

BULLETIN

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BULLETIN
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NUMBER EIGHT

JULY, 1946

NOTES ON UNDEVELOPED CAVES OF VIRGINIA

By WM. M. MCGILL

(ASSISTANT STATE GEOLOGIST—VIRGINIA GEOLOGICAL SURVEY)

The following brief descriptions and notes on the location of undeveloped, and many of them unexplored, caves in the Appalachian Valley region of Virginia were compiled by the writer prior to 1935, some from personal observations and others from reports to him. Several of the caves herein referred to have since been explored, mapped, or studied in some detail by members of the Society, and others, heretofore unrecorded, have been reported or located. This partial listing, though somewhat out-of-date and prepared originally for the writer's sole use, is here offered as a guide and incentive to the continued study and more complete listing of caves (wherever they may be) by the Society and its members. The caves here listed are arranged by counties. As is well known to members of the Society, caves, sinks, sink-holes, and disappearing streams are of widespread occurrence throughout the limestone and dolomite areas of the Appalachian Valley region; and it would not be surprising if some caves of considerable extent and interest, possibly worthy of commercial development, were found as a result of further investigations and continuous explorations.

Alleghany County

N*NATURAL WELL CAVE.*—A large sink and cave are found along the southwest strike of the Helderberg limestone, just east of the Callison-Falling Spring road about one and three-fourths miles northeast of Natural Well, in Alleghany county. This cave has not been explored but probably is extensive along prominent joints in the limestone.

Other Caves.—No other important caves are now known in Alleghany county. Several large sink-holes, a few small sink-hole caves, and suddenly disappearing streams occur along Jackson River north of Covington as far as the Bath county line. The number of sinks, sink-holes, and sinking streams indicate that underground drainage channels extend northeast-southwest along soluble beds of limestone in the central and northeastern parts of the county. Some of these channels lead possibly to typical caves, as for example, from the large sink-hole half a mile southeast of Jenkin's Ford.

Augusta County

Burketown Caves.—West of the Lee Highway (U. S. 11) and on the slope of a small hill near Burketown, occurs a small cave which, according to local residents, is very interesting. Another cave has been recently reported from a hill on the east side of the highway near Burketown.

Gibson's Hole.—Four and a half miles southwest of Waynesboro, and about half a mile east of State Highway 12, from which it is accessible by a good dirt road, is Gibson's Hole. It is an irregularly shaped sink-hole, ranging from 30 to 50 feet across at the top and having a depth of from 60 to 75 feet. It was formed by the collapse of part of the roof of an underground channel through which a stream still flows. The stream in the exposed part of the channel is about 10 feet wide and is said, by local parties who have measured it, to be 25 feet deep. Persons who have explored the underground

channel claim that one can go 300 feet in it in a boat, and that the stream is deeper at the rear end of the channel where it ranges from 10 to 30 feet in width. An abandoned passage leads from the west side into the sink-hole at a height of about 12 to 15 feet above the stream. This old channel is choked or filled with broken blocks of limestone and travertine. A few slender stalactites are on the ceiling and small stalagmites occur in portions of the filled channel. It is claimed that a moderately thick and picturesque growth of stalactites is found along the roof and portions of the wall of the occupied stream channel, at a slight distance back from the sink-hole.

Madison's Cave.—The entrance to this cave is about 1,500 feet south of the entrance to Grand Caverns, on the east side of Cave Hill about 110 feet above South Fork of Shenandoah River. It is approximately 20 feet higher than the entrance to Grand Caverns. It is one of the oldest known caves in Virginia and is reported to have been the first opened to visitors. It is claimed that this cave was worked for saltpeter during the war of 1812. This cave is said to contain several spacious rooms, many chasm-like openings, and a number of narrow galleries, beyond which the main corridor leads down to a deep underground lake or stream. It is in the same belt of Conococheague limestone in which Grand Caverns occur.

There is another cave, known as *Madison's Cave*, the entrance to which is a few hundred feet north of the entrance to Grand Caverns. It appears to be connected with Grand Caverns; and although not generally accessible, possesses some interesting features, among which is an underground lake. This cave is reported to have been frequented by Bishop Madison after whom it is named. It also is in the Conococheague limestone.

Natural Chimney Caves.—About a mile north of Mount Solon on the east side of North River and in the same limestone hill from which the Cyclopean Towers rise to impressive heights are two small caves. These caves were most probably excavated by the same waters which carved out the massive pillars of stone. There is a natural tunnel through the base of one of the "chimneys" opposite the present hillside entrance to the partly explored cave, and it is probable that the cavern channel once extended through this tunnelled tower. Because of the small size of its opening, the other cave, which is about 100 feet east of the larger opening, has not been explored. It is possible that these two openings are from the same cave. Several large sinks and sink-holes occur in the vicinity of Natural Chimneys and Mount Solon. The Sapphire Blue Pool at Mount Solon is fed by an underground stream from a large sink-hole a short distance across the Mount Solon-Harrisonburg highway (Route 43).

Nininger's Cave.—This cave is about three miles west of Waynesboro and is on the Nininger estate, a short distance north of the Waynesboro-Staunton highway (U. S. 250). A small narrow opening leads through a partly exposed ledge of limestone to an underground channel of unknown extent. This cave has never been explored. About a quarter of a mile southeast of the cave entrance, just across the highway in an apple orchard, is a small sink-hole which may be connected with an underground channel from the cave on the hill. The sink-hole has been plugged so that it is now a cup-shaped depression about 30 feet in diameter and about 10 feet deep.

Other Caves.—Small caves and sink-holes are of common occurrence in most of Augusta county. Two small caves are reported to occur at the base of Mary Gray and Betsy Bell mountains near Staunton, and others are said to occur within short distances of them.

Bath County

Blowing Cave.—The entrance to this cave opens directly on to the Goshen-Millboro highway (Route 39), about 18 feet above Cowpasture River and about 10 miles northwest of Goshen. The cave is in the Helderberg limestone and was named from the blowing or whistling phenomenon which it has long exhibited. As far as explored, it consists of a small single passage free from stalactitic growths. A small underground spring of cool clear water occurs about 100 feet from the entrance. The blowing phenomenon is attributed to the change in air currents in the cave. In the summer, the air in the cave is cooler and denser than that outside and hence rushes out through the entrance; in cool weather, the cooler outside air rushes into the cave displacing the warmer air.

Bratton's Cave.—In the spring of 1929 a sink-hole was accidentally discovered on the Bratton farm about midway between Goshen and Millboro. A youth who was let down into the hole a few days after its discovery reported that three small passages led from it into the surrounding limestone. This sink-hole has since been filled by the owners.

Clark's Cave.—An unexplored cave of unknown size occurs near McClung on the farm of Mr. W. G. Clark. It is said that this cave is very interesting and contains some pretty travertine deposits. It is in Helderberg limestone.

Healing Springs Cave.—A cave of undetermined extent occurs on the property of Mr. Reed near Healing Springs. Recent attempts to explore this cave were abandoned because of its being filled with water. Indications suggest, however, that it is a cavern of moderate size.

Hot Springs Cave.—This cave near Hot Springs is reported to consist of five branching corridors, each having a large room at its end. It is said that from each of these large rooms openings lead to deeper channels and other large rooms. This cave was described by Hovey in 1882, and was said by him to have been previously described by Nicklin ("Perigrine Prolix") in his "Letters on Virginia," in 1834.

Withrow's Cave.—An unexplored cave occurs on the farm of Mr. Free Withrow, about four miles from Millboro on the Goshen-Warm Springs Highway (Route 39). It is claimed that this cave has been known locally for a long time and that many people have visited it. It is said to have three separate entrances, to contain several rooms, and to be very interesting.

Other Caves.—About three miles west of Healing Springs and between one and one and one-half miles south of Callison are two unexplored caves, one on either side of the Callison-Falling Spring road (Route 268). Entrance to both caves is through small sink-holes which lead into solution channels along joints in the Helderberg limestone. Considerable surface drainage at times enters these caves, as is shown by the debris at the cave mouths. It is probable that this belt of soluble limestone contains extensive underground channels. There is a small cave on the southwest end of Piney Mountain, about one and one-half miles east of Warm Springs. Two small caves are reported to occur in the Helderberg limestone east of McClung Ridge along Thompson Creek a short distance east of Bath Alum Springs. Another is reported near Dunns on the Warm Springs-Hot Springs road (U. S. 220), and two more unexplored caves are said to occur along Back Creek about two and three miles southwest and northwest, respectively, of Cowardin, one being on Boler Mountain and the other on Back Creek Mountain.

Botetourt County

Murder Hole Cave.—About five miles northeast of Catawba Sanatorium, on the east side of the Catawba-Fincastle road (Route 114), near the crest of Little Ridge, is Murder Hole Cave. It is a sink-hole cave approximately 50 feet in diameter and more than 250 feet deep. It is reported that several channels lead from the shaftlike hole to passages of unknown extent under Little Ridge, and that the partly explored rooms contain interesting groups of stalactites. This cave is in the Conococheague formation according to Woodward,¹ who states that the belt of the Elbrook and Conococheague formations north of Roanoke is marked by numerous sinks.

The huge, vertical well-like entry to this underground

¹Woodward, H. P., The geology and mineral resources of the Roanoke area, Virginia: Virginia Geol. Survey Bull. 34, p. 150, 1932.

passage is on the crest of Little Ridge, and the suddenness with which one finds himself at this gaping hole is awe-inspiring. Considerable legend is associated with this cave and several weird stories of its discovery and history are related by the older residents of the area. It is claimed that many people visit this cave annually.

Other Caves.—A few smaller sink-hole caves and other cavernous channels of unexplored extent have been reported to occur in the vicinity of Tinker, Haymakertown, and at other places to the north along Catawba Creek.

Clarke County

Thurman's Cave.—An unexplored cave, claimed to be of local historic interest, is reported on the property of E. R. Thurman. No other data are available on this cave and no others have as yet been reported from this county.

Floyd County

Thompson's Cave.—This cave is about four miles southeast of Snowville and about 12 miles southwest of Christiansburg, near the Pulaski-Floyd-Montgomery county boundary. There are two entrances, one on either side of Little River about two miles from the mouth of Indian Creek. It is a small cave known only by local residents. It is said to be worth visiting.

Frederick County

Bean's Cave.—This cave is about 12 miles directly west of Winchester, on the farm of Mr. Joseph F. Bean. This property has been in the Bean family for more than 125 years. It is one of the oldest known caves in Virginia and one regarding which several interesting legends are told. It is claimed that Thomas Jefferson visited this cave in 1780. According to local reports, this cave has never been fully explored. It is said to consist of several rooms connected by a series of picturesque passages. Stalactitic and stalagmitic deposits of much beauty are said to be found in several rooms of this cave, and a mineral spring is reported to occur near it.

McLeod's Cave.—A cavern was accidentally discovered on the McLeod Farm near Stephens City, by Mr. E. J. Hiser while plowing for corn on January 23, 1932. The two horses with which Mr. Hiser was plowing suddenly sank and disappeared through a sink-hole. One horse was recovered. It was planned to fully explore the underground passages thus discovered to determine if a cave of commercial possibilities exists.

Giles County

Sinking Creek Cave.—About a quarter of a mile north of the Pearisburg-Blacksburg Highway (Route 8), and a short distance from the road leading from Lone Eagle store to Mountain Lake, is a small cave. The cave extends through a spur ridge of Johns Creek Mountain northeast of Sinking Creek. It is in Stones River limestone.

Other Caves.—A few small sink-hole caves have been reported from the limestone hills along New River and Sinking Creek, from Narrows to Pembroke, but none of them have been explored except by a few local people. Sink-holes are of frequent occurrence throughout Sinking Creek and Johns Creek valleys, from Pearisburg and Pembroke, Giles county, to Newcastle, Craig county.

Highland County

Pinckney Cave.—There is a small cave on the west slope of a small hill about a mile south of Pinckney, along Jackson River, east of the road from Pinckney to Wilsonville. This cave has not been fully explored but is reported to consist of a channel excavated along the strike of the Helderberg limestone in a northeasterly direction.

Other Caves.—Two small unexplored caves occur on the southwest slope of Bullpasture Mountain along Bullpasture River, about two miles south of Poverty. These are also in Helderberg limestone.

Lee County

Sand Cave.—Near the crest of the southeast end of Cumberland Mountain, northeast of Cumberland Gap, and west of Rose Hill, is a small cave which is said to be visited annually by numerous tourists. A large number of different colored sands are reported to occur in the cave, from which the cave derives its name. The cave is in Mississippian limestone (probably St. Louis?).

Montgomery County

Erhart's Cave.—Within a short distance of Radford, a small cave occurs on the Erhart property. It is known to several local residents.

Other Caves.—Several small caves have been reported to occur along New River, in the vicinity of East Radford. One of unexplored extent, known locally as Adams Cave, is on McConnells Run on the Adams place, east of New River.

Page County

Hitt's Cave.—This is a small cave known locally to the few people who have partly explored it. It is near Newport, in the Cub Run district.

Kaiser's Cave.—This small cave about eight miles north of Luray consists of a narrow low passage not more than 25 feet long, which leads into a room about 35 feet long. It is reported that in the large room was found an Indian grave containing 12 skeletons.² Several of the skulls and bones were said to be covered with dripstone.

Lauler's and Count's Caves.—Lauler's Cave is about half a mile long and has two entrances. One entrance is about two miles north of Luray, near South Fork of Shenandoah River. About half a mile to the north is Count's Cave, another small cave.

Robert's Cave.—This is a small cave about eight miles north of Luray. It is near Kaiser's Cave and its existence has been known for many years. It was described by Hovey when he visited Luray Caverns in 1882.

Patrick County

Sheep House Cave.—There is a small cave on Sim's Summit, within a mile or so of Bursted Rock and about two miles from the "Saw Teeth" bends of Dan River. Its name was derived from the fact that sheepherders once used it to protect their flocks from deep snows.

Pulaski County

Bullard's Cave.—The entrance to this cave is approximately 25 feet above Little River, about half a mile south-east of Snowville. The cave has never been fully explored and knowledge of its existence is limited chiefly to local residents. It is in the Shady dolomite.

Pulaski Cave.—In the face of a bluff overlooking a branch of Peak Creek, a tributary to New River, a short distance east of Pulaski, is a small cave which, extending through a small hill, has two entrances. The narrow entrances open into a fair-sized room containing several pretty groups of stalactites and a small crystal-clear spring. It is claimed that this cave was used as a retreat for soldiers and others during the War between the States. Many of the names and initials carved and burnt on the walls are said to have been inscribed before "war days." It is reported that an interesting ebbing and flowing spring occurs within half a mile of the cave.

Roanoke County

Bushong's Cave.—A small unexplored cave is reported to occur on the Bushong property along the Hollins-Salem Highway (Route 117), three miles west of Hollins.

Goodwin's Cave.—There is a small cave on the old Goodwin property near Glenvar (U. S. 11), about three miles northeast of Dixie Caverns. It is said to contain stalactitic and stalagmitic formations of much beauty.

Moomaw's Cave.—This cave is on the property of Mr. John Moomaw, on the south side of Lick Creek Valley a short distance west of Moomaw Springs. It is just outside the Roanoke city limits near the intersection of Lafayette Boulevard and the County road. It is in the Elbrook dolomite.

Other Caves.—Several small caves have been reported to occur along Roanoke River in the vicinity of Dixie Caverns. One along the Virginian Railway and near the river is said, by the local residents who have visited it, to contain no travertine deposits.

Another cave occurs at Cave Springs, about seven miles southeast of Salem.

²Hovey, H. C., *Celebrated American Caverns*, p. 161, Cincinnati: R. Clarke and Co., 1882 and 1886.

Rockbridge County

*Cave Spring Hill Cave.*³—The entrance to this cave is about one mile northwest of Lexington, near the crest of Cave Spring Hill, and about 170 feet above North River. The cave consists of two converging channels, which extend in a general northeasterly direction to the point of union. The shorter channel is about 460 feet long, has several side passages and alcoves along its sinuous course, and slopes steeply from the entrance to its junction with the longer passage. The longer tunnel-like passage is on a lower level than the shorter one and follows a straight course for about 1,500 feet. A small stream flows through this channel from the small recessed lake at the far (southwest) end to the convergence of the two channels. The total length of the explored channels is about 2,300 feet. The channels are generally very narrow, low in places, and wet and muddy throughout. The floor in places is covered with fairly thick deposits of chert fragments, pebbles, and boulders. The walls are smooth and, in places, polished. At one place in the larger channel, a small side stream flows over a large travertine cascade.

Saltpeter Cave.—About 60 feet north of Natural Bridge, on the west side of Cedar Creek and about 30 feet above it, reached by a rustic footbridge, is Saltpeter Cave. This cave is an abandoned undercut channel which was carved out of the wall of the limestone gorge by Cedar Creek when it flowed some 30 feet higher than its present bed. The original opening has been largely blocked by huge fragments of limestone which long ago fell from an overhanging ledge.

This cave has a very interesting history. It contained a deposit of cave-earth which was mined for saltpeter during the War of 1812 and again during the War between the States. This cave has been described by Reeds.⁴

Rockingham County

Saltpeter Cave.—There is a small cave in the Stones River formation (Lenoir and Mosheim limestones), about 45 to 50 feet southwest of the entrance to Massanutten Caverns and between this entrance and the old quarry in the southwest end of Cave Hill. This cave has long been known as Saltpeter Cave, probably because it has been reported that at one time saltpeter was obtained from it. The entrance is now clogged by fallen rock and inwashed surface debris, and the underground passages are therefore inaccessible.

Other Caves.—A few small cavernous openings and a number of sink-holes have been reported to occur in a northeast direction between Keezeltown and Endless Caverns.

³From an unpublished report on Cave Hill Springs Cave, near Lexington, Virginia, by M. H. Stow, Washington and Lee University, Lexington, Virginia, 1928.

⁴Reeds, C. A., *The Natural Bridge of Virginia and its environs*, pp. 29-30. New York, Nomad Publishing Co., Inc., 1927.

Scott County

Natural Tunnel Caves.—Several caves, many of them small but some reported to be extensive and to possess historic and scenic interest, occur in the vicinity of Natural Tunnel on the Big Stone Gap-Gate City highway (U. S. 23), 12 miles south of Big Stone Gap and 45 miles northwest of Bristol. Several of these caves are said to contain picturesque groups of stalactites. Many interesting stories of "pioneer days" in southwest Virginia relate to the use of these caves as retreats from marauding Indians.

Shenandoah County

Burner's Cave.—Several sink-holes and a small cave occur on the property of Mr. C. O. Burner, about five miles west of Strasburg. The explored passages are narrow and do not appear very extensive. The floors of the examined passages are covered by mud and few travertine formations exist. Several short crevices trend in the direction of some of the sink-holes and may lead to more extensive passages.

Edinburg Cave.—This cave is about a quarter of a mile west of the Lee Highway (U. S. 11) in the south slope of a hill below the high school in Edinburg. Entrance is through a small cleft in the limestone hill, from which a narrow muddy passage leads about 15 feet to an underground chasm, beyond which few people have explored. Those who have gone farther claim that a large sink-hole occurs across this gorge and report unconfirmed signs of the former occupancy of this cave by Indians. There are but few travertine deposits in the cave, which is in the Beekmantown formation.

Henkel's Cave.—An unexplored cave and a large "boiling spring" occur on the Henkel estate near Quicksburg. It is thought that the cave is connected with one of the subterranean channels of Shenandoah Caverns, although the owners of the property on which it occurs have made no attempt to explore it. Quicks Boiling Spring, as the spring is called, has been of local interest for many years. Both the cave and the spring are in the Conococheague limestone.

Smyth County

Rye Valley Cave.—In Rye Valley, along the South Fork of Holston River, near Sugar Grove, there is a cave which is reported by local residents to consist of a number of intersecting passages and large rooms. It is said that the ceilings of some of the rooms are very high and that portions of the cave are profusely decorated with stalactites.

A number of other smaller caves are reported to occur in this area, mostly in the Shady dolomite.

Wolf Hills Cave.—Near Abingdon, originally called Wolf Hills, is a small unexplored cave which, according to tradition, is intimately connected with the pioneer history of southwest Virginia. It is said that during the early

settlement of Abingdon, wolves were rather plentiful and that they often annoyed travelers through this section. It has long been reported that wolves occupied the cave which now bears the name of the hill on which they were once numerous.

Tazewell County

Liberty Hill Cave.—Near Liberty Hill (Route 91), occurs a cave in which, according to local residents, human footprints may be seen in the travertine-coated floor. Several other caves are reported in the vicinity, and it is claimed that in some of them human bones of unusual size have been found.

Lost Mill Cave.—About nine miles southwest of Tazewell, a short distance from State Highway 91, is a very interesting cave, or sink-hole, formed by the partial collapse of the roof of an underground stream channel. It is 80 to 100 feet long, about 60 feet wide, and about 70 feet deep. The walls around three sides are nearly perpendicular. A stream of considerable volume flows through the bottom of the sink-hole, emerging from a channel on one side and disappearing into a smaller passage on the other side. Many years ago a mill at the edge of the sink-hole was operated by power obtained from the stream below, through an ingeniously designed, steeply inclined wooden shaft. Portions of the two dams constructed in the underground stream channel near its entry into the sink-hole still remain. The old mill has long since disappeared, but a part of the foundations and fragments of the old turbine and box wheels may still be seen.

Maiden Springs Cave.—About 12 miles south of Tazewell and within 50 yards of U. S. Highway 19, the waters of Maiden Creek issue suddenly from an underground channel in the steep slope of a limestone hill. A few miles to the east, in Thompson's Valley, Maiden Creek sinks suddenly into an underground channel through which it courses to emerge as a large spring at the base of a spur ridge of Clinch Mountain. There is a large rolling mill on Maiden Creek near the cave mouth.

Rich Valley Caves.—In Rich Valley about seven miles from Tazewell are several small caves from which, it is claimed, saltpeter was extracted for the manufacture of gunpowder during the War between the States. Several interesting legends are connected with these caves. A cave of considerable size, only partly explored by local residents, is reported to occur in Rich Mountain, a few miles from Tazewell. It is said that a stream flows through this cave and that fish are found in the stream.

Steele's Cave.—About two miles northeast of Tazewell and about half a mile from State Highway 61, on a tract now owned by the Poor Farm, is a cave known locally as

Steele's Cave. The entrance to the cave is narrow but leads into a fair-sized room. This cave has been only partly explored but is said by local residents who know it, to be well worth visiting. It is in the Beckmantown limestone.

Hugh Young's Cave.—Some 12 miles southwest of Tazewell, in Bowen's Cove, a few miles from Maiden Spring, occurs a cave of local historic importance. This cave, known as Hugh Young's Cave, is said to be quite extensive and to contain several spacious rooms. Several large sink-holes and a few smaller caves occur in the immediate area. Near here occurs also the "Boiling Waters" where, for a distance of several hundred feet in a small meadow, the waters of a large spring appear to boil and rise several inches. The scenery in this general area is very picturesque. Many legends of historic and local interest associated with the caves and mountains, and accounts of early encounters with Indians are related by residents of this section of Tazewell County.

Washington County

Robert's Cave.—A small cave, but partly explored by local residents, is reported to occur on the Henry Robert's place, about eight miles north of Abingdon and about three miles from Holston, on North Fork of Holston River.

McMullen's Cave.—Near Ebbing Springs, on the old Fayette McMullen farm and on Middle Fork of Holston River is a cave which is reported to have been the headquarters for a band of outlaws and desperadoes in the early settlement of southwest Virginia. It is said to have been used also as a rendezvous by soldiers during the Revolutionary War.

Other Caves.—Several caves of unknown extent and but partly explored have been reported to occur in Holston Valley, along South Fork of Holston River between Abingdon and Bristol.

Wise County

Caves of Horror.—Within two miles of High Knob, at the head of Powell Valley, about five miles south of Norton, are several caves which, it is claimed, were used for the manufacture of gunpowder during the War between the States. Two of these caves are said to be quite extensive and many legends of local historic interest are associated with them.

Wythe County

Speedwell Cave.—There is a small unexplored cave in a spur ridge of Iron Mountain at Speedwell.

Other Caves.—A smaller cave is reported to occur north of Cripple Creek in Sand Mountain, a short distance north of Speedwell. A few caves of unknown extent are reported to occur south of New River in the vicinity of Jackson's Ferry.

RELATED NATURAL WONDERS

Natural Bridge and Natural Tunnel

Other remarkable natural wonders of Virginia which, like the caverns, owe their origin largely to the geologic action of ground water are Natural Bridge in Rockbridge County, 15 miles southwest of Lexington, and Natural Tunnel in Scott County, 45 miles northwest of Bristol and 12 miles southeast of Big Stone Gap. Natural Bridge is a remnant of the roof of a former elongate narrow cavern, whereas Natural Tunnel is a natural passageway through a high spur ridge of a picturesque mountain. Both features have been eroded from thick masses of almost horizontal limestone. The streams which formed these remarkable natural monuments still flow through them. Natural Bridge carries the Lee Highway (U. S. 11) across its top. Natural Tunnel carries through a mountain ridge a standard gage railroad, the Bristol-Appalachia division of the Southern Railway.

Because of its scientific and popular interest several articles have been written about Natural Bridge, describing its characteristic features and origin in some detail.^{4 5 6 7}

Natural Tunnel has been described by Woodward.⁸

⁴Reeds, C. A., *The Natural Bridge of Virginia and its environs*, Nomad Publishing Co., Inc., New York, 62 pp., 1927.

⁵Gilmer, F. W., *On the geological formation of the Natural Bridge of Virginia*: *Trans. Amer. Phil. Soc.*, vol. 1, pp. 187-192, 1818.

⁶Walcott, C. D., *The Natural Bridge of Virginia*: *Nat. Geog. Mag.*, vol. 5, pp. 59-62, 1893.

⁷Malott, C. A., and Schrock, R. R., *Origin and development of Natural Bridge, Virginia*: *Am. Jour. Sci.* 5th ser., vol. 19, pp. 257-273, 1930.

⁸Woodward, H. P., *Natural Bridge and Natural Tunnel, Virginia*: *Jour. Geology*, vol. 44, no. 5, pp. 604-616, July-August, 1936.

MOUNTAIN LAKE

Mountain Lake, about seven miles northeast of Pembroke, in the picturesque Valley Ridge section of the Appalachian Valley region, in Giles County, is a notable example of a naturally formed inland lake. Its origin, which is closely related to the geology and geologic history of the area in which it occurs, has been ascribed to the clogging of a large sink-hole, and to the damming of a normal surface stream.⁹ The lake occupies a basin about half a mile west of the crest of Salt Pond Mountain. It is about three-quarters of a mile long and about a quarter of a mile wide, with the surface having an altitude of 3,874 feet. The maximum depth reported is 75 feet.

Surrounded by mountains except at the northwest end, and bordered by a dense growth of trees this "Silver Gem of the Alleghenies" has an ideal location, from which grand scenic views are obtained. About half a mile to the south Bald Knob towers to an altitude of 4,368 feet; about the same distance to the east, Salt Pond Mountain attains an altitude of 4,327 feet; whereas Doe Mountain, about one and three-fourths miles to the southwest reaches a maximum elevation above sea level of 3,996 feet.

From the summit of Bald Knob, it is claimed that on a clear day landmarks in five different states are visible. A summer resort, consisting of a modern hotel and cottages, is situated at the lake and offers pleasant accommodations at this inviting site. The lake and resort are accessible by picturesque winding mountain roads, about four miles long, from the Pembroke-Blacksburg highway (Route 8), at Hoges Store, about two and one-half miles east of Pembroke, or Lone Eagle Store, about one and one-half miles east of Maybrook.

⁹Sharp, H. S., *The Origin of Mountain Lake, Virginia*: *Virginia Geol. Survey Bull.* 46, pp. 79-84, 1936.

EXTRACT FROM BIOGRAPHICAL NOTES
OF W. L. McATEE

IN THE zoological laboratories of Indiana University (Bloomington), there were at that time (1900-1904) aquaria and vivaria in number, most of which required attention by the "Curator." Always on hand were some of the pallid, blind fishes (*Amblyopsis spelaeus*) that had been the subject of so much of Dr. Carl H. Eigenmann's earlier work. He was engaged with other things then but just liked to have some of them around. To replenish these and other cave animals needed for the collection or laboratory, trips to some of the numerous caverns ac-

cessible in the region were required. The so-called Twin Caves near Mitchell were visited when blind fishes were needed. The upper one of these caves was accessible because long ago a section of the roof had caved in, forming a short open valley. The stream was not large but had deep pools in the cave, and in general handicapped operations enough so that a boat was needed for practical travel and especially for the carrying and safeguarding of equipment. A rather large and cumbersome, folding canvas craft was used and I* recall that carrying this to the stream,

*Mr. McAtee, naturalist of international reputation and prolific contributor to scientific journals, is currently engaged in completing the manuscript of a *Dictionary of Vernacular Names of North American Birds*, to be published by the University of Chicago Press. This work, for which he has been collecting material for 35 years, is being done in accordance with an agreement, to run three years, between the University and the U. S. Fish and Wildlife Service, for which federal agency Mr. McAtee has been editorial advisor for many years. He also will continue to conduct the *Wildlife Review*, Ed.

putting it in cruising order, and lifting it over obstructions in the cave, were accompanied by groans and lamentations on our part.

Within was another world. Although we labored with the boat, slipped on slimy rocks, fell into pools, and got thoroughly wet and bedraggled, we saw things that could be seen only there. Near the entrance, daddy longlegs and cave-spiders were in evidence; a little farther in, cave-crickets were seen. Beetles, sow-bugs, and other small fry were frequent. Occasionally a cave salamander or some fish or frog waif from the outside would be found. But the main objects of our quest, the white (in daylight pinkish) blind fishes and crawfishes gave a greater thrill as the gleams of our lights revealed them. In the deeper pools, the blind fishes swam about unhurried and stately, dominating a world unknown to the multitude, but there for us to enjoy and to catch. Yet it seemed a sacrilege to disturb them.

The entrance to the lower Twin Caves was filled by the stream which emerged "for good" through a spacious dry cave a short distance below. One knew it was the same stream, and scraps of paper thrown in came out to prove it. Yet the questions as to whether it filled the channel, whether there were any detours or man traps, deterred all but the hardest from trying to go through it. There was a tale to the effect that some earlier student had made the passage and in our time I think John D. Haseman did. He was of powerful physique, could swim "like a fish," and had the necessary daredeviltry. He was reported to have said the trip "didn't amount to anything."

The dry cave was readily explorable almost by light coming in the large entrance. On its ceiling large numbers of bats hung up to sleep, and presumably also to hibernate. When this area became state property, my friend Walter Hahn was the first resident investigator and carried on here his interesting experiments with bats.

Caves near Bloomington were nearly or completely dry. These we visited frequently. In fact parties of students explored them just for a lark. Yet they were not to be trifled with. They had labyrinthic passages, sudden descents, tight places, and other hazards. Our means of lighting were not too good. Some depended on candles alone. Some carried kerosene lanterns, while carbide lamps were just beginning to come in, and the later more satisfactory portable electric lights were unknown. Losing or wetting matches and breaking lanterns were distinct possibilities and the carbide lights were undependable.

The very careful cave visitors would unwind a ball of cord to be followed out again. In the long-travelled caves, arrows smoked on the walls or ceilings, supposedly pointed the way out, but their advice was soon found to be confused, so little attention was paid to them. I do not know that there were any fatal mishaps but there well might have been. William Perry Hay, with whom I got acquainted later in Washington, told me of getting stuck in a rounded cavity about the size of a wash-tub, in one of the Indiana caves. Except for having companions, and their pulling off his coat to make him smaller, thus releasing him, he probably would have perished there. Sometimes in squirming through passages that were a rather tight fit, I gave some thought to the possibilities of becoming wedged in, but it never happened.

If one desires to know what absolute darkness is, let him penetrate a cave for some distance and put out all lights. It is overwhelming; man is simply not fitted for existence in such a place. If I had to choose between a dry or a wet cave for being bereft of light, I should take the latter, for by feeling the current one could travel the proper direction to reach the entrance. But progress would have to be slow and even so, would be painful from many bumps and falls.

Curiosity of the inhabitants of Reigate on the English Channel coast concerning Cave No. 1A, alone among hundreds of caverns earmarked for air-raid shelters closed to them, has been satisfied after five long years.

In 1940 when Cave No. 1A was shut off, a hut furnished and complete with every home comfort was erected and a mysterious stranger took possession of it.

It is now revealed that the cave had been turned into a bonded warehouse, in which air-conditioned and electrically lighted retreat was stored, safe from enemy action, the whisky supply of the county of Surrey for several years to come. The denizen of the hut guarding access to the maturing stock is a customs and excise official.

Exploring caves in the Pyrenees is not merely a summer pastime to Susan Kent; she is seriously interested in archaeology. She hopes to make important discoveries, such as prehistoric remains, but when she finds a body too recently dead to be prehistoric, that is another matter. The villagers have been suspicious of her from the first, and now they are sure she is not what she pretends to be. Her adventures include two narrow escapes from death in the caves and encounters with persons whose activities will not bear the light of day. Just what some of these people are up to remains a mystery to the end.

Blood From a Stone. By Ruth Sawtell Wallis. 205 pp. New York: Dodd, Mead & Co. \$2.

CAVES OF THE BRITISH ISLES

BY ROBERT E. MORGAN AND FRANK SOLARI

AS A SCIENCE, speleology had its beginning in England. For that reason, the caves of the British Isles have been among the most extensively explored and described.

Although caves had been known and used in other countries, general interest was developed in England through a controversy which arose between the Church and the leading scientists of a century ago over the question of the length of time man had been on the earth and whether the great deluge of the Bible was universal.

The Church of England, accordingly, set out to prove that the flood of Noah's time had indeed covered the entire earth. Dr. William Buckland, who was both a minister of the Church and a geologist of note, was commissioned to confirm this belief by geological investigations.

Dr. Buckland systematically inspected the best-known caves of the British Isles and Northern Europe and in 1822, published his results in *Reliquiae Diluvianae*. His statements tended to confirm those in the Bible concerning the Deluge and the interpretations placed upon them by his colleagues in the Church.¹ In this volume, incidentally, Dr. Buckland tells of the original investigations in some of the most famous caves of the British Isles, and includes the first description of the "Red Lady of Paviland."

It is said that in 1840 Dr. Buckland stood up at a meeting of the Geological Society of London and took back all that he had said about the Deluge.²

In the years that followed Dr. Buckland's first cave work, many important questions have been answered by the exploration and study of British caves, including proof of man's great antiquity. The first definite evidence of the age of man was discovered by Rev. J. McEnery in Kent's Cavern at Torquay. Here, flint implements were found buried, in association with the bones of extinct animals, beneath a thick layer of stalagmite.

The continued interest and research in speleology is now being carried on by numerous speleological societies and hiking clubs in the British Isles. As a result of this intensive work hundreds of caves have been located, explored, and described. The following list contains the names, approximate locations, and bibliographical data on a portion of these caves.³

The caves are listed by counties in alphabetical order. As an aid in visualizing the distribution of caves in the British Isles and as a guide to the relative locations of the counties, a map showing only those counties where caves are known to exist is included with this list.

The reference numbers refer to the bibliographical material given at the end of the list. The numbers in paren-

thesis refer to the page or pages in the publication where the cave under consideration is discussed.

R. E. MORGAN,
Richmond, Va. (6/20/44)

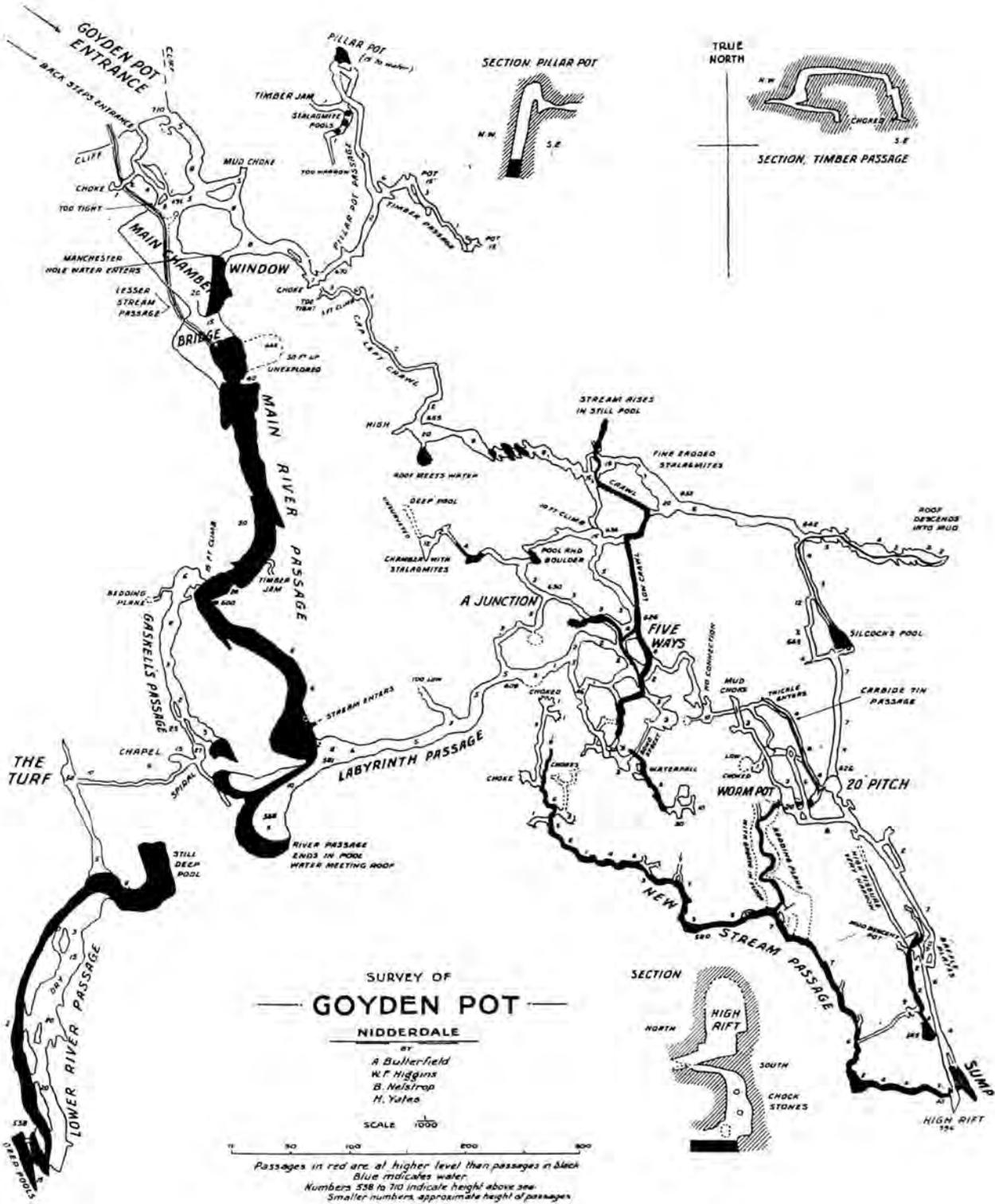
<i>England</i>		
<i>Cave Name</i>	<i>Location</i>	<i>Reference No.</i>
<i>Cumberland</i>		
Tutman's Hole	Gilderdale near Alston	
<i>Derbyshire</i>		
Anchurch (Anchor church)		
Ashwood Dale		
Bagshawe Cavern		18(48)
Balvey Cave	Wirksworth	7(61)
Bamforth Hole		
Baules Cave	Wirksworth	15(30)
Bawlee		
Beeston Tor	Manifold Valley	19
Bird Mine Cave	Peak	
Blue John	Castleton	24
Boat House Cave		
Boden Quarry Cave		
Bon Dog Hole Mine		
Bossen Hole	Peak	
Boson's Cave		
Bull Pit Cave	Peak	
Cales Dale Cave		20(128)
Carlsward	Middletondale	
Cave Dale Cave	Castleton	20(128)
Challenge Low Holes		
Chelmorton Dale		
Churn Hole	Buxton	24
Cliffe	Peak	
Climbing Tree	Peak	
Coal Pit Hole	Peak	
Creep Hole		
Cress Brook Cave		
Cresswell Cave		
Cross Low Mine		
Cucklett Church Cave	Peak	
Cumberland Cave	Matlock	
Cummins Dale		
Darfa Swallow		
Deepdale	Peak	
Devil's Hall Cave		
Devonshire Cave		
Devonshire Dale Swallets		
Donkey Hole	Manifold Valley	*
Doveholes	Chapel-En-Le-Frith	10(285); 19
Dove Pit		
Dowel Dale Sws.		
Drake Mine		
Dream Cave	Wirksworth	7(61); 20(128&284)
Dust Pit		
Elderbush Cave	Manifold Valley	19
Eldon Hole	Peak	15(19)
Faucet Cave		
Fern Cave	Peak	
Ferney Cave	Peak	
Finney Hollins Cave		
Fissure Cave	Manifold Valley	19
Flour Cave		
Foxhole Cave	High Wheeldon near Earl Sterndale	19(89)
Franki'th'Rocks	Beresford Dale	19
Frog Hole	Peak	
Gantries Hole	Peak	
Giant's Cave	Peak	
Giant's Hole	Peak	24
Glebe Mine		
Godfrey Hole	Peak	

¹Fifty years later, in 1874, W. Boyd Dawkins, also a geologist, wrote his book, *Cave Hunting*, to prove exactly the opposite.

