by rope or ladder.

a low passage 50 feet long, 10 feet wide, and 4 to 5 feet high. A squeeze leads to a pool of water. This is a pretty little cave. (Smeltzer)

LISBURN CAVE

[redacted] **New Cumberland Quadrangle**

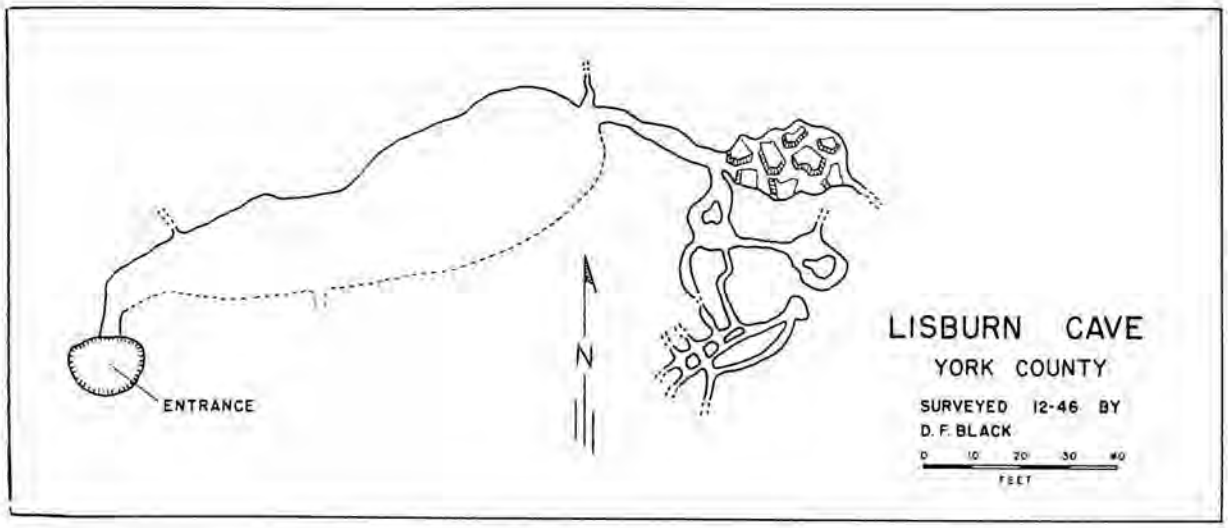
Lisburn, an old settlement in the big bend of Yellow Breeches Creek is in Cumberland County, but this cave is on the York County side of the creek. It is about [redacted].

Lisburn is in an area of Triassic sediments containing limestone conglomerate. The cave is in this conglomerate where it strikes EW. and dips N. 20°. The entrance is about 10 feet wide and 2 to 3 feet high. It is on land owned in 1952 by Levi Hoffman, Lisburn, whose address is Mechanicsburg, R. D. 3.

In January 1941, Don F. Black and three companions from Camp Hill, explored and mapped this cave. According to their map, about 25 feet from the entrance the low passage about 10 feet wide bends to the right or northeast and continues in a nearly straight course for 200 feet. It widens to 20 feet or more but the ceiling is only 1 to 4 feet high until a room is reached at about 200 feet. This room is about 40 feet across and 10 to 12 feet high, and contains white dripstone. Beyond this room a passage several feet wide but only 2 to 3 feet high turns right or southeast for 50 feet and then south. At this turn a room about 25 by 50 feet and 5 to 15 feet high and extending east is partly filled with huge fallen blocks. The southern extension is a maze of small passages from a few inches to 3 feet high. To map this maze, Black had to squeeze through a slot only 8 inches high.

Black saw fox tracks about 50 and 250 feet from the entrance. The writer was told that a dog chased a fox into this cave and came out on the bank of Yellow Breeches Creek, where there are said to be two openings, one above and one below a bridge.

Lisburn Cave has about 700 feet of passages, not counting several crevices too small to enter. In a straight line, the farthest point is about 300 feet from the entrance.



NORTH YORK CAVE

[redacted] **York Quadrangle**

The cave is located in a small limestone quarry alongside of highway 111 from York to Harrisburg one mile from North York. The cave entrance is in the southwest corner of the quarry, is quite small, and is partially blocked by a heap of rock debris and clay. A passage 20 feet long and 10 feet wide with a roof 2 feet high leads south into the main chamber of the cave which is 50 feet by 40 feet and 7 feet high. About 3 feet below the roof, remnants of a once continuous layer of travertine, in places deposited on clay which was subsequently removed, protruded from the walls and bridges some of the narrow places in the cave. In places this travertine deposit is 18 inches thick. Many blocks of the travertine are lying on the cave floor or partially blocking passages.