²*This Puzzling Planet*—Brewster, Edwin Tenney.

³Asterisk indicates cave from Solari's list where no other information than indicated, was available. Information on caves in Derbyshire, Somerset, Yorkshire, and Wales not otherwise credited, was obtained from files of *The British Caver*, through the permission of Gerard Platten, Editor.

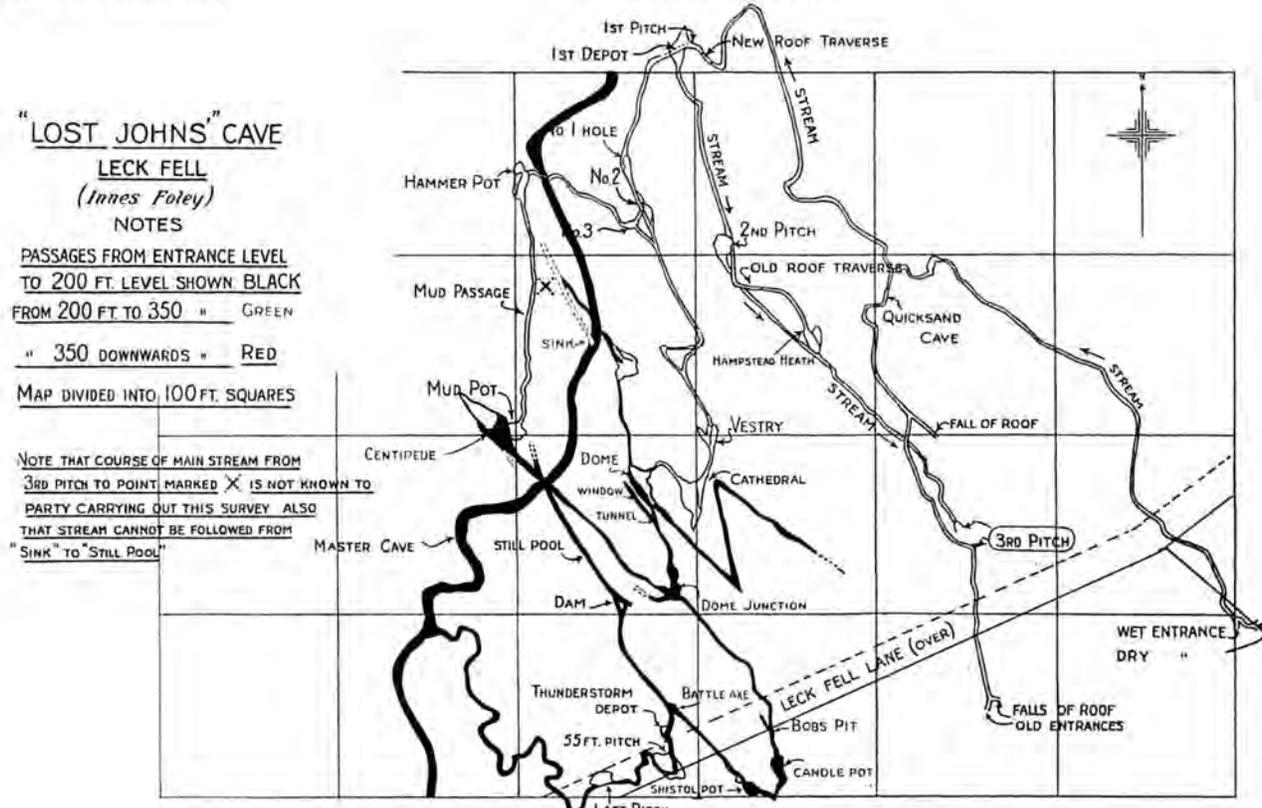
<i>Cave Name</i>	<i>Location</i>	<i>Reference No.</i>	<i>Cave Name</i>	<i>Location</i>	<i>Reference No.</i>
Godfrey Hole Cave			Thirst House Cave	Deepdale	20(128)
Golconda Mine			Thor Cave	Manifold Valley	10(127); 19
Grassdale Sws.			Tideswell Dale Sws.		
Great Rocks Dale Sws.			Tinswell Cave		
Green Lane Fissure			Traycliff Cave	Castleton	24
Ham Dale Sw.			Treak Cliff	Peak	
Hamps Dale Sws.			Walker's Cave	Bradwell	24
Hanging Holes	Peak		Waterfall Cave		
Hannah's Cave			Waterswallows		
Harborough Cave	Brassington		Windy Knoll Cave		19
Hartle Dale Caves (4)	Bradwell	10(285); 20(128)	Winnats Cave	Peak	
Hawthorne Edge Cave	Peak		Wonder Cave		
Hay Dale Sws.			Yew Tree Cave	Pleasley Vale	19
Hermit Cave	Peak		<i>Devon</i>		
High Top Cave			Ash Hole	Brixham	10(324); 18
High Tor			Bench Cave		10(324); 17
Hill Car Sough	Peak		Berry Head Cave		18
Hillocks Cave	Monyash		Brixham Cave	Brixham	17
Hoe Grange Cave	Near Brassington	19	Cattedown Cave	Near Plymouth	18
Jacobs Cave			Chudleigh Cave		18
Jug Holes	Peak		Cow Cave		18(48)
Kinder Low Cave	Peak		Happaway Cave	Torquay	17
Knowells Mine	Peak		Hoe Cave	Near Plymouth	18
Langwith Cave	Peak		Kent's Cavern	Torquay	17
Larhkill	Peak		Knackersknowle	Near Plymouth	18
Liner Dale Caves	Peak		Mount Wise	Near Plymouth	18
Long Cliff	Peak		Oreston Cave	Near Plymouth	7(67); 17
Longridge Wharf Cave	Matlock	19	Pixies Cave		18(48)
Lud's Church	Peak		Pridhamsleigh	Ashburton	35
Lynx Cave	Beeston Tor, Manifold Valley	19	Stonehouse	Near Plymouth	18
Manifold, The	Peak		Torbryan Caves	South Devon	18
Masson Hill Cave	Peak		Windmill Cave	Brixham	10(319)
Merlin Cave	Peak		Yealmpton Cave	Near Plymouth	18
Mill Close Mine Cave	Peak		<i>Durham</i>		
Miller's Dale Mine Cave	Buxton	24	Bishop Cave	Bishop Middleham	20(127)
Monkey Rock Cave	Peak		Heathery Burn	Near Stanhope	10(141); 20(127)
Moredale Cave			Jack's Scar Cave	Middleton in Teesdale	26
Mother Grundy's Parlour			<i>Gloucester</i>		
Nettle Pot	Peak	8	Derdham Doen Cave	Clifton	7(60)
New Keys Cave	Peak		<i>Hampshire</i>		
New Rake Cave	Peak		Scratchell's Cave	Isle of Wight	1(46)
New Speedwell	Peak		<i>Herefordshire</i>		
Nicker Groove	Peak		Ippiken's Cave	Kingsland	18
Odin Mine Cave		24	<i>Kent</i>		
Odin Sough Cave	Peak		Oldbury Rock-shelter	Ightham	20(127)
Old Woman Cave			<i>Lancashire</i>		
Orchard Cave			Dog Holes Cave	Warton Crag	20(127)
Owl Hole Sws.			<i>Middlesex</i>		
Oxlow Mine Cave	Castleton	24	Uxbridge Cave	Uxbridge	7(166)
Peak Cavern	Castleton	24	<i>Shropshire</i>		
Perry Foot Sw.			Craven Caves		10(114)
Pickering	Peak		<i>Somerset</i>		
Piggenhole	Peak		Aveline's Hole	Mendip	9
Pin Hole			Axbridge Ochre Cave	Burrington Combe	
Plaeket Mine Cave			Badger Hole		
Plunge Hole			Baker's Temple Cave		
Poole's Cavern	Bruyton	10(126); 20(128)	Banwell Cave		19(92)
Radcliffe Stables	Manifold Valley		Banwell New Cave		
Ranter Mine Cave			Betsy Camels Hole		
Ravencliffe Cave	Cressbrook Dale	20(128)	Bishop's Lot Sw.		
Ravensdale	Peak		Blagden Fissure		18
Ravensdale Shelters	Peak		Blakes Wood Sw.		
Redhurst Cave	Manifold Valley	19	Bleaden Cave		19(91)
Reynards	Peak		Bone		
Ricklow	Peak		Bridged Pot Shelter	Ebbor	18
Robin Hood's Cave	Peak		Burrington Combe		
Roman Cave	Peak		Caverns	Burrington Combe	7(164); 10(141)
Russet Well Cave	Peak		Cheddar Cliff Cave		
Rutland Cave	Matlock		Cheddar Gorge Cave		19(92)
St. Bertrams Cave	Manifold Valley		Chelm's Combe Cave	Cheddar	18
Silica Cave	Perryfoot		Cockle's Wood Fissure		18
Speedwell Mine Cavern	Peak	27	Cooper's Hole	Cheddar	
Spider Cave			Coral Cave		
Taddington			Cow Hole		14
Tatcho Cave			Cox Cave		
The Levels					



<i>Cave Name</i>	<i>Location</i>	<i>Reference No.</i>	<i>Cave Name</i>	<i>Location</i>	<i>Reference No.</i>
Crookes Peak Cave (Denny's Hole)			<i>Yorkshire</i> Albert Cave		10(82)
Cross Swallet			Alum Pot		
Denny's Hole			Angle Holm Pot		
Dinder Wood Shelter		18	Ash Tree Sink		
Dulcote Hill Fissures		18	Ashberry Wind pits		
Durnham Down Cave		19(90)	Attermire Cave		20(129)
East Twin Brook Swallet	Burrington Combe		Aygyll Cave	Swaledale	
Eastwater Swallet			Barbon Fell Pots		
Ebbor Gorge Shelter No. 1			Batty Cave		
Ebbor Gorge Shelter No. 2			Birks Fell Cave	Wharfedale	
Ebbor Gorge Shelter No. 3			Birkwith Moor Cave	Ribble	
Fairy Cave			Bishopdale Gavel Pot	Kidstone Pass	
Flint Jacks Cave			Black Beck Hole		
Fox's Hole			Blayshaw Gill No. 1		
Goatchurch Cave	Burrington Combe	2; 18	Blayshaw Gill No. 2		
Golgarth Cave (Cow Hole)		114	Blind Beck		
Golgotha Cave	Nordrach-on-Mendip	*	Blue John Hole, Lamps Moss	Swaledale	
Gough's Cave		18	Boggart Hole	Whernside	
Green Ore Sw.			Boggart's Roaring Hole No. 1		
Guy's Rift Cave	Slaughterford (Wiltshire)	18	Boggart's Roaring Hole No. 2		
Hollowfield Sw.			Bornns Moor Cave		
Holwell Cave			Bracken Gill		
Hutton Cave		7(59-60); 19(91)	Brady Garth Cave		
Hyena Den			Braithwaite Wife Cave	Ingleton	
Lamb Leer		4; 12	Braithwaite Wife Sink		
Lherm Cavern		10(316)	Brow Gill Cave		
Long Hole	Cheddar	19(92)	Browside Cave		
Longwood Sw.			Bruntskar Cave	Whernside	
Loxton Cave			Bucken Pike Cave		
Milton Hill Swallet	Near Wells	18	Buckhaw Brow Cave		
Nancy Camel's Hole			Bull Pot Cave No. 1	Kingsdale	
Nedge Hill			Bull Pot Cave No. 2	Leck	
Nettlebridge Fissure	Near Wells	18	Bull Pot of the Witches	Barbon Fell	
Ochre Cave	Banwell	32	Buttertubs	Kidstone Pass	
Oones Hole			Calf Hole or Elland Cave	Skyrethorns	20(128)
Outlook Cave	Ebbor Gorge		Calf Holes		
Penny Sleigh Cave			Calf Pot		
Plumley's Den			Capnut Cave		
Pride Evans Hole			Car Pot		
Read's Cavern	Burrington Combe	31	Cave Ha	Giggleswick	20(129)
Read's Grotto			Cellar Pot		
Ricklow Rising Cave			Churn Mill Hole		
Rodney Stoke Cave			Clapham Cave		
Roman Cave	Cheddar		Coates' Cavern	Fountains Fell	
Rowberrow Cavern	Burrington Combe	30	Cove Hole		
Sandford Hill Cave		19(91)	Cow Dub Holes	Easegill Force, Leck Fell	
Sandpit Hole			Cow Pot		
Soldier's Hole	Cheddar	18	Cow-Skull Pot	Ribble	
Stoke Lane Swallet			Crack Pot		
St. Suthbert's Swallet			Cradle Hole		
St. Vincent's Cave (Quarried)	Cheddar		Cross Pot		
Sugar Loaf Rock			Cuddy Gill		
Sun Hole	Cheddar	18(50)	Dangerous Cave		
Swildon's Hole		3	Dead Man's Cave		
Thrupe Swallet			Death's Head Pot	Leck Fell	
Tickenham Cave		18(50)	Diccan Pot	Ribble	
Twin Brook Sw.			Dickon		
Tynnings No. 1			Dismal Hill Hole		
Tynnings No. 2			Dissapointment Cave		
Uphill Cave	Near Weston-Super-Mare	10(194, 294); 19	Double 3 Hole		
Waldergrave Sw.			Douk Cave No. 1	Chapel-le-dale	
Walton Bone Cave	Near Clevedon	19(92)	Douk Cave No. 2	Graven	
Whitcombe's Cave	Burrington Combe	10(140)	Dow Cave		
White Spot			Dowkerbottom Cave	Nr. Kilnsey, Wharfedale	10(195); 20(128)
Willie's Hole			Duncombe Park Fissure	Helmsley	7(54)
Wilts Q. Cave			East Gill Cave	Swaledale	
Windsor Hill Cave	Shepton Mallet	13	Elbolton Cave	Thorpe, near Skipton	20(128)
Wookey Hole	Cheddar	17(20)	Elgans Hole		
York Ho			Eyeholes	Leck Fell	
			Far Douk		
			Fairy Hole		

<i>Cave Name</i>	<i>Location</i>	<i>Reference No.</i>	<i>Cave Name</i>	<i>Location</i>	<i>Reference No.</i>
Fairy Throne			Long Kin Holes		
Faries Workshop			Long Kin West		
Fell Beck Sw.			Lord's Top Hole		
Flamborough Cave			Lost John	Gragrth	
Flatstone Pot			Lost John's	Leck Fell	
(Scales Moor Pot)			Lost Pot		
Footnaw's Hole	Ingleb.		Low Birkwith	Ribble	
Foss Gill Cave			Low Moor Cave		
Fox Holes			Lower Douk	Gragrth	
Gable Pot			Lower Dry Laithe Cave		*
Gaping Ghyll			Malham Cave	Craven	
Gate Kirk Cave	Whernside		Malham Tarn Sink	Craven	
Gavel Pot	Leck Fell	*	Manchester Hole		
Giant's Grave	Pennyghent, Littondale	*	Marble Pot	Simon Fell	
Giggleswick Scar			Marble Steps	Gragrth	
Gill Head Pot			Mere Ghyll	Chapel-le-dale	
Gingling Cave			Middle Pasture Cave	Ribble	
Gingling Hole			Moughton Fell Cave		20(129)
Gipsey Hole			Mud Foot Pot		
Goyden Pot			Nanny Carr Hole		
Gravel Pot			Navel Pot		
Greater Kelco Cave		*	Nether Lodge Cave	Ribble	
Greygarth End Pot			New Cave		
Grey Gill			New Pot		
Gritstone Pot			New Year Pot	Fountains Fell	
Gunner Fleet Cave			Nick Pot No. 1	Simon Fell	11
Hagform Pot			Nick Pot No. 2		
Hardraw Kirt			Old Ing Cave	Ribble	
Hell Hole			Ousd Hole		
Hidden Pot			Penny P. Hole		
High Birkwith Cave			Pennyghent House Cave	Pennyghent, Littondale	
High Douk	Gragrth		Pennyghent Long Churn	Ribble	
High Hull Pot	Ribble		Philpin Hole		
High Lathe			Pillar Pot		
Hodge Hole	Craven		Pin Hole		
Hole Bottom Cave			Pinnacle Pot		
Hollow Mill Pots	Swaledale	*	Rainscar Cave		
Home Hill Cave			Ray Gill Fissure		
Homeshaw Cave			Ribble Swallet		
Horseshoe Cave		*	Ribblehead Cave	Ribble	
Hull or Thirl Pot	Ribble		Ribblehead Hole	Ribble	
Hunt Pot	Ribble		Rift Pot	Ingleborough	*
Hunter's Hole	Ribble		Ringle Mill Cave	Green Cave	*
Hurtle Pot	Craven		Rippon Swallets		*
Ingleborough Cave		7(36)	Robin Hood's Mill Cave		*
Ingleton Cave			Rocky Pot	Fountains Fell	
Ireby Fell Cave			Rosebush Pot	Swaledale	
Jackdaw Hole	Ribble		Rowan Tree Holes		
Jeffrey Pot			Rowden Pot		
Jerry Pot			Rowten Pot	Dentdale	*
Jingle Pot	Hubberholme, Wharfedale		Rowting Pot		
Jingling Cave No. 1	Kingsdale		Rumbling Hole	Leck Fell	
Jingling Cave No. 2			Scales Moor (New?)		
Jockey Hole			Pot	Whernside	
John-is-Coming Hole			School Boy Cave		
Jubilee Cave		*	Scoska Cave	Littondale	
Juniper Gulf Cave			Scots Hole Pot	Cotter End, Wensleydale	
Kail Pot			Sell Ghyll Hole		18(48)
Karnot Cave			Sell Gill Hole		
Kel Bank Spring Cave			Shatter Pot	Fountains Fell	
Kelco Cave	Giggleswick	20(129)	Sheepfold Cave		
Kings Scar			Short Drop Cave		
Kinsey Cave	Giggleswick Scar	20(129)	Silva Pot		
Kirby Moorside Caves		7(52)	Skirath Cave		
Kirk Gill Cave		*	Skirwith Cave	Ingleton	*
Kirkdale Cave		7(1); 17	Sleets Ghyll		
Knaresborough Cave			South Bank Pot	Stockdale	
Knave Knoll Cave			Spectacle Pot	Whernside	*
Lesser Kelco Cave			Staircase Cave		
Little Hull Hole	Ribble		Strangle Pot	Fountains Fell	
Little Pot			Stump Cross Cavern	Greenhow Hill	
Lockey Cave			Sulber Pot	Ribble	
Long Churn Cave	Ribble		Sunset Hole		
Long Drop Cave			Swindale Pots		
Long Kin Cave			Swinnergill Kirk Cave		
Long Kin East			Swinsto Hole	Kingsdale	

Cave Name	Location	Reference No.	Cave Name	Location	Reference No.
Tatham's Wife			Upper Hesledon Caves	Pennyghent, Littondale	
Taylor's Cave			Victoria Cave	Ingleton	16
Thirl Pot			Walled Cave		
Thompsons Hole			Warm Hole		
Thoms Gill Cave		*	Washfold Cave		
Three Trees Pot	Leck Fell		Waterfall Cave		
Tot Lords Cave			Waterscale Cave		
Treller Hole			Weathercot Cave		
Trolers Cave			Whernside Chas.		
Turn Dub Cave		*	White Scar Caverns	Hawby, Near Riding	
Unnamed No. 1			Windy Pits		
Unnamed No. 2			Witches		
Unnamed No. 3			Yockenthwaite Pot	Wharfedale	
Upper Dry Laithe Cave		*	Yordas Cave	Dentdale	
			Yordas Wood Cave		



Ireland

Cave Name	Location	Reference No.	Cave Name	Location	Reference No.
<i>North Ireland</i>			<i>County Fermanagh</i>		
Cat's Hole			Fisherstreet Pot		
Cradle Hole Upper Cavern			Gunman's Cave		5 (38)
Marble Arch Cavern			Pollapouka Ballyelly		5 (39)
Monastir Sink			Poll Balliny		
Noon's Hole			Poll Binn (Upper Poullnagollum)		5 (39)
Pollasumera			Poll Dubh Lower		5 (39)
Pollawaddy			Poll Dubh Upper		
Pollbwee			Poll na Pooka		
Pollnagapple			Poll Lismaurahaun (Upper Poulnaelva)		5 (39)
Skreen Hill River Cavern			Poulliam (Poullwillin)		
<i>Eire</i>			Poulnaelva		5 (38)
<i>Cavan Co.</i>			Poullnagollum		5 (38)
Magherry Cave	Belturbet	10 (335)	St. Catherine's Well Caves		
<i>County Clare</i>			<i>Tipperary Co.</i>		
Ballycasheen Cave		5 (40)	Mitchelstown Caves		
Coolagh River Cave			<i>Waterford Co.</i>		
Coolagh River Swallet	(Polldonough)	5 (39)	Shandon Cave		10 (335)
Faunarooska Cave		5 (39)	Whitechurch Cave	Dungarvan	10 (335)

Cave Name	Location	Reference No.	Cave Name	Location	Reference No.
<i>Scotland</i>					
<i>Argyllshire</i>					
Oban Cave	Oban	10(195)	Cathedral Cave	Gower	
<i>Sutherland</i>					
<i>Inchnadamph</i>					
Uamh an Uisge (cave of Water)			Cat Hole Cave		10(145)
Uamh Cailliche Pearag			Crawley Rocks Cave	Swansea	7(80)
<i>Staffa</i>					
Clamshell (Scallop) cave		1(15)	Culver Hole	Llangennith, Gower	20(130)
Fingals Cave			Deborah's Den	Gower	
<i>Skye</i>					
Nursling Cave (Slochd Altrimen)		22	Decoy Pond Sw.	Gower	
<i>Wales</i>					
<i>North</i>					
<i>Denbighshire</i>					
Perthi-Chwareu Caves	Corwen	10(149); 18	Dihonow Fissure		
Rhos Digre Cave (also, Rhyd-Isop)	Near Llanarmon yn Ial	10(156); 18	Dunraven Hole		
World's End Cave	Near Llangollen		Dyffryn Ho. Sw.		
<i>Flintshire</i>					
Allegele Ogo (also Gurych & Llandulais)	Near Holywell	18	Fairy Hill Sw.	Gower	
Barnewell Cave			Freedown Sw. No. 1	Gower	
Bryn Bella (also Cae Gwyn & Pfigmon Bueno)			Freedown Sw. No. 2	Gower	
Cae Gwyn Cave		17	Garth Woods		
Cefn Cave		10(159); 17	Goat's Hole (Paviland No. 2)	Port Inon	7(82)
Ffynnon Beuno Cave	St. Asaph	17(21)	Kittle Sw.	Gower	
Gdp Cave	Newmarket	*	Lesser Garth Cave	Radyr	18
Glyn Ceirog Caves		*	Llwyn y Bwch	Gower	
Gop Cave			Mumbles Cave	Gower	
Goy Cave	Newmarket	18(51)	North Hill Tor Cavern	Gower	
Grange Farm Cave	Near Holywell	18	Park Wood Cave No. 1	Gower	
Gurych Cave			Park Wood Cave No. 2	Gower	
Gwaenysgor Cave	Near Prestatyn	17	Paviland Cave No. 1	Port Inon	19(92)
Plas Heaton Cave	Vale of Clwyd	10(287); 17	Paviland Cave No. 2	Port Inon	7(82)
Pontnewydd Cave	Near Cefn	10(287); 17	Paviland Cave No. 3	Port Inon	7(96)
Tremerchion Caves	Near St. Asaph	17(21)	Porth yr Ogorf		6
<i>Miscellaneous</i>					
Beune Cave			Raven's Cliff Cave	Gower	10(288)
Halkyn Mts. Cave			Spiritsail Tor Cave	Gower	10(288)
Holway Cave			Upper White Lady Cave		
Llandulas Ogo			White Horse Cave		
Ogo Cave			Will's Hole Cave	Sechnant Valley	
<i>South</i>					
<i>Brenockshire</i>					
Craig y Nos No. 1	Brecon	18	Wind Hole		
Craig y Nos No. 2	Brecon	18	White Lady Cave		
Cwm Callan Sw.	Brecon		<i>Monmouth</i>		
Dan yr Ogorf	Brecon	6(97); 21; 37(43)	King Arthur Cave	Wye Valley	10(290); 18
Ffynnon Du	Brecon		Merlin's Cave	Wye Valley	18; 25
Llangatrock Cave	Brecon		<i>Pembrokeshire</i>		
Penwyllt No. 1	Brecon		Black Rock Cave	Tenby	10(68)
Penwyllt No. 2	Brecon		Caldy Cave	Tenby	10(62)
Pwll Byfree	Brecon		Coygan Cave	Pendine	10(62)
Pwll Pant Mawr	Brecon		Hoyle's Mouth Cave	Tenby	
Sink y Giedd	Brecon		Priory Farm Cave	Monkton	18
Upper White Lady Cave			Tenby Bone		
Weigh Bridge Cave	Brecon		<i>Miscellaneous (County Location Uncertain)</i>		
White Lady Cave	Brecon		Arcade Cave		
<i>Carmarthenshire</i>					
Carreg Cennu		18	Bardsey Is. Caves		
Llandebie		7(166); 10(194)	Blaen-Sirhowy Sws.		
<i>Glamorganshire</i>					
Bacon Hole	Gower	10(288)	Brynirio Gleison Cave		
Bishopston Cave No. 1	Gower		Brysgill Cave		10(160)
Bishopston Cave No. 2	Gower		Cader Fawr Sws.		
Bosco's Den	Gower	10(288); 20(130)	Caldy Cave		10(62)
Bridge Cave	Gower	*	Carnau Gwys Swa.		
Castell Coch	Gower	*	Castle Carn Dochan		
			Cefn Cadlan Sw.		
			Cefn Cil Sanws Sws.		
			Cefn Esgair Carnau Sws.		
			Cefn Mably Sw.		
			Cefn-y-Garn Fadog Sw.		
			Coedymstwr		
			Craig v Dinas		
			Crow Hole		10(288); 20(130)
			Cwm Dwr Quarry Cave		
			Cwm-Pwll-yr-Rhyd		6(96)
			Cwm y Porth Wood Caves		
			Devil's Hole		10(288)
			Druids Moor Sw.		
			Fan Fraith Por		
			Ffrydiau Twrch		
			Galtfaenan Cave	Galtfaenan	10(287)
			Great Bedding Cave		6(94)
			Gwaen Cefn y Careg Pot		
			Hepste Bridge Sw.		

(County Location Uncertain)

Hywell's Grotto
(Cafell Hywell)
Kittle Hill Cave
Llanelly Quarry Cave
Llygad Llwchwr Cave
Llwchr Cave
Llyn-llech Owen Sw.
Llyn-y-Baban
Long Hole
Longbury Bank Cave
Lydstep Cave
Monkton Cave
Nanna's Cave
Nettle Tor
Odyn-fach Swallow
Ogof Fawr
Ogof Liadron
Ogof Pwll y Rhyd
Ogof Ystffwlglas
Ogor Dinas
Ogor Du
Pant Mawe Pot
Pant-y-Llyn
Pulpit Hole
Pwll Du
Silver Bog Sink
St. Donat Cave
Southern Down Cave
Stoney Ford Sw.
Town Drain Cave
Twym Shon Catts
Twyn Drainage
Waen Fignen Felen
Walnut Tree Bridge Cave
Wogan Cave
Unnamed Cave No. 1
Unnamed Cave No. 2
Unnamed Cave No. 3
Unnamed Cave No. 4
Unnamed Cave No. 5
Unnamed Cave No. 6

(Locations Unknown)

Bowen's Parlour Cave
Careg C. Castle
Careg yr Ogof
Carweley Rock Cave
Ceirog Cave
Cwm Gored
Gob Cave
Gogafan Cave
Halkyn Mine
Llanarmon Cave
Llandulais Cave
Llanmadoc Cave
Minchin Hole
Ogof Diban
Ogof y Gaseg
Ram Tor
Ravens Tor
Slide Pit
Star Cliff
Tv Newydd
Varteg Sw.
Ynys Rock

Channel Islands

Jersey

La Cotte de St. Brelade
La Cotte de St. Ouen

Sark Island

H. C. Hovey in "Celebrated American Caverns" states that some of the finest sea caves in the world are along the three-mile coast line of Sark Island in the English Channel.

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I have had a fairly intimate acquaintance with the Derbyshire and Yorkshire caves, over a period of six years or so ending 1942, but I have not visited the South Wales or Irish caves. If it is of interest, however, I herewith submit a much more complete list of British caves than that given in the *Bulletin* issues Number Five and Six.

Exploration in South Wales and Mendip had been proceeding at a very high rate during the past few years (before the war, I mean), and publication has not kept pace with the exploration. I think, therefore, that there must be many more caves in those two regions than I have shown in my list. The other regions have been fairly well explored for many years, and nearly everything has been reported.

You will note the peculiarities of Welsh, Gaelic, and Celtic names—in Welsh *Ogof* (sometimes *Gof*) means

“cave”; in Gaelic, *Uamb*; in Celtic, *Poll* or *Poul*. Welsh, I'm familiar with; Gaelic slightly; Celtic not at all. I believe that the names are the phonetic English transliteration of the Celtic, which uses a different alphabet, anyhow.

I have omitted from the list the Deve Holes and Chislehurst caves, as these are, unquestionably, man-made excavations in the chalk, and contain no natural cavities. (There is a story going around that the roof of Chislehurst caves show the marks of the deer-antlers which were used by primitive man as tools! About similar to the Roman coins found in the same caves with Julius Caesar's head and the date 55 B. C.)

I had the good fortune to make a business trip to Kentucky recently, and visited Mammoth Cave—the first cave I had entered since arriving in the U. S. A. some time ago. Normally I have little leisure time; but I was interested to note the list of caves, however, as there seemed to be some within a weekend excursion of New York. My interest in caves is more sporting and, exploratory, than archeological or biological.

Frank Solari,
New York, N. Y. (1944)

CAVES OF THE SEWANEE AREA

By HENRY T. KIRBY-SMITH, M. D.

HARVEY TEMPLETON of Winchester, Dr. Edward McCrady of Sewanee, and I have explored during the last four years 51 caves located in Franklin, Grundy, Marion, Lincoln, Warren, Cannon, and DeKalb counties, Tennessee, and in Jackson county, Alabama. There are many different types of caves in this area; but those in the immediate vicinity of Sewanee belong to a distinct group. It is caves of this one latter type only which are discussed here.

Sewanee is located on top of the Cumberland Plateau, a range of mountains composed of limestone with a sandstone cap. The Plateau is about 2,000 feet high, breaking off sharply about 1,000 feet to the highland rim below. Both the top of the mountain and the valley floor are relatively flat, broken into small hills and ravines by streams, but without peaks or high hills. The sides of the mountain are quite steep and contain no level areas of appreciable extent. The sandstone cap of the mountain is comparatively thin and below this nothing but limestone is found. This condition is associated with the formation of many caves.

There are numerous valleys and coves in this region which have been formed by erosion. In the long and narrow valleys of Crow Creek and Battle Creek on the East we have found most of our caves. Our largest ones are

found at the foot of the mountain, although the whole side of the mountain is probably honeycombed with small ones. As water flows through these small caves, like streams on the surface, they tend to unite into a drainage pattern until a cave is formed which is large enough to be traversed by man.

The sandstone cap is relatively impervious to water and caves are not, therefore, under the cap. They do not extend under the cap but rather are found running under the sides of the mountain only. Their entrances are found, not at the heads of the ravines, but at the ends of spurs which project into the valley. Wonder Cave, near Monteagle, illustrates this point. The true mouth of the cave is not the break into the cave through which visitors are taken, but is an opening at the very end of the ridge about 200 yards further down.

The location of the mouth of the cave at the end of a ridge rather than at the head of a ravine may be explained in this way. Water which flows down the sides of the mountain always flows through underground passages rather than on the surface. These passages are formed at first by water seeping through cracks which are enlarged into caves by the action of carbonic acid on limestone. A cave so formed follows the general direction of the ravine, but under the side of the mountain, a variable distance

from the surface, becoming larger toward the bottom of the ravine. When there is an intersection of two large ravines, a spur of the mountain is formed and a cave is cut across and opened at the end of the spur.

The caves of the Sewanee area are numerous and their most distinctive characteristic is that they are new live caves in the process of formation. Thirty or 40 miles north of Sewanee in the Collins River, Beersheba area the caves are altogether different. They are old, dry, dead caves the mouths of which are not at the foot, but several hundred feet up on the sides of the mountain. South of Sewanee in Jackson county, Alabama, the caves are not nearly as numerous or extensive. Northwest, in DeKalb county, where the caves are found below the Chattanooga black shale, we again find dead, dry caves on the sides of the hills.

Our caves, as I have said, are like streams on the surface. They have numerous side passages through which smaller streams enter the main passage. The side passages are usually quite small and not traversible for any distance. Often the only evidence of their existence is a trickle of water.

Our caves appear to be solution channels formed by flowing streams of water. Some geologists have postulated a two-cycle theory of the formation of caves. It is believed that at one time the cave was completely under the water table and erosion took place only by the action of carbonic acid. Later the water was lowered and the cave became open. (See W. M. Davis, for example, in *Bulletin of the Geological Society of America*, 1930.) Apparently both theories enter into a comprehensive explanation of all the different characteristics of cave passage.

The length and size of caves are, of course, varied. We have found only two caves which are passable for a distance of as much as a mile and a half. I may digress here to say that no subject, unless it is snakes, inspires so much popular misconception as the question of the length of a cave. People living near a cave will report it to be six or eight miles long or will maintain that a neighbor walked in it for a day and a night without stopping and without reaching the end. A cave that is three-quarters of a mile long is a long cave. The height and width of cave passages varies from cracks that one can barely squeeze through to chambers 200 feet wide and 70 feet high. We have measured several rooms and found few to exceed 70 feet.

Another interesting aspect of these caves is the relatively slight change in altitude of the cave floor from the mouth to end. The streams have swift flowing rapids but there are also many large, still pools. There are no

large waterfalls. An exception to this is found in a few caves which terminate in a high chimney through which a stream of water pours. In our largest cave, known as Boat Cave and located in Battle Creek valley, the change in elevation is so slight that it is possible to go the whole distance of approximately a mile and a half in a boat. Except in a few places there is no perceptible current. In one place the water is found to be 24 feet deep and quite clear.

The caves are solution channels and in places the passages are almost perfectly oval in shape. In other places there have been falls of rock from the roof, and the floor is a mass of broken rocks of all sizes up to 20 or 30 feet across. Often such a rock fall seals off a cave, but it is sometimes possible to crawl around or through the fall and re-enter the main passage of the cave beyond. We have not seen evidence of recent changes of positions in the rocks of such falls.

The caves with entrances further up on the sides of the mountain are not very long, but there is one type which should be mentioned—the so-called chimney, or "Hell hole." These are vertical shafts found at almost any level on the side of the mountain. They are usually small at the top and open out into a single large room. The floor is a jumble of loose rock, leaves and sticks. As a rule, no side passages are found. Mr. Templeton has been our foremost explorer and in one cave we let him 165 feet straight down before he hit bottom. He found deer's antlers, a bear's jaw, and other smaller bones. From one of these holes which has a connection with a large cave, on a clear, cold morning a large column of mist can be seen, rising into the air and visible for a mile or more.

Annals of Philadelphia . . . in the Olden Time, by John F. Watson (1855) contains a brief section on "The Caves" (p. 171-2), which explains why present-day descendants of several first-families of Philadelphia are to this day called "Cave Dwellers."

"Most Philadelphians," says Watson, in an excerpt from the section, "have some vague conceptions of the caves and cabins in which the primitive settlers made their temporary residence. The caves were generally formed by digging into the ground, near the verge of the river-front bank, about three feet in depth; thus making half their chamber underground; and the remaining half above ground was formed of sods of earth, or earth and brush combined. The roofs were formed of layers of limbs, or split pieces of trees, overlaid with sod or bark, river rushes, etc. The chimneys were of stones and river pebbles, mortared together with clay and grass, or river reeds."

This was in the latter quarter of the 17th century. There were several of these caves used as barrooms. The last family cave disappeared in 1830.

CAVE FORMATIONS IN THE SEWANEE AREA

BY HARRY M. TEMPLETON, JR.

MOST, if not all, of the water found in caves carries a certain amount of dissolved mineral matter, usually calcium carbonate, but calcium sulphate, magnesium carbonate and sulphate, iron, manganese, and nitrogen compounds are also found. Rainwater from the surface picks up these minerals in its passage downward to the cave, there usually being a prevalence of calcium carbonate derived from the action of the weakly acid water on the calcium limestone of the Sewanee Cave area, Tennessee. Since the calcium carbonate is responsible for the most interesting formations we will discuss that alone.

There are a wide variety of conditions leading to the deposit of the carbonate so that the size and type of formation is determined by the concentration of the solution, its pressure, temperature, and carbonic acid content, and by the quantity of the solution together with the speed and continuity with which it enters the cave. After the water enters the actual cavity the physical position of the water, the temperature, and the degree of saturation of the air with water vapor and carbon dioxide exert their influence. Movement of the air, other compounds in the solution, and possibly other circumstances enter into the picture. Therefore we may expect a great variety of deposits.

As the water drips from the ceiling stalactites, stalagmites and capillary tubes are formed. These are obvious and better-known cave deposits, and so well understood that we need not discuss them.

An interesting formation, which I have never seen described, however, is sometimes formed on the surface of a few stalactites which from unknown causes, exhibit many deep hairline cracks. A slow flow of carbonate solution passes down through the stalactite and issues from the cracks so that both their edges receive a calcite deposit which, in time, projects for an inch or so. Since the two deposits never quite touch, the resulting formations very closely resemble an unopened oyster.

Water dripping to the floor does not always form stalagmites—several other deposits sometimes result, the most interesting of which are Cave Pearls. Cave pearls have the shape and structure of a true pearl and are the result of the deposit of concentric films of calcite around any nucleus, such as a grain of sand. They may reach the size of a marble. In each deposit there may be several dozen, all contained in a small, circular basin lined with a slick, slimy calcite deposit. They are extremely rare, since both the degree of agitation by the dropping water and the rate of calcite deposit must be precisely

right for their formation—too slight a movement allowing them to adhere to the basin, and too violent a movement throwing them out. Movement without sufficient deposit will sink a pebble; and too great a rate of deposit will form irregular-shaped bodies, or cause all to coalesce.

Many cave surfaces are constantly wet with a very thin film of carbonate-bearing solution of questioned origin, which gives rise to all the forms of knobstone and cave coral. This film seems to evaporate more quickly from and therefore deposit calcite on, any small projections so that the projection is built further outward and eventually assumes the shape of a rounded knob attached to the original surface by a stem of somewhat smaller diameter. In places these projections are so very numerous that the smaller types resemble moss. They sometimes grow to be a foot long, studded with knobs the size of an egg; but they are then usually intensely compound—i.e., younger formations arising from the body of the older deposit.

Whenever there is enough carbonate solution present to form pools on the floor and the solution is concentrated enough, a rim of calcite is deposited around the edges of the pool which becomes progressively deeper as the rim



is built up. Where well developed, these rims reach a height of two or three feet and confine a body of crystal-clear water with an area of several hundred square feet. On the inside surfaces of the resulting basin, there is commonly found a heavy deposit of large, glistening calcite crystals.

Evaporation from the surface often causes the formation of a thin film of calcite which floats on the water, and this film sometimes reaches such a thickness that sections of it can be picked up with ease. After reaching a certain thickness, the calcite flakes usually sink

and may accumulate to the extent that quantities of the delicate sheets of stone may be scooped up from the bottom.

In one instance we have found in such a pool numerous examples of very perfect hemispheres about a quarter of an inch in diameter and composed of a thin sheet of calcite which we believe to have once floated on the water as little stone boats. In this pool we also found examples of complete spheres, hollow, and consisting of a thin calcite shell which we assume to have formed around bubbles of air or other gas below the surface.

In a number of the caves there are excellent examples of formations of obscure origin about which very little is definitely known. These are grouped under the term "helictite," which at present includes all cave formations deposited in apparent defiance of gravity. Of the formations conforming to this description, there are a number sufficiently diverse to suggest separate modes of deposit but all are commonly referred to as helictites.

One of the more interesting is a deposit of calcite, or aragonite, of a cylindrical shape with a diameter of up to a quarter of an inch. This type grows outward from the walls, ceilings, and floor of the cave in any direction in complete defiance of gravity and may reach a length of five or six inches. As they grow they twist and turn to a marked degree; and since usually many are found arising from a common base and are grouped close together, they form somewhat the same picture as the gorgonians of tropical waters. They present a rather striking appearance because of their numbers and because many are white or translucent.

There are other formations of somewhat the same conformation but usually of larger size, up to an inch or so in diameter. These are usually more nearly straight, gray or brown on the surface, and resemble porcelain within. They may extend nearly horizontally from a wall for two or three feet; or vertically downward from the roof (as would a stalactite) for perhaps a foot, at which point they abruptly change to the horizontal.

We have found a group of delicate sort which consists of a needle-like deposit growing almost vertically upward to a height of five or six inches. At any point branches may develop which, after growing out nearly horizontally for an inch or so, turn sharply upward producing somewhat the effect of a tree without the smaller branches. All the extremities are needle-sharp, and are interesting because almost no other formations exhibit this feature.

One cave on the edge of the Sewanee area has fairly good examples of a type which is better developed in some Virginia Caves. These resemble long, thin crystals, white or translucent, which begin to form close together and

diverge as they extend outward giving a sunburst effect. This type, as we find it, is closely associated with a well-developed knobstone so that the long crystals radiate from points between the knobs.

Associated with capillary tubes, there are sometimes found delicate water-clear formations which usually grow nearly horizontally from the wall and sometimes reach two inches in length. Most of these are nearly straight, and may be simple crystals; but some show a pronounced corkscrew shape which would seem to eliminate the idea of a single crystal.

Helictites in general are usually interesting; partly because of their rarity and their varied shapes, and partly because it is so difficult to form any reasonable theory



as to their formation. Wherever we have found helictites, we have found evidence of gypsum formation which may have some bearing on the question; as far as we know, however, gypsum does not enter into their composition.

Many of the formations described may be either calcite, aragonite, or dolomite; and possibly some consist of both calcite and aragonite, since both of these forms seem to be sometimes deposited under the same conditions.

Other minerals sometimes form typical deposits of their own, and sometimes seem to contribute to, and somewhat alter, the formations described. As we continue to investigate the Sewanee cave area, more formations come periodically to our attention; and we have no reason to think that we have as yet found all of the types.

A night club, 500 feet under the Ozark Mountains at Bella Vista, Ark., will be open throughout the summer, the American Express Company reports. Wonderland Cave, where 2,500 people can dine and dance, is air conditioned by nature and has a uniform temperature of 62 degrees. The central cave contains a convention hall with conference side rooms, a mammoth banquet room with theatrical lighting effects and has served unofficially as the Arkansas Senate Chamber.

Editorial

ANNUAL REPORT OF THE PRESIDENT (1945)

February 27, 1946

The last year has shown a generally satisfactory growth and development in our Society. The annual meeting of 1945, which officially opened the year, was without doubt the biggest event to date in our Society's history.

Our membership has increased by 47 new members during the past year, though this growth will, of course, be offset by some loss because of deaths, resignations, and for other causes. During the year we instituted the practice of assigning membership numbers. This should serve as an incentive to retain low-numbered memberships in full force. These numbers should be on the 1946 membership cards. It is expected that a full fledged membership drive will be conducted during 1946, now that the war is over and peace-time field trips can be resumed. Our long-awaited Brochure has been completed in preparation for the coming membership drive.

Under the capable editorship of Bill Hill and the cooperation of the Cleveland Grotto the *Newsletter* has been developed so that it now is a perfect supplement for our BULLETIN. Through the *Newsletter*, members now have a medium for publishing their personal notices and keeping up with the various current activities of the Society.

BULLETIN 7, which was released late in the year, was indeed worth waiting for. Our BULLETIN has constantly improved with every issue. If this improved high standard is to be maintained, we all must do our best this coming year to increase the Society's income, as our present membership is insufficient to support a BULLETIN of this quality in view of rising printing costs.

Early last summer the Society was called upon by the War Department for information on Virginia and West Virginia caves. Your President, together with member William McGill, spent several days in the field with their representatives, helping them locate caves for sealing and demolition experiments. It is hoped that a complete report of these experiments will appear in BULLETIN No. 9. Value of the Society's help in this project was acknowledged by several letters, all now in our official files. This emergency call by the War Department clearly justified the efforts of the Society to continue its field work during the war. The Society will continue its efforts to interest the government in caves for storage, emergency shelter, and other purposes.

Some progress was made during the last year toward the organization and functioning of the Society's committees. A new committee on legislation was authorized, whose duty will be to sponsor local and national legislation dealing with the protection of caves and for maintaining standards of commercial caves. The State of Virginia has already passed such legislation. A special committee was appointed to attempt to obtain a national charter for our organization.

Under the leadership of Dr. Walter Jones, a three-day national field trip was held in northern Alabama. Several new caves were investigated and considerable fauna collected. All who attended this trip profited from Dr. Jones' instructions on collecting methods and from the field contact with other members from divers sections of the country. Another such trip is planned for September of next year.

With the return of peacetime conditions and of many of our members from the armed forces, it is expected that the coming year will be a bright one for our Society.

Respectfully submitted,

Wm. J. Stephenson, President (2/27/46)

Report of Annual Meeting (1946)

The three-day annual meeting of the National Speleological Society in Washington, D. C., was perhaps the largest and most enthusiastic get-together of our members since the formation of the Society.

The morning of Friday, February 22nd, was devoted to registration and spelunkers from all parts of the country met at the U. S. National Museum to renew old acquaintances and make new ones. Many were recently back from the far corners of the world on the business of war, and expressed gladness at the prospects and promises of post-war caving.

The afternoon session convened at 1:30, and Mr. Stephenson introduced Charles E. Mohr of the Philadelphia Academy of Natural Sciences. Mr. Mohr treated the assembled cavemen to a highly instructive lecture, complete with movies and color slides, on "Hunting Cave Animals" and "Thirteen Years of Banding Cave Bats." After finishing the lecture, Mr. Mohr was called on to answer specific queries by various members of the audience. This done, the meeting turned to business, and the election of members for the new Board of Governors followed. Results of this election are reported elsewhere in the BULLETIN.

At 4:30 the meeting was adjourned and the members went their way until time for the annual dinner and social, held at Joppa Temple at 7:30. More than 70 per-

sons turned out for this excellent dinner, at the close of which members of the new board who were present were introduced. This done, the evening's entertainment was commenced with a lecture and movies by Dr. W. F. Foshag of the Division of Mineralogy, U. S. National Museum. These movies were in color and entitled "Volcano Paricutin." This is the volcano that was "born" in Mexico just four years ago; Dr. Foshag had been sent there to investigate and report on it, and had spent four years watching the volcano grow and capturing its progress with these spectacular pictures.

At the end of the lecture and movies, the banquet tables were cleared away and the room made available for dancing. The ice was broken by a "Paul Jones," with Dr. Benn calling the shots, and from there on in it was a lively evening.

Saturday's program provided for late registration of members and a morning discussion of grotto problems with Elton H. Brown representing the D. C. Grotto; Betty Vaught the V. P. I. Grotto; Barton Faust representing Richmond; and Bill Blaha for Cleveland. A Board of Governors meeting took up most of the afternoon, but the day's activities were high-lighted by a visit of approximately 40 members to the U. S. Army Map Service, arranged for by Capt. W. E. Davies. The evening was left open and a number of members congregated at Bill Stephenson's home in Bethesda; another party of about 11 persons, guided by John Petrie, visited the Neptune Room.

The big event for Sunday, February 24th, was the visit to Luray Caverns, Va. Forty-eight persons made the trip by private cars, and were treated to dinner by the management of the caverns, represented by the gracious Robert Harnsberger. Following dinner, they were taken through the cave and given opportunity to examine its formations and features to their hearts' content. On leaving the cave, an invitation was extended to visit the Lapidary Shop or "Stone House," where ornamental objects, costume jewelry, etc., are made from cave formations. A number of those present took this opportunity to learn something of the unusual art, while others prepared to leave for visits to other caves in the area.

Before reaching Luray Caverns, two cars in the party stopped at Woods Cave, near Rileyville, Va., and did a little exploring. They found the bottle left there the year before by Al Lewis, Dr. Morrison, and others, and pushed it back another 100 yards. After going through Luray, several cars headed for Skyline Caverns, which have been closed throughout the war but are about to be reopened, and took opportunity to go through and examine this cave's peculiar helictites. Another car, con-

taining Chuck Wood, Leroy Foote, Bob Hall, John Meenehan, and Jack Wilson, went exploring south of the town of Luray and spent some time examining rocks along a stream, but without finding any cave entrances large enough to enter.

Later they visited property known as Willow Grove Mill, located on U. S. 12 just a few hundred yards south of the town limit of Luray, and were given directions to a "Fox Cave" nearby. This cave was easily located and, although it was already late, the party entered and explored it. The results of this exploration are reported elsewhere in the BULLETIN.

Jack Wilson

Membership Data

During the year since March 15, 1945 when the last membership list was issued, 52 names have been added, bringing the total from 320 to 372 as shown on the new list supplied to all members. Death has claimed four more of our members and eleven others have either resigned or been dropped for non-payment of dues. These bring our total losses since the beginning of 1939 to 98, leaving 274 active members, including 31 life members and two Honorary Members, Dr. Swinnerton and Dr. Wetmore, not included in the annual and life membership ranks.

Fifteen life members were obtained during 1943 when this class of membership was instituted, 10 more in 1944 and six during 1945. The Alabama Geological Survey remains our only Institutional member, but Messrs. Curry and Ward of the Commercial Cave Committee have hopes of increasing this number materially from the ranks of the commercial caves. University or Museum Libraries in New York, Indiana, Oklahoma and Texas comprise four subscribers to our publications. Personnel at our V. P. I. Student Grotto in Blacksburg, Va., shifts from quarter to quarter with 22 voting in the recent election.

During the past year the membership applications from the beginning have been carefully checked and evaluated, and serial numbers in chronological order to the best of our ability from existing records assigned to all members of the National Society. Numbers vacated by members dropping out are not thereafter reassigned to others, thus making it possible for any member who has resigned or been dropped for non-payment of dues to regain his original number by payment of back dues. During the past year two members thus reinstated themselves. Others having a large "backlog" of dues in arrears may prefer to add enough to this amount to equal the current year life membership rate and thus simultaneously regain their original low membership number and forever free themselves of the

bugbear of annual dues. Since only half of such funds are available for current expenses (primarily the BULLETIN), the remainder being placed in a permanent fund, the Society and the member both benefit throughout the years. Members acquainted with any of these "ex-members" may do all concerned a good turn by helping or encouraging them to "get back into the fold."

With many members still in the service and those returning shifting around considerably, maintaining an entirely accurate and constantly up-to-date mailing list has proved impossible. A break-down of membership by states as formerly presented seems therefore under these conditions to be of little value. Suffice it to say that at this time 30 states and D. C. are represented in our membership, besides seven English, two Venezuelan and one French member. About 34 women and 36 doctors are included, as well as representatives of a large number of our commercial caves.

Joining the V. P. I. student grotto, and the Richmond and Cleveland Grottoes, a new D. C. Grotto has been organized. It is understood that plans are under way for reorganizing the New England Grotto, and for organizing grottoes centering in Arthurdale and Charleston, W. Va., and Evansville, Ind. Unorganized groups in Steubenville and Toledo, Ohio, Pittsburgh, Pa., the Shenandoah Valley and perhaps elsewhere may well take notice. The simple application requirements for a grotto comprising adoption of a brief constitution and election of officers constituting an executive committee are relatively easily met, and the resulting organization seems to stimulate membership increase and effectiveness in the group. With a goal of 1,000 members by the end of the year as has been suggested by our President, expansion of our grotto system may well play an important role. As our Membership Committee Chairman suggests, every member should constitute himself a productive member of the Membership Committee, and then "watch us grow."

J. S. Petrie, Secretary.

Nice Words to Hear

This office acknowledges the valuable assistance rendered by you in connection with locating and selecting caves in the western part of Virginia for use by the War Department in important experimental work. Your technical knowledge and expert advice contributed greatly to the success of these experiments.

Your complete co-operation is appreciated.

C. J. Blair, Jr.,
Lt. Colonel, Corps of Engineers,
Chief, Real Estate Division (6/12/45)

POTHOLE

Somewhere inside of us is a complaint wanting to worm out: e. g., "What Do YOU Think Speleology Should be?" We queried members at large (inside back cover, BULLETIN No. 7). Replies—or even comment: O. In POTHOLE for same No. 7, we posed half-a-dozen questions, begged for sundry aids, suggested as many topics for articles, etc., etc. Replies, or even comments: O. (Ed. comment: O.) The Ed. crows a bit: he bought recently in Denver, an excellent copy of H. C. Hovey's *Celebrated American Caverns*, inscribed to "Dr. S. V. Leech with the fraternal regards of the author. Albany, N. Y., June 2, 1890." Nice?! ☞ Several people have written: why publish letters written so long ago, as you frequently do? *Ans.* Because, in some cases, The Ed. just received them; in some cases, just not room in previous issues. Anyhow, if undated, you'd seldom notice the difference for most of them. Which reminds us: Do not be impatient or despair that your material—letter, article, note, etc.—written perhaps years ago, is destroyed or rejected. If it had value or interest, it will eventually be used. ☞ For the armchair speleologist (such as The Ed. has perforce become), browsing in *The Archaeology and Prehistoric Annals of Scotland*, by Daniel Wilson (Edinburgh: 1851) is very productive. On p. 25, e. g., one finds data on tigers (*Felis spelaea*) and hyaenas (*Hyaena spelaea*) in ossiferous caverns; p. 88-90, on "natural and artificial caves which . . . have supplied hiding-places . . . and even permanent native dwellings;" and, p. 183-86, on Kent's Hole Cave. This latter section contains a *most* interesting three-page, fine print quotation from *Cavern Researches*, or Discoveries of Organic Remains, and of British and Roman Reliques in the Caves of Kent's Hole, Anst's Cove (sic), and, by the Rev. J. MacEnery. Buckland (*Reliquiae Diluvianae*) owed much to MacEnery for data; and Owen, in his *History of British Fossil Mammals*, refers to Kent's Hole as "perhaps the richest cave depository of bears hitherto found in England." ☞ Vic Craun (see *Texas Caves*) writes that he's recovered from tropical fever caught on his first trip south, and is off again to Central America—to "look over the Manatee Cave in British Honduras . . . (near) Belize." ☞ Bretz' *Phreatic and Vadose Features of Limestone Caves* is something enlightening to those who wish to learn of cave formation. Copies are \$1.25 each. (Apply to LeRoy W. Foote.) ☞ John Hooper (member from Great Britain) writes suggesting the Society design and bring out for sale stiff binders with suitably printed or engraved lettering on the cover, to hold back issues of BULLETIN. Any comments? ☞ In *Wide World*, for January, 1928: "Crawling Caverns," by Mark Howard, p. 225, tells of land crabs in caves in Mindanao, Philippines. ☞ From Departamento De Exploraciones Y Estudios Geologicos, Instituto Geologico De Mexico: "Recently-explored Xoxafi (So-sa-fe) Cavernas, at Octopan, Hidalgo, will soon be commercially developed. This is a fine group of caves near the highway from Laredo to Mexico, D. F." ☞ (1) Cave 38 m. from Gunnison on highway from Denver: 26 m. on r., 12 miles off.* Supposed to go down, shaft-like, opening into large room filled with artifacts.

(2) "Another cave" (in area). See Art Ebert, Gunnison. ☞ "The world's largest natural storage refrigerator was scheduled to become completely operable late in July after three 250-ton refrigerating compressors had gone into action at the Atchison, Kan., cavern chosen by the Government for storing reserves of perishable food. The temperature was expected to go down to 30 degrees at the end of about 30 days, the time required for the 48 blast-type units to cool below freezing the great stone vault that reaches back into the high hills on the banks of the Missouri River and has a capacity of 3,000 carloads of food." (From Aug., 1945, *American Cattle Producer*.) ☞ Two caves on Chaffee Mountain in Vermont are five feet apart and lead to two unconnected caves. Careful examination revealed no explorable passages between them. ☞ Clay Perry lists 58 caves, mines, notches, natural bridges, gorges and ice beds in Vermont. But we have no members there to tell us of all the wonderful sights to be found. A Society Grotto in the Green Mountain state would not add one iota to the natural wonders there but would tell the world of the sights in one of our most picturesque New England states. New England is old and wrinkled, geologically, and if flattened out might be twice its present size and could be seen on the map but a map could never paint its alpine scenery and verdant valleys. ☞ A cave at the base of a cliff in Cold River (very cold), Vt., can be reached only by swimming under water. Gold is sometimes panned in the river bed but not in the cave. It's hard to hold the pan level while swimming. ☞ At North Clarendon, Vt., a complete French telephone set, with no wires attached, was found recently. Finder was unable to get the operator, but clay stone rag dolls were at each end of the phone. Another collection of clay stones has been picked up, having been found many years ago in a New Hampshire cave. ☞ Ice skating can be enjoyed in July in a limited area at the Pittsford, Vt., Ice Cave. No rescue equipment needed. Ice is a foot thick in midsummer. Be sure to take warm clothing. ☞ *Science*, Feb. 8, 1946: "Algae in Carlsbad Caverns, N. M.," p. 175. ☞ From London papers, Capt. T. T. Perry sends us a score of interesting clippings indicating the value of caves in wartime. Dover's famous chalk cliffs, honey-combed with bombshelter caves, were providing an "underground" for much of the home life of Dover's blitzed peoples in October last year. Other clippings tell of the caves of Aachen, turned into forts by the enemy, from which they had to be blasted out. The "mountain cave" (near Maastricht, Holland) where the Dutch villagers cast horse manure in which to grow mushrooms "where were hidden 800 of the world's finest paintings" of the 16th and 17th century masters and the "last battle for Ali Baba's Cave (in northern France) . . . reputed to contain secret German apparatus." All these and other clippings of speleological interest, incidentally, are now kept by our keeper of the scrapbooks, Mrs. Francis Snell, 2750 W. 16th Street, Chicago, Ill. ☞ *Life and Adventures of Robert, the Hermit of Massachusetts*, who has lived 14 years in a cave, secluded from human society. Wood-engraved portrait, 12 mo., 36 pp. Wrappers.

"Taken from his own mouth and published for his benefit." A mulatto who turned hermit to escape from "unjust and cruel bondage." Providence, H. Trumbull,

1829. ☞ Charles E. Mohr photograph in *Popular Photograph*, Feb., 1946, p. 55: "Inching his way through a tight squeeze, this cave explorer may encounter sudden danger. Solitary expeditions are frowned upon and hunters never enter a cave alone."

Text: "Volumes could be written about nature photographers. You may find them anywhere! One group haunts caves, crawling on their stomachs through narrow cracks to take flashgun shots of bats, rats, salamanders, blind fish, and owls . . ." ☞ See *The Pheasant Jungle*, by William Beebe, p. 170, for data on Batu Caves in Pehang, Malasia—full of bats, roaches, and serpents; *Uncle Tom and Andy Bill*, by Charles Major, for chapters on adventures in Wyandotte Cave and Blue River district; *Anna and the King of Siam*, by Margaret Landon, p. 355, for "hot springs, caves and grottoes" near Petchaburi, on river of same name, 90 m. s. w. of Bangkok. ". . . very beautiful. Stalactites like carved pillars and the wonderful colors of the roofs and walls made them seem like temples. One was, in fact, used as a temple. The others had been left as they were except that steps had been cut into them so they could be entered easily." ☞ Nearly 2,000 years ago, Pliny the Elder described the famous cave out of which the northeast wind was said to issue, and which place—because it was also a gold mine—"they call the cloister, or key to the earth." In this cave dwelt the Arimaspians and the Griffins. The Arimaspians were "known for having one eye only the midst of their foreheads," and for being engaged in perpetual war with the Griffins, "a kind of wild beast that flies and filches gold out of the veins of those mines." ☞ During the tunneling operations at Gibraltar, said a story in the *Washington (D. C.) Star* (5/10/43), a series of five cave chambers were discovered. The main features were their "tremendous size, a profusion of calcite formations, and a lake of about 70,000 gallons of water." An accompanying photograph shows a man on a raft and another on an outcropping of stalagmite in the lake, examining the "cathedral-like beauty of the 'salt formations.'" ☞ From June 11-30 the U. S. National Museum in Washington, D. C., held an exhibit of reproductions of Indian Cave Murals and paintings of India today by Katachadourian. ☞ On June 25 last year, a small mountain near La Paz, Lower California (Mexico), disappeared one day. When investigated, the cause was revealed as an underground river which had swallowed the mountain! ☞ A Ripley cartoon sent us depicts the Crystal Cross of Grand Roc Cave, in France. "Remarkable helictite formations," says the caption: "The arms of the cross were formed by water dripping sidewise!" ☞ Gunn's Plains, northern Tasmania (near Hobart), Australia, is over a "honeycomb of limestone caves," says a clipping (11/4/44). "Recently a resident walked out of his house and almost stepped into a hole that had swallowed up a pile of logs, a 20-foot tree, and a creek!" ☞ From *God is My Co-pilot*, by Col. Robert L. Scott, Jr., Air Corps, U. S. Army (with a foreword by Maj. Gen. C. L. Chennault). New York; Scribner's, 1944. Chap. 21, (p. 162): "Some Good, Honest Lead-Poisoning."

"As the transport got away and the dust settled down, I climbed out of my tighter and looked around the country. I could but marvel at the geographical situation. Col.

Cooper and I—Cooper had been in the movie production business—used to discuss the peculiar beauty of the place, and he'd say that it would make the greatest location in the world for a moving picture.

"It was a flat, tableland country, and over the ages it must have been under water. From the level plain rose vertical, rocky hills, like stalagmites. These were honey-combed with caves where water, when they were submerged, must have dissolved the limestone that had been in the pockets. Evidently the glacier period had planed the valley flat as the glacier moved South, but the jagged rocks had withstood the pressure. Then, as the glacier melted, the caves had formed under water. Now the gray pinnacles of lava-like rock pointed straight toward the heavens. These 1,000- to 2,000-foot sentinels gave the valley an eerie appearance that always subdued my general feeling of cheerfulness. As long as I went to Kweilin, I dreaded the extra nervous tension that I knew it would produce. Add to this a summer temperature of over 100 degrees, a humidity of almost 100 percent, and a fine powdery dust that gagged you, and you can realize that Kweilin was not a summer resort.

"There was just the single runway for the planes, cut there between those silent needles of stone. We had operations office in one of the natural caves, and the radio set in another. As I climbed out of my P-40, I could see neither." ☞ Industry in China thrives in countless caves despite more than seven years of attacks by Japanese armies. Plants several acres in extent have been built underground in sites far from normal production centers. Education, too, as well as normal living, has gone underground. Whole cities, almost, and many colleges, vocational training and teaching centers are now and long have been entirely underground in natural caves, and natural caves further enlarged by excavation. ☞ Acknowledging the British Speleological Association's "Programme of Meets, Yorkshire and Derbyshire Sections." Running in two- to five-day sessions, at intervals, from March 30 to July 1, parties visited a score of caverns, holes, and pots. (Possibly this note will draw a report of some sort from one of the members . . . it will be welcome.) ☞ Acknowledging, from the British Speleological Association, at Settle, Yorkshire, a most interesting and valuable packet of scientific data on archaeologically-famous Victoria Cave, at Settle, Yorkshire. A large map of the cave, a series of five photographs made during the famous 1870-78 excavations of the cave, and six exceedingly scarce reprints of annual reports on Victoria Cave from the B. A. S. publication, 1874-78. These have been sent to the Society Library for reference. ☞ The *Atlanta Journal Magazine*, for 7/8/45, has a nice full-page illustrated article, "Dangling on a Rope Under Georgia," by Carolyn Carter. It tells about Ernest Ackerly ("Georgia's cave authority") with his party of five (including Dr. E. P. Odum, zoology professor, U. of Ga.) who explored Case Cave, near Trenton, Ga. ☞ After The Ed. visited Frank and Grace Morse's "Rockhound Colony," near Bayfield, Colo., he said he would mention it in the BULLETIN. It's a fascinating project and mineralogists will do well to write the owners for details. ☞ *National Geographic Magazine* for February, 1936, carries an Ever-ready advertisement about "Sam's Point Caves in the

Catskills"—but, are there such? And on page 177 of this same issue are mentioned and illustrated the Waitomo Caves (three of them) in New Zealand—famous for the Glow Worm Grotto. (We have it listed . . .) ☞ *Trailways Magazine*, Vol. 9, No. 4, for Summer, 1945, contains Clay Perry's "Underground Trails." It gives Luray and Shenandoah Caverns another going over for the public, nicely illustrated—good "Perry." The Society and members get a boost. Thumbnail of author also gives Society a good nod. Thanks, Clay. . . . ☞ Recreational Booklet No. 1, of Missouri State Department of Resources and Development, *White River Country of Missouri*, contains beautiful color and black and white pictures of Brown's, Smallin's Ash, Marvel, Fairy, and Roaring River Spring Caves; also Devil's Den, "great limestone sink," near Fordland, Mo. Of the latter, the legend notes that "At times a loud roaring sound is heard, apparently caused by the escape of water from the sink. . . ." ☞ *Atlantic Monthly*, for October, 1945, has "Cave Hunting," an article by Thomas Barbour of great interest to speleologists. It is a section from the late N.S.S. life-member's book, *Naturalist in Cuba*, and tells of his blind fish finds on the island. Most interesting, I think, is his reference to the "group of young men affiliated with the Geographical Society of Cuba in Havana (who) have formed themselves into a union called the 'Speleologists.' These wise and fortunate young people have started a systematic study of the caves of the entire island; they have already entered and studied more than 1,000 caves of which we have hitherto known little, and they are only beginning." (No mention is made of the "Speleologists" of the U. S., although Barbour was one of us before his recent death. And what contact have we had with them, if any, or with the American Cavers Association, of—where (Oregon, is it?)? ☞ *Photography*, for January, 1946 (p. 55), has a picture illustrating the article "Combating the Hard Water Menace," by R. W. Henn and J. I. Crabtree. The legend under the picture,—a cave interior, reads "Calcium carbonate deposits as found in nature in scenic underground caverns." Can anyone identify the cave? ☞ For good reading anyhow, we can recommend *Blue Ridge Country*, by Jean Thomas (Duell, Sloan & Pearce, 1942). But there on page 300, it stared us in the face: "There's Gandy Sinks where my friends of the Speleological Society were trapped by a cloudburst on August 1, 1940; and Seneca Caverns, in Monongahela National Forest, once the refuge of Seneca Indians about 20 miles west of Franklin on U. S. Route 33, and six miles from Spruce Knob . . ." And more about Luray Caverns, etc. Also, on pages 235-39, the two best ballads we know about Floyd Collins, one by the famous Jilson Setters, the other by Adam Crisp. Both are six-stanza effusions, but—good! in the traditional melodramatic style. Wish we could have space to reprint 'em—but they will have to wait until your Editor's projected anthology, "A Voice from the Cave." Incidentally, he hereby throws out the Help! Help! signal, for any and all citations, quotations, and references to poems dealing in whole or in part with caves, caverns, mines, sinkholes, potholes, and other *res speleologicae*. Thanks, in advance. . . . ☞ In Stewart Holbrook's *Murder Out Yonder* (not a detective yarn; studies of outland crimes—but good!) mentions

"Roger Johnson, of Springfield, Mass., New England's noted expert on caves." Note, please, that Clay Perry's new book will be heavily indebted to this same R. J., since the latter is turning over his files to Clay. ☞ In an undated tear-sheet from *Amazing Stories*, sent in by Martin H. Muma, appears a "letter to the Editor" signed by Betty A. Yoe, Sec., Cleveland Grotto, N.S.S., anent a story in that magazine by a Mr. Shaver with "reference to large caves, etc." It plugs the name of the Society—Betty's letter, that is. . . . ☞ Acknowledging, from Victor S. Craun, October, 1944, issue of *Outdoor Indiana*, with his splendid illustrated article, "Underground Wonderland." (On Poster, Donaldson, Marengo, and Wyandotte caves); from Dr. R. W. Stone, the September, 1944, issue of the Commonwealth of Pennsylvania's *Department of Internal Affairs*, in which appears his article about N.S.S., "Cave Explorers Form Organization."

Craun also sends us his portrait-illustrated prospectus which, on a broadside, reads as follows:

"Victor S. Craun, 30 years exploring caves throughout the world, member Wisconsin Geological Society, Wisconsin Archaeological, National Speleological Society, presents an illustrated travelogue through the celebrated caverns of the world, adventure, mystery, romance, tragedy in *Adventures in Cave Lore*. New Zealand, Australia, Tasmania, England, Germany, South Africa, Czechoslovakia, Cuba, Mexico, Canada, Bermuda and United States. Shrines of beauty and gorgeous temples carved by nature. The habitation of Oracles, Sibyls and Nymphs in ancient mythology, and were the dwelling places of the fairies, gnomes and dragons. Now being converted into modern archives for the storing of valuable art and museum material, hospitals, bomb shelters and storage depots, for the duration." ☞ In volume on *Shenandoah*, in *Rivers of America Series*, by Julia Davis, is a section on the caves and caverns of the area. It's a good book *without* this, however. . . .

CAVERSE CORNER

WORSE VERSE

(This punning epitaph is engraved on the stone that marks the burial site of a man named Cave on Barrow-on-Soar, Leicestershire, England.)

Here in this grave, there lies a Cave,

We call a cave a Grave;

If Cave be Grave and Grave be Cave,

Then, reader, judge, I crave,

Whether doth Cave here lie in Grave,

Or Grave here lies in Cave;

If Grave in Cave here buried lie,

Then, Grave, where is thy victory?

Go, reader, and report, here lies a Cave,

Who conquers death, and buries his own Grave.

The potato crops of Colorado and Nebraska are being sent to a huge cave in Atchison, Kan. The cave makes an ideal place to store the large potato crop, and 1,000 carloads are now on their way there.

—*Rocky Mt. Union Farmer* (Aug. '45)

LINES TO A PIPISTRELLE

By Jay Espy

*Caving's a science of such faceted mien
That to be cherished needs but to be seen,
And seen quite oft, as its paths we trace,
Our cares depart and our troubles erase.*

*He liveth best who loveth best
All caves both great and small,
For the dear God who loveth us,
He made and loveth all.*

*He whom from dome to dome
Guides through the endless night thy certain flight,
In the long way that I must tread ere home,
Will lead my steps aright.*

—Adapted from Pope, Coleridge, and Bryant.

THE TROGLODYTES' SONG

(Contributed, but not by, LeRoy W. Foote)

*We troglodytes are bold and brave;
We're not afraid of any cave;
Tho wet or dry, tho large or small,
Caves never frighten us at all.*

*We start out early on the trail,
And in our purpose never fail.
We'll cross a brook! or climb a fence;
Or plow through underbrush that's dense.*

*We only stop to eat and rest,
And then continue on our quest.
We gladly give our time and skill
To find a cave in any bill.*

*We take it all in cheerful mien
And reap enjoyment deep and keen.
We know the value to be found
Exploring nature underground.*

Chorus:

*Ho! Ho! Ho! Troglodytes we,
Modern cavemen bold and free,
We find our fun in nature grand,
Exploring caves thruout the land.*

To be sung to the tune of *The Little Brown Jug*.

"What may prove to be man's most ancient work of art, a prehistoric painting in red found in a cave near Valencia, Spain, and supposed to be about 15,000 years old, shows a man surrounded by bees taking honey combs out a hole in a cliff to place in a basket."

USDA Clipsheet, 3/10/46

WHAT WE KNOW ABOUT CAVES

By William J. Stephenson

CAVES* are supposed to have been used by man from the earliest time. Markings have been found in caves in Europe indicating that prehistoric man used them for his habitat and his temple. Evidence in America shows that the pre-Columbian Indian used caves in Kentucky and Indiana as a source of epsom salts, and also probably hammered out pieces of calcite for use as a medium of barter with other tribes.

Caves also have been of considerable economic importance to our country. During the War of 1812, Mammoth Cave furnished saltpeter for practically the entire powder output of the country; and during the Civil War, the South obtained nearly all of its saltpeter output from its caves. There is hardly a cave of any size in Virginia or West Virginia which does not show evidence of having been mined at some time for this mineral.

In spite of this long association of man with caves, little is yet known scientifically concerning them. The knowledge of the average geologist (who should be an authority on caves) is usually limited to the phrase, "A cave is 'a hole in the ground' which was formed by water whose CO₂ dissolved the contents out of the limestone." Such a statement, while accurate, serves to emphasize how little we know concerning or appreciate the underground mysteries.

Many Unanswered Questions

About six years ago, the National Speleological Society came into being primarily because a group, the members of which knew next to nothing about caves, began asking questions to which they could get no satisfactory response. Peculiarly enough, the first questions which started the formation of the National Speleological Society related to fauna; such as "How far in the caves do bats go?", "Are they always found near an entrance?" If so, "Does the presence of bats in any passage indicate the proximity of an entrance?"

At the time these questions were asked, there appeared to be no one who could authoritatively answer them. Now the Speleological Society has among its members some of the country's foremost authorities on bats, such as Dr. Charles Mohr of Philadelphia Academy of Sciences, and Dr. Donald Griffin of Harvard, who is famous for having recently co-conducted experiments aimed at discovering how bats can fly in the dark. These men can now answer the questions which started the National Speleological Society. However, one question has led to another, and

*Text substantially the same as that of a talk delivered by Mr. Stephenson before officers and members of the Section of Geology of the Virginia Academy of Sciences, Richmond, Va., May, 1944.

the list of questions relating to caves that are still unsolved appears to be constantly growing.

Prior to the year 1930, it was assumed by all geologists that caves were all formed by vadose water. In that year, Dr. William Morris Davis (*Bull. Geo. Soc. Am.*, Vol. XLI, 1930, pp. 475-628) advanced the theory that caves may be formed by phreatic solution. It is unnecessary at this time to delve into this theory. It is pertinent, however, to point out that Dr. Davis himself stated that his actual underground experience was meager, and was primarily derived from the underground observations and from the written works of others. He invited younger and more active people to get underground and make the observations which would prove his new theory to be either wrong or right.

In response to this plea for further work, Dr. J. Harlan Bretz published in the fall of 1942 (*Journal of Geo.*, Aug. Sept., 1942, Vol. L, pp. 675-811) his work on "Vadose and Phreatic Features of Limestone Caves." The present diversity of opinion concerning Bretz's work shows that the geologist is at least awakening to the fact that there is much still to be learned underground.

Age of Caves Moot Question

As the questions of how caves are formed is still unsolved, so are those relating to the age of caves. Most people take it for granted that caves are thousands or millions of years old. From the work of the National Speleological Society to date, it is believed that it can definitely be stated that many caves are nowhere nearly as old as people think them to be. On the other hand, some caves may be older. Ernest Baker, in "The Nether World of Mendip," sets forth rather conclusive evidence which tends to show that certain caves in England were in existence prior to the Triassic Period. Such an age for a cave is probably beyond the accepted beliefs of any gentleman present. There is much evidence that many of our caves were formed prior to the last glacial invasion, but we do not know how much before.

The estimation of cave age is baffling because the time which it takes to form a cave has nothing to do with the actual age of the cave. Once a cave is formed, it may remain dormant for untold ages, until the earth's surface wears down to the point where the cave is completely destroyed. How to tell the exact age of a cave is still one of our unanswered questions.

The actual time required for forming of caves may be less than anyone has suspected. Outside of Lexington, Va., there is a small cave called Tolley's Cave. This cave appears to be of vadose origin, and is typically of underground cutoffs as described by Mallott. As the drainage area of the stream which formed this cave is bounded

by semi-permanent hill crests (that is, hills whose streams are on opposite sides, so no pronounced tending toward "piracy", it may be assumed that this drainage area in the last several thousand years has remained practically constant. By observing the flow of the stream, its percentage of dissolved solids, and computing the present size (volume) of the cave, it is possible to compute the minimum time in which this cave could be formed. This turns out to be less than 700 years. Even if the actual time of forming this cave were five times this minimum time for computation, we have only 3,500 years for its formation.

A much different problem is presented by Trout Cave in West Virginia. This cave is a dry cave, high on the side of a mountain. The stream which formed this cave has long since been drained away. At present we can make no assumptions as to the size of the stream or any other fact relating to it. We therefore have at present no knowledge upon which to base any assumption as to how long this cave was forming, or how long it has been since its forming stream was drained away. We only know that the cave has probably been on the side of the mountain since the date when the valley was formed below its mouth. I bring out these facts to show that there is a great deal more field work and study to be done before we can accurately determine the age of any given cave.

Formation Growth Unsolved

Another question arises as to the exact rate of growth of cave formations. It is commonly assumed that it takes over 1,000 years to form one cubic inch of cave deposit. We now know from positive observation that under good conditions, such a deposit can grow as fast as an inch a year. We now know that the rate of formation depends upon many factors: the concentration of solids in solution, the rate of evaporation, and the amount and consistency of flow, etc. However, all of these factors are variable. Many caves, in times of drought, have long periods of inactivity when there is no deposition taking place. At our present state of knowledge, it is therefore still impossible to estimate accurately the age of any formation.