Several stalagmites have been removed by previous visitors. (Hickok)

Old farmers in the neighborhood claim a large chamber underlies the main room and contains lots of formations. During dry seasons, they said, it was possible to descend through a hole which now is permanently full of water. It was formerly entered by descending a hole where a pool is at left of the main intersection. (Smeltzer)

WILLIAMS GROVE CAVE

[redacted] **Carlisle Quadrangle**

In the abandoned Williams Grove quarry in Tomstown dolomite 2½ miles north of Dillsburg, beside the Reading Railway tracks, is a dry and dusty cave. It is a narrow passage along a joint parallel with the quarry face. It is about 70 feet long, 5 to 10 feet high, and 20 to 30 inches wide. The smoothly rounded walls have thin, sharp, projecting quartz veins. There is no dripstone.

In the opposite side of the quarry, directly in line with this fissure, an opening 3 feet high leads into a low passage dipping downward for about 30 feet. **This passage is dangerous because of a shattered ceiling.** (Smeltzer)

YELLOW BREECHES CAVE

[redacted] **New Cumberland Quadrangle**

North of Lisburn [redacted]. The fissure is high, but only at the bottom is it large enough for one to crawl through.

Higher on the hill and a little farther south is a rock shelter with arched opening 3 feet high and 10 feet wide. The shelter is about 12 feet deep and at the back is 5 feet high and 20 feet wide. (Smeltzer)

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Who's Who in Bulletin Fifteen

WILLIAM E. DAVIES, Vice-President for Research of the National Speleological Society, is a geologist for the United States Geological Survey. In 1939-40 he explored numerous Pennsylvania caves while engaged in field work for the Pennsylvania Geologic and Topographic Survey. His present speleological interest is a study of the stratigraphy and composition of earth fills in caverns. He is author of two important contributions to speleological literature *Caverns of West Virginia,* published by the West Virginia Geological Survey and *The Caves of Maryland,* published by the Maryland Department of Geology, Mines and Water Resources.

WILLIAM DEVITT, III, directed mapping of over 40 central Pennsylvania caves and the gathering of much new information for this issue of *The American Caver.* In the summer of 1951 he assisted Dr. Ralph W. Stone and Bernard Smeltzer in field-checking descriptions of caves previously reported in the former's state-published Bulletin G-3 of the Pennsylvania Geological Survey. Upon entering Pennsylvania State College he joined forces with a group of independent cavers led by Dr. Stuart W. Frost at that institution resulting in reactivation of the 3-year dormant Nittany Grotto of the National Speleological Society, serving as President for two years. In October, 1952, Devitt was appointed to the Grottoes Committee of the NSS responsible for activity in New England, New York, New Jersey and Pennsylvania.

S. W. FROST, a member of The National Speleological Society for nearly 15 years, is Professor of Entomology at Pennsylvania State College and has been teaching and conducting research for 36 years. He received his doctorate from Cornell University where he taught for a time. Travel and insect collection in Canada and in Central and South America resulted in publication of three books, a college text *General Entomology,* a children's work *Ancient Artizans, the Wonders of the Insect World* and a technical publication entitled *Leaf-mining Insects.* He has visited nearly all the commercial and undeveloped caves of Pennsylvania and is a member of Nittany Grotto of the NSS, serving as advisor for it.

DONALD R. GRIFFIN has just returned to Harvard University as Professor of Zoology after seven years on the faculty of Cornell University. During that period his early interest in biospeleology revived. As an undergraduate and graduate student at Harvard (Ph.D., 1942) Griffin had attracted wide attention through his extensive bat banding activities and his discovery, with Robert Galambos, of the sensory basis of obstacle avoidance by bats. His studies on bats were followed by investigations into the sensory basis for bird navigation. At Cornell, accessibility to Aitkin Cave and its large bat population led to renewed studies on the acoustics of the ultrasonic cries of bats. An account of one of these trips appears in this bulletin.

JEROME M. LUDLOW, NSS Bulletin Editor, was connected with the Brookings Institution at Washington, D. C., when that economic and governmental research organization was founded. He spent two years with a Chicago firm of consultants in municipal administration and seven years as chief clerk and research assistant with the New Jersey Taxpayers Association before joining the U. S. Geological Survey in January, 1940. An invitation from Charles E. Mohr to participate in an NSS field trip in April, 1947 resulted in his gradual change from a somewhat normal individual to a speleoeditor.