Cave Fauna and Temperature

We still, as yet, know relatively little about the various forms of life found within the caves. Within the last few years, the members of the National Speleological Society have discovered new species of cave life and probably will discover many more. In this field we have, to date, made the most headway since we have many able men now actively working on the zoological problems presented by the caves.

It is presumed generally that cave temperatures are constant. Cavern literature usually emphasizes the con-

stancy of cave temperatures. Recent readings taken in Virginia and West Virginia caves, however, show considerable variations of cave temperatures, especially in the winter time. These temperature differences are not hard to explain, but they are a fact which had apparently escaped previous observation.

Cave Hydrology Difficult

Hydrology presents some of our greatest unsolved problems. We still have the important question of where water found in certain caves actually goes. This question is specifically raised by studies on Blowing Cave near Milboro Springs. The entrance to this cave lies in a quarry right beside the road and not over 200 feet from the Cow Pasture River. As far as one can easily go into the cave, it appears to be nearly level, and leads to the offhand conclusion that the cave was formed by a stream which no doubt flowed into the river. However, we have recently been able to penetrate back into this cave for a considerable distance.

About 1,000 feet from the entrance, a stream has been found which, as a result of accurate survey, is found to be 13 feet below the level of the Cow Pasture River. As the Cow Pasture River is the main drainage stream of the area, it is not at present understood where this stream can go. To make matters worse, the stream has been followed down stream for 750 feet and rough readings show that it falls on an average of three to four inches in 100 feet. Also, it flows away from the river. Where this stream comes from and where it goes, is a mystery which I hope to report on in detail at some future date.

This is a good example of many similar problems that have recently arisen from observations on cave streams.

Cave Mysteries Yet Unexplained

We have every reason to believe that those caves which we can now enter represent but a small portion of the cavities that exist underground. Exactly where these underground caverns are, their size, and patterns are mysteries of the first order. Some work is said to have been done on locating such cavities from the surface by a sounding or sonic procedure, but without much success. Perhaps now some procedure involving the use of radar may be devised to chart our undiscovered caves. Perhaps some technique with small floating radios may be also developed to chart the underground courses of streams.

Preliminary study by Professor Showalter of V.M.I. at Blowing Caves, with the standard army walkie-talkie and handi-talkie, tends to show that radio waves are channeled in the cave passages, and suggests the need for further research along these lines.

Some other problems that our studies have raised are: What is the effect of selective soil concentration in caves? What is the composition of cave soils as compared to

that on the surface? What is the result when cave soils are redistributed by the destruction of the caves? What is the real origin of the nitrates found in cave earth? What economic importance can caves still have other than their sightseeing commercial value? What significance is to be attached to the general lack of archaeological material in the caves of Virginia and West Virginia? What is the military importance of caves? (Present war developments may eventually make our caves more important in this field than we wish to imagine at present.)

The preceding remarks, though brief, should be ample to give some insight into the many unanswered problems awaiting scientific investigation.

Before any speleological study can be undertaken, equipment and technique for getting into and out of caves safely must be devised. The National Speleological Society has had to develop various methods and equipment for getting into caves, securing data, returning safely, but still much remains to be done along these lines I have suggested.

Note on Grotto Formation

The Morgantown-Arthurdale Grotto was organized last night in the home of Rev. Alfred Lee Klaer, University pastor of the First Presbyterian Church, Morgantown, W. Va. Fifteen people were present. It was a long, but interesting meeting.

The next event will be Friday, March 10, when Dr. James Moreland will be our host in his home in Morgantown. He will entertain with local folklore. It is at this meeting that our grotto will assume more tangible form. To date, we can count on about a dozen members. I think that by the next meeting several more will join.

The officers are as follows: Felix G. Robinson, chairman; Prof. Jacob Saposnekow, Vice Chairman (he is professor of sociology, U. of W. Va.); Prof. Joe Gluck, secretary, Sigma Nu House, U. of W. Va. (professor in Dept. of Agriculture); Daniel Houghton, Arthurdale (handcraft artist), Treasurer. Of the 15 present, three were women; and Dr. Reese, who attended the recent Symposium, was also there.

I outlined the history of the society; passed around BULLETINS 2, 3, 4, 5; the article in *Saturday Evening Post* by Clay Perry; pictures that Petrie had sent me; and the last *Newsletter*. I also read the Constitution of the Richmond Grotto. There was a long discussion in which all participated.

Felix Robinson,
Arthurdale, W. Va. (2/5/44)

Frankly Stated

Our experience with the BULLETIN leads us to believe that it will be a very slow sales item. We are of the opinion

that practically every person who visits Luray, or any other commercial cave, does so from an entirely different point of view than those who belong to the Speleological Society. Our customer shows very little interest in the scientific side, and it is a pleasure trip so far as he is concerned.

We have on sale and for free distribution, plenty of literature pertaining to Luray Caverns which the visitor takes in large volume. We have been unable to sell the BULLETIN because he is unwilling to buy a publication which describes the caves he never has seen and may never in the future see.

This is not a new experience with us. We have had on sale countless publications that did not deal entirely with Luray Caverns. All have had the same sad experience as our BULLETIN. Travelers will buy practically anything that deals with the attraction they are then visiting; but unless the item is largely representative of that particular place, the sales appeal is lost.

We have a good publication, one that is a credit to the Society. Sorry we have not been able to make some sales, but we believe the above explanation shows the true conditions.

Robert C. Harnsberger,
Luray, Va. (3/4/44)

Diorama in Florida

A. R. Janson sends us a program of the 270th anniversary of the First Christian Service held (6/12/44) in the Marianna (Fla.) area. Of interest to us, especially, as it was conducted in the South American room of one of the caverns of the area. Over 150 people of four denominations attended. Janson, besides delivering the welcome



address, had set up in one cave a lighted diorama showing 40 figures in colors of old Friar Barreda (who first conducted Christian services in this region, probably in Rattlesnake Hollow, northwest of Marianna, in 1674), Spanish soldiers, Indians, etc., as at the 17th century gathering.

Cave Life Envisioned

America's only defense against the day when the secret of atomic destruction will "certainly" become the property of all nations is to prepare immediately for a new era of underground civilization, which will be marked by vast industrial and housing areas built beneath mountain ranges and supplied by extended systems of subterranean railroads, according to Louis Bruchiss, aerial armaments expert.

Mr. Bruchiss, who at 38 is an associate editor of *Aerosphere*, international aviation yearbook, and a specialist on automatic engine controls for aircraft, warned that political and economic considerations must not blind this country to the fact that the atomic age will bring not only new benefits but new dangers and responsibilities and a radically different way of living.

Throughout his interview, Mr. Bruchiss emphasized that the present mysteriousness of the atom bomb's mechanism and functioning could not last long.

Long before President Truman's announcement of the first use of the bomb, he said, many countries were exploring the secret of the atom. It is only a matter of time, he said, before some other nation is successful.

Granting even the possibility that any other country is able to use the atom for war, Mr. Bruchiss said, the United States cannot afford to leave itself defenseless to attack.

He declared that great progress can be expected in the development of radar and radio-controlled protective devices designed to ward off a bomb attack. But he said that even the best of these measures could be only partly successful and that some atom bombs would get through.

"There is no use hiding from that fact," he said emphatically. "Some will get through. We've already seen what devastation the present atom bomb can do, undeveloped as it is. The effect of a few really powerful atom bombs on our major industrial centers would be catastrophic."

Going underground in a hitherto undreamed-of scale would afford protection, because the atom bomb, even if it is carried by a rocket, cannot penetrate the earth's surface very far, Mr. Bruchiss said.

Without waiting even as much as a year or two, he went on, we must begin the task of constructing the underground cities on a scale that would make the subterranean factories of Germany and England look picayune. The best way to build them, he said, would be to take advantage of the protection afforded by our mountain ranges and start burrowing beneath them.

To maintain our production system in event of atom-war, Mr. Bruchiss estimated, at least 20 to 30 percent of our industry would have to be underground. The construction job would last about 20 years, he said, and as a side-benefit, would provide work for millions of men and women.

Mr. Bruchiss admitted readily that the plan would entail a new way of life for the country—industry would have to be decentralized, great cities like New York and Chicago might lose their importance and people would have to get adjusted psychologically to living underground for long periods of time.

"It's drastic and the cost would be immense," he concluded, "but it's the only way we can be sure of surviving."

—*New York Times* (8/21/45)

Sanitary Code Violated!

Four campers and their counselor, who had dabbled in archaeology during their two weeks in New Hudson, N. Y., discovered yesterday in Grand Central Terminal just what a rumpus can be raised by a "genuine Indian relic."

Descending from their train with 184 other youngsters, after a two-hour ride from the Children's Aid Society Camp Bowdoin, they were carrying, among other things, a highly polished human skull.

Over to them rushed Patrolman Eugene Muhlmeyer of the State Railway Police.

"Where did you get that thing?" he gasped. "Do you have a permit?"

A circle of children, parents and photographers, the latter notified by the society that some "arrowheads, bones, a peace pipe, etc." had been uncovered by the campers, quickly gathered round John Pavese, nine years old; Danny Rosselli, nine; Peter Marroccoli, 10, and James Naoum, eight.

Joseph De Ceglia, 17, of 82 Hudson street, the boys' counselor, explained:

"We found the stuff in a cave near a cliff about a half-mile from camp." He pointed anxiously to the rest of the youngsters' booty.

For a moment, Patrolman Muhlmeyer's attention was diverted to the peace pipe, with its two-foot long dark wood stem and tiny metal bowl. "If I ever saw one, that's an opium pipe," he muttered.

After handling the skull gingerly, noting a fine line that he said denoted a "bad fracture," he decided that he had no authority to confiscate the souvenir. The group gradually dissolved, the archaeologists retiring with their trophies to show it to the families before donating it to the camp museum.

Later in the day, Margaret M. Fellows, public relations director of the society, said that it was a misdemeanor of violating Section 37 of the Sanitary Code—which prohibits the bringing of "any part of a human body" into the city without a permit—was completely unintentional.

The camp director had told her nothing of the finding of a complete skull, she declared. The camp museum, she added, has received interesting and valuable gifts over the past several years, probably including some highly-polished human skulls.

—*New York Times* (8/17/45)

Caves Are NOT Dumps

The Society would be performing a valuable service in the preservation of caves and for the health of the communities in which these caves are located if it discouraged their use as a dumping ground for dead animals.

Norbert Casteret, in his book, *Ten Years Under the Earth*, told of the dumping of dead cattle in crevices in France. He also proved that underground streams may take unpredictable courses.

In BULLETIN No. 6, an article by J. L. Wingfield tells of his finding the decaying carcass of a cow in a shaft in West Virginia. The body had been thrown there by the

owner presumably to save the work of digging a grave. The stench from a large decaying animal is considerable and would prove an unpleasant handicap in the exploration of a cave. The entry of such a cave would be something to be postponed for a long time. Another article in BULLETIN No. 6 by Charles Matchett tells of a similar experience. If this were common practice the entrances to many valuable and beautiful caves would be obstructed, exploration and study of them prevented and if continued might mean the closing and loss of some good caves.

Should such dumping be permitted it is possible some underground streams would be polluted. These streams might be supplying water to wells and reservoirs. Casteret's experiment showed that without definite knowledge of the courses of streams, pollution of them might be hazardous.

There is a law in Connecticut which lays a penalty upon a person convicted of placing or leaving a dead animal or carcass in a pond, spring or reservoir or any water of the state. Quite likely there are similar laws in other states. The one referred to seems inadequate as a dead body thrown into a cave may be placed in such a position as not to fall into water but the excretion drain into water supplying a community. Unless the course of a stream so polluted is known, it would be difficult to say whether or not it was being used as a source of supply. Needless to say it is a detestable habit and should be discouraged. Members should report to the Society conditions like these that come to their attention or any situation where health and destruction of caves are involved. Unless this falls into the field of some committee already set up, perhaps we should establish one for the purpose of preserving caves and the prevention of pollution.

Should the Society take action to correct the misuse of caves our purpose might be accomplished with good grace by appealing to the owner to refrain from using a cave for this purpose. A letter from the Society to cave owners, particularly those who have acquired the habit, stating the reasons why it should be discontinued, would in most cases, be complied with. The obstructing or closing of any cave is a matter that should be decided by competent authorities. A thorough knowledge of caves, their intrinsic value and the safety factors involved are, of course, necessary. I would like to see it on record that the Society disapproved of the fouling of caves and pollution of cave streams.

Our Society, being national in scope, is in a position to correct matters of this kind even beyond state borders. Perhaps it is a duty.

Le Roy W. Foote,
Middlebury, Conn. (9/6/44)

Society Loses Valuable Member

Dr. Thomas Barbour, director of the Harvard University Museum and the Museum of Comparative Zoology, who was recognized as one of the world's outstanding naturalists, died on January 8 at Phillips House of the Massachusetts General Hospital. His age was 61. Death was caused by a cerebral hemorrhage.

He also was Agassiz Professor of Zoology at Harvard, custodian of the Atkins Institution of the Arnold Arboretum at Soledad, Cuba, honorary curator of books relating to the Pacific in the Harvard Library and president of the New England Museum of Natural History.

Dr. Barbour's first papers on zoology were published during his freshman days at Harvard. Since then he had led expeditions to all sections of the world and obtained an international eminence in his field. The expeditions carried him to India, China, Burma, Japan, South and Central America and won for him recognition as an authority on the geographical distribution of reptiles and amphibians.

Born at Martha's Vineyard, son of William and Julia Sprague Barbour, Dr. Barbour prepared at Browning's School in New York and was graduated from Harvard in 1906. He received a Master's Degree two years later and a Ph.D. in 1910. He held honorary doctorates from Harvard and Dartmouth.

Dr. Barbour was the author of several books, including "That Vanishing Eden," a naturalist's acidulous view of Florida, "Naturalist at Large" and "A Naturalist in Cuba."

D. S. Reichard Drowned

Donald S. Reichard, one of the early members of the National Speleological Society, drowned while swimming near an island which he had recently purchased in Belmont Lake near Havelock, Ontario, on September 6, 1945.

Mr. Reichard, age 37, was a highway engineer employed by the Public Works Administration in Washington, D. C. He had recently spent two years in the Yukon Territory of Canada helping in the construction of the Alaska Highway.

Don was an accomplished draftsman, and drew many fine maps for our Society. He attended Carnegie, Maryland, and George Washington universities.

Always a great lover of nature, Don had organized and participated in many trips in the United States, Canada and Mexico, and all who came in contact with him will remember his friendliness, generosity and helpfulness on all occasions.

Mr. Reichard is survived by his mother, Mrs. Mary C. Reichard, and two sisters, Mrs. Burrows and Mrs. Brown of Washington, and a brother, of Philadelphia.

As We Remember Him

Mr. Edwin W. Beardsley of West Cheshire, Conn., a member of the Society, died March 8, 1945, at the age of 72. Mr. Beardsley was known to very few members but to those few he endeared himself strongly.

Having retired a few years ago from the American Brass Company where he worked for 30 years as mechanical engineer he devoted his time, as all of us would like to, "doing the things he always wanted to do." He was of extremely friendly nature and cherished companionship with all, both young and old. It was his custom to keep close contact with those he knew by frequent visitation in correspondence. His most time-consuming hobby in late years was acting as a "cheerio" for the old and infirm with whom he was acquainted. A continual stream of one-sided correspondence was carried on by him with elderly persons who were unable to write but who looked forward to his cheery letters.

Fond of everything in the great outdoors, he was familiar with the geology of Connecticut and knew the location of many caves in New England. When John Meenehan of the Photography Committee showed his kodachromes in Waterbury, September, 1944, Mr. Beardsley was present and was so pleased with the lecture that he immediately joined the Society.

In the six months that Mr. Beardsley was a member he furnished valuable information to the Society about caves in Connecticut. The week prior to his death he forwarded the Society a voluminous folder on Connecticut caves. This included corrections of a recent publication, on the identity of caves at Salisbury, Conn., known as Twin Lakes Caves; a report on three Connecticut caves, two of which were new to the Society; a map of the location of Twin Lakes Caves; and the following letter written by him to an invalid in Delaware:

A Visit to Twin Lakes Caves, Salisbury, Conn.

I wrote this for a helpless paralyzed man in Delaware in January. He was shot while hunting when 17 and that must have been around 35 or 40 years ago. I think I first saw him well toward 20 years ago.—E. W. B.

We read sometimes about the possible far-reaching results of our words and acts, like the ever-widening rings on the pond when we throw a stone onto its placid surface. It becomes more and more impressive as we observe its truth through life.

The following is an account of occurrences that were years apart and caused no thought of the succeeding events with which they were related. They seem worthy of more than passing thought in that connection, when such little things as remembering an interesting account in a newspaper, and the telling of an experience to friends, can bring about such utterly unthought-of events.

About 50 years ago (probably as early as 1895), I read in the *Hartford Courant* an account of a Yale College professor, or instructor, exploring a cave in the limestone

near Twin Lakes, Salisbury, Conn. It now seems to me that it mentioned something about his having traveled about a half-mile underground, and I think there was a sketch map, indicating a long narrow passage.

About 40 years later, my son-in-law asked me if I ever heard of a cave near Twin Lakes. I told him what I remembered of the newspaper account. Someone had told him something about the cave. He was quite insistent that we go to see it.

I think it was in the month of February, 1935, that we made the trip. It was not too cold then, in spite of snow on the ground, because of the relatively uniform temperature underground. I procured some photo-flash bulbs, hoping to find something worth taking a picture of. We provided ourselves with hand flashlights and spare batteries to illuminate our way.

I knew the way to the lakes, but nothing about the relative location of the cave. We had to inquire a time or two. When we reached the place to park and leave the automobile, we had probably traveled about 60 miles from home.

We had a long walk up a trail running southward from the lakes and upgrade through the woods before we saw any indication of caves. Then I discovered a green spot on the lower surface of a rock where the warmer air from the cavern had kept the vegetation from dying. We "kept our eyes peeled" after that and soon discovered a depression at the bottom of which were unmistakable signs of an entrance. Besides footmarks, there were several strings left from what visitors had used to be sure of finding their way back to the entrance.

We added our cord to the collection there tied, and with eager anticipation began our descent with care. It was but a short distance to horizontal passages, which were so narrow that we went "Indian file."

We saw the stumps of stalactites and stalagmites which ruthless visitors had broken off. The only undisturbed ones I saw were very tiny ones in a horizontal crevice too small for hands to reach them.

After prowling along and around, chiefly southward, we came to a "well" which needed a ladder to safely go down to the lower level. Trail strings showed that others had been down there.

We had consumed about an hour in our ramblings and seemed to have seen about all that we thought was worthwhile with our limitations, so we returned to the surface.

We looked farther around and discovered *another* entrance not many rods away, farther upgrade. It was farther east and perhaps led *under* our previous route, or at a lower level. For a "white collar worker," I had used up a plenty of my muscular energy, but I had an appetite for more cave scenery.

This opening was entered easily—no climbing. A little stream of water flowed along the bottom of the passage. We came to a section several feet wide, but so low that we had to lie down and *roll* along beside the brook, which left dry space for that.

If this was what the "well" we had seen, connected with, we did not discover it. Beyond our "farthest north" we could hear the water falling as the brook proceeded toward the lake.

By the time we returned from this second exploration, I was so tired that I preferred to forego the satisfaction of taking the photographs, which would have required my taking a round-trip to the automobile for the equipment. We all agreed that we had had enough for one day and we simply returned to the auto and started home—tired, but happy “Spelunkers,” although that word was then unknown to any of us.

I told my friends, Sarah and LeRoy Foote, about this expedition. It aroused their interest. They, too, visited the caves. It resulted in their learning of the National Speleological Society, of which he has been the treasurer for some years now.

A few months ago LeRoy telephoned me that there would be an illustrated lecture in Waterbury on a certain evening, by the Society's official photographer, Mr. Meenehan. Son-in-law Frank took me to that interesting lecture. There LeRoy remarked that I was, in a sense, responsible for that lecture. It would not have been given if I had not told him about the Twin Lakes Caves.

Soon after that, LeRoy and Sarah were successful in their search for a copy of Clay Perry's *Underground New England*, which they presented to me.

I am now a member of the National Society, too.

I have learned this winter that Twin Lakes Caves are considered to be the most beautiful in New England.

I have seen the Howe Caverns in New York state; the Crystal Caverns in Virginia, and the wonderfully beautiful Shenandoah Caverns in Virginia, but the Twin Lakes Caves hold a unique place in my pleasant memories.

Edwin W. Beardsley,
West Cheshire, Conn. (2/14/45)

(I don't like to waste space.) In the Shenandoah Caverns we had as a guide a middle-aged man whom I inferred was now one of the owners of the cave, but had in earlier years been a guide. One young man was complaining that he “could not understand” something. The wise guide responded, “Why do you *try* to understand it?—you *can't*.”

Twin Lakes Caves

Location: Township of Salisbury, Conn., on slope of hill south of the western one of the Twin Lakes; and north of highway U. S. 44.

Approaching from the village of Canaan, follow U. S. 44 to top of “Smith Hill,” (four and one-half miles) which rises 300 feet in less than three-quarters mile. (Note wonderful view of mountains to the north from top of hill.) Take right-hand road; down-grade for about one mile, to house, on left. (Park auto south of house.) Follow trail to south, or southwest.

Approaching from Millerton, N. Y., follow U. S. 44 east (eight and one-half miles) through Lakeville and Salisbury, to top of “Smith Hill,” described above. Turn left (north) before starting down hill. Proceed as above.

The entrance to one cave (probably “Jack-in-the-Pulpit”) is in a depression several feet down from the surrounding surface, and continues down several feet farther.

The entrance to the other cave (probably “The Bashful Lady”) is only a few rods southeastward, from a lower level, and is more easily entered, beside a small stream (perhaps dry in summer).

Formation: Limestone caverns, with flowstone and the stubs of stalactites and stalagmites which have been broken off. See *Underground New England*, by Clay Perry, pages 84 and 85, and illustrations opp. page 15; second page back from p. 129; and opp. p. 208.

Remarks: The book *Underground New England* is confusing with reference to these two caverns. The illustrations referred to in the preceding paragraph, and the “Twin Lake C” on the frontispiece map, all apparently refer to these “Twin Lake Caves” on pages 84 and 85.

A personal visit. Date: February, 1935. We had probably gone a half-mile or more along the trail, when a bright-green spot on the lower portion of a rock at the right, suggested that we were over a cave. Soon we saw the entrance and began our descent. It was quite a climb downward, then along narrow passages horizontally. We saw some tiny stalactites in a crevice too narrow for hands to reach in.

When we reached a “well” which needed a ladder for its descent, we retreated to the surface. We thought we had seen all that appeared worthwhile without a ladder. My son-in-law tried a different route back and apparently passed through the “marvelous marble hall” described by Mr. Perry on page 85. We had been down about an hour.

We then discovered what I suppose was “The Cave of the Bashful Lady.” This was much more easily entered. We came to a section of several feet wide but so low we had to lie down and roll through beside the brook. We did not discover any connection to the other cave.

After another hour or so, we were tired enough to give up going back to the auto for the camera and photo-flash bulbs. We were weary but happy “Spelunkers,” although that name was then unknown to us.

It was my description of this experience that aroused LeRoy Foote's interest in the caves and finally resulted in his becoming the Treasurer of the National Speleological Society.

Bill Warren's Den

Location: Town of Farmington, Conn., about two miles south of Farmington village, near the top of the south end of Rattlesnake Mountain.

Going south from Farmington, on Route 10, opposite the mountain, keep straight on left-hand road at fork of

concrete roads. If going from Plainville, proceed east, toward New Britain about a mile on Route 72, to White Oak Corner (by "John Cook Restaurant"), and turn north.

Approaching from either north or south, take the dead-end road eastward from the concrete road up the slope to "The Pinnacle" dairy farm, which is in plain sight. When I was that near to it a few years ago, there was a good parking place near the end of the road, where one could leave an auto and walk the (perhaps) half-mile to the den.

Formation: Spaces between glacial boulders on top of the trap rock of which the mountain is composed. It is the western edge of the Connecticut River Valley sheet of trap rock.

Folklore: It is said to have been the hiding place of "Bill" Warren, a bandit in Revolutionary times.

Remarks: In 1891 or '92, Mr. Richard R. Porter, of New Britain, Conn., told me of visiting his uncle who conducted the tavern at "White Oak Corner," a mile or so to the south. He visited the cave and did a little exploring. He found an opening which he enlarged enough to crawl through into a second "room." There he found an old canteen, a tin cup, a rusty bayonet. I presume this was in the 1860's. The owner feared the greater danger from rattlesnakes to boys going there and he filled up that entrance to the second room. I do not know what its condition may be now. I have not been there in about 40 years. In those years we had no pocket flashlights and I never had a good view of even the first room. I think I never found any other person who had known of the second room.

See relation of this location to "Papoose Cave" on another sheet.

This description is written from memory, largely from observation and reading from 40 to 50 years ago. The writer hopes to substitute for this sheet, a better description when he may, in warmer weather, be able to find the box which contains an old-time half-tone magazine picture and description of the cave.

Papoose Cave

Location: Township of Southington, Conn., on the west shore of Lake Compounce (one-half mile long), an amusement resort, one mile east and two and one-half miles south from Bristol, Conn.

(This is six and one-half miles southwest across the sandy plain, from "Bill Warren's Den," elsewhere described. This one is at the foot of the eastern edge of the granite hills west of the trap rock formation there described.)

Formation: This is a boulder cave at the foot of Compounce Mountain. It is formed by a large slab which tumbled from the mountain back of it and landed on other rocks which hold it several feet from the rocks and ground at its front, which faces the lake a few rods away.

The ceiling of the cave presents a striking contrast, in its reddish tint, from the weathered gray of its outer surface which has been exposed to the storms of thousands of years.

Folklore: This cave was the home of the Indian Chief Compounce. He is said to have been to Farmington (or to Hartford), where he bought a new brass kettle. Coming out of the forest on the east side of the lake, he undertook to swim across the few rods, instead of walking around the end of the lake. He hung the kettle by its bail, around his neck. The kettle filled with water and he was drowned.

Remarks: Geologists will be interested in the immense boulder probably a dozen rods south of the cave, which also fell from the mountain, apparently.

Some may be interested in following the highway south two miles, to a road coming onto it from the east. On the other side of the road (west), "a path follows Roaring Brook a short distance to the Great Unconformity. Here Triassic sandstone, resting on upturned and eroded granite, which is probably the remains of a former mountain, shows the stages of a process of the formation of the earth which took place during a period of about 325,000,000 years." (The writer can't vouch for that. He was not there then.) The quotation is from the WPA guide to Connecticut, page 493.

This description is furnished from memory, largely 15 to 40 years ago. The writer hopes to replace it with a better one if he can find material which has eluded him at the present writing.

Edwin W. Beardsley

Legislative Committee Set Up

To Jack Wilson:

At the last Board meeting a committee on legislation was authorized. It should be the duty of this committee to prepare and sponsor uniform state legislation on all matters relating to caves. It is our aim to have this a permanent committee. The committee should also work in close harmony with the special committee headed by Dr. Jones, which is now attempting to obtain a national charter, and should work in close harmony with the American Cave Men Association.

I am enclosing a copy of a bill* which is now before

*Inserted at page 36.

the Missouri State Legislature. This bill should be a starting point for the work of our committee. There are many things about the bill which might be slightly changed or improved. For example: where a state has a small Geological Survey (Bureau of Mines), the bill should provide for inspection by a trained speleologist appointed by the State Geological Survey for this purpose. The bill should also include a provision (or another bill should be drawn up) to afford protection to undeveloped caves, as for example, by making it a misdemeanor or felony with suitable penalties to enter and deface an undeveloped cave unless this was for some scientific purpose by an approved scientific organization for the purposes of scientific study. (It might be well to mention a few typical organizations, such as the State Geological, U. S. Geological Survey, National Speleological Society, National Museum, etc.)

I believe that there is a real need for constructive cave legislation, and our Society should be a leader in this field. Will you be willing to take chairmanship of this committee? It no doubt will involve considerable work on your part, but I feel that you should receive enthusiastic help from many of our members. You're at liberty to choose your own committee; however, the following are suggested for your consideration: Dr. Burrill, who has been urging that some measures be taken by the Society for cave conservation and to whom we are indebted for the Missouri bill; Capt. Wm. E. Davies, 2311 North Ninth street, Arlington, Va., who has worked with Dr. Stone on Pennsylvania caves and is much interested in this matter; Gordon C. Curry, Hoover Company, North Canton, Ohio, chairman of our committee on Commercial caves; Virgil Clymer of Howe Caverns and a lawyer; and Dr. Jones of the Alabama Geological Survey.

I rely upon you to accept this job and go to it. Will you keep us informed as to your progress?

W. J. Stephenson (11/28/45)

In Newsletter (2/45): "In September, 1945, the 63rd General Assembly of the State of Missouri passed what is probably the first state law ever enacted requiring all cave owners of commercial caves to submit to annual inspection. An inspector of the State Bureau of Mines must inspect each cave and pass on the adequacy of its guard rails, platforms, barriers, etc., before it can be opened to the public. For this an annual fee of \$35 is to be charged. Any visitor to a cave may make a written complaint to the Bureau of Mines if he finds any condition he deems dangerous to the public health or safety and this complaint must be investigated by the Bureau within 30 days." (Communication from A. C. Burrill, Jefferson City, Mo.)

Handbook on Caves

I am especially interested in the article by W. J. Stephenson, "The Speleologist Defined," in BULLETIN Five.

It seems as though the Society and caves need to do a great deal more national advertising than they are doing.

As a thought, perhaps some company, such as Standard or Shell, which sells gas and oil all over the country, could use caves as a new wrinkle in advertising their products to tourists. The oil and gas will be the thing which will take the tourists throughout the country. This would undoubtedly have to be after the war. The Standard Oil Company of California, for example, went in for colored scenes and the public really went for it. The Continental seems to have made quite a thing out of their travel bureau. The parks, monuments, freaks of nature and the like, have received their share of advertising.

In regards to the program of the Commercial Caves Committee, a pocket-sized, general handbook on caves would be the thing, I think. Many other sciences have handbooks. In my case, whenever I go into the field, I take along a handbook for the particular job I have to do, such as a handbook on surveying, culverts and drainage, or even a Blaster's Handbook.

By taking a chapter of the cave data known by each committee a pretty good text in itself could be made.

Maybe this cave handbook idea is already in the minds of the Board of Governors. The handbook would be on cave facts, a spelunker's reference.

What I am thinking about is a book about five and one-half by seven and one-half inches, 700 or 800 pages, flexible cover, to sell for about \$6.00. I am sure any member of the Society would pay that for it. I would say that 1,000 copies at this price would yield some profit for the Society. Of course it would take a year to get it out, and then about every three or five years put out a revised edition.

In your recent letter you mentioned a guide to commercial caves. This is really needed. The handbook would serve one purpose, and the guide to commercial caves would serve another.

Bruno Petsch,
Vermillion, S. D., (12/24/43)

I have brought the matter of the handbook to the attention of the Board, but in view of the present world situation, the matter was tabled.* Cave operators, it was felt, aren't likely to be financially able to support such a project until better times, and some felt our members aren't either. This doesn't mean we shouldn't do some of the spade work necessary, and I will be glad to push before the Board anything you may suggest along this line. Our experience with the Jackson book has made

*Many other members have made similar suggestions relative to a Handbook for the Speleologist. This idea has been definitely tabled by the Board of Governors, however, until after the war. The reaction of our readers to this proposed project is solicited.

the Board pretty skittish about any publications outside of our BULLETIN, at the present.

J. S. Petrie, Sec.

More Theory on Origin of Cave Species

I write solely to create an interest in the most interesting and important environmental factor dealing with the origin and dispersal of species. It is now definitely known that the energy freed from radio-active materials, as well as the energies of activation of at least materials containing activated carbon and silicon, do affect organisms.

This type of energy was always more or less concentrated in valleys during the major geological changes. There seems to be a direct relation between the environmental concentrations of radio-active and -activated silicon and carbon-containing materials, and the major successions of fossils as well as the major geologic transformations of our earth's surface. So the energies of activation of activated carbon- and silicon-containing materials, and the energies of radio-active materials doubtless have much to do with the origin of cave species.

As so far, I alone have worked on this plan dealing with the changes produced in the energy levels of the active hydrogens by activated energy-yielding materials, I hope that some of the young cave workers may be induced to gather data along this line.

The great naturalist Carl H. Eigenmann has been dead several years, and his library and collections were sold to the California Academy of Sciences. He published a large volume on the origin of the blind fishes of Cuba and North America that is now probably obtainable only from second-hand book dealers. If you want Prof. R. R. Ramsey's paper on radio-active gases of the St. Genevieve limestone of Missouri, the Richmond limestones of Ohio, and cave springs near Bloomington, Ind., I feel sure he will send them, as I recently got two papers on radio-active gases from him, and he had a few of these other papers to spare. They deal strictly with the physical nature of the gases.

I have a set of beautiful cave pictures from the Iperanga region of Sao Paulo, Brazil, taken by the late Ricardo Krone of Iguape, Brazil. You might like to get copies of these sometime.

The sole cave there having blind fish is entered through a huge mountain sink hole. The day I was collecting in it, there came up a storm as I learned by placing my ear to a reef. Two Indians and I left for the exit six miles away, and got out just as an Iguapean torrent descended. The next day this sink-hole entrance contained water more than 40 feet in depth above the entrance to the cave. So this cave should be visited only during the dry season.

All of the caves of Cuba are jug or cistern shaped except the Alacarenes cave near Alfonso Dece north of Pinar del Rio into which I slipped and lost my light. I suggest, in case you are interested, that you get my good friend, Dr. Norman McIndoo, formerly with the federal Bureau of Entomology and Plant Quarantine, to give you a talk on these Cuban caves, as he accompanied me on my last expedition there.

You recently had a meeting at which Dr. Leonard P. Schultz spoke on "Blind Fish and Their Origin." I would like to get a copy of Dr. Leonard's talk if possible, as I worked on this same problem with Professor Eigenmann in the caves of Cuba and in those near Bloomington and Mitchell, Ind.

I also did work on blind fish near Iperanga, Sao Paulo, Brazil, on *Typhlebagrus kronii* Miranda, which revealed it as the first true living ancestor of a blind fish. The blind fish was, in all respects, except for its degenerate eyes, pale color, and more sensitive skin, like a common, widely-dispersed catfish that lives in the open along sand bars and does not avoid light. It was found only in one of these many Iperanga-region caves which had its mouth stopped up by a huge landslide. Hence, at that time, I gave up Eigenmann's views as to gradual adaptation to cave habitat in favor of one associated with accidental origin.

But my recent experimental work has led me to believe that more than accident is necessary, and that certain caves have also a far greater amount of radio-activity and activated carbon- and silicon-containing materials which emit energies that are known to change organisms. Ramsey at Illinois University, years ago, showed that the spring waters from caves in both the St. Genevieve and Richmond limestones, vary in amount of radium gases or emissions, both regionally and locally with the amount of flow. Hence when trapped in a cave for vast periods, this energy-yielding material could degenerate the eyes as Morgan and others demonstrated with *Drosophila* gnats using strong X-rays and radium.

However, as Hofrath Steindachner told me in his private study in the K. K. Hof-Museums, Wien, Austria, the origin and evolution of species normally did not proceed with degeneration of already-originated characters, but with the addition of new characters or entire loss or change of old characters. Hence, the blind fish in Cuba, born with good eyes which degenerate, may be representative of a process radically different from that which obtains in species where no eyes at all are inherited.

I am certain that the activated carbon- and silicon-containing energy-yielding materials play a major part.

As, so far, cave workers have not made any attempt to investigate this subject, I have written so that contact may perhaps be made with Dr. Schultz or others with a view also of looking into this subject, and gathering samples that can be tested readily in regard to their energy-yielding properties and their relation to the amount of degeneration and other cave-related changes in species they affect.

I would also like to get in touch with the insect expert, Dr. Valentine, who published an article last year in regard to beetles found in two West Virginia caves and having their nearest and only relatives in caves of Europe. (I collected considerable cave life throughout South America, and I doubt if the insects have been worked yet, at least in full; they are in Carnegie Museum, Pittsburgh, Pa.) He might desire to look up that material sometime. I would also like to have him send me some literature and drawings or photos of these beetles if any are available, and I would try to get a search made for them in both Chester and Mississippian limestones of Monroe and Green counties, Indiana.

I worked for years following the old biological viewpoint of H. F. Osborn, Gregory, Grabau (based on fossils) and Ortman, Eigenmann, Von Ihering, Steindachner, and Pillsbury (on recent species). I then shifted to Johanssen's theory as modified by Morgan and Huxley, and finally left that for the physico-chemical viewpoint in which the energy levels of the active hydrogens produced by germ-plasmic- and semaplasmic-activated carbon-containing, are changed by the naturally-activated carbon- and silicon-containing, and radio-active energy-yielding materials of the ever changing environment.

The origin of cave life is a wide open field for work along this line by active minds that can shake off the shackles of the past. For example, do the cave sands have concentrates of thorium silicate or any of the other 42 listed radio-active materials that might affect species as did the radio-active materials of the Joplin, Mo., lead mines? Do they have activated carbon- or silicon-containing materials such as silica gel, Fuller's earth, activated bentonite, gold-precipitating carbons, etc., which I have shown produce similar effects on *Drosophila* gnats as Morgan and his students obtained from using radium and hard X-rays? This hypothesis is subject to both field and laboratory tests, and is one in harmony with modern concepts of colloidal chemistry and experimental biology.

I have not yet found time to prepare for you an article on the Iperanga, Brazil caves, as I am still wrestling with the problem of changes in the vertical magnetic intensities, geo-chemically invoked by both "fault lines" and differential sedimentations. I have been seven years

completing this, the last of the studies of my brother William P., who built the first seismograph in 1921 in Oklahoma.

J. D. Haseman,
Linton, Ind. (1941)

Report on Charter Awaited . . .

To Dr. W. B. Jones:

At the Board meeting August 4th, it was decided to go after a national charter for the Society. In view of your offer to head up this work, you were appointed Chairman of a special committee for this purpose. You are at liberty to select your own committee and proceed in any way which you think desirable. I stand ready to help in any way possible. I suggest using the *Newsletter* freely for any message which you may wish to send to the entire membership relative to this project.

Clay Perry is very enthusiastic about the matter, and I am sure will be very glad to help. He is very intimate with Congressman John W. Heselton, of Massachusetts, who is on the Congressional Library Committee. Perry believes this matter might be referred to that committee. He believes that Heselton is interested, and I understand has already talked to him at length relative to this matter. George Dare has pretty good connections in West Virginia politics and should be of value when you need him. Jack Preble should prove of value, as he has many influential friends. When Dr. Paul Price comes back, he should also be of considerable value.

I do not know what is the usual form of wording for national charters. Without a doubt your congressman can get this information for you, or at least obtain copies of the charters or bills chartering the National Red Cross, National Geographic, etc., so as to give us something to start with. Virgil Clymer and Harry Wilson are both successful attorneys, and probably would be glad to help with the legal end.

I see no reason why a proper wording of the charter could not be devised which would result in some degree of government sponsorship of our organization, the very least of which should be either an authorization or directive to other government agencies for co-operation (even to the extent of loaning equipment, etc.). The wording for the attainment of this end should be carefully chosen, so that it will not be outstandingly glaring or radical at first glance, but yet broad enough to support any request for co-operation that we in the future might wish to make upon any government agency. It would also be well if the charter could grant access for the Society to any cave for scientific investigation (this might be out of place). I know that West Virginia has a law requiring property

owners to permit access of the State Geological Survey to any property within the state for purposes of their studies. Something the equivalent of this is what I am thinking of.

We should have plenty of material on hand to support arguments relative to granting of the charter. While you will probably have to do most of the work assembling such material, I would like to point out the following for your consideration. 1. The Society is doing work which years ago should have been done by some government agency. 2. It is cheaper to have the government foster an independent society than to assume all the responsibility themselves for speleological work. An organization of two or three thousand hobbyists should be able to do as much field work in a year as 100 paid men. All that is necessary is to give them the tools. 3. Speleology is and will become more important every year to our nation (at least until we can be assured of no more wars). The new atomic bomb, to my mind, demands that every cavity in our country be fully explored and mapped so as to be ready for any possible emergency. 4. The science of speleology is so broad that it does not fit into any present government agency. The Geological Survey, Museum, Public Health Service, National Park Service, and the army are a partial list of agencies which should have direct interest in caves. A society devoted to speleology as a separate subject is in a position to investigate the whole field and is not limited to the interests of a single governmental bureau. 5. The science of speleology is practically untouched. Many discoveries in the field of hydrology (water supply), sanitation, mineralogy, zoology and chemistry await speleological investigation. We definitely need research on cave soil, fungus, and bacteria. 6. Speleology has unique recreational value which should prove of particular importance in the post-war period. This recreation is both helpful and healthful. 7. There is already a decided undercurrent against too much government and bureaucracy. If our work is as important as you and I believe it is, it should be easy to find favor for a paternal support by the government rather than the government setting up a new bureau to take care of this matter. (This argument should be particularly persuasive to Congress.)

Besides the above, I believe that you are aware that we were called upon to produce on a minute's notice caves suitable for experimentation in cave demolition and sealing. This is one instance which illustrates the practicability of our work. There was not a government or state agency which had the information which was desired. I can go into greater detail about this if you find it necessary.

W. J. Stephenson (8/13/45)

Where "Numbers" Idea Began

I am passing on to you my suggestion of assigning numbers to members of the Society. Other organizations use this idea, the membership cards usually being numbered in the order in which the members are accepted. Perhaps a general discussion may bring out some other ideas such as reserving special number brackets to identify honorary or life members.

In one organization (organized about 1890) the membership numbers run to the order of 10,000. Of course the first 9,000 or more of these numbers are extinct because of death or discontinuance of membership for any reason, yet the current numbers assigned to new members do convey some idea of the strength of the organization. The Speleological Society is still too young for the membership numbers to have significant value in this regard, but it is felt that as the years go on, the published lists of members (each name followed by membership number) would serve to identify more completely the long-time members.

Also the secretary-treasurer of the organization above referred to tells me that it is quite surprising how many people who become delinquent in dues or who have been out of the organization for one reason or other, will pay up back dues for the privilege of retaining their original lower numbers.

Another use of the number system is to establish seniority quickly wherever it may be of interest. Sometimes the by-laws of an organization state that in the absence of committee chairman the member present with the lowest number shall act in his place, etc.

If this system were used, encouragement should be given to members to sign official correspondence followed by their number. Also at conventions or wherever a register is used, the number should be appended.

An assignment of numbers to the existing membership should not prove difficult even though there should be no complete record of the order in which the members were accepted into the Society. Relatively speaking, the numbers would be of a low order when compared to the long-time membership of the Society.

"Hermie."

Washington, D. C. (7/23/45)

PREVIEW OF A CAVE BOOK

BY CLAY PERRY

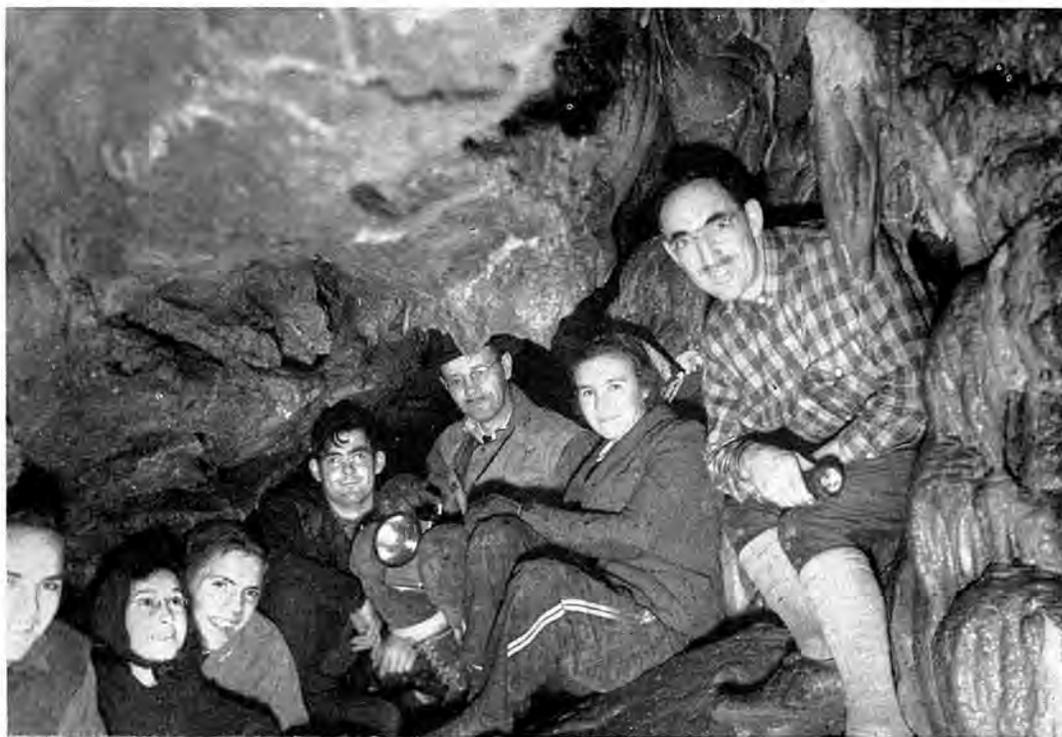
This is one time when an author gets the jump on the critics and reviewers. As the author of the soon to be published book, *New England's Buried Treasure*, which received the hearty endorsement of the N.S.S. at its recent annual meeting in Washington. I am privileged, by request, to write a preview, if not a review of the book.

In the first place, it will be the first book in a proposed "American Cave Series," and why not? We have the American River Series, and the American Lakes Series, etc.; and, goodness knows, there are more caves and tales about them than there are rivers and lakes in the country—and their stories have not been told, over and over again, either. They are brand new, just waiting to be dug up and related. Some of them have been told, here and there, in newspaper articles, magazines, pamphlets, folders and other scattered publications; in a few real books, such as Hovey's famous old volume, "Famous American Caverns," and one or two others. And in the BULLETIN of course.

But the first "story book" about American caves, I believe, and will stand corrected if it is not so, was my book,

and in the astonishing experience of several people, including the author, in fruitless efforts to find at least one or two copies lying around loose and for sale. Not a single—even used—copy could be obtained. Indeed, it was discovered that a batch of 10 copies, on the inventory of the publisher who had bought out the Stephen Daye Press, were gone from the shelves, gone with the wind!

Following this discovery and repeated inquiries of the new publisher, it was proposed, last year, that I permit a reprint of the book, a second edition. My reaction was an emphatic "Yes—but why not a completely revised and enlarged edition, a new book, bigger, fatter, with many more illustrations, an index by states in alphabetical order of all caves, sites, persons, places, with reference to pages whereon these were described or mentioned, so as



Clay Perry (the gent with hat on) and crew in a cozy corner in The Cave of Beauty or Crystal Pool Cave, South Egremont, Mass.

"Underground New England—Tall Tales of Small Caves," published in 1939.

That book, from the Stephen Daye Press of Brattleboro, Vt., who issued only books about New England, had to be "sold" by high pressure salesmanship, because the subject was so novel and strange to the editors. An outline, chapter by chapter, however, a big batch of cave photos, and a lot of enthusiasm on the part of the salesman—myself—convinced the editors that there was as much interest in the caves of New England, as for instance, in books they had published about the lighthouses on the Maine coast and the covered bridges of New England, etc.

The proof was in the complete sell-out of the edition,

to make it a real guide book to New England caverns and sites?"

So that is just what the book will be, under the new title, with at least 100 more pages, to a total of 400 pages or more, and with 40 to 50 illustrations, a majority of them new.

The book will be printed by the offset process, which reproduces photographs splendidly, will be of larger format, and is scheduled for issue in late May or early June by the Stephen Daye Press of 105 E. 24th St., N. Y. C.; Frederick Ungar, editor, also a successful publisher under his own name.

I have also signed contract to produce a book on New York State Caverns, next, planned for issue in 1947—and if these two prove popular and successful enough, will continue with other books on caves of the more interesting areas in the United States. It is a long lane with many a turning!

The American Cave Series project has been approved by and will be sponsored by the National Speleological Society. The author has sold the idea to the publisher, and they will take all the risks between them. The book will be priced at \$3.50. It will contain all the material in the original "Underground New England," with corrections, additions, new chapters, and an Appendix covering: Equipment for Spelunkers, The Geology of New England Caves, Underground Wildlife, and A Cave Index and Guide.

Of the contents of the book the publisher has this to say: "In response to a wide demand for a complete relation of the 'tall tales,' legends, historical records, and other curious and thrilling stories that cluster about the caves, old mines and quarries, purgatories and gulches of the northeastern states, the author of *Underground New England—Tall Tales of Small Caves*, originally published in 1929 has, in this volume, after seven more years of research and exploration, added a very complete collection of new and striking story material to the original book, making it much more than a new edition or reprint.

"It does contain all of the material that was included in *Underground New England*, a book that has long since sold out every copy and which is so valued by those who secured copies, that none can be found for sale even in the second-hand markets. But *Buried Treasure*, in fact and figuratively, has been turned up by the author, with new chapters, revisions, and corrections and many more pictures, to make a fresh and fascinating book for which there is already an eager demand.

"This book is sponsored by the National Speleological Society, an organization with headquarters at Washington, D. C., and which was largely stimulated to organize by Mr. Perry's first book, to operate as a scientific and very athletic and sporting outfit, with ambition to explore and map and photograph every possible cavern in America—within the next 100 years or so—for there are probably at least a million miles of crawlable passages under the earth of this continent.

"Clay Perry has already begun his exploration and research for a following volume on the *Caverns of New York State*, as the second of a proposed series of books on the *Caverns of America*. He is familiar with the cave country of the East from Maine down through Virginia, and is keeping on crawling, with companions well equipped to help him capture the 'buried treasure' of beauty and mystery and story in the most wonderful caverns in the world."

Note that the author has a job ahead of him—and all speleologists, spelunkers and anyone interested in caves and their stories, please copy—and send copy to Clay

Perry at East Acres, Pittsfield, Mass.; especially at once, about New York state caves.

Clay Perry has published half a dozen illustrated magazine articles on caves, in such nationally known media as the *Saturday Evening Post*, *Travel*, *Nature*, *Trailways*, *Short Stories*, (fiction and fact there), and his latest, in *Holiday*, the new Curtis Publishing Co. magazine, with kodachrome illustrations. He is a member of the Board of Governors, Chairman of the Folklore Committee of the N.S.S., organized the first grotto of the N.S.S., as the New England Spelunkers' Grotto, No. 1—in a cave in his homeland, the Berkshire Hills—and has recently directed the reorganization of the grotto under the new national constitution and by-laws.

TVA Promises Data

I appreciate very much your letter with enclosures and BULLETIN No. 6. From this information I have been able to obtain an idea of the data which you have on underground hydrology. Undoubtedly you must have a large volume of this in your files, and it will be a valuable contribution to scientific knowledge if you are able to assemble and publish it sometime.

You are correct in your understanding that the explorations for locating a number of our dams in the Tennessee Valley found openings at considerable depths. Where our dam sites have been in the limestone country we have, as would be expected, encountered many of these openings. It has been necessary in our foundation excavations so thoroughly to treat such openings as to insure water tightness of structures as well as security. Our data with respect to information that might be of value to your Society is somewhat like that of your underground hydrology at the present time. It is separated through a number of files pertaining to each particular job. If it is possible some time to collect such information that would be of value to you, we will be glad to have this done and send it to you.

A. S. Fry,

Chief, Hydraulic Data Division,

Tennessee Valley Authority (8/8/45)

Engineering News Record, Dec. 27, 1945, pp. 61-65, describes how the Navy built underground oil storage in Hawaii. They built 20 tanks, 100 feet in diameter to 250 feet in height, each spaced at least 200 feet from the other, with the top of each tank about 200 feet below the surface. Of course, the larger rooms at this particular place had to be carved out of solid rock. This illustrates to what expense and trouble the Government goes to put the resources underground. Navy caves could be lined with concrete to serve as oil storage without this great expense of digging them out of rock. Few caves that we know of have so large a volume. Imagine a cave with 20 rooms each 100 feet in diameter and 250 feet long!—W. J. Stephenson.

Commercial Caves

CRYSTAL CAVE—WISCONSIN

By T. C. VANASSE

CRYSTAL Cave was discovered in the year 1881 by W. R. Vanasse, a local farmer and life-long resident of the Spring Valley area. The discovery was purely accidental. As he walked through the heavy woods a half-mile from his home, he came upon a small sink partly filled with dead leaves. His curiosity prompted him to find a long pole and push it into the leaves at the bottom of the sink. To his astonishment, the pole escaped from his grasp and disappeared into the ground. Thus, as the result of a boyish whim, Crystal Cave became known to local residents.

The first exploration of Crystal Cave took place the day following its discovery. The 16-year-old W. R. Vanasse and his younger brother, George, now a resident of Spring Valley, visited the cave together prepared to lower themselves through the vertical entrance.

Crystal Cave at that time was not the cave it has now become. The two boys descended into only the upper 20 feet of the clay- and debris-filled dome. From this "room" they descended a short distance into the upper part of what is now a 30-foot, arched gallery. In other directions the boys saw only shallow entrances to clay-filled galleries on the upper level. The existence of other levels and other galleries was unsuspected; and only a geologist, or one versed in the structure of caves, would have seen the evidence of such other levels and galleries in the crevice at the bottom.

Crystal Cave remained in this semi-filled condition for several decades. A slight amount of washing and caving from the sink on the surface was the only alteration visible to the succession of generations of small boys who visited it. And so the cave remained, visited but rarely, and known only to a few in the local community, until 1941.

The entrance to Crystal Cave today is located in the center of an alfalfa field on the uplands one mile west of Spring Valley. It is less than one-quarter mile from the hard-surfaced State Highway 29, and is clearly visible from that road.

His knowledge of caves, of topography, and of geology led the present owner, Mr. H. A. Friede, to believe at once that here was a cave worth investigating. The sink is located in the weathered remnants of the very old Kansan glacial clay, and enters a dome in the upper layers of nearly 100 feet of the lower Magnesian limestone, or

Oneota dolomite. The cave, of course, is of pre-glacial origin. Since its location is upon the uplands, there is very little drainage into the sink—hence, the interior of the cave is perfectly dry. The cave, moreover, is located so near to the edge of the driftless area that the relatively thin superincumbent ice was unable either to remove the rock or to crush in the cave roof. Such being the conditions, Mr. Friede was sure that if the filling of clay and debris could be removed, a large cave having numerous galleries and all the beauties and wonders of cave formations would be exposed. His subsequent activities have proved that he was right, for his discoveries have enormously exceeded his expectations.

Much of the debris has now been removed from many of the galleries and from the dome. Although further and probably continuous cleaning and enlarging will be done, Mr. Friede is now erecting a building over the entrance.¹ This building, for the present time, will measure 52 feet by 30 feet, will be built almost entirely from the loose fragments of dolomite removed from the cave, and will be of one story with a full basement. An easy series of stairways will lead from the basement to the first and to the second and third levels below. The basement will be used to display the numerous minerals, rocks, and fossils found at the cave site and at neighboring parts of the state.

In size Crystal Cave compares favorably with the largest caves in Wisconsin, is the deepest, and the only three-level cave in the state. At present, with much of the work unfinished, 1,101 linear feet of rooms and passageways have been opened for the public. Known but unopened and little-explored galleries will surely raise the length to 1,500 or 2,000 feet or more. The width varies from three feet to 75 feet. The height of passageways varies from five feet to probably 18 feet; of the 20 to 25 rooms from five feet to 30 feet; of the dome from 30 feet to 60 feet. At present, the greatest depth attained is about 81 feet below the surface.

The numerous rooms are divided among the galleries leading away from the main dome on three levels. At present only one small room has been cleared on the first level about 32 feet below the surface. The largest rooms,

¹Crystal Cave was to have been opened to the public early in June, 1941.

on the second level about 40 feet below the surface, are lacking in stalactites and stalagmites, but are beautifully varicolored and are awe-inspiring in height. These rooms resemble the vaulted nave and aisles of a church. Also they contain a natural fireplace, the Chapel, the Bridal Chamber, the skull of the Caveman, and the Head of the Irishman ("shanty" Irish or "clay-pipe" Irish as yet undetermined).

From the entrance to another gallery on the second level the depths of the dome may be seen falling away directly below. This gallery and the galleries on the third level contain the rooms and passageways which exhibit the great variety of cave formations—stalactites, stalagmites, helictites, crystalline encrustations, and differential weathering. The lower level, too, contains the wonder of Crystal Cave—The Lost River—revealed in swirling rock contours, in water-smoothed knobs and pillars, and in intricate honeycomb structure.

Unexplored openings on every hand and on every level will undoubtedly reveal more rooms and unknown wonders later. Work is now going on in some of these unexplored spots, but a greater effort is going into the opening of a fourth and lower level.

The geology of Crystal Cave is also one of its interesting features. The entrance passes through a clay mixture composed of top soil, weathered Kansan glacial drift, and a small amount of residual soil. The cave itself lies entirely within the Onecota dolomite, or Lower Magnesian limestone. The base, which has not yet been reached, will lie on the Jordan sandstone below. This contact between the Jordan sandstone and the Onecota dolomite is also the contact between the ancient Cambrian and Ordovician rocks.

Limestone and dolomite, of course, are sedimentary rocks which have accumulated as ooze upon ancient ocean bottoms. Simple shell fish—snails, for example—were the highest form of life in those ancient seas, and we find their fossilized remains embedded in the rock. A large number of such fossils have already been removed from the Onecota dolomite at Crystal Cave. A few of the many found by Mr. Friede have rather disconcerting names: *Gasconadia putilla*, *Ophileta oweni*, *Helicotoma umiangulate*, and *Walcottoceras shannonense*.

A number of common minerals are present in considerable quantity in Crystal Cave. They color the cavern walls; they are the substances from which a number of the various structures are formed; and, in their crystalline forms, a few of them are the sources of beauty in the cave's formations and in the walls of the building now being built over the entrance.

Limonite, the brown oxide of iron, is perhaps the first mineral that attracts attention. This ore in a soft, earthy form colors the upper walls in a great diversity of pattern. Wavy stratifications join and alternate with numerous lenses of the ore. In spots large irregular masses of limonite may be seen near the top layers of the dolomite. Also limonite has often stained portions of the cave structures. Another form of limonite occurs as an alteration product of "fool's gold," or marcasite. This form may be seen in small pockets, or as projecting knobs, lined or covered with small octahedral crystals.

Glauconite, a green, clay-like substance, also occurs as seams between strata and as a coloring material in the sandstones and limestones. Soft, sticky masses of the substance also line and fill small pockets, or project from the walls.

An interesting form of kaolin also occurs in pockets in the rock. This very smooth, sticky clay is a product of weathered and disintegrated feldspar. In Crystal Cave it is stained by limonite to the exact color and consistency of bitter chocolate.

The upper layers of the Onecota dolomite are characteristically filled with seams, nodules, and irregular concretions of chert, an impure form of flint. In color the chert in Crystal Cave varies from black and gray to pure white. Chert is a non-crystalline form of quartz. The crystalline form also occurs abundantly in cavities all through the rock. Such cavities, some of which are called vugs, formed by the leaching of limestone, have their inner surface lined with small six-sided crystals of quartz. The crystal-covered surfaces are known as druses, and will add much to the beauty of the masonry at the cave entrance.

Finally, calcite, the crystalline form of calcium carbonate, occurs most abundantly in Crystal Cave. It is present as stalactites, stalagmites, and helictites; and also areas of the floors as travertine, and forms crystalline encrustations on walls and projections of stone.

Stalactites are present in the lower levels of Crystal Cave literally by the hundreds. In many rooms they hang thickly overhead and also extend like inverted forests into low, unopened chambers as far as light can penetrate. They are not large, perhaps seldom exceeding a foot in length and an inch in diameter; yet this adds to rather than detracts from the total beauty. They vary in color. Some are clay-stained, some are yellow from included iron ore, and others (perhaps ten percent) are of a milky-blue translucency having a soft, glittering, opalescent luster. Many of the stalactites are alive, having drops of water clinging to their open ends. Most of these are colorless and transparent, seeming to be formed from thin,

Reprints

A FORGOTTEN FREAK OF NATURE

By FRA ELBERTUS*

TIME was when the Mammoth Cave of Kentucky was one of the wonders of the world.

The Cave is there yet, but only colored picnic parties go there now, or possibly an occasional person wanders thither because he remembers how, in days ago, his father and mother made their wedding journey here, and then came home and talked of it for the rest of their lives.

Records can be seen at the Mammoth Cave hotel showing the exact number of persons who have visited the Cave since this hotel was opened in 1837.

It is worth while to note that in the year 1844 an average of ninety-three persons a day were shown the wonders of the Mammoth Cave, while in 1905 the average, not counting local picnic parties, was less than a dozen. In 1844 the population of the United States was less than twenty millions, and there was not a railroad in the state of Kentucky. And yet people came here from all the New England and Middle States by the hundred.

Edward Everett guided a party of New England school teachers here in the summer of 1847. They came by way of Pittsburg, taking a steamer thence to Owensboro, Kentucky, and then by stage a two days' ride—eighty miles—to the Cave.

The hotel is here now practically as it was then, and one can easily believe that no new furniture has been added,

*Article by Elbert Hubbard, reprinted from *The Philistine*, Vol. 25, No. 1, June, 1907, pp. 1-22.

CRYSTAL CAVE—Continued

fluted, needle-like crystals of calcite. Other forms have joined the stalagmites to form columns; others growing from cracks are like flowing ribbons. And occasionally some have assumed the form of a glistening frozen waterfall.

Twisted and distorted stalactites, known as helictites, occur in unusual numbers and beauty in Crystal Cave. Usually the helictites are small, but they are so easily accessible and of such queer forms that they are one of the outstanding features of the cave. Some curve away from walls, knobs, and ceilings like the claws and fangs of an animal; some have taken the form of small clothes hooks; others project from short, bulbous stalactites like bent pipes from a bagpipe; and, most unusual of all, are

From 1840 to 1870 scarcely a person of note then living but visited the Cave—it was a sort of finishing touch to one's education, and people who could not talk intelligently of Niagara Falls and the Mammoth Cave had no standing in polite society.

Everett gave lectures at Harvard on the Mammoth Cave. Webster gave a great speech at the Cave in 1854, and Emerson, in his essays, several times refers to his visit here, telling of the fish that have no eyes to see.

Barnum brought Jenny Lind here, and she sat in a stalagmite chair that is now proudly pointed out by the guides.

From the year 1850 to the breaking out of the war in 1861, there were held over three hundred conventions of learned societies, college alumni, and gatherings of prominent people from all over the world.

It is worth while to note the stern fact that even the wonders of creation do not actually attract any special attention unless some advertising man gets busy. The railroads really make Niagara Falls go. They are advertising it continually as a continuous performance, and filling people with a desire to go there, then transporting them for a consideration.

In 1869 the man who owned the Mammoth Cave died, and since then the Cave has been an orphan. There were thirteen heirs scattered in different cities throughout the United States, all valiant booze fighters, intent on spending the beautiful income that was forced upon them from this magnificent paying property. Every person who went into the Cave paid two dollars for the privilege—it was a monopoly. People would come, of course; there was no other Cave to go to.

But soon the people ceased to come.

The advertising man was dead.

those that resemble the fingers of an extended, clutching hand.

Crystalline encrustations upon the walls and rocks, and even upon stalactites as an additional secondary deposit, often exhibit a soft sheen of satin. Also it is on such encrustations that we see better than elsewhere, because of the larger area, that luminous, milky-blue, opalescent luster. This beautiful phenomenon has not yet been fully investigated in Crystal Cave. It may be due simply to the arrangement of the myriads of crystal faces on the deposit, it may be that the crystals are of dolomite, which often have curved faces; or it may be due to a simple inclusion of a small quantity of fine clay in the calcite formation. Whatever the explanation, the phenomenon is one that will add one more bit of charm to the already attractive Lost River in Crystal Cave.

Humanity slipped back into indifference. They forgot to think of caves or gently pooh-poohed them.

Caves are not necessary to human happiness. Caves are not necessary until some man by astute advertising fills us with the desire to see them.

Fie on you, Uncle George, with your Whirlpool Rapids and Horseshoe Falls! Of course the water falls—what's to hinder it? But to drink it in is an innocuous superfluity. You give us the itch and then charge us for scratching.

President Pierce and four members of his Cabinet visited the Mammoth Cave, and for a week it was the capital of the United States. But has Teddy ever been there? Not exactly, nor have any of his Cabinet, and I doubt me much if Grover Cleveland ever heard of the place.

The advertising man is dead.

That man who managed the Mammoth Cave in the good old days was an ornithological specimen worth while.

He used to have folks lost in the Cave, and searching parties would go to find them. To properly impress his patrons—for he was a psychologist—he had them all put on special suits when about to enter the Cave—women in trousers and short skirts, and around the edges of the skirt were tiny bells that tinkled as the fair ones walked. This was so you could find her if she got lost, or didn't. The caps he provided were very fetching. And as for the men's garb, it was sufficiently hideous to be interesting.

Then for a time the plan was adopted of tying the entire party together with ropes, lest some be lost or fall into dangerous places. For the use of the compulsory suit one dollar was charged, and besides this the regular fee for the services of the guide was two dollars. Geological specimens, gathered by yourself, were figured according to your pocketbook. Statistics say that forty million pounds of specimens have been carried from Mammoth Cave; this is not counting those imported to the spot from distant points, in defiance of the Interstate Commerce ruling as to the long haul clause.

As for the Cave itself, let it be known that it is for the most part perfectly dry; there are no dangerous places in it where the casual sight-seer is expected to take risks, and Mark Twain in a white duck suit could make the trip and come out with his attire looking as immaculate as it did when he made that little journey in company with Phoebe Snow.

I said that the manager of the Mammoth Cave was a lulu, the proof of which lies in the fact that he attracted P. T. Barnum to this hole in the ground, and Jenny Lind sang there, miles from daylight, at ten per; and the money was given to poor people who crawl on the earth's crust, so they could afford to visit this wonder of the world.

People came from Memphis, Louisville, Cincinnati, and Lexington to hear Jenny warble below the surface.

Beecher once preached in the same place from a stalagmite pulpit, built by Providence. The manager was quite religious, and so had services in the Cave every Sunday for the spiritual benefit of his guests, wherein the preacher used a strictly underground vocabulary. The communicants walked into the bowels of the earth, each carrying a lighted candle, and there had the unique satisfaction of lifting up their voices in prayer and praise to God, who, having made the Cave, was doubtless pleased with its use.

One innocent little piece of pleasantry that good manager of the olden time used to practice was in giving each person a lighted candle when the assembled pilgrims stood on the steps of the veranda, clothed in overalls and their right minds, ready to descend to purgatory. Down the hill they walked in solemn procession, and as they filed into the mouth of hell, the strong draft that always blows outward in summer from the cavern put out every light. About this time a man with a candle would mysteriously appear farther ahead, where the air was still, and the wise virgins would grope on a little way into the ebony gloom and there renew their lights.

And everybody for a time ceased introspection and got a No. Six Thrill!

At the Mammoth Cave hotel is a large Newfoundland dog that has a gravity of demeanor like unto that of William of Albany, or Bill Walker of Fargo. This dog accompanies each party down the hill to the mouth of the Cave; and as they enter the gloaming the dog loses his nerve, and turning about, still preserving his dignity, altho with tail at halfmast, walks deliberately back to the hotel.

Not long ago a humorous swain, thinking to amuse the ladies, and feeling sorry for the dog that was so near Mammoth Cave, yet had never been in it, seized the beast brute by the collar and attempted to drag him into the yawning entrance that lured and invited.

It cost the humorist five dollars for cauterizing the region of his glutius maximum, this amount being paid to a local Wire Grass doctor, who refused to guarantee against rabies until the patient had invested as much more in the Kentucky specialty for everybody.

We all drank to the health of the dog. This true story should be prized by the young, since it teaches two things: First, that some dogs have wills of their own. And second, that occasionally the Smart Aleck gets what is coming to him.

As you go down the hill to the mouth of the Cave you traverse a hundred yards or so of the finest woodland scenery in the world. It looks like a virgin forest where the hand of man has never trod, to use the phrase of

my Hibernian-American friend, Colonel William Marion Reedy. Great gnarled walnut trees stretch out friendly branches over you; tall sycamores tower to the sky as if on guard; clumps of pawpaw and tangles of blackberries abound, while below a wilderness of ferns and mosses revel in Linnaean wealth. And thru the branches you see that the great trees are held together in common brotherhood by giant grapevines that wind in and out in hawser-like coils.

The beauty of all this verdure impresses itself on one, just as we are told that a man on the way to the gallows beholds a charm in nature that before he wist not of.

Down below us yawns the entrance to the Cave; all around it this beauteous mass of verdure. Across the entrance to the cavern falls a Minnehaha veil of water. You dodge the cascade, and looking down are surprised to find that this falling water does not flow on in a stream—it just disappears right into the ground as it falls.

We pass on into the Cave that narrows as we walk. Fifty feet or so and we come to a narrow, barred iron gate locked with a padlock. The guide hands his lantern to one of the visitors and fumbles at the lock.

Thru the gates we peer into impenetrable night; back behind can still be seen a tiny glimpse of the blue sky.

"Oh, I feel so faint!" cries a lady of our party. Flasks are produced, for we are all Kentucky Colonels. Also there is a priest with us we have dubbed the Kentucky Cardinal, and he offers consolations. "She is not faint—she only thinks she feels faint," says her brute husband who has been conversing with a disciple of Mary Baker Eddy.

"Oh, dear, oh, dear, I'll have to go back," moans the lady.

"The dog will show her the way," suggests the guide in pretended disinterestedness. The dog with his bishopric dignity has just solemnly turned back, and the lady follows.

We pass on into the narrows where that bear hunter, Hutchins, in 1802, crawled fearlessly after one thing and discovered a greater, just as did Columbus—and as we all do.

We look back and see only blackest night; the same in front. The way widens—but night still holds us in his arms.

Silence has given place to talk and the most persistent chatterer is still. The only book read in the Cave is the *Essay on Silence*.

The awfulness of solitude subdues. We think of the Newfoundland dog and inwardly commend his judgment.

The guide stops.

From the pouch which hangs over his shoulder he takes something, fastens it in the sharp end of his cane, lights this at his lantern, and flings it, burning, aloft.

The rocket hisses thru the air, and to our astonishment we are standing in the famed Rotunda, a natural theater hewn by natural forces out of the solid stone. This theater is sixty feet high, eighty feet wide and over a hundred feet long. The Bengal lights illumine every crevice with a strange, wondrous light, and reveal traceries of stalactite spun as fine as silken curtains and beautiful as a dream.

"It seems just like a play!" whispered a ten-year-old girl to me.

A flaring torch is lighted, and our spirits revive. Everybody draws heavily on his stock of adjectives.

The Mammoth Cave is no fake. Nobody who ever sees it is disappointed, no matter how blase his temperament or curdled his heart.

If nothing more than this Rotunda were shown, it would still be one of the wonders of creation.

But beyond the Rotunda you follow mile after mile thru this never ending night. Seven miles are walked—we had been gone three hours. Not once did I hear any one speak of being tired.

There are longer routes, and many of them. Stay a week and hire a guide by the day if you are a genuine descendant of the cave men. One man I met at the Mammoth Cave hotel had been there two weeks, had hired two guides by the day, and traversed one hundred and fifty miles of tortuous passages.

In Egypt, in the presence of the pyramids, Napoleon began that famous speech by saying: "Soldiers: Twenty centuries look down upon you," but in the Mammoth Cave one can say one hundred centuries look down upon you.

The Cave is there, but to mankind at large it is no longer one of the wonders of the world.

This is because the advertising man is dead.

No matter how good a thing is—how great, how excellent, how magnificent—it must be properly presented, rightly advertised. Humanity, so far as mentality and spirituality go, still lingers in the age of the cave man, and swims like eyeless fish in the dark waters of Echo River.

We prefer vaudeville to geology, and Coney Island catches us when knowledge of the world we live in and of which we are part and particle pass us by.

A curious comment on the quality of the genus homo that visits the Mammoth Cave is the fact that in various and sundry places along the way visitors leave their cards.

One great flat rock is called the dead letter office, and here you leave the envelope of some letter that has been directed to yourself. Bushels of these envelopes and visiting cards are to be seen left by worthy nincompoops, who have a desire for immortality without the wish or ability



*A detail of the famed Paradise Lost portion in the Oregon Caves.
(Pictures taken by George Grant, U. S. Dept. of the Interior.)*



*"Age before beauty" . . . We give you the hoar and well-known Pillars in Joaquin Miller's Chapel, Oregon Caves (National Monument, near Grant's Pass)—but we can't identify the "beauty" part.
(Can the Cave Men of Grant's Pass help us?)*

to do anything commendable. Believers who have never done anything either good or ill—said a good thing or did a wise one—wish and expect as rewards for being neutral salts a life of eternal idleness and everlasting bliss.

Thousands of names are on the walls, mottoes, verses of doggerel and other sweet emblems, so that at times one imagines he is in an adjunct of a bucolic hostelry sacred to necessity which the guests have in error mistaken for the registry office. Mounds of rocks with flags stuck in the top attest to Irish, British, or Yankee patriotism. Buggy Builders' Conventions and Barbers' Conclaves are immortalized by dinky monuments piled up in fifteen minutes while the guide smokes his pipe. A Christmas tree fitted out with tawdry ribbons and popcorn in 1888, by a dame with a strange lust for doing something unnatural, still pollutes the path of the pilgrim.

The guides, who from long service have grown to accommodate themselves to the law of supply and demand, and give their guests what will please them most, point you strange resemblances on the somber ceiling, as, for instance, a lion at play, an ant-eater, a giant father and mother tossing their baby across thru space, a hen and chickens, Martha Washington's statue, etc., etc. Just as if the miracle of the Cave was not enough—we demand a hen and chickens on the wall sculptured by mysterious agents.

In storied Westminster Abbey, in Poet's Corner, is a bust of Longfellow. On the pedestal of this bust patriotic Americans daily leave their cards, a wilted flower, or something to express a maudlin sentiment they do not feel, but which they think is proper. One gentleman from Arizona, who seemed full of the idea that life is real, life is earnest, I saw surreptitiously leave his quid of tobacco amid the calling cards. I think the Arizona gent was a humorist, but his action was quite as relevant as that of the pert miss from the Lake Shore drive, Chicago, who leaves her calling card at a poet's bust, or, in lieu of this, the envelope of a letter addressed to herself postmarked "Kalamazoo."

I think now I have a clue to why that big Newfoundland dog refuses to enter the Cave, even tho he has lived above it since puppyhood's happy days, now gone, alas, forever! He even declines to act as Cerberus, for no sop will secure his services to guard the entrance to this Kentucky Avernus. The dog is psychometric—he realizes the spiritual pollution of the place thru the multitudes who have visited the Cave, left their calling cards, written their names, made mounds, deposited badges, and reached out for a cheap and transient fame. As the Buddhists believe that a place once visited by a person is forever after a different place, so this clairvoyant, self-respecting kioodle

refuses to mix his aura with that of the mob million, lest, mayhap, he lose his identity.

To reach the Mammoth Cave you take the Louisville & Nashville railroad to Glasgow Junction. There you change cars and take the Mammoth Cave railroad, an institution that has an equipment of one passenger coach and a dummy engine. I was interested in seeing a Kaffir cutting the grass between the two streaks of rust, and was told this had to be done three times a year, and is the thing that keeps down the dividends. It seems that the management asked the conductor to cut the grass, but his answer was, as he himself told me, "Damn me if I mow!"

The conductor—there is only one on the road—came for my fare and said, "Two dollars, please!"

I handed out the money.

"Well, say it!" he exclaimed.

"Say what?" I asked.

"What is in your head. Out with it!"

"What do you want me to say or do?" I asked.

"Why kick, protest, rail, balk, or goddam at being charged two dollars for riding nine miles and back."

"I never kick on any railroad that has less than ten miles of mileage," I said.

When this merry conductor wanted the train to stop or go ahead he went to the front door and yelled to the engineer.

The Mammoth Cave Railroad belongs to the Mammoth Cave estate, and the estate is so land poor and the heirs so greedy that the engineer told me he had hard work to get grease for his cylinders.

It took us just one hour to make the nine miles.

"You notice," said the conductor, "that we have our cowcatcher on the rear end, so as to keep the cows out of the ladies' coach." He then explained, "Why, a bull got after us last week and would have ketched us if we hadn't been on the down grade."

Reaching Mammoth Cave one is let down near the hotel, which, with its barns and rambling outbuildings, is all there is of the terminus. This great, wide stretching hotel, with its six hundred feet of piazza, is worth the trip alone. It tells of stage-coach times and days when slaves were sold at auction from its broad piazzas, and two hundred horses were in the stables.

It is Southern luxury in ruins. There is the ancient bar, fifty feet long, where the thirsty colonels befo' de wah named their pizen, and argued politics in deferential phrases.

The floors of the hotel look like the gentle billows of a summer sea. The driveways are overgrown with

grass, and there are three colored persons to wait on every guest.

Back of the hotel is a picketed garden that supplies the hotel tables. And a charming garden it is, with its semi-tropical wealth of yams, butter-beans, melons, squash, potatoes, berries, radishes, tomatoes, cabbages, and climbing gourds. Down on the flat we saw a herd of milch cows, and the old spring-house, with its crocks of cream half submerged in the running water, reminded me of boyhood days when churning was paid for in promises of picnics and circuses to come.

The landlord of the Mammoth Cave hotel is a gentleman of the old school, and no pains are spared to put the guest at his ease. The prices are very reasonable, and there is fried chicken morning, noon and night; and if you wish you can go out into the garden and get the vegetables you like best, and a good old mammy will cook them as your mother used to do.

The marvel is, that such a retired, restful hostelry is not full of boarders the year round. But the estate is in chancery, and the case of Jarndyce vs. Jarndyce saps the landlord's aspirations and keeps ambition at low ebb.

The heirs, grabbing at everything, get handfuls of empty air—just what they deserve.

But death is the great benefactor, and time the adjuster, regulates all things.

The Mammoth Cave will soon go under the auctioneer's hammer, and I prophesy that the L. & N. will buy it in and put the Mammoth Cave engine and passenger coach in a museum. Proper railway facilities will be provided, the hotel will be rejuvenated, and C. S. Stone, G. P. A., will name an advertising man, and the bats of the Cave will wing their way in panic and whirl in wild alarm to the eyeless fish the news, echoed by the American Indians when they saw the ships of Columbus, "Alas, we are discovered."