CHARLES E. MOHR, President of the National Speleological Society, was born at Reading, Pa., June 3, 1907. He attended Bucknell University, receiving his A.B. from that Pennsylvania institution in 1930 and his A.M. in 1931. A few months after his first visit to his first cave (Woodward) in 1930 he captured a rare Leib's bat on a return visit. Thus began a study of cave fauna which included 5,000 miles of travel in Pennsylvania alone during his first winter out of college. Among his many contributions to speleology he contributed to Ralph W. Stone's second edition of "Pennsylvania Caves" (1932) by giving locations of 30 new caves and writing a chapter on cave fauna therein. He pioneered with Don Griffin on large scale bat banding projects and has published numerous papers on this subject and on cave fauna in general. He has written cave articles and supplied photographs for numerous publications including LIFE, ILLUSTRATED LONDON NEWS, NATURAL HISTORY, AUDUBON MAGAZINE and others. Mohr's literary contributions are based on a broad and firm basis of extensive exploration and upon keen observation and collecting in caves throughout the United States and Mexico.

JOHN DYAS PARKER, a malacologist, became interested in caves while a geology student at Rutgers University. His hobby of spelunking has been pursued on three continents. Recently returned with a scientific expedition from the Cayman Islands, B.W.I., he is now busy on a paper on the Karst and caves of Grand Cayman for the next issue of *The American Caver.* At present he works with marine snails, both fossil and living, under Dr. H. A. Pilsbry at the Academy of Natural Sciences of Philadelphia. He also teaches Geomorphology, Paleontology and Mineralogy for that institution. He is a Director of the National Speleological Society for the Midappalachian Region, Chairman of the N.S.S. Safety Committee, Chairman of the 1954 N.S.S. Convention, a charter member of the Philadelphia Grotto and has served in several capacities in the latter. In his free time he delights in spelunking with his wife and three children.

HENRY W. SHOEMAKER, Director of the Pennsylvania State Historical Commission, has been a lifelong student of the folklore of caves. He has achieved prominence as a diplomat, army officer, publisher, columnist, biographer, and historian. He was a member of the diplomatic service, 1903-05, served as U. S. Minister to Bulgaria 1930-33, and has been decorated by many foreign countries. He served with the General Staff of the U. S. Army in World War I and on numerous military and historical commissions. Dr. Shoemaker holds honorary degrees from Juniata and Franklin and Marshall Colleges and has been an officer of many historical and folklore societies. He served as President of the Pennsylvania Cave Men's Association and is still active in that organization.

RALPH W. STONE, life member and past president of the National Speleological Society, was a geologist for the United States Geological Survey from 1901-21 and was connected with the Pennsylvania Geological Survey from 1922-46, serving in many capacities including that of State Geologist. Special interest in caves was developed when in 1928 Pennsylvania State Geologist George H. Ashley asked him to prepare a report on that state's caves for publication as a bulletin of the Pennsylvania Geological Survey. The first and second editions of that publication (*Pennsylvania Caves,* Topographic and Geologic Survey, Bulletin G-3, 1932) described 35 and 85 caves, respectively —all that were known at that time. Since that publication appeared, and especially since the organization of the National Speleological Society, more than 250 caves are known to exist in the Keystone State, most of them described herein.

LIST OF MAPS

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ACKNOWLEDGMENTS

PRINCIPAL CREDIT for this issue of The American Caver is due to Dr. Ralph W. Stone, retired, former State Geologist of the Commonwealth of Pennsylvania and former President of the National Speleological Society, under whose supervision and direction this voluminous compilation of the descriptions and locations of 272 individual caves was accomplished. Without Dr. Stone's assistance, his extensive knowledge of the State, and his wide speleological experience, it is doubtful if the task could have been accomplished,—certainly not to the degree of accuracy we hope we have attained. The National Speleological Society will be forever indebted to him for the many hours of painstaking work he devoted to the preparation of this volume.

The authors of the special articles contained herein, William E. Davies, William Devitt III, Stuart W. Frost, Donald R. Griffin, Charles E. Mohr, John D. Parker, and Henry W. Shoemaker, have all, through their combined efforts, made this issue a valuable contribution to speleological literature.

So many individuals have contributed to the final product, however, that it would be impossible to name all of them. Some will never receive the acknowledgment due them because we do not have personal knowledge of their work but particular credit should be given to the members of the Philadelphia, Pittsburgh and Nittany Grottoes and, more specifically, to that of Bernard L. Smeltzer, all singled out by Dr. Stone for mention.

The large insert map of Pennsylvania showing cave locations, and the 44 individual cave maps were all drawn by Samuel L. Davis of Trenton, N.J. The latter were retraced and relettered from originals contributed by many persons to whom our sincere appreciation is hereby also formally acknowledged.

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