The advertising man will yet appear and give this wonder back to the world.

That wild region of Kentucky fifty miles square, of which Mammoth Cave is the geographical center, is a country of caves.

The marvel is that an entrance is ever found to them, since stone and silt and vegetation are forever working with the law of gravitation to cover up and fill every surface crevasse.

In 1809, the year that Lincoln was born, it was discovered that the Mammoth Cave contained valuable deposits of "peter dirt," or nitre—from which saltpetre was made. And it is an actual fact that without the Mammoth Cave deposits the Americans could never have fought

the war of 1812, as up to that time all of our gunpowder was brought across the sea.

The cumbrous wooden pipes, the leaches, vats, and troughs used by the saltpetre miners from 1809 to 1814, can still be seen in the Cave. And, in fact, a part of the Mammoth Cave hotel is the identical log house where lived the enterprising foreman who worked slave labor in the Cave to a purpose and made for his employers the snug sum of three hundred thousand dollars in five years out of an original real estate investment of forty dollars.

But the man who built the hotel, advertised, and started the human tide thitherward in 1837, made more than did the man who mined the villainous saltpetre.

Geologists and prospectors have now discovered that the whole of Edmonson and Warren counties is honey-combed with caves. And over two thousand distinct surface openings to these caves have been found and mapped. Indeed, the farmer in Edmonson county who hasn't a cave on his land is poor indeed. These caves have a uniform temperature winter and summer of fifty-four degrees, and so are useful for storing vegetables, fruits and various other perishable things. They are dry because the water all drops to a lower level—Mammoth Cave itself having three distinct levels, the lowest one, only reachable by boring, showing a river or lake that rests beneath the entire Cave.

On the surface you see as you ride along various dips or "bowls," which are merely places where the Cave has caved in and let the roof drop. These bowls often fill with water, which shows neither inflow nor outlet, but which from the temperature and quality of the water must have both.

One honest farmer I met had such a miniature lake on his farm that he had stocked with carp. It seems that certain colored gentry in the neighborhood who had tired of chicken and God knows had asked for fish, planned to get these carp.

They timed the farmer when he had gone away to town with his family, and putting down a pipe in the pond, exploded a few sticks of dynamite. Result: The water blew up, subsided, and disappeared, finny tribe, aqua pura, and all. A hole had been blown in the bottom of the pond.

So amazed and terror-stricken were the Negroes at what they had done that they confessed, were duly punished, and have since joined the Methodist church and are walking now in the fear of the Lord.

The formation of these caves is purely a geological accident on the part of nature, just as is the formation of Niagara Falls.

At Niagara Falls there is a hard stratum of limestone, covering a bed of shale. The shale wears away below, and the hard limestone projecting above gives a perpendicular

fall. If the shale was above and the hard stone below the waters of Lake Erie and Lake Ontario would have reached an understanding centuries ago. The prevailing outcrop of Mammoth Cave is a carboniferous limestone. Great geologic upheavals have cracked and fissured the strata so that the dripping and running water could easily find a way thru. But there are two distinct kinds of limestone here: one is hard, solid and compact; and the other is soft and gives small resistance to its enemy, the carbon-dioxide, which eats and gnaws just as oxygen attacks iron and dissolves it into rust.

So the hard Chester limestone above and the soft St. Louis limestone below made it possible for water and the carbon-dioxide to work together and do their deadly work.

The dioxide crumbled the rock and the water carried away the debris. For Mammoth Cave is but the dried-up water way of some mighty subterranean river, and all the thousand little caves that are to be seen along its sides were once the bed and pathway of streams that emptied their waters into its mighty mass.

CAVES IN VIRGINIA—1795

From an old "geography"—one volume of maps and one volume of descriptive matter covering each country (both had detailed treatment of the U. S. A. by states and under Virginia)—I found the enclosed interesting report on the caves as they were known in 1795:*

In the limestone country, there are many caverns of very considerable extent. The most noted is called Madison's Cave, and is on the north side of the blue ridge, near the intersection of the Rockingham and Augusta line with the south fork of the southern river of Shenandoah. It is in a hill of about 200 feet perpendicular height, the ascent of which, on one side, is so steep that you may pitch a biscuit from its summit into the river which washes its base. The entrance of the cave is, in this side, two-thirds of the way up. It extends into the earth about 300 feet, branching into subordinate caverns, sometimes ascending a little, but more generally descending, and at length terminates in two different places, as basins of water of unknown extent, and which appear to be nearly on a level with the water of the river. It is probably one of the many reservoirs with which the interior parts of the earth are supposed to abound, yielding supplies to the fountains of water, and is distinguished from others only by its being accessible. The vault of this cave is of solid limestone, from 20 to 40 or 50 feet high, through which water is continually exuding. This, trickling down the sides of the cave, has incruited them over in the form of elegant drap-

ery; and dripping from the top of the vault, generates on that, and on the base below, stalactites of a conical form, some of which have met and formed massive columns.

Another of these caves is near the North Mountain, in the county of Frederic. The entrance into this is on the top of an extensive ridge. You descend 30 to 40 feet, as into a well, from whence the cave then extends almost horizontally, 400 feet into the earth, preserving a breadth of from 20 to 50 feet, and a height of from five to 12 feet. After entering this cave a few feet, the mercury, which in the open air, was 50°, rose to 57° of Fahrenheit's thermometer.

At the Panther gap, in the ridge which divides the waters of the Cow and Calf Pasture, is what is called the Blowing-cave. It is in the side of a hill, is of about 100 feet diameter, and emits constantly a current of air of such force, as to keep the weeds prostrate to the distance of 20 yards before it. This current is strongest in dry, frosty weather, and weakest in long spells of rain. Regular inspirations and expirations of air, by caverns and fissures, have been probably enough accounted for, by supposing them combined with intermitting fountains, as they must of course inhale the air, while the reservoirs are emptying themselves, and again emit it while they are filling. But a constant issue of air, only varying in force as the weather is drier or damper, will require a new hypothesis. There is another blowing cave in the Cumberland mountain, about a mile from where it crosses the Carolina line. All we know of this is, that it is not constant, and that a fountain of water issues from it.

The Natural Bridge is the most sublime of nature's works. It is on the ascent of a hill, which seems to have been cleft through its length by some great convulsion. The fissure, just at the bridge, is by some measurements 270 feet deep, by others only 205. It is about 45 feet wide at the bottom, and 90 feet at the top; this of course determines the length of the bridge, and its height from the water. Its breadth in the middle is 60 feet, but more at the ends, and the thickness of the mass, at the summit of the arch, about 40 feet. A part of this thickness is constituted by a coat of earth, which gives growth to many large trees. The residue, with the hill on both sides, is solid rock of limestone. The arch approaches the semi-elliptical form; but the larger axis of the ellipsis, which would be the chord of the arch, is many times longer than the tranverse. Though the sides of this bridge are provided in some parts with a parapet of fixed rocks, yet few men have resolution to walk to them and look over into the abyss. You involuntarily fall on your hands and feet, creep to the parapet, and peep over it. If the view from the top be painful and intolerable, that from below is delightful in an equal extreme. It is impossible for the emotions arising from the sublime, to be felt beyond what they are here: so beautiful an arch, so elevated, so light, and springing as it were up to heaven, excites in the spectator a rapture really indescribable! The fissure continuing narrow, deep and straight for a considerable distance above and below the bridge, opens a short but very pleasing view of the North mountain, on one side, and the Blue Ridge on the other, at the distance each of them or about five miles. This bridge is in the county of Rockbridge, to

*Extract from: *A New System of Modern Geography*, by Wm. Guthrie, Esq. (Vol. 2 of the First American Edition, printed for Mathew Carey, Phila. April 27, 1795). Page 490: "State of Virginia; Cascades, Curiosities, and Caverns."

which cannot be crossed elsewhere, for a considerable distance. The stream passing under it, is called Cedar Creek. It is a water of James River, and sufficient, in the driest seasons, to turn a grist-mill, though its fountain is not more than two miles above*.

W. Van B. Claussen,
Washington, D. C. (10/23/43)

GRAND PARTY TO EXPLORE A CAVE

Abstracted from The New Purchase, by Bayard Rust Hall. Printed in 1843; reprinted in 1916. Indiana Centennial Edition.

We . . . encountered Bill . . . and received directions (and) that place was reached . . .

Our exploring party became *small* if not *select*. Some ten feet down, after *scratching* through briars and bushes, we espied a rat hole, or to make the most of it, an opening thirty inches long by eighteen wide; excepting where sharp points of rock projected and made the aperture an inch or two less. And this hole was the vertiable door of the cavern! This was manifest from the worn trace of some kind of beasts; but mainly from Domore's report, who crawled in backward, and in five minutes crawled out head foremost, saying—"He backed in a rite smart chance, yet arter a while he finded he could a kinder sorter stand up—and then he kim out to sartify the kumpine."

Immediately commenced a metaphorical backing out; most of the ladies declared at once they never *would* crawl into such a place! Some also refused out of cowardice; and some were *bound* to refuse by tight corselettes and other bandages. Yet some half dozen, and among them Mrs. Clarence and Mrs. Carlton (who usually kept together), defying natural and conventional objections, said they would follow the preacher, as he could exorcise foul spirits; and as to other inhabitants, they would leave them to Domore and the other brave hunters with us. Some gentlemen that wished to go in, had to remain with the recusant ladies: and some hardy bucks, with rifles, preferred hunting an hour or two "to crawling on all fours under the airth like darn'd brute critturs!" But this was "possum"—these latter feared to be cut out, and intended to stay above ground and improve the time in sparking . . .

At length all was ready. Then we formed in Indian file, faces outward and backs toward the entrance, and began slowly to retrograde from the sunlight. Domore *led* the *rear*; then came the braves; then backed in Professor Harwood, then Mr. Carlton, his wife following *before* him, and then Principal Clarence, with wife ditto.

*Don Uiloa mentions a break, similar to this, in the province of Angarnez, in South America. It is from sixteen to twenty-two feet wide, one hundred and eleven deep, and one and three-fourths miles continuance, English measure. Its breadth at top is not sensibly greater than at bottom.

Doubtless all backed in judiciously, as we heard no complaints, although there was incessant laughter, screeching, squealing, and the like; and an occasional explanation, as—"You, Joe!"—"Awh! now Sam, let me *be*"—"Go away—I don't want none of your help!"—"Take that now!"—which last was followed by a hard slap on somebody's face, and instantly answered by—"Darn it, Peg! if you ain't a bustur!"

The entrance was the grand difficulty; for on squeezing down a few yards, the rocks went down like irregular steps, and our heads began gradually to rise, till by our torches were seen the rocks above ascending in a similar way; and in about fifty feet from the aperture we could stand erect and look round on a vast cavern, widening in every direction. Here the rear awaited the center and then both, the van; and then all the torches being lighted, we could see more distinctly. . . .

Deep fissures were apparent in the rocks below, into which one might have fallen in the dark; but we met no accident, and continued now our advance to the Grand Saloon, or as Bill had called it, "the biggerest cave where he couldn't see the top like." On reaching the entry of this room, we clambered down some rough projecting rocks; and thence passing along two abreast for fifteen yards, we all stood safe in the Saloon itself. Here nothing was remarkable but the size. It was an apartment about eighty feet long and from fifteen to forty wide, the height varying from twenty to sixty feet—although in some places we could not discern any roof.

Near one end, however, was a rock not unlike a pulpit, about four feet high and ascended by natural steps and encircled by a stony balustrade. . . .

I proposed to try the effect of a unanimous and vigorous "hurraw!"—and to ascertain if the party outside could hear our shouting. This was agreed; and then at the signal we let it out!—and oh! the uproar! inconceivable before, indescribable now! And the effect so different from noises in the world—in a few moments hundreds of bats, hitherto pertinaciously adhesive to the rocks, took wing, and flying with no discretion, they dashed in panic against our very faces and open mouths, and speedily extinguished more than half our torches . . . The bats soon withdrew to their clinging, and our torches were relighted; and—"Hark! what's that!?" "What?" "Listen!" We did, and heard an indistinct and peculiar noise—now like whining—now growling—and then it seemed a pit-pat sound like padded feet! and it then died away, and we were left to our speculations. . . .

The ladies all in unaffected alarm, proposed an immediate retreat. Yet Domore and Jesse and half a dozen other chaps, said "they did most powerful bad jist want to see

into the next room a little down like, afore goin' back; . . ."

The explorers, then, set off; and for a time were heard their footsteps and merry voices, till all were hushed in the distance; and we in silence remained striving to catch some faint sound—when forth on a sudden came the burst of terrific screams and outcries from the exploring party. And that soon followed by the noise of feet coming back quicker by far than they had gone away! And then into the Saloon jumped and tumbled the whole party, a few laughing and jeering, but most bawling out—"a Ba'r! a Ba'r!!"

. . . The . . . account from Domore . . . "Whare I was goin' to step, . . . darn my leggins if the hole didn't seem a movinin and a movinin, till all of a quick up sprouted a bar's head! and his eyes a sort of starin' so—(imitating)—rite slam smack on mine! . . ."

It was voted to retire immediately *into* the world, and our line of retreat was as follows. (1) Nearly all males, headed by Jesse, who, wishing to show his spunk, and retrieve the disgrace of his "screecher," led the van, now in front. (2) All the females. (3) the Faculty and Mr. Carlton. (4) And lastly, Domore as rear guard.

Without memorable accident our van in due time gained the cave door and crawled out head foremost; then, aided by the upper party, collected around at the unexpected egress, they helped out the female incumbents; and then, among united congratulations and derisions, we, the last division, were ushered slowly once more into ordinary life.

Later . . . Mr. Carlton was really Mr. Hall, the author.

It was "Truit's Cave," later called "Mayfield's Cave," six miles west of Bloomington, Ind. Both names are given in the N.S.S. "Index" to caves, BULLETIN No. 5.

Edwin W. Beardsley
West Cheshire, Conn.

Ashland, Mo., Nov. 6 (1945)—The will of Howard Turner, 85-year-old Negro resident of this community, bequeathed an acre and a half of land, the site of two large caves in this area, to the county for the use of Boone countians as a picnic resort.

Turner died several weeks ago. His farm was the site of the caves and a large spring. Prior to the advent of the automobile residents of this community used the place often for picnics and outings are still held there. One of the caves was formed to provide a large room where basket dinners could be served.

Turner's will was made in March, 1941 after the death of his wife. In making the gift to the county he stated that the land is "never to be sold but to be held in trust and always open to the public so that not only those of this generation but those of others may enjoy its use."

UNEXPLORED REGIONS OF WYANDOTTE

By GEORGE F. JACKSON

There is a fascination in solving the mystery of what has lain for untold ages beyond human ken; in venturing where no man has ever trod. The Unknown has ever beckoned. The urge to see what is beyond the next hill lures adventurous spirits.

This fascination caused a group of us to start into the so-called Unexplored Regions of Wyandotte Cave on the night of July 11th.* This part of Wyandotte is not unexplored, but very few people have ever made the long, dangerous, tiresome trip.

In our party were Mr. and Mrs. Gordon C. Curry of North Canton, Ohio; Graham Roth of Louisville; Bill Rothrock, son of one of the owners of the cave, and myself. Mrs. Curry is the first woman to attempt the trip. However she proved herself to be a daring cave-explorer, going into narrow crevices and down pits where most men beg to be excused.

We left the hotel at 8:45 at night, taking plenty of candles, lunch and 200 feet of rope, for there were pits to be explored. This rope proved to be the most difficult thing to carry I have ever seen. We divided it into three sections and wrapped it around our bodies.

There are many to whom the bare thought of exploring vast natural cavities in the earth is horrible and mad. Who so ventures into such places without a guide, must be subject, they think, to some strange perversion that makes him vain of fearsome and foolhardy experiences. To a sensitive mind unfortified with scientific training an unexplored cavern is charged with fantastic perils.

But, on the contrary, anyone who is keen to observe natural phenomena will smile at such fears. And yet, he is alert to real dangers that will test his fortitude to the limit. The abruptness of the change from world to underworld, the sudden descent from sunshine or starlight into a void blacker than any gloom on earth is a strain upon one's self possession.

One's very life hangs on the proper functioning of his light. There is no means of forecasting whither his steps may lead, nor how shocking may be the next minute's adventure. The rays of his light cannot penetrate 100 feet; for the cave atmosphere being optically as well as chemically pure, does not transmit the rays as well as our outer air. There may be pitfalls ahead, slippery ledges, hazardous passages over gulfs that no torch can fathom, rotten rock crumbling in one's grasp. You may wedge fast in a crack. The light may fail. You may be lost in the bowels of the earth!

All these risks were real enough, but all of us were well versed in cave work, and were ready to tackle almost anything.

To get to the start of the "Unexplored" we traversed the Long Route to the "Ball Room," and here branched off.

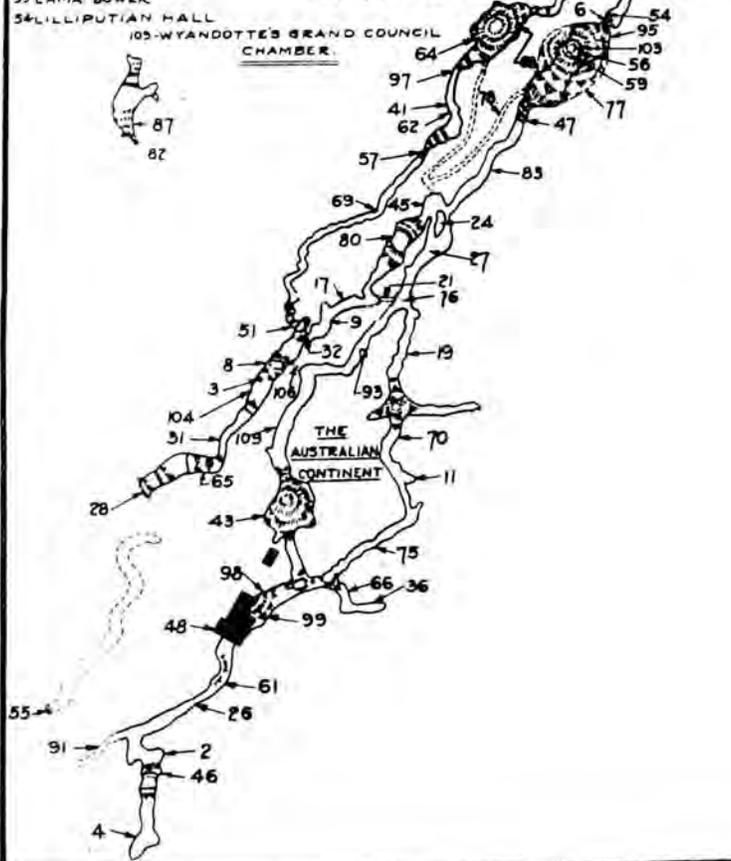
At the very start we had to drop to hands and knees and crawl some distance. Then the passageway became even smaller, and we were forced to lie on our stomachs and wriggle for 35 feet over hard mud. This required some time, for those of us who had knapsacks and the rope had to push them ahead. Our only lights were candles.

*From newspaper clipping dated 7-11-29.

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WYANDOTTE CAVE IS -
 THE SECOND LARGEST CAVE KNOWN,
 23 1/2 MILES IN LENGTH OVER TRAVELLED
 ROUTES,
 615 FEET ABOVE SEA LEVEL.
 A DRY CAVE - THEREFORE SAFE,
 AT ITS LOWEST POINT, 385 FEET BELOW
 THE LEVEL OF THE ENTRANCE.
 55 DEGREES IN TEMPERATURE ALL THE
 YEAR AROUND,
 NATURAL-AS 'GOD' MADE IT
IT CONTAINS -

THE WORLD'S LARGEST
 UNDERGROUND MOUNTAIN - 175 FT HIGH
 UNDERGROUND ROOM - 225 FT HIGH &
 1/2 MILE IN CIRCUMFERENCE,
 STALAGMITE - 34 FT HIGH & 75 FT IN
 CIRCUMFERENCE.

IT WAS -
 DISCOVERED IN 1798, OPENED TO THE PUBLIC
 IN 1850, BUT HAD BEEN INHABITED BY THE
 WYANDOTTE TRIBE OF INDIANS - HENCE
 THE NAME.



**MAP OF
 WYANDOTTE CAVE,
 IN CRAWFORD CO. INDIANA,
 SHOWING EXPLORED
 REGIONS.**

1928.

G. C. CURRY, 8-10-28

as it would be almost impossible to get one of the cave lanterns through some of the places we were to go.

Arriving at last in the "Round Room," we took stock and prepared to face the almost unknown.

Starting on, we climbed a wall for 12 feet and scrambled through a small opening, and were in a room not unlike the one we had just left. It was 50 feet high, and almost perfectly round, and on one side was a hole 15 feet deep. The route on, was up the almost sheer, wet wall, just above this hole. Since I was the only one who had made the trip before I started up first, and after several slips and some pushing from below, I finally made it. The rest followed and we were in the famous "Lonigan's Pass," a passage four feet wide and 30 to 50 deep. The easiest way was along the top of this crack to the "Jump." Here we must jump across a deep hole to a small opening on the opposite side. This was our first real dangerous place, and we managed it much like mountain climbers, holding on to each other, so in case one slipped the others could keep him from falling to the floor, 50 feet below.

Amid sighs of relief, we safely crossed and started on, over rough rocks and through some wonderful formations for almost a quarter of a mile, where we found "Wild-cat Avenue." This was a low, very long muddy room, where an early explorer claimed to have seen the tracks of the cat for which it was named. Recently there had been a stream flowing through this room, perhaps to run

"Through caverns measureless to man,
Down to a sunless sea."

Going on we toiled over a jumble of sharp edged rocks that skinned our hands and knees, and came to "Little Giant Avenue." This was another narrow, very high passage. At one place the walls were only three feet apart, and I climbed up easily by bracing my feet and back across the crack. At the very top I found a small passageway filled with some of the most beautiful stalactites I have ever seen in any cave. Some of them were slender as a pencil and were from three to 30 inches long. All were pure white. I called to "Doc" Curry and soon, he and Roth scrambled up; and we took several pictures, the first ever to be taken in this part of Wyandotte.

Moving on, we found we must cross several pits that seemed to have no bottom. The limestone here was what is known as rotten, some ledges crumbling easily in one's grasp. And we never had more than a three-inch ledge to hold to at any time! Some had water on the floor, others were dry. Few of them have been explored, but we did not take time to examine many. We had more things to see beyond.

It would be tedious to describe our wanderings in detail. We went up, down, left, right. At times we were in a maze of passages. Again there was only one way to go. But, at no time did any of our party falter. Mrs. Curry in particular proved to be a daring explorer, never hesitating at any place the rest of us led.

We saw many beautiful formations, some more wonderful than in any part of Wyandotte. One in particular was called "The Himalayas," and looked like a miniature mountain chain. We managed to take pictures of some of these lovely spots.

Finally we arrived at what some early explorer had named "Dinner Table Rock." There was a small spring

nearby, and much to "Hungry Bill's" delight we decided to eat lunch. We had been in the cave just six hours when the knapsack containing the sandwiches was opened. Although we were tired, very muddy, and somewhat battered, I am sure everyone enjoyed very much, that lunch.

Roth had been wearing a much battered hat which he seemed to value more than his life. By now, it was hardly becoming or useful. It had been dropped in pits, in mud and water, been stepped on, and in general had had a hard time of it. His reluctance to discard his headgear had caused the rest of us to "razz" Roth ever since we entered the cave. Now he tried to get revenge by washing it in the spring before we could stop him.

The place where we lunched was long thought to be the end of this part of the cave, but one day a venturesome explorer discovered a small hole that led to many more miles of cavern. This small passageway is very unique. It is from 12 to 24 inches high, and several hundred feet long, and the walls, ceiling and floor, are covered with a red clay that gives everything a reddish hue. Even the lights seemed red. In one place the floor was covered with small stones. These did not add to our comfort and progress was slow.

Roth's suggestion that we call the tunnel "When a man sees red" met with a general laugh, and we took the longest rest since we entered the cave.

Since we were almost to the "Double Pit" that we must descend to complete the trip, we began to plan as how best to use the rope. On previous occasions parties had always climbed down hand over hand, but as the top of the pit is wet, this was vetoed as too dangerous. Finally we arrived at a workable plan, and moved on. After much grunting, wriggling, and exclamations of pain, we reached a room where we could stand upright. Thirty minutes more and we were at the top of the pits, the most dangerous part of the entire journey.

The first pit is 50 feet deep but we were able to climb down without the aid of the rope. In one corner of this large pit is another, 30 feet in diameter, with sheer, wet walls 50 feet high. This was the place most of us had been dreading.

Earlier explorers had always tied their rope to a stalagmite about four feet high, and several back from the edge of the hole. We planned to use this formation, but not to tie our rope to it. Tying all the pieces together we made a continuous loop and dropped one end of it over the stalagmite, and the rest of it over the precipice. Then, we tied a couple of knots for hand and foot holds near the top of our loop. The plan was for one person to hang on the rope while the rest of us pulled or held back on it. Thus even those who descended first could help lower the others from the bottom.

The passage above continued for miles, but we did not have time to explore it, although it contains many wonderful formations. A great many branches of it have never been fully explored, and some future explorer may find wonderful things in them.

As "Doc" Curry prepared to try our "system" there was a general air of nervousness. He grabbed the knots and we slowly lowered him down into the dark. Much

(Continued on Page 56)

Random Notes

Scientific

Faunal Note

In an article published in *The American Midland Naturalist*, Vol. 34, No. 2, pp. 475-484, Sept., 1945, by Dr. Libbie H. Hyman entitled "North American Triclad Turbellaria. XI. New Chiefly Cavernicolous, Planarians," four new species and one new subspecies are described. Among the new forms described, one, *Sphalloplana virginiana*, was collected by the National Speleological Society from Showalter's Cave near Lexington, Va., Oct. 30, 1943. With the addition of the new forms described in this paper, there are thus 11 species of cave planarians known for the United States, although one of these has actually been found only in a spring.

J. A. Fowler

UNEXPLORED WYANDOTTE—Continued

to our relief his voice soon came up to us saying he had landed safely.

Graham, leaning over the hole to talk to Doc dropped his hat, and his hurry down to get it, gave rise to his alias, "King of the Pit."

Mrs. Curry did not seem to be as excited as one would imagine as we began to lower her. She was forced to hang in mid-air for some time as one of the knots became fastened in a crack. Bill and I, on top, managed to get it loose and before very long she, too, was standing on the muddy floor. Bill next went down, and I started to follow, but my weight wedged the rope in a crevice after I had swung out over the hole, and I was forced to climb and slide down, much to the amusement of those below me.

Beyond the "Double Pit" was a regular labyrinth. Passages branched off in every direction, like holes in a worm-eaten wood. I had some difficulty in finding the correct opening, and "Doc" suggested that "when in doubt lead trumps" would be a good rule to follow. But I played a trump, and finally picked the right tunnel.

For 1,000 feet we wriggled over the hardest going in the cave, the "Air Torrent." It took us exactly one hour and 30 minutes to make it. Just a few feet more, and we were in the Main Cave, on the Long Route, a few hundred feet from where we had entered the Unexplored.

Another hour, and we arrived in the outer world, almost exhausted, just 12 hours after starting. We had made one of the quickest trips known through the "Round Trip."

All in all, our trip was not the most difficult one ever made in Wyandotte, yet is probably one of the most interesting any of our group will ever make. After all, it is not the magnitude of results, but the uncertainty about them that makes a game worth playing.

Proposed Classification by Process of Formation

(When, within the same cave, other formative processes have taken place, it will be necessary to determine which process played the most important part in the creation of the cave as a whole.)

I. *The Solution Group.*

(Comprises all those caves formed by the solvent action of water passing through rock strata.)

- A. Limestone.
- B. Gypsum.
- C. Chalk.
- Etc.

II. *The Lava Group.*

(Comprises all those caves formed by the solidification of lava or allied volcanic phenomena.)

- A. Tubes.
- B. Bubbles.
- C. Vents.
- Etc.

III. *The Weathering Group.*

(Comprises all those caves formed by the work of the elements on exterior rock surfaces, as by differential weathering, or corrosion and corrosion by wind and rain.)

- A. Sandstone.
- B. Granite.
- Etc.

IV. *The Wave Action Group*

(Comprises all those caves formed by the action of waves on the rock of shorelines.)

- A. Water filled.
- B. Dry.

V. *The Miscellaneous Group.*

(Comprises all those caves of an usual nature that (1) are too few to be considered as a group, or (2) are the result of unknown formative processes or of processes that defy satisfactory classification.)

- A. Marine (sea floor and totally submerged types).
- B. Ice (periodic or nearly permanent cave entirely formed of ice.)
- Etc.

Erwin W. Bischoff,
San Bruno, Cal. (1945)

Note on Breathing Cave Fossils

The fossils from Breathing Cave recently submitted by W. J. Stephenson to Dr. Bassler were referred to Dr. G. Arthur Cooper, Curator of Invertebrate Paleontology and

Paleobotany, for examination and Dr. Cooper reports on them as follows:

"Mr. Stephenson is correct in believing that the specimens submitted are of Helderberg age. Three different animals are represented in the collection. The largest one is a snail, known as *Platyceras*. The ribbed shell is a brachiopod, known as *Eospirifer*, and the small, conical specimen is a cup coral belonging to the genus *Stereolasma*."

In accordance with the instructions in your letter the Museum is keeping the specimens and will record them as a gift from Mr. George A. Robertson, who will be duly notified.

A. Wetmore, Secretary,
U. S. National Museum,
Washington, D. C. (1945)

Sabre-tooth Tiger Find!

I know you will be interested in a discovery we made in the same Sewanee area with helictites, blind fish and the new salamander already noted.

This time we found the nearly complete skeleton of a sabre-tooth tiger*. The bones are on the surface but encased in flowstone and mud, and were so little disarranged that we could easily tell the exact position of the tiger at the moment of death. The room was so low—about 18 inches high—that we could secure no photographs; but we succeeded in removing almost the entire skeleton in pretty good shape. Please don't consider us vandals for disturbing this find because we had competent authorities with us.

There is no doubt as to the identification and this find is especially interesting in that it seems to be only the second record from Tennessee.

We will later identify the exact species of sabre tooth and I will probably write you more about this. Some cave, what!

Harvey M. Templeton Jr.,
Winchester, Tenn. (1944)

Cave Fossil Described

I was reading an article the other day that reminded me of cave fossils, which prompts me to write you concerning a recently discovered cavern—The Cave of the Mounds, located near the town of Mount Horeb, Wis., as described in *The Highway Traveler*, published by the Greyhound Corporation in connection with their bus travel bureau.

In describing one of the rooms, the author, Bert Studebaker, states that in the ceiling is the fossil of a "cephalopod," a shellfish now extinct, but which lived in the sea millions of years ago. The fossil is six feet long, tapers to a point at one end but is eight inches broad at the

*See paragraph 5, col. 1, p. 116.

other. This creature of the ancient sea lived in a shell. As it grew, new shell was formed in front and when ready, the creature moved into its new house. But the old shell must be carried along, so Nature provided a tube thru which the animal pumped air back into the old shell, causing it to float. Strange to say, the cephalopod reversed the usual manner of travel. It moved about by forcing water out of its mouth, therefore always traveled backward. This animal was far more ancient than the dinosaur; it lived in the Ordovician sea 411 million years ago.

L. E. Ward,
Toledo, O. (1944)

"Joints" in Cudjo's Cave Explained

For years I have wondered, when I saw different formations in caves, if there would be any that had no explanation. I believe I have now found one. In nearby Cudjo's Cave, "The Pipe Organ" has "joints" which protude from each side.* I have heard various explanations but none have satisfied me. I would be very glad to get your explanation.

Eddie Salyers,
Cumberland Gap, Tenn. (1944)

Here is one answer to your request for an explanation of "enlarged joints":

After the columns were formed, the support below may have given away, allowing the column to crack and later refill or "heal." Or, during original formation, there may have been some foreign matter at this point occasioned by highwater or some accidental flood and then later built over.

We would be interested in hearing other suggested explanations.

J. S. Petrie, Sec.

Recent vs. Fossil Remains

My note is intended to keep in touch with you, and suggest people I run into who are doing fossil work.

I have had a good letter from the Mammoth cave superintendent about the bones of animals found in Mammoth Cave, and have written Mr. Dearolf about it. Also, I am getting Dr. Stone's article and have asked him some questions about the Port Kennedy Cave and other formations. I also have the final summary of the National Museum work near Cumberland, Maryland. I was glad you called my attention to the fossil bat as I might have taken it for a recent species.

*A picture submitted was not of such quality as to allow reproduction. It can be found in the Society's photo collection, however.

There is some difficulty in deciding when I am trespassing on the work of the Fauna Committee when I list Pleistocene bones of animals that are not yet extinct. If the accounts say it is Ice Age, or before, I take them as fossil, even though the same species continue to exist. When they take bones out of a cave and do not think they are any older than Indian bones, I figure that they must be recent. Only a few Indian bones have been proved back to the Ice Age, so that I am considering all Indian bones as recent, and in Barloga's province.

I gave a talk recently to a biology class at Lincoln University in which I covered both recent and fossil. I think I shall assemble my notes on this and submit them in a paper to the Editor, and let him refer it to you if necessary as to the correctness of the recent forms. It will be written to popularize rather than to keep technical the subject of cave fossil fauna.

Alfred C. Burrill,
Jefferson City, Mo. (1944)

Caves Yield Fossil Remains

Recently I saw an abstract of Sinclair's work on the fossil remains in "Potter Creek Cave" in the University of California publications, V. 2, No. 1, 1904, pp. 1-27. I had hesitated buying this, as Sinclair's lists are repeated in B. Brown's Conard Fissure paper (Mem. Am. Mus. Nat. Hist., V. 9, Pt. 4, 1908).

I think your idea of keeping the members interested and working is a fine one. It is really needed in these times. Would it pay to say that this cave exploration and excavation tends to yield more concentrated scientific results than digging at random through whole river valleys, or in every Indian mound?

A. C. Burrill,
Jefferson City, Mo. (1944)

I feel definitely that it would pay both archaeologically and paleontologically to excavate caves and cave entrances rather than to dig anywhere at random. Archaeological and paleontological material in caves is bound to be more or less locally concentrated; and digging at such places, once evidence shows its presence might be fruitful, should yield results far better than casual digging in the country even in the so-called Indian Mounds.

Wm. J. Stephenson

Recent Wyandotte Research

You may be interested in my recent investigations in Wyandotte Cavern. As you know, this is the largest cavern system in Indiana. I became curious where the waters came from which developed the great cavern with

its series of nearly parallel runways, and also what happened to cause the waters to vacate the well-developed graded routes of the cavern.

Not impressed with the current theory, advocated by Davis and recently advocated by Bretz, that caverns are developed by phreatic waters of vague or unaccounted origin and still more uncertain in flow, I have given consideration only to development of the well-defined routes of the Wyandotte system to inflow of large quantities of waters from the surface.

A sufficient supply could come from the storm waters of sinking tributaries to the deeply entrenched Blue River, or the supply could come from the diversion of a part of the waters of Blue River itself. The position and course of the system have ruled out a sufficient inflow from the small surface tributaries, and at the same time give excellent support to the idea that Wyandotte's well-defined runways were formed by waters from the deeply entrenched Blue River across the neck of a great compound loop of this valley. It is 10 or 12 miles about the great eastward extending loop, and only three miles obliquely down the rock-dip across the neck.

The underground channels have been traced half way across the neck still retaining the same characteristics and size. Moreover, the channels contain silts and gravels of the same character as those carried by the Blue River itself. The floors of the great channels rise to the northeastward towards the place where the entrance of the waters very likely took place. The discharge of the waters from the system took place into Blue River at the lower end of the system near Wyandotte Inn, where the present silt-covered floors, now largely obscured by fallen rock, are 65 feet above the present Blue River.

It is a pertinent and interesting question to consider why this proposed diversion of part of the waters of Blue River beneath the great meander neck ceased to flow through such a well-developed underground channel system. That question has an answer in the late history of the episodes of Blue River itself, indicating a marvelous connection between the Wyandotte Cavern development and the physiographic relations of the outside terrain.

In the meantime, I continue to seek for more and more evidence from the far-reaching cavern system itself. The history of cavern development is elusive, as we seldom have large parts of any big cavern in their entirety. Hence the divergence of interpretation of the phenomena seen in our caverns.

I trust that you have not been bored by my diversion and interest in Wyandotte Cavern, but caverns do have an interest beyond the phenomena of themselves, even

though these things in themselves form cavern scenery so unlike that of any exterior landscape.

Clyde A. Malott,
Bloomington, Ind. (1945)

Bat Feeding Habits

Have you any information concerning the distance that bats travel from the high point of sleeping to their feeding ground? The reason I ask this is that a party of members were traveling the other week-end between Franklin and Upper Tract, Va., just about dusk for a four or five-mile stretch. Just about midway between these two towns there were a good number of bats along the road indulging in their evening meal. The next day we investigated the cave on Cave Mountain a few miles north of Upper Tract. In this cave was a large colony of long-eared bats. A few miles south of Franklin in Trout Rock Cave colonies of both long-eared bats and *Myotis* bats have been reported, but usually in the early spring.

The bats which we saw on the road did not appear to be large enough to be the long-eared variety. Would it be possible that these bats which were midway between Franklin and Upper Tract were living in a cave somewhere in that vicinity? We have no reports of any cave in this area, but maybe the presence of these bats would warrant a search here. Of course I know that the bats may have been Wood Bats, in which case they would have no relation to the presence of a cave.

This inquiry, to my mind, may be of general interest to our membership, and I believe that your answer to this question might possibly prove good material for our BULLETIN.

W. J. Stephenson

I was much interested in your letter telling about the bats you had seen around Franklin and Upper Tract, Va. Your main question, though, about whether a good number of bats are a sign that a cave is nearby. I am afraid I cannot answer very helpfully. In summer the little brown and big brown bats often congregate into large colonies in old buildings or hollow trees. These colonies in my experience are almost always composed of females and their young. In fact the German naturalists call similar colonies "Wochenstube," or maternity wards.

Now the concentration of bats you saw might have been coming from one of these summer colonies or even have been a gathering about some particularly rich source of their insect food, or it could have been the bats which had just left some cave in the immediate vicinity. I think that the habits of the local bats would determine whether

or not you could use them as a sign of caves. For instance in New England the bats are not in caves at all during the summer, except on rare occasions, so that they would be of no use at all. In many areas, though, they do use caves as summer retreats and come out each evening and return in the early morning. The bats at Carlsbad are of course the classic example of bats as a guide to caves. Just where Virginia falls in this regard I do not know, but I suspect that the situation is more like that in New England. Of course the bats which you have found in caves in summer must come out every night, but they probably scatter quickly. In short, I doubt if a lot of bats, unless definitely seen coming from one spot in early evening, can be taken as very good signs of a cave. If the place where you saw them was not near a water course or other good insect territory and if no signs of a summer colony could be found, then I would begin looking for a cave. The way to look for summer colonies in my experience is to inspect all old buildings for dirty smears from bat droppings on the walls and to listen on a hot summer day for the bats' squeaking—especially in the attic or under the eaves.

War work is keeping me quite far from caves or bats just now, but I certainly am glad to hear from you and read the BULLETIN and get such reports of bats in caves as were contained in your letter. Members of the N.S.S. could be very helpful to biologists interested in bats if they kept notes and records of their visits to caves, noting when they did and *when they did not see* bats, and if possible the species. Such notes might be simply kept on file by the fauna committee, and some of them would certainly be very helpful to students of bats at some later date when many such observations had accumulated. The movements of bats in and out of caves are not at all understood as yet, and such records might well help clear up some of the mysteries.

Donald R. Griffin

Phenomenon of "Blowing" Cave

(The following exchange of letters constitutes an interesting explanation of the curious phenomenon of "blowing," noted for centuries in connection with caves.)

William McGill from Ralph W. Stone

A friend in military service in England writes:

"One of my colleagues, an elderly professor of engineering at one of the English universities, mentioned at supper the other evening the curious phenomenon of the Blowing Cave, described by Jefferson in his notes on Virginia. I could offer no explanation but suggested that he have the passage copied, and I promised to pass it along to you.

If it is not too much trouble, I am sure we both should like to hear your explanation."

The quotation is as follows, from *The Life and Selected Letters of Thomas Jefferson* (Ed. by A. Koch and W. Peden):*

"At the Panther Gap, in the ridge which divides the waters of Crow (Cow?) and Calf pasture, is what is called Blowing Cave. It is in the side of a hill, is of about 100 feet diameter, and emits constantly a current of air of such force as to keep the weeds prostrate to the distance of 20 yards before it. This current is strongest in dry, frosty weather, and in long spells of rain weakest. Regular inspirations and expirations of air, by caverns and fissures, have been probably enough accounted for by supposing them combined with intermitting fountains, as they must of course inhale air while their reservoirs are emptying themselves, and again emit it while they are filling. But a constant issue of air, only varying in its force as the weather is drier or damper, will require a new hypothesis. There is another blowing cave in the Cumberland Mountain, about a mile from where it crosses the Carolina line. All we know of this is that it is not constant, and that a fountain of water issues from it."

The Speleological Society BULLETIN No. 1, June, 1940, p. 41, has this:

"Blowing Cave. This cave is located on the highway running between Goshen and Warm Springs, Va. The entrance to the cave is about 50 feet off the highway about one-half mile west of Millboro Springs, Bath county, Va. The present entrance of the cave is in the face of a quarry which was used by the state for local road building but which is now abandoned. The cave is of interest primarily because of the fact that prior to the establishment of the quarry the cave was entered through a very small entrance in a small cliff beside the road, through which entrance air would blow with considerable force. It is from this phenomenon that the cave obtained its name. The mouth of the cave used to be a regular stopping point for the old stage coaches where the women folk were amazed by the ability of the air drafts to suspend their handkerchiefs in mid-air. The quarrying operations have now so enlarged the entrance that this blowing phenomenon is no longer noticeably present."

This cave is further described in National Speleological Society BULLETIN No. 3, pp. 10-11. Its passage is small except for a room 50 by 150 feet far back. No mention made of the draught of air.

I think the cave mentioned by Jefferson is not the one explored by John Petrie et al. and described in the Society BULLETIN. One is in a hillside at a gap in a ridge that separates two streams, therefore, possibly at the headwaters. The other is only a few feet above "a good sized creek," also spoken of as "the broad Cow Pasture River." One is said to have an opening 100 feet in diameter and the other is mostly small passages or crawlways.

To me a constant air current from a hole 100 feet in diameter and strong enough to keep weeds prostrate at a

*But see footnote, p. 51, reference!

distance of 20 yards seems improbable. I wonder if Thomas Jefferson was "taken in" by some teller of tall tales. Blowing Cave in Bath county was 70 miles from his home and across the mountains. He may not have visited it.

Furthermore, under some geologic conditions, air would flow *into* a cave in dry, frosty weather and in wet weather it would flow out strongest.

Can you explain the curious phenomenon to the satisfaction of a professor of engineering?

McGill to Stone

The Blowing Cave which I know, and which I visited once, about eight or 10 years ago, is in a small anticlinal hill on the north side of Cowpasture River, in Helderberg limestone, about three-fourths to one mile west of Millboro Springs. I have passed by the cave several times in the past six to seven years but have not further investigated it. This is the cave explored by Petrie and his party and described in two bulletins of the Speleological Society. These descriptions differ considerably from the accounts of Jefferson, Harlan, Walton, and Moorman, which I have read, but I am inclined to believe that the cave described by Petrie et al. is the same as Jefferson's "Blowing Cave."

The cave I know is located in the second (westerly) narrow strip of Helderberg, west of Millboro Springs, crossing or north of the Goshen-Millboro Springs-Warm Springs highway, shown on the Geologic map of the Appalachian Valley in Virginia (Butts, 1933). Cowpasture River flows in a nearly easterly direction about opposite (south) of the entrance to Blowing Cave. Stuart Run, a southward flowing tributary to the Cowpasture discharges into that river a short distance from Cowpasture. This may be "the good-sized creek" you refer to.

Howe stated that "the mouth of the cave was reported to be about 20 to 30 feet above the road, semi-circular in shape, and about four feet high." The Old Stage road has long since disappeared, the local road has been relocated twice in my memory, and a quarry was opened in the south face of the hill during the last relocation, to obtain stone for the highway. Thus a part of the hill, the old entrance to the cave itself, and former roadbeds have been removed or destroyed. Now there is a roadside parking area on the north (former hill slope) side of the road, between it and the (present) entrance to the cave. I would estimate that the surface of the highway, the "parking space," and the floor of the entrance, are now about 15 feet above the water level of Cowpasture River and that the present entrance to the cave is about 150 to 160 feet north of the river.

My recollection is that the cave, or as much of it as I saw, consisted mainly of a narrow corridor, about four to five feet wide, seven to 11 feet high, and 100 to 125 feet long, trending northward from the entrance, with a small spring occupying a small shallow basin-like depression at the rear of the single passage. I do not now recall whether water from the spring flowed along and out of the passage (entrance) or not, but I do remember that Highway Department workers told me that, during the last relocation of the road, they obtained drinking water from a spring in the rear of the cave.

I have not found any explanation of the "Blowing phenomenon" in anything that I have read on Blowing Cave or other caves, and I am unable to offer one myself.

It is my understanding or recollection that the movement of air is influenced or controlled by variations in atmospheric pressure, density, temperature and moisture content, but I am not as well versed in meteorology as I once thought I was.

Petrie et als. have described silt and mud-covered passages, and "an underground lake 13 feet deep in one large room." Perhaps during Mr. Jefferson's time and later, all or parts of the passages or rooms described by Petrie et als. were (seasonally or periodically at least) filled with water, and perhaps the spring at the rear of the original single passage (100 feet long instead of in diameter) was fed by some syphoning or overflow action from the water-filled chambers. Would not such conditions influence or affect the movement of air out of or into the original entrance corridor, and perhaps cause the Blowing or "Whistling" phenomenon at the entrance?

I understand that the "Blowing phenomenon" is scarcely perceptible today. Is this due to alteration of the original (size, shape, etc. of the) entrance as to drainage of water from the newly (?) discovered passages of Petrie et als., or to other causes?

[Notes by McGill]

Blowing Cave

Bath County

Mease, James (1771-1846), "A Geological Account of the United States . . .", Philadelphia, Birch and Small, 496 pp., 1807.

Jefferson, Thomas (1743-1826). "Notes on the State of Virginia," 1st ed. 1784-85; 2nd ed. 1794; 3rd ed. 1825 (344 pp.). See below.

The Writings of Thomas Jefferson, Washington, The Thomas Jefferson Memorial Association, ed. of 20 vols. bound into 10 vols., 1905; Vol. 2 pp.

Harlan, Richard (1796-1843: M. D.), "Tour to the Caves of Virginia": Monthly Amer. Jour. Geol., Vol 1, pp. 58-67, 1831.

Hinton, J. H. (1791-1873), "The History and Topography of the United States," London, J. Downing, 3rd ed. vols. 1 and 2, Geol. map of the United States, Vol. 2, p. 44, 1842; Boston, Samuel Walker, 2nd ed., 2 vols, 1945.

Howe, Henry, "Historical Collections of Virginia . . .", Charleston, S. C., Babcock & Co., 544 pp., 1945 (pp. 185-86).

Walton, George (: M. D.), "The Mineral Springs of the United States and Canada . . .", New York, D. Appleton and Co.; 2nd ed. 414 pp., 1874, p. 323.

"On the road from Millboro to the springs (Warm Springs) the *Blowing Cave* is passed. It was thus described by Thomas Jefferson: 'It is in the side of a hill, is of about 100 feet in diameter and emits constantly a current of air of such force as to keep the weeds prostrate to the distance of 20 yards before it. This current is strongest in dry, frosty weather, and in long spells of rain, weakest.' At the time I passed (August, 1871) the outward current was exceedingly strong and of a coldness to render one chilly if he remains in it for any time."

Howe, Henry, "Historical Collections of Virginia," Charleston, S. C., Babcock & Co., 544 pp., 1945.

pp. 185-186—"One mile west of the little village of Millboro Spring, and 12 miles east of Warm Springs, on the road between the two places, in a high ledge on the banks of Cowpasture River, is the celebrated "*blowing cave*," described in Jefferson's Notes. The mouth of the cave is 20 or 30 feet above the road, in shape semi-circular, and in height about four feet. It has been explored for a considerable distance. It is said that a small dog who entered found his way out through some unknown passages. When the internal and external atmosphere are the same, there is no perceptible current issuing from it. In intensely hot weather the air comes out with so much force as to prostrate the weeds at the entrance. In a warm day in June, in 1843, as Dr. John Brockenbrough, the principal proprietor of the Warm Springs, was passing in his carriage, he sent a little child to the mouth of the cave, who let go before it a handkerchief, which was blown by the current over the horses' heads in the road, a distance of 30 or 40 feet. In intense cold weather the air draws in. There is a flowing and ebbing spring on the same stream with the blowing cave, which supplies water-power for a grist mill, a distillery, and a tan-yard. It flows irregularly. When it commences the water bursts out in a body as if let loose from a dam."

Moorman, John J. (1802-1885), "The Virginia Springs . . .", Richmond, 1st ed. 1839; 2nd ed., 319 pp., 1855.

Dr. Moorman, for many years resident physician at White Sulphur Springs (now in West Virginia), devotes most of the text to the medicinal properties of the springs. He names a great many springs and compiles many known facts about them, especially of a chemical nature. The springs treated in the text include Salt Sulphur, Red Sulphur, Blue Sulphur, Sweet, Bath Alum, Berkeley's, Capon, Huguenot, Hot, Warm, Healing, Red Sweet, Jordan's, White Sulphur, Orrick's Sulphur, Alleghany, New London, Dibbrill's, Rawley's, Fauquier White Sulphur, Rockbridge, Alum, Shannondale, Grayson Sulphur and Pulaski Alum.

Various natural curiosities mentioned are Weyer's Cave, Madison's Cave, Blowing Cave, Natural Bridge, Peaks of Otter, Hawk's Nest, Ice Mountain, Candy's Castle, Tea Table, Hanging Rocks, Salt Pond, and Old Point Comfort. VSL, USGS, LC.

Hinton, J. H. (1791-1873), "The History and Topography of the United States of North America," Boston, Samuel Walker, printer, 2nd. 2 vols., 1945.

In Volume II the author has brief notes on Virginia, as the Natural Bridge, region around Harpers Ferry, Weirs (now Grand), Madison, and Blowing caves and other points of unusual scenery. USGS, LC.

Stone to S/Sgt. Philip S. Brown

Inquiry of the president of the National Speleological Society and of the assistant state geologist of Virginia, both residents of Virginia and familiar with Blowing Cave, resulted in questions, not explanation of the phenomenon. So today I asked the U. S. Weather Bureau at Harrisburg Airport, and was told to consider the Washington Monument.

You know that masonry shaft 550 feet high with a door at the base and small windows near the top. Remember the thick walls and how cool it is inside? Well, describe it to your colleague, the elderly professor of engineering. Warm air rises, cold air settles. Mr. Rock, of the Weather Bureau, says that on a hot day with outside air rising, the cool air inside the monument settles and comes out the door at the base. The temperature differential makes a current. He believes that on a cold day with outside temperature lower than that inside the monument the current would be reversed and blow out of the windows at the top.

So on a warm day in Virginia, rising air currents would cause the cool air in a cave to pour out. Likewise, on a frosty day the temperature would be 30° lower than the cave temperature of 56° to 60° F., so the warmer air in the cave would tend to escape and be replaced by cold air entering the main opening. Henry Howe, in his Historical Collections of Virginia, Charleston, S. C., 1845, page 186, says of this cave, "In intense cold weather the air draws in."

It is a common experience on approaching a coal mine drift on a warm day to feel cool air blowing out, and on entering the drift to find warm air moving in over the cold outgoing air.

Long rainy spells would tend to reduce the temperature differential and weaken the air currents.

So, Thomas Jefferson seems to be right on that point, but wrong about the air current being "strongest in dry, frosty weather," if he meant blowing out from the cave.

Also we are skeptical about the weeds being kept prostrate for 20 yards by the current of air coming from the cave.

It has been proposed that in a period of heavy precipitation or flood, a cave or the lower passages in a cave might be filled with water, thus forcing the air out; and when the water receded, air would rush in. Jefferson spoke of intermitting fountains, or syphoning, as the cause of regular inspiration and expiration. In the former case it is doubtful if there would be a noticeable current of air, and in the latter case, the air current would be intermittent.

Blowing Cave on Cowpasture River is one mile west of the village of Millboro Spring, in Bath county, Va. Quarrying has removed the original mouth and the opening now exposed in the quarry face is about four by six feet. Wm. H. McGill, assistant state geologist of Virginia, writes that he visited the cave several years ago, and traversed a narrow passage four to five feet wide, seven to 11 feet high, and 100 to 125 feet long. Other explorers have penetrated farther and found a room 50 by 150 feet with a "lake" 13 feet deep and evidence that in wet seasons water probably fills the lower passages.

McGill has not been in the cave recently but understands that the blowing phenomenon is scarcely perceptible today. This may be because those reporting the observation were at the cave when the temperature differential was least, or because part of the cave has been quarried away. Perhaps under favorable atmospheric conditions, Blowing Cave could even now blow a child's handkerchief "over the horses' heads in the road, a distance of 30 or 40 feet," as reported by Henry Howe in 1845.

W. J. Stephenson to Stone

I now have some positive ideas backed, I believe, by many observations in the field and in literature references on Blowing Cave. These caves (blowing) are not uncommon. I believe they are all caused by two entrances at different levels. In all, or at least most instances, the process should be reversed in winter and summer. Note these facts: 1. Blow Hole, W. Va., known to have two entrances on different levels. In summer the draft from the cave blows violently the foliage over 10 feet from its mouth. In winter dry leaves are sucked into its mouth and spread over the floor 100 feet or more into the first chamber. 2. Blowing Cave, Va., still blows, but the increase in the size of the entrance makes it not so noticeable now. At the Keyhole, 300 feet or so in the cave, it is sometimes nearly impossible to retain a lighted candle either summer or winter. In winter, cold air taken in chills the cave as far as the big room nearly 400 feet in. A second

entrance to Blowing Cave has not yet been discovered but it must exist. (There is a rumor that daylight was once visible from the ceiling of the big room.) It may be that the higher entrance is merely a number of small crevices leading to the surface. 3. Schoolhouse Cave shows this blowing within the cave in winter only. Air currents in the upper passage will blow out candles in winter at the entrance. A temperature of 32° has been observed at a drop more than 800 feet from the entrance, in January. In summer, cool air in the cave does not rise out of the entrance so there is practically no circulation in the cave when the outside air temperature is above 58°. 4. At Rumbling Bald Mountain Caves (see BULLETIN 2, p. 19), N. C. (a mass of split granite rock), this blowing is illustrated in a small cave called "the Refrigerator," with entrances about 30 feet vertically apart, and the passageway of the cave about two to three feet in diameter.

Intensity of blowing depends upon many factors, such as (1) difference of elevation of opening; (2) difference in temperature of cave and outside air; (3) size of cave and shape of passages, etc.

The above, to my mind, is practically the sole cause of cave blowing. The filling of a cave with water and thus displacing the air, while possible as a cause, is highly improbable and should be ignored unless proved. Such a blowing, if it should exist, would be independent of season and would depend upon rainfall and drought. No such relationship of water condition to outside rainfall has yet been established at Blowing Cave, Va.

Blowing should not be confused with "breathing." Breathing is dependent upon many more complex factors, apparently, than blowing and needs much study. It is a fairly widely observed phenomenon and has been reported at Mammoth Cave by Martel and Eigmann. Saltpeter Cave No. 3, Burnsville, Va., is the most "classic" example yet to come to the attention of the Society. Faust of the Richmond Grotto has written a short paper on breathing in this cave. We plan more work and investigation here. I believe that we can not yet definitely prove that breathing is merely an attempt at adjustment of the barometric pressure of a cave to that of the exterior atmosphere.]

Longhorn Cavern, State park of Texas, contains the largest graphite deposits in the world, *The American Express* reports. In the eight miles that have been explored, five giant rooms are perfectly formed by transparent crystals. Other beautiful features are the petrified clouds of billowy colors and the waterfalls of solid stone.

The time approaches for house cleaning as it has every spring since the wife looked around the cave and asked: "Don't you think that rock would look better over here?"

—Chicago News

Cave

Vast Room in Tennessee Cave

Some months ago Dr. Kirby-Smith, Dr. McCrady, and I explored Higgenbotham Cave which is mentioned in Bailey's book on Tennessee Caves. Here we found a room the measurements of which are a little over 1,800 feet long, average of over 100 feet wide! The room seems to be practically straight, so that I believe you could see from one end to the other if you could see that far. The ceiling, which is about 10 feet high, is perfectly flat from wall to wall and end to end, and of uniform height, and the floor is almost perfectly flat except for a few banks of clay. This makes it a very interesting as well as a very large room.

This room is only a small part of this cave, there being another terrific room parallel to and considerably higher than the first, and many large passages some of which we are certain have never been entered.

Harvey M. Templeton, Jr.,
Winchester, Tenn. (12/31/44)

Caves of Florida

A number of caves in the state of Florida have been discovered and brought to the attention of persons interested in addition to the Florida Caverns in the State Park area near Marianna.

Three other areas are known in the state where caves exist and there are many other suspected locations due to the large number of sinkholes in different sections.

Probably the most prolific area is in the vicinity of Lecanto, west of Inverness. The writer has personally investigated three caves and has been informed by the residents of the area that 10 to 12 other caves are known.

A third area is in the vicinity of High Springs on property near Camp O'Lena of the Florida Forest and Park Service. William F. Jacobs, Assistant State Forester of Florida, reported the existence of caves here to the writer.

A cave in a fourth area near Gainesville known as Warren's Cave has been reported by a number of persons. The writer, while never having been in this particular cave, has talked with several persons who have.

Any person who can provide information of any other caves at any other location or can give more detailed information concerning any known cave in the state of Florida is requested to do so.

Burton Faust

I continue to find new caverns in this area. Recently, I explored a hill with a caved-in dome (which used to house a still in the prohibition area). The ceiling had fallen through with a young tree on top above ground;

it now grows right through the open roof, and is about 14 inches in diameter. A convenient wild grapevine from this tree makes a handy "rope" for descent—and there is no other way in. There are smaller caves about the hill. I found two buzzard eggs (black vulture?) under a ledge in one.

Recently accompanied by Mr. Novak, a geologist for one of the several oil companies investigating Florida, we visited several caves. All were in Ocala limestone. Several with fine formations. None seemed to have been visited in recent years.

Some were "well" entrances; others, narrow slit inclines. A few had fairly large rooms. Two have water areas.

In the dim light of one we were startled by what seemed to be a big black snake, but which examination showed to be a dark root. In a depression along the wall we discerned the thighs of a body apparently stuffed into the place, like a mummy, which on closer scrutiny became thick wet tap roots of a big tree growing near the center of the domed roof. Other roots were found deep under floor openings. Off in the distance there appeared, over a water area, the ridge of a jagged mountain range. We wanted to explore further, but no one knew our whereabouts. We plan to see its extended mysteries on another trip.

There must be miles and miles of caverns in this region. The extensive Ocala beds are undermined with them.

Andrew R. Janson,
Supt. of Caverns State Park,
Marianna, Fla. (5/3/44)

(Janson supplies this brief note about himself: As an artist formerly with the American Museum of Natural History and listed in *Who's Who in American Art*, I offer my services as art editor of the BULLETIN and consultant for display, exhibit, presentation, etc., of speleological material, having served with scientific institutions at various times for more than 25 years. If you were at the N. Y. World's Fair you saw my work for states of New York, New Jersey, North Carolina, Pennsylvania; Federal and Industrial exhibits of oil, mines, copper, etc., from microscopic details to large murals.

I am starting a series of paintings that the outside world may see the glories of our amazingly beautiful subterranean vistas.)

Note on Porcupine (Ice) Cave

About 138 miles southwest of Denver (Route Col. 285) through Fairplay and into the South Park "prairie" country (no mountains over 4-5,000 feet) lies Porcupine Cave, known both to Hayden (*Survey*, 1872) and Bancroft as

Ice Cave, from the fair abundance of gypsum incrustations on the walls and ceilings of a few rooms.

A dry, dead cave, situated approximately one-third mile up the side of a rugged hill from an old arroyo, Porcupine Cave once aspired to commercialism. The first 40 feet have been somewhat excavated and shored, and inside the cave at two levels are ladders of ancient vintage. No one 'round about has knowledge of the entrepreneurs, but it is rumored that they thought gold might be mined from the cave.

It is a Withero in miniature, lacking any formations or real labyrinthine passageways; however, all main and side passages would perhaps total one-fourth mile in extent. Two levels are present, filled with broken limestone blocks.

In a small, calcined depression in the ceiling of one room were found a group of perfectly transparent rectangular crystals of gypsum, plane formation. To the writer, these were a new formation.

Don Bloch,
Denver, Col. (9/23/45)

Devil's Den Not So Big

Just got a report on a cave up in New Hampshire that had been previously reported to me and it seems that it needs some exploring sometime. In fact, several caves. I had them in my index in my book but nothing about them, and to add to my previous report of a cave "probably the largest in New England," I have to shade it down some.

The final report to date comes from Hans Scheer, Gen. Sec'y of the Manchester, N. H., Y. M. C. A., to whom my friend, formerly of Pittsfield, had appealed for a finding.

It's called "Devil's Den," on the east side of the front pond reached going through from Manchester to Auburn toward Chester . . . "of fair size and at one time it held a ladder on which small boys could enter at the bottom of the cave and squeeze up through an opening in the roof."

Informant says he does not know the exact size of this cave.

"Then there is another set of small caverns or passageways (known as 'The Caves' [I have it 'Sulphur Caves' in my book]) among the rocks on the south side of the back pond at Lake Massabesic. I have been at this particular place, and it seems to be a mass of boulders (jungled) where boys can go in one way and out another. This can be reached in normal times either from the Lake Massabesic side on the road to Londonderry, or from the Manchester side from the road that leads out of Valley Street. I understand that both of these roads are now closed to the public as a war precaution."

As N. H. is all granite, we cannot expect to find anything but "jungled" rock caves (jumbled must be the word) and not any great size in this vicinity. As is usual, things get exaggerated.

Clay Perry,
Pittsfield, Mass. (1945)

Data on Illinois Caves

As an example of the service frequently rendered by the Society . . .

Wrote H. A. Friede, owner-manager of Crystal Cave (see pp. 42-44, this issue):

"Please send us all the information you have on:

- "1. Council Cave at Ottawa, Ill. Reference No. 26.
 - "2. Devil's Cave near Aurora, Ill. Reference No. 26.
- Both by Erwin Bischoff.

"We appreciate the fine work the Society is doing and have sent you a write up on Crystal Cave for whenever you can use it to an advantage."

Answered the Records Committee (Florence Whitley, Chairman):

"Council Cave is located in Starved Rock State Park near Ottawa. It is a high shallow cave produced by the overhanging sandstone. It is probably not worthy of being called a cave but as the Illinois state geologist has listed it as a cave we have included it in our records. We have no record of its location within the park or of its measurements.

"Devil's Cave is supposed to be located in a state park along the Fox River near Aurora. It is not reported to have been developed. Our information on this cave was furnished by Mr. John Meenehan who is now overseas with the army. It is believed that this may be Council Cave or Cave in Rock reported under a different name. We have no more definite information as to the location although local inquiry would no doubt enable one to find it.

"Burksville Cave near Burksville is said to be three-quarters of a mile long (probably 300 to 400 feet). It was opened to the public during the St. Louis World's Fair and is also called New Design and Mammoth Cave. Perhaps you would be interested in this one.

"Please send us any additional information which you are able to gather on these or other caves in Illinois. Data on any other caves is also welcome since the usefulness of our records depends greatly upon their completeness."

Note on Castle Rock Cave, Wis.

Castle Rock Cave is located about 14 miles southwest of Muscoda, Wis., and has never been fully explored, but may offer possibilities of great interest. It is located on a high hill in a beautiful scenic country, deriving its name from the high cliffs surrounding it.

People who have been in the cave claim it has large rooms, also some onyx formations, and have seen *white* bats in it. About one-fourth mile from the entrance at the foot of a hill is an ice-cold stream of water gushing out of the ground at an enormous speed. This may come from the cave. This cave has never been fully explored because of its small treacherous opening. Blasting would be necessary to enlarge the entrance.

Mrs. S. H. Gillette,
Muscoda, Wis.

Note on Benny's Cave, Va.

This cave, so named for the boy who guided the exploring party composed of Silsby, Foster, Henry, and Faust, to the entrance, is located approximately .4 of a mile above the juncture of the Cow Pasture River with the nearest highway, .5 of a mile south of the entrance to the property on which Clark's Cave is located in Bath county, Virginia.

This is a crawl hole, located 50 feet up the face of the cliff above the road, parallel to the Cow Pasture River and 90 feet north of river bank. The general direction of the cliff face is 125°. The entrance to the cave is 25°. The entrance to the opening is roughly semi-elliptical, with the semi-major axis in a vertical plane, five to six feet in height and three to four feet in width. Entering the cave the first crawl is 15 to 20 feet long, with an upwardly rising mound three to four feet high to a point 25 feet from the entrance. The crawl then opens out into a slot passage eight to 10 feet high and 12 to 18 inches wide. At the end of 50 feet the lead becomes too narrow for further progress.

Nothing of interest is contained in this crawl hole. The cave is dry, contains no formations and presents evidence of having been used as an animal den, probably fox.

Burton Faust (1944)

Note on Eastville Cave, Pa.

Eastville Cave is located near the southern boundary of Clinton county in Greene township, on the property of Mr. T. O. Miller, one-fourth mile northeast of a small village named Eastville. It is on Williamsport Quadrangle at 41° 2' 24" N. lat., 77° 13' 15" W. long.

The entrance is a small, triangular opening on the side of a limestone hill, just large enough for a person to enter. There is a 50-foot descent to the floor of the cave. The

course of this descent is very crooked, with a few vertical places where a rope is necessary. The floor is on a level with Big Fishing Creek which flows along the base of the hill. This stream sinks during dry weather one-eighth mile east of the cave, and flows through an underground channel a distance of 12 miles. It is during these summer months when the cave can be entered.

At the foot of the vertical descent is a narrow winding crevice ranging from two to three feet wide and 15 feet high. This passage has almost vertical walls. Following this passage a distance of 27 feet, one enters a larger opening 20 to 15 feet by 5. A number of crevices lead from this room in different directions. Some are too small for a person to enter. Others lead to large openings and other crevices. The writer explored six of these openings. In some of these the roof ranges from 20 to 30 feet in height. The farthest point reached was 160 feet from the mouth of the cave.

This cave has few formations. One room contains a few stalactites, the largest of which is about 10 inches long; in earlier years the cave was entered quite frequently, and most of the nicer ones were taken as souvenirs.

The small size and difficulty of access make this cave unattractive for commercial purposes; however, some crevices may lead to the underground channel of the main stream which may well repay one's efforts.

Ernest H. Geisewite,
Forest Ranger,
Loganton, Pa. (1943)

Some Data on Marble Cave, Col.

We do not have any detailed information in this office regarding Marble Caves. These facts may be of value, however.

Carl Blaurock, a member of the Colorado Mountain Club, and several other members explored this cave in 1925, again in 1931, and later in more detail in 1932. On the last date the exploration was the result of several articles which appeared in the *Rocky Mountain News*, Denver, regarding this cave, in which an old yarn was mentioned to the effect that the cave had been investigated in the Spanish explorations in the eighteenth century; also that it is supposed to have yielded a large quantity of gold and other valuable minerals. Mr. Blaurock told me this morning that this group went down into this cave a distance of 500 feet or more vertically and 2,500 feet horizontally. It is of limestone formation and there are no signs of any mineral. There was evidence of early visitation, including names carved on rocks, but these date mostly back about 50 years ago. The party found old worn-out and rusted shovels, a single-jack and rope

which fell to pieces when touched. So far as Mr. Blaurock's party could tell, there is no evidence in the cave of any visitation of Spanish explorers several hundred years ago.

I am sending a copy of this letter, together with your inquiry, to the Supervisor of the San Isabel National Forest at Pueblo and to Ranger Paul Gilbert with the request that, if either has any additional information regarding this cave, it be made available to you.

Fred R. Johnson,
Chief, Information and Education,
U. S. Forest Service,
Denver, Colo. (10/4/44)

Fulford (Yeoman Park) Cave

From Eagle, Colo., on the Denver & Rio Grande Railroad, a 15-mile automobile ride through a well-developed and prosperous stock-ranching country brings one to the silver mines at Fulford. From here it is but a two-mile walk to the natural caves near the Yeoman Park Ranger Station of the U. S. Forest Service, on the Holy Cross National Forest.

The entrance to these caves is small, and gives but little promise of what is in store. Inside, however, is a series of rooms of varying sizes, cut off from each other by rock walls with openings so small that one can barely squeeze through, and extending back into the hillside for unknown hundreds of feet. Here and there in the cave floors are narrow crevasses deep down, in which can be heard the rushing waters of some unknown stream. About, on every hand, are wonderful stalactites and stalagmites of a weird beauty that is beyond description. The thrill that one carries away from a visit to these underground palaces lasts for a long, long time.

(Files of U. S. Forest Service,
"History of Holy Cross National Forest")

Fulford, an old mining camp situated on Nolan Creek, a tributary of Brush Creek, was named for A. H. Fulford who, with A. C. Ring, was the first locator. Other early prospectors were: B. S. Morgan, A. McLouth, Joe Good, John Bauman, and S. N. Ackley. Nolan Creek was named for William Nolan, another early settler, who accidentally shot and killed himself there in June, 1887. B. S. (Dick) Morgan, located the Adelaide group of mines there, which he named for his wife who was Adelaide Fulford. The story of their first meeting, when Dick rescued Adelaide from a bear, and their lives together throughout the mountains, furnishes one of the most remarkable and tender romances of early Colorado history.

Morgan named not only his mines for her, but also Adelaide Park and Adelaide Lake. On the large "register

tablet" in the Fulford Cave, for years could be seen the names "Dick-Adelaide," with the heart symbol between.

This cave was found by Morgan while he was prospecting the base of Craig Mountain. He returned the next day with Art Fulford and entered and explored the cave. It has never been fully explored, but is immense in size and wonderful in construction. The "register" is about three miles from the entrance. Other locally named wonders are the Pipe Organ, a steep incline which reverberates musically when a pebble is dropped down it; the Cathedral; the Winding Staircase—out of the Cathedral 100 feet up; the Bridal Chamber; the Pullman Car; the Fat Man's Paradise—a 12-14-inch passage, 30 feet in length; and the Man and the Bear, where two objects resemble a bear reclining and a man sitting. There is also a passage where it is necessary to follow a running stream.

Who Were "the Four"?

"While the swirling storm of Sunday night raged overhead, four men battled wind, pebbles and terror in the Wyandotte Cave, near English, Ind.

"The four, three guides and a friend, were sitting in Monument Hall, on the short route. They were bearing candles.

"A whirring sounded afar, grew in volume and then whipped into the cavern chamber, dousing candle lights and whisking the men from their feet. They struggled to gain a wall, assailed by stinging sand and tiny stone fragments.

"Again and again they were buffeted, frequently thrown to the floor. Then the gale reached its climax, to die away as swiftly as it had arisen.

"One of the guides had experienced a similar storm 20 years ago. It was he who led the party outside. It is reported that they were surprised to find trees and houses standing when they emerged.

"Veteran guides expressed the opinion that the wind entered the cave through some unknown passage."

—*Indianapolis Star* (3/11/23)

New Pennsylvania Cave Noted

On my last week-end home, I went up to near-by Island Ford Cave, in Alleghany county. My brother once explored part of this cave, and what he told me of it has made me curious for some time to go in. Well, here's the dope on said cave, which I don't think you have noted.

To reach this cave, one leaves Clifton Forge on Rt. 60, and travels west about seven and one-half miles until reaching what is called Island Ford Bridge. This is a large steel span over which the road passes. The cars must be parked along the roadside at any available place. Then one proceeds downstream on the north side of the river for about three-quarter mile (this is the unpleasant part of the trip.) The cave entrance is large, about 30 feet in diameter, but this funnels down inside.

There are several levels, with a small stream on the lowest one. Because of lack of time, we just followed the stream channel for a good way, maybe 300 feet, and there was every indication that it went back much further. As far as the upper levels go, we are sure of one large one, so I feel sure that one could map 1,000 feet of passages without trouble.

As far as fauna, my interest, goes, we saw no bats or the usual crowd of crickets and spiders (probably would have on the upper level); but in the stream we got a very big crayfish—which I am sending to the National Museum—and a crew of cave salamanders. Of these latter we saw about 20 and got 10. I think there are two species in the lot—the real Cave Salamander, and the long-tailed salamander. I am sending two to Fowler.

We saw no archeological objects, but quite a few large bones and bone fragments, and quite a few formations but none large. The sides of the stream channel have quite a "scaloped" effect, as if large flakes were chipped off.

Richard L. Hoffman.

Charlottesville, Va. (1945)

A Query—and the Notes

In James Snell's *History of Sussex and Warren Counties*, (N. J.) 1881, there is brief mention of a cave called The Devil's Hole, on land then known as the Babbit farm, near the Andover-Hampton line. At that time it seems to have been a spot of considerable local note, although even then almost inaccessible.

Can you give me any information about this cave? I'd like to know the name and address of the owner of the property, and the name of anyone who has explored it and can give a reasonably accurate description.

Perhaps by now it has been completely forgotten, for I can find no reference to it in any more recent work and even the above-mentioned history restricts itself only to the mere mention.

Pvt. Tom Goeller,

c/o Postmaster, San Francisco (8/26/45)

There is a cave called the Devil's Hole on farm now owned by F. J. Francisco and Sons of Andover. When I was about 10 years old I went as far in as anyone I know of. With five or six others we took a Sunday to get souvenirs off the walls and roof. The usual limits were rather close, but being the smallest of the group, two of us wiggled through a small crevice into a larger room and found what we took to be a pool of water although our only light was a poor lantern. Flashlights were not for boys to play with 45 years ago. My recollection of the room are none too good, but I will admit I was rather

worried about the crawl to get back out. I doubt if very many people remember it now; but it was still open enough to get in about five years ago, although I did not try it then. It is about one-half mile from Route No. 31 in Andover.

E. M. Seely,
Andover, N. J. (9/4/45)

This enclosed reply to my letter just reached me. I thought some of you might be interested. I won't be able to use the information for quite awhile . . .

Tom Goeller,
Maebashi, Japan (10/29/45)

Newly Explored Branch of Blowing Cave, W. Va.

This survey was made September 3 last year in an apparently unexplored branch of Blowing Cave.

Our party of six men entered the cave at 10 a. m. and proceeded directly to the stream room. Additional equipment including shovels, a mattock, a short-handled hoe, an inflated inner tube, and a gasoline lantern, were brought in to facilitate travel over such expected obstacles as mud and water.

Almost diametrically across the stream room from the main entrance there was a small opening entering into a branch, that from all indications, had only been explored a short distance. The first 10 to 12' necessitated "snaking" because of low ceiling and close side walls combined with a slanting mud bottom. About 20' in from the stream room mouth, the rock formed across the narrow passage like the cross-bar in the letter H. Immediately beyond was a low arch which, together with the "H" formation, made a difficult obstacle and required a bit of bone bending to slip through. Some distance farther the passage opened into a pit of about 15' in diameter with mud at the base forming a conical hole. From this point on there were no indications of any former explorations. The mud was plentiful and bore no signs of ever having been disturbed.

There was a second pit about 190' from the stream room mouth that was very much like the first pit in appearance. The passage was narrow and relatively straight to this second pit. Near the end of this branch the passage flared outwardly into a room, parts of which had low-hanging ceilings.

The general direction of the passage from the stream room mouth to the second pit was about 30° E. of N.; and from the second pit to the end room, about 50° E. of N. On the southerly side of this end room a large crack between the rocks formed a wide chimney; on the easterly side there was a short passage that ended in resemblance

of a small chimney; and on the northerly side there was a short passage that graduated upward until it was cut off by the ceiling. This end room or chamber measured 308' from the stream.

Mud and clay were plentiful throughout the length of this passage. Without the digging tools, little or no progress would have been made. Each of the three men who explored the new passage carried one of the digging tools, and each man used the implements many times in cutting footholds, clearing mud off the sidewalls of narrow passages, leveling the bottoms of narrow passages, and ditching where necessary or helpful. The digging tools also proved helpful as stabilizers on the very slanted walls of the conical mud pits.

The gasoline lantern was not taken through the new branch, but it was unanimously considered quite an asset to the caveman's equipment.

H. H. Losche (1944)

Notes on Knox Cave, N. Y.

Caverns have been my hobby since childhood, when the first playhouse I remember was in a cave where we boys cooked chicken, etc., and where I learned to burn lime by use of pine knots and forced draft—kid experiments. I have studied many caves from the commercial angle as well as geological. This is something that may interest you. My wife and I retired in 1925. In 1927, because of work under John Cook, on New York underground water survey and my map of Howe Cave, made about 1905, I was employed as general manager to reopen Howe Caverns. I left that company after 41 weeks because I could not approve of plans. In 1933, to do our part in creating new jobs then so badly needed, we bought and began developing Knox Cave.

In 10 years, it paid \$1,000.00 in taxes instead of consuming them; it provided many thousands of days' work. Lodge on property has 1/10 mile track for roller skating and is also used for dancing. It is air conditioned from the caverns. Average number of visitors per year (over 10 years) about 60,000 to the property.

Knox Cave has a two- by three-foot "tablet" of character writing. The Latter Day Saints say that it is one of their ancient writings. An expert Egyptologist studied the writing and, in a written opinion, says that because of recurrence of characters it must be a written language although he could not read it. He copied from it a number of hieratic signs to prove its source. My study of it proves to me that someone about 400 A. D. wrote with resin on the rock surface and so protected that part of the rock from solution and the result is the raised characters.

In one angle of rock is a face, including ear and loop earring. It is natural enough to cause many people to examine it to see if it is artificial. In a quarter circle buried in the clay floor were three pine torches with their charred ends pointing to the face. In places, the rimstone or flowstone on this clay was two inches thick over the torches. This proves age probably before 1600 A. D.

A human skeleton in the clay floor of a narrow passage between rooms is of a man with a larger body than mine. I have a rib which proves this, and I weigh 270 pounds. He evidently stuck and died there very long ago, as in the same area was found a prehistoric tooth, a vertebrae with spine ridge, and a free bone like the wrist or ankle bones but as large as a baseball.

At another place is a rock carving—the Iroquois sign for lightning and a story about the lightning. Another place shows a group of broken stalactites that could have been broken only by human agency. New growth on the old breaks puts date of breakage over 500 years ago.

Small bones in and under formation have an age fixed at over 2,000 years. Museum at New York says that they are bones of the little brown bat, and that there is no physical change in the bat from then to now. These are the things that interest me most. All have been reported to the State, some have been sent or carried in for examination. If a specimen is sent, it may be damaged or lost. In all this time I have not been able to get the State to study the cave or give a quotable opinion on anything. Blind fish were found in '33, but although found or reported by news people, the State would not check reports. These are the only ones of which I know in this State.

In '32 I tried to give over 30,000 feet of the cave to the State as a self-liquidating work project. It was refused. My idea is that State employes cannot give a true scientific reason or proof. The few men of science are interested in their work and do not know of requests like mine. My ambition is to continue to create new jobs when these jobs are needed. A new factory or a new process displaces other workers; a new cavern development does not complete, but only increases general interest.

D. C. Robinson,
Altamont, N. Y. (11/20/44)

Caves in Florida

Next Saturday I plan on making a trip to some caves about 10 or 15 miles from here that, according to the owner, have just been discovered after a particularly heavy rain we recently had. The entrance was probably covered with clay or mud, then when the rain came along it washed

it out, and exposed the entrance. If this is a virgin cave, we are likely to find some very interesting things in it. If it turns out notable, I shall send you a complete report on the exploration.

A few weeks ago, I went through some caves near here that were very beautiful, indeed. In one of them, there was a whole side of a room covered by a pure white "waterfall" formation, no less than 50 feet long and 30 feet high. It was very uniform in its construction, and that alone was worth the trip into the caves. We went as far back as we could, and came to an underground stream that was impossible for us to cross, as we were lacking the right equipment. Soon, I hope to re-visit it and cross the stream, because we could see that the passage extended on and on, as far as the light would reach, on the other side of the stream. The rooms in that cave, in height, were from two feet to at least 60 feet from the floor.

On that same day, we visited another cave, known as "Stone's Cave." The entrance is a hole, about six feet across, and you have to climb down on a rope, hand over hand, about 40 feet to get inside the cave. On the way down, I aged about 10 years, as I spotted a four and one-half-foot diamond-back rattler perched on a small ledge about two feet from me. I just let go and slid the rest of the way down.

The rooms in this cave were of about the same dimensions as the other, except they were a little lower in height. After going back into them about one and one-half miles, the passage abruptly came to what seemed a dead-end. After closer examination, found that there was a passage near the ceiling, about 25 feet from the floor. After much perspiring, we made it, and were very much surprised to find that the passage led back the way we had come. In other words, it was what you might call a "two-story" cave.

In one of the "upstairs" rooms, we found some of the most beautiful and oddest ceiling formations I have ever seen. It is very hard to describe them to you, but they were from crystal clear to white and red in color, and the whole ceiling looked like the top of one of those fuzzy coconut pies. They were more on the order of helictites than anything else, but the habit of growth they followed was completely adverse to the normal helictites. They seem to defy all laws of gravity. Some of them have razor-sharp edges, while others have very sharp points; sharp enough to penetrate a pith sun-helmet without breaking.

Hope you'll be able to see this speleological freak if you ever get to Florida.

C. Sid Morse,
Tallahassee, Fla. (4/12/45)

Portfolio of Photographs

of Carlsbad Cavern



Mecca for Cavemen

(All photographs courtesy of National Park Service,
U. S. Department of the Interior.)

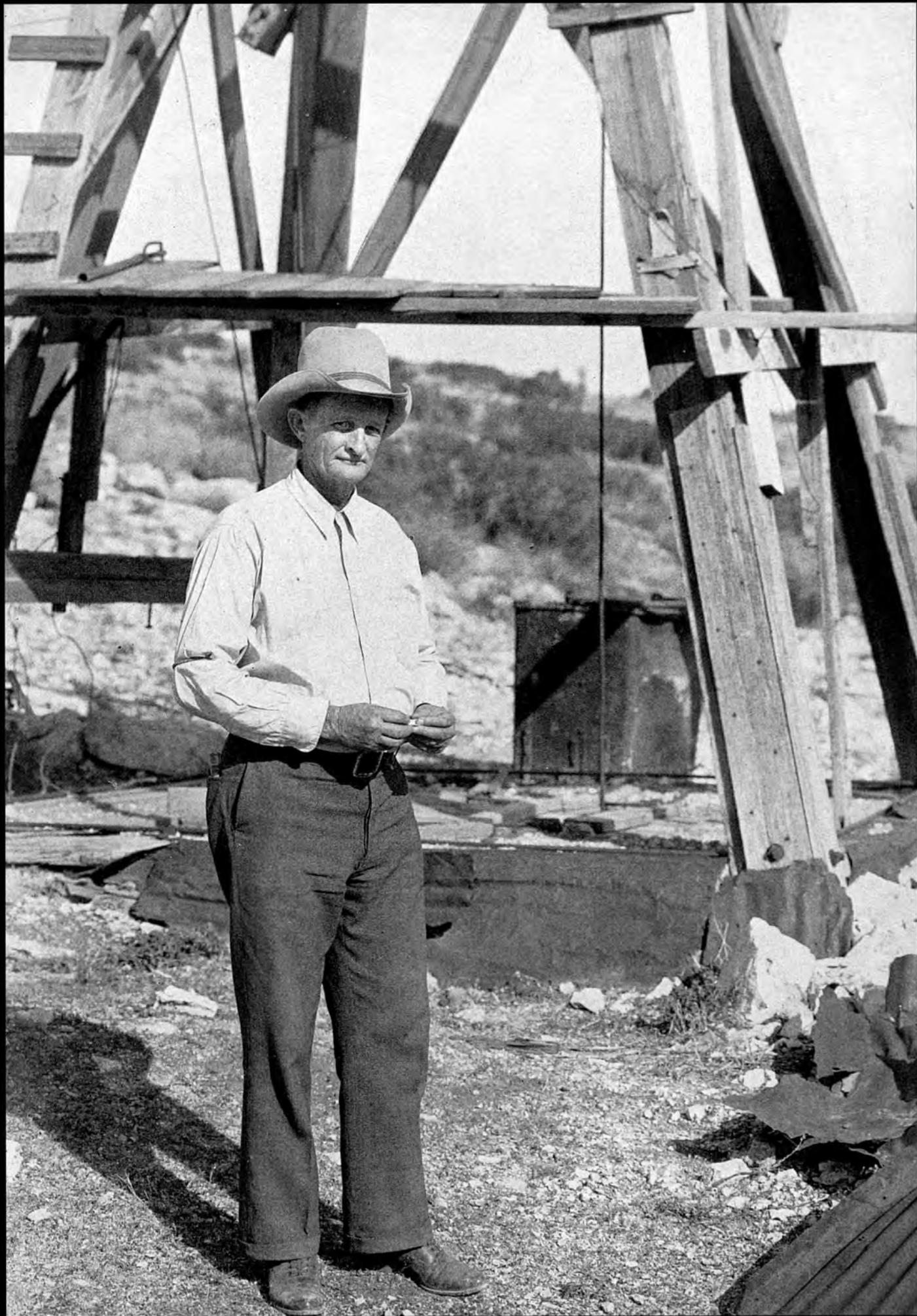
PAGE 1. As we go to press, the news comes of the death of James L. White, 63, in a Carlsbad hospital, on April 28 of this year. Known as the first white man to explore the natural wonder, which he entered in 1901, Jim tirelessly publicized the caverns. They became a National Park in 1923. Here, Jim is standing beside the bucket hoist which let the first intrepid visitors down to see the subterranean world of the Carlsbad Caverns.

PAGE 2. (Left to right) Hanging drapes in the Queen's Chamber; festooned jewel stalactites depending from the Crystal Spring Dome; stalagmitic wonders rise to the chiseled ceiling in part of the Big Room; along the fantastic trail in the Big Room beyond the Temple of the Sun; and—by way of contrast—part of the present surface layout, showing the parking area and Cavern Entrance.

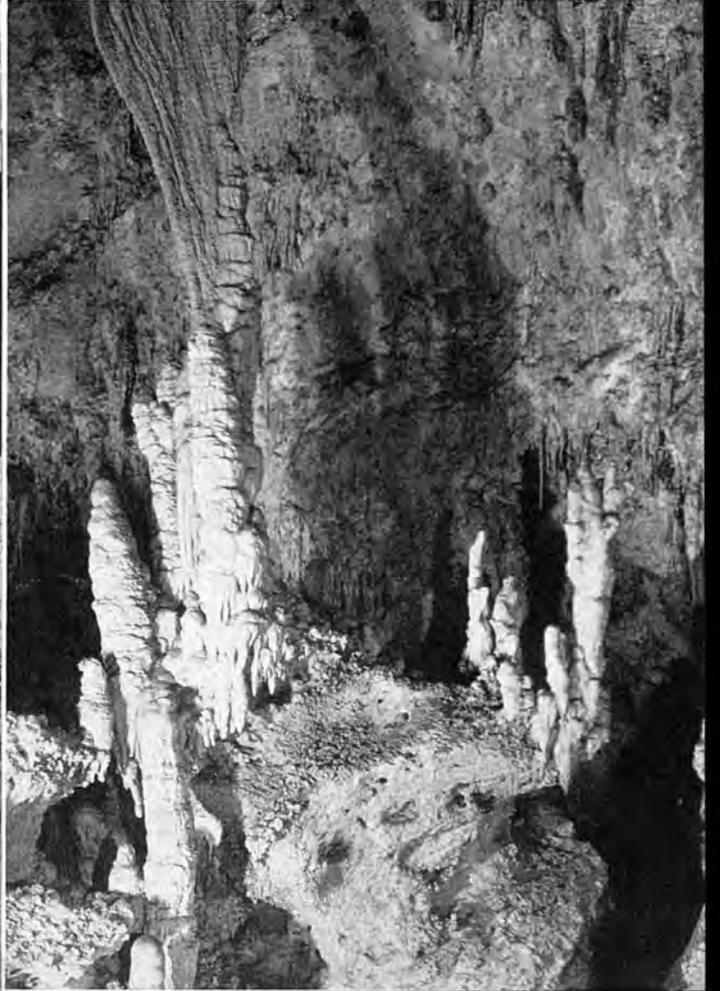
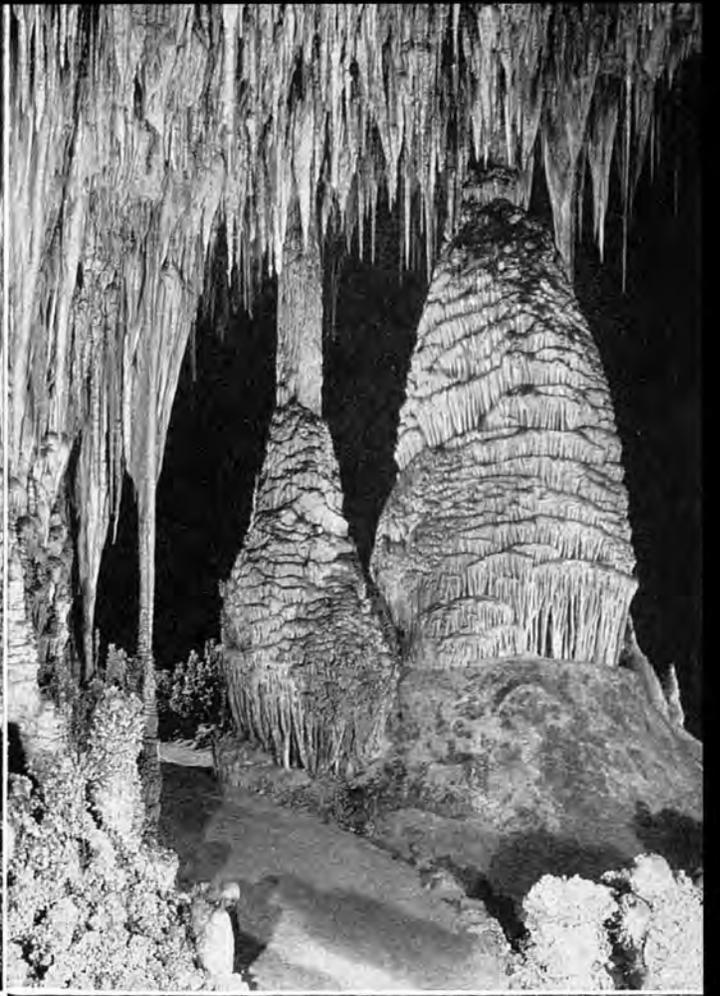
PAGE 3. A lone worshipper in the Temple of the Sun, Big Room; another angle of the Temple of the Sun; the Chinese Pagoda, in the Big Room; and a lush growth of flowstone and stalagmite formations in the Queen's Chamber.

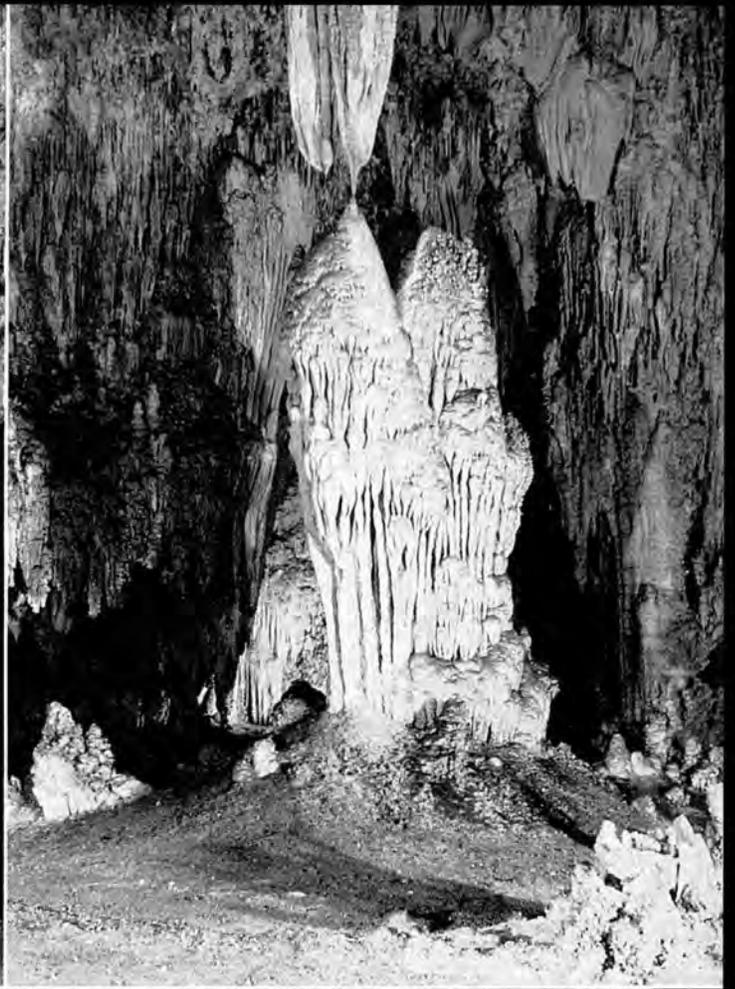
PAGE 4. The Rock of Ages, in the Big Room; vast stalagmite with stalactite drapery above it—one of the principal features in the King's Palace; onyx drapes at the entrance to the Hall of the Giants, in the Big Room; and vaulting grotesqueries in ages-formed stone at the entrance to the Hall of the Giants.

PAGE 5. Fanciful formations along the trail near the entrance to the Hall of the Giants.











Committee Reports

REPORT OF THE COMMITTEE ON PALEONTOLOGY

By A. C. Burrill, Chairman

The Missouri Museum has been seeking to interest the public in what can be found in caves for over 20 years. A sincere attempt was made to find out what the public likes, and to attract more cave finds to the institution. We succeeded very well. We had to attract the eye with beauty, with something odd or of very great age, and show how man's tools and kitchen middens were left in caves—some of the bone middens at the mouth, and long-fossil bones far inside.

At one time we sought to have a part of a dripstone cave reproduced. This was done at a state fair, with running water to keep the stalactites looking fresh. However, the engineering features did not look good for a permanent exhibit in the Capitol, and there was much danger that the available water would slowly dissolve stalactites away or that they would build grossly, choke the exhibit up, and ruin its color. So we decided on a glass case in which to lay out fragments of stalactites from many parts of the United States, including an helictite tip from Fairy Cave, in Stone county, Missouri.

For years we showed a low onyx table and legs, standing about two feet from the floor and three and a half feet long, of a shading of whites and orange dyes that greatly suggest alabaster. This was popular for color. It came from a Camden county cave where a small company went out of business years ago and local folks used the unfinished blocks for doorsteps. For something odd, we show a cheroot-like hollow stalactite, over three feet long, that was formed on the under side of the Capitol steps in the past twenty years. It formed by rain seepage on the Carthage marble (Burlington limestone) from below Carthage, Missouri.

From Jacob's Cavern, near Pineville, McDonald county, Missouri, are shown solidified ash heaps of lime-drip stalagmite embedded charcoal, part of a turtle plastron, turkey or other bones, arrowheads of stone, crude potsherds, a bit of Eskimo harpoon ivory stained from being long in humic acids or sea, and part of a deer humerus with an evident mastodon scratched on one side and a double zigzag and perhaps a dish-tined moose intended on the other side.

The stalactites and low onyx table are with the mineral cases, but the Jacob's Cavern material occupies a center case with two small canvas paintings of the view at the entrance and the backwall dripstone formations, contrasted with Arizona-New Mexico artifacts, and the great find of spooled pearls near Ft. Sill, Oklahoma, to bring out the archaic look of the Jacob's Cavern tools and the heavily mineralized deer-bone carving. The broken slate of New Jersey-Delaware with mastodon sketch is the other chief art of mastodon age.

There are several other exhibits. From Poole Hollow Cave on Spring Creek in Northern Phelps county, are several small glass dishes of human teeth and bones of various small beaver-like animals including their teeth, carnivores, and a turkey bone or two. A few bones and neolithic tools came from Stone Cave in Texas county.

From Boulder Cave on the Meramec River bluffs in Crawford county, is a fine series of snail shells, each species segregated in small glass dishes of finds at various depths from 18-42 inches. A long series of bones, bone tools, hackberry pits, and other evidences of Indians or earlier man were also found in Boulder Cave.

REPORT OF THE FOLKLORE COMMITTEE

By Clay Perry, Chairman

This will be a very brief and extremely informal report for the Folklore Committee, because all the material collected during 1944 has been placed on file with the Society and most of it has been published in the BULLETINS. Another reason for brevity is the fact that your chairman has had opportunity to do very little actual cave creeping the past year. That condition I hope to correct when jeeps go on the market. The jeep, by the way, should be a godsend to spelunkers who want to get closer to a cave in rough country, haul a lot of paraphernalia and toughen themselves up for the adventure underground.

My only New England cave crawling was done in April, with Mr. Petric, Dr. Ralph Stone, and Mr. and Mrs. Wilson, while Mrs. Petrie stood guard with her son, Bill. This was a new venture for the party from the south—getting into our white marble tunnels up in the Berkshire Hills of Massachusetts, in the so-called Disappearing Brook area in Lanesboro. During this expedition we learned from the owner of the property, a genial farmer, Dean Newton, that there is a "lost" cave in the vicinity, its entrance buried by an earth-fall or something which I hope to discover and excavate next summer.

My next spelunking trip was something! Making my first visit to the caverns of the Shenandoah Valley might be said to be the Carcassonne of a spelunker, a visit to the place of dreams. Besides being my first trip south and to

Washington, it was made most pleasant and wonderful by the cooperation, hospitality, and assistance of the managers and owners of several beautiful commercial caverns, the officials of Virginia Trailways bus lines, and some of the members of the N.S.S. who not only made a sort of preview pioneering trip in advance of my expedition, but assisted me in selecting the better caverns to visit and guiding me to some special ones, in person.

There is such a mass of folklore to be collected about the caves of this country that it will probably never all be done, any more than all the caves will be found and explored. I think that sometime soon there will be a book or two published that will be of immense aid and assistance to the Folklore Committee and the entire Society—but I wish to implore all members to be on the lookout for human folklore about the caves they visit or hear about and to report them to the Folklore Committee in writing or in person.

BACKGROUND ON YOACHUM DOLLAR¹

Memories of the day when the "Yoachum dollar" was in circulation were recalled recently when an old log cabin, formerly a bunk house of a sawmill crew, was razed and a Yoachum dollar found buried beneath heaps of trash under the floor. The cabin stood on the banks of Indian Creek about three miles from Notch, Stone county, Missouri. Even the early settlers in this section cannot remember when it was built, but it has been repaired from time to time and was used about 25 years ago as a bunkhouse for a sawmill crew which was working in that vicinity. For a number of years prior to the establishing of the sawmill on Indian Creek, the cabin had been unoccupied except for an occasional hunter or herdsman who tarried there for the night or a traveler who sought its shelter during a winter blizzard or spring downpour.

Where Did He Get Silver?

There are many stories regarding the Yoachum dollar, and from them have arisen numerous tales of lost silver mines and buried treasures in the Ozark region.

The Yoachum dollar really contained a certain amount of silver, although this amount was far below the proportions carried by the regular coin of the realm. The mystery has, and probably always will be centered around the silver. No one seems to know where Jim Yoachum obtained the metal which he used in the coins, and this has given birth to the numerous buried treasure stories.

Yoachum was one of the pioneer residents of Stone county. He came into the hill country before the depar-

ture of the Delaware Indians from southwest Missouri and settled not far from where Reed Springs now stands. The Indians were friendly and Yoachum, after his marriage to one of the Delaware maidens, was adopted by them. He heard the stories of the explorations by the Spaniards when a band of De Soto's men searched the hills of the White River country for gold and silver. The Indians showed him the sites of several mines which were worked by the Spaniards, who for some time held members of the Delaware tribe in virtual slavery. At least one of these mines, according to the folklore of the hills, carried a rich deposit of silver.

Later, when the Delawares left the country, Yoachum and his wife were supposed to be the only persons who knew the location of the Spanish mine. Within a few years after the departure of her tribe, Yoachum's Indian wife died and he alone was in possession of the secret.

Made His Own

By this time there were numerous white men in the Ozark country and villages had begun to make their appearance. Yoachum made frequent and prolonged trips back into the hills; when he returned, he always had a new supply of silver coins. Most of these coins were cast to resemble the ordinary silver dollar, but they became known throughout the hill country as the Yoachum dollar, and were readily accepted by traders throughout this section of southwest Missouri. Yoachum did not attempt to conceal the fact that he was making the money himself, but he never divulged the location of the mine even to his closest friends.

Several men who were familiar with Yoachum's habit of making long trips back into the hills once made an effort to follow him to the mine. They followed him two days and then lost the trail. About two weeks later, Yoachum returned to his cabin and within a few days a new supply of Yoachum dollars were circulating. This, so far as is known, was the only attempt ever made by neighbors to follow Yoachum to the mine.

Yoachum never was arrested for counterfeiting, and after his death his coins soon passed out of circulation.

A few years ago, a book, giving the proportions of metals used in making money, was found lying on a ledge in an unfrequented passage of Marvel Cave,* located a short distance from Notch. This gave rise to the theory that Yoachum's mine was located in Marvel Cave, where traces of Spanish exploration may yet be seen. The cave was explored several times by treasure hunters, but no mine was ever found. However, there are many passages of the cave which have not been explored, and the theory

¹From newspaper clip from Missouri Museum of State Resources and Development Dept., Jefferson City, Mo. Kindness of A. C. Burrill, Director.

*Spanish Silver Mine and Marvel Cave (Museum notation).

that the mine is located in the cave is still advanced by many of the natives in this section of the Ozarks.

Another story has the mine on the crest of Bread Tray Mountain, about twelve miles southeast of here; while still another legend gives its location as Wild Cat Cave, about six miles from Reed Springs.

The natives believe Yoachum followed a long, winding, out-of-the-way route to the mine for the purpose of losing anyone who happened to attempt to follow him. It is generally believed that the mine, if it ever existed, is located in Stone county and not far distant from the site of the old Yoachum cabin near Reed Springs.

To Clay Perry:

I have just turned up a letter that had got mislaid and which I wish I had been able to show you when you were here or at the Baker's Quarry Cave and Brown's Boulder. It is from an aged woman, formerly a resident of Lanesboro, and a schoolteacher for years, who wrote me under date of April 30th from her home in Cheshire, Mass., something that sheds better light on the Susan Baker-Capt. John Brown story, and might be of sufficient interest to be included in the BULLETIN, along with the report of your visit to those caves.

"As a former resident of Lanesboro and with some little knowledge of the history of that old town, I have often wished to correct a misapprehension which has often appeared in the newspapers and perhaps in your book (which I have not seen) with reference to the cave in the west part of Lanesboro. Incidentally, I would like to do belated justice to a most estimable woman, Miss Susan Baker, who owned the land on which you found the cave, and the vindictive scrawl of a disappointed suitor.

"Of course, I did not know Miss Susan Baker personally, but my parents did. She was for many years the richest woman in Lanesboro and if she refused the old widower, John Brown (with some ten children), she had abundant and sufficient reason for doing so. It was her privilege. Also, the whole town know at the time that Susan was not half so anxious to 'find a man' as John Brown was to get a hold on Susan's 'barren land' which was then and is now chock full of first quality marble, not to mention the entire mountain to the west of it, then covered with wood, lots of it valuable lumber.

"Susan Baker also owned the Baker Tavern (now demolished), which was a historical landmark for the Masons of Berkshire county, as well as the Cole House in Cheshire, as the earliest meetings of Mystic Lodge were held there and in Cheshire, alternately."

Mrs. Anna Fuller Bennett,
Chester, Mass. (5/23/44)

The cause for this bit of historical correction is the still legible, carved inscription on a large marble boulder near what is known as Baker's Quarry Cave, often visited to this day, and recently explored by a party of speleologists from Virginia and Washington, D. C. The inscription reads: "Cap. John Brown, born at Stafford's Hill, Cheshire, Mass. Oct. 1, 1809. Inscribed upon this rock, April 2, 1878:

May God Bless Susan and all of her barren land
And when she gets to Heaven, I hope she finds a MAN."

The story was that Captain Brown, an officer in a militia company, paid court to Miss Baker, when she was 81 years of age and he was 69, and his suit was rejected.

(The story is told, in its essentials, in the book "Underground New England—Tall Tales of Small Caves," by Clay Perry.)

REPORT OF THE COMMITTEE ON BIBLIOGRAPHY AND LIBRARY

By Betty Bray, Chairman

For report of this committee, I submit the following recent additions to the Society library:

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REPORT OF THE COMMITTEE ON FAUNA

By James A. Fowler, Chairman

The 1944 report of the Fauna Committee includes the usual additions to the list of fauna collected from caves by The National Speleological Society, another list of recent literature on North American cave fauna, and a reprint of an article by the chairman of the Fauna Committee.

In an effort to simplify the list of new additions to the fauna of caves in this report, the animals listed have been separated into two main groups, the vertebrates and the invertebrates. In the initial category are included animals with a backbone such as bats, birds, lizards, snakes, frogs, toads, salamanders, and fishes. The latter category is representative of animals without a backbone and includes such forms as insects, spiders, crayfish, millipedes, snails, and worms. At the same time, however, the individual species are listed by their scientific names in order to retain the usefulness of this report to the more technical readers.

Persons who are doing field work are urgently asked to collect any specimens of cave fauna that come to their attention. To accomplish this end, all that is needed are some vials and bottles and a preservative such as 5-10% formalin or 70-80% alcohol. In addition, a pair of tweezers and a camel's hair brush will facilitate collecting. Skeletal material, which is also desired, may be conveniently put into a jar or cigar box. With regard to preservation of living material, most specimens can simply be dropped into a container filled with preservative. Except for amphibians (salamanders, frogs, and toads), whose skin is soft enough to permit penetration of the preserving fluid, large forms, particularly, should be slit open along the abdomen to insure proper preservation. Such slitting is best done with a sharp knife or a razor blade. Smaller forms such as flies, mosquitoes, spiders, etc., are best caught by dipping a camel's hair brush in alcohol and "picking them up" with the tip of the brush which is then "washed off" into a vial of preservative.

All material collected should be labelled with the date, name of cave, and locality. Locality data should include the name of the nearest town, the county, and the state. For this purpose, small slips of white paper and a soft lead pencil are quite satisfactory. Where possible it is also valuable to indicate in what part of the cave—i.e., with regard to light conditions—the specimen was collected. For this purpose the following abbreviations are useful: CE, PD, and TD. These represent "cave entrance," "partial darkness," and "total darkness," respectively.

Any faunal material secured should be forwarded to the Fauna Committee in care of James A. Fowler, 39 W. Irving St., Chevy Chase 15, Md.

New Additions to the Cave Fauna List

INVERTEBRATES

Harvestmen or Daddy-Long-Legs

Family Phalangodidae

Phalangodes acanthina Crosby and Bishop.—21 specimens (TD), 1 (PD) by J. A. Fowler, Grand Caverns, Grottoes, Va.; 5 specimens (TD), 1 (PD) by J. A. Fowler, Fountain Cave, Grottoes, Va.; 5 specimens (TD), Saltpeter Cave, Grottoes, Va.

Family Phalangidae

Leiobunum bicolor Wood.—1 specimen (PD), Sand Cave, Loch Lynn, Md.; 1 specimen (PD), Mystic Cave, Teterton, W. Va.; 2 specimens (TD), Fish Hatchery Cave, Newcastle, Va.

Leiobunum politum Wood.—1 specimen (CE), Athey's Cave, Rush, Md.

Spiders

Family Pholcidae

Pholcus phalangioides Fuesslin.—1 young female (PD), Luray Caverns, Luray, Va.

Family Amaurobiidae

Amaurobius bennetti Blackwall.—Several specimens (PD), Goat Cave, Cumberland, Md.

Family Agelenidae

Calymmaria cavicola Banks.—1 female (PD), Sand Cave, Loch Lynn, Md.

Cicurina pallida Keyserling.—1 female and 1 young female (TD), Fountain Cave, Grottoes, Va.

Coras fidelis Banks.—1 female (PD), Sand Cave, Loch Lynn, Md.

Coras medicinalis Hentz.—1 female (CE) Beaver Run Cave, Alesia, Md.

Family Pisauridae

Dolomedes tenebrosus Hentz.—1 young female (CE), Seeler's Cave, Cumberland, Md.

Family Theridiidae

Theridion redemptum Gertsch and Mulaik.—1 male (PD) by Earl Beardsley, Round Top Cave No. 1, Hancock, Md.; 3 young (CE), Showalter's Cave, Lexington, Va.; 2 females and 8 young (PD) by J. A. Fowler, Fountain Cave, Grottoes, Va.; 2 males and 5 females (CE) and (PD), Barterbrook Cave, Barterbrook, Va.; 1 young pair (PD), Moch Cave, Luray, Va. The last record was entered incorrectly as *Theridion tepidariorum* Koch on p. 11 of BULLETIN No. 4.

Theridion tepidariorum Koch.—1 female (CE), Dead Horse Cave, Twiggstown, Md.; 1 female (PD) by Earl Beardsley, Round Top Cave No. 1, Hancock, Md.; 1 female (PD), Snively's Cave, Keedysville, Md.; 1 pair (CE), Showalter's Cave, Lexington, Va.; 1 pair (PD), Bell Cave,

Lexington, Va.; 1 female (PD), Saltpeter Cave, Grottoes, Va.; 2 young females (PD), Grand Caverns, Grottoes, Va.

Family Linyphiidae

Frontinella communis Hentz.—1 female (TD), Showalter's Cave, Lexington, Va.

Linyphia marginata Koch.—1 young male (CE), Mystic Cave, Teterton, W. Va.; 2 females (CE), Devil's Den, Flintstone, Md.

Microneta zonaria Keyserling.—1 female (PD), Snively's Cave, Keedysville, Md.

Nesticus pallidus Emerton.—3 females (PD) by K. E. Mumia, Crystal Grottoes, Boonsboro, Md.; 1 young pair (PD) by J. A. Fowler, Fountain Cave, Grottoes, Va.

Nesticus tennesseensis Petrunkevitch.—5 males and 9 females (PD), Fish Hatchery Cave, Newcastle, Va.; 1 male and 2 females (TD), Walk Through Cave, Newcastle, Va.

Phanetta subterranea Emerton.—1 female and 1 young male (TD) by Earl Beardsley, Skyline Caverns, Front Royal, Va.

Troglohyphantes cavernicolus Keyserling.—3 males and 1 female (TD), Bell Cave, Lexington, Va.; 3 females (TD), Buck Hill Cave, Natural Bridge, Va.; 1 female and 2 young (TD), Fountain Cave, Grottoes, Va.; 3 young (TD), Saltpeter Cave Grottoes, Va.

Family Argiopidae

Mangora placida Hentz.—1 female (CE) by Earl Beardsley, Bell Cave, Lexington, Va.

Meta menardi Latreille.—Several specimens (PD) by Earl Beardsley, Snively's Cave, Keedysville, Md.; 1 male and 1 female (PD), Sand Cave, Loch Lynn, Md.; 1 young female (CE) by Earl Beardsley, Beaver Run Cave, Alesia, Md.; several young (PD), observed, High Rocks Fissure Cave, Keyser, W. Va.; 1 male by R. Bray, Tony's Cave, Giles Co., Va.; 2 young females (PD), Saltpeter Cave, Grottoes, Va.

Theridiosoma gemmosum Koch.—1 female (PD), Sand Cave, Loch Lynn, Md.

VERTEBRATES

Salamanders

Family Plethodontidae

Plethodon c. cinereus (Green).—Barterbrook Cave (CE), Barterbrook, Va.; Friend's Cave (CE), Sang Run P.O., Garrett Co., Md.; Siler's Cave, nr. Tomahawk, Berkeley Co., W. Va.

Plethodon g. glutinosus (Green).—Seeler's Cave, nr. Cumberland, Allegany Co., Md.; Quarry Cave, South Fork, nr. Franklin, Pendleton Co., W. Va.; Buck Hill Cave, Natural Bridge, Va.

Pseudotriton r. ruber (Sonnini).—Barterbrook Cave (PD), Barterbrook, Va.

Frogs and Toads

Bufo a. americanus (Holbrook).—1 small specimen in a crevice between the wall and ceiling (PD), Siler's Cave, Tomahawk, W. Va.

Further Additions to the Literature on North American Cave Fauna

1943

Chamberlain, Ralph V. On Mexican centipedes. Bull. Univ. Utah, Vol. 33, No. 6, pp. 55.

Grobman, Arnold B. Notes on salamanders with the description of a new species of *Cryptobranchus*. Occ. Papers Mus. Zool. Univ. Mich., No. 470, pp. 1-12, pl. 1.

In a discussion of specimens of *Eurycea lucifuga* from the Nashville Basin in Tennessee, which vary considerably with regard to size and pigmentation from typical *E. lucifuga* from localities outside the Nashville Basin, a specimen collected from Phelps Cave, Kentucky is mentioned.

Hitchcock, Harold B. Banding as an aid in studying the activities of the Little Brown Bat, *Myotis lucifugus lucifugus*. Papers Mich. Acad. Sci., Arts, and Lett. 29: 277-279.

Hubricht, Leslie. Studies on Nearctic freshwater Amphipoda, III. Notes on the freshwater Amphipoda of eastern United States, with descriptions of 10 new species. Amer. Midl. Nat. 29(3): 638-712.

Loomis, H. F. New cave and epigean millipedes of the United States, with notes on some established species. Bull. Mus. Comp. Zool., Vol. XCII, No. 7, pp. 373-410.

Middlekauff, Woodrow W. A record of the cave salamander from Alabama. Copeia, No. 2, p. 126.

Eurycea lucifuga reported from a small limestone cave along the shore line of Wilson Reservoir between Town Creek and Leighton, Colbert Co. This is the first definite Alabama locality for this species and represents its southernmost station.

Miller, Loye. The Pleistocene birds of San Hosecito Cavern, Mexico. Univ. Calif. Publ. Zool., Vol. 47, No. 5, pp. 25.

1944

Bishop, Sherman C. A new neotenic Plethodont salamander, with notes on related species. Copeia, No. 1, pp. 1-5.

Typhlotriton nereus, a neotenic salamander whose distribution is limited to the Ozark Plateau in Oklahoma, Kansas, Missouri, and Arkansas and which has hitherto been confused with larval *T. spelaeus*, is described. Many of the localities from which it has been collected are caves. These cave localities are as follows: *Missouri*—Rockhouse Cave, Barry Co.; Wilson's Cave, Jasper Co.; Downer's Cave, Sarcoxie, Jasper Co. When found in caves this species is pale, while it is pigmented when living in the

open. *T. nereus* is regarded as distinct from *T. spelaeus* because it occupies the same general territory as *T. spelaeus*, and in some instances the same streams and caves, without evidence of intergradation.

Coles, V. Nesting of the Turkey Vulture in Ohio Caves. Auk 61(2): 219-228.

Fowler, J. A. The Cave Salamander in Virginia. Proc. Biol. Soc. Wash., Vol. 57, pp. 31-32.

A reprint of this article in its entirety may be found below.

Grobman, Arnold B. The distribution of the salamanders of the genus *Plethodon* in eastern United States and Canada. Annals N. Y. Acad. Sci., Vol. XLV, Art. 7, pp. 261-316.

Among several new subspecies described are specimens collected from caves. *Plethodon glutinosus albagula*, insofar as the paratypes are concerned, occurs almost exclusively in caves. These caves are as follows: *Texas*—Heindrich Cave, Braunfels, Comal Co.; San Marcos, Hays Co.; Posey Cave, San Marcos, Hays Co.; Schneider Cave, Boerne, Kendall Co.; Prassell Ranch Cave, Boerne, Kendall Co. The light throat, as signified by the subspecific name of this form, may be a correlative of the cave habitat and may represent a very early stage of loss of pattern. The holotype of a new subspecies, *Plethodon cinereus angusticlavius*, was collected at Mud Cave, near Fairy Cave, Stone Co., Mo.

THE CAVE SALAMANDER IN VIRGINIA*

J. A. FOWLER

The range of the Cave Salamander, *Eurycea lucifuga* (Rafinesque), as stated by both Stejneger and Barbour (1943, Checklist of North American Amphibians and Reptiles, 5th Edition, p. 33) and Bishop (1943, Handbook of Salamanders, p. 431) does not include Virginia, despite the fact that Bishop's distributional map (loc. cit., p. 432) for the species indicates that it occurs in the southwestern corner of the state. The species has, however, been reported from Giles County, Virginia by Dunn (1936, List of Virginia amphibians and reptiles, Haverford, Pa., mimeographed, p. 2).

The following records for *E. lucifuga* in Virginia, accumulated as a result of the cave collecting activities of The National Speleological Society and augmented by records of specimens in various museum collections, are thus presented to more definitely establish this cave-inhabiting salamander in the state as well as to more accurately delineate its present distribution. The sources of these records, and the abbreviations used to designate them, are as follows: National Speleological Society (NSS), Virginia Polytechnic Institute (VPI), United States National Museum (USNM), Carnegie Museum (CM), Academy of Natural Sciences of Philadelphia (ANSP), and the personal collection of the author (JAF). For making these records available, the writer extends his thanks to the following persons: Dr. Doris M. Cochran, Mr. M. Graham Netting,

*Reprinted from Proc. Biol. Soc. Wash. 57:31-32, June 28, 1944.

Dr. Helen T. Gaige, Dr. Arnold Grobman, and Mr. Charles E. Mohr. Especial thanks are due Dr. Herbert W. Jackson of the Biology Department, Virginia Polytechnic Institute, who generously contributed his records for this species from caves in southwestern Virginia as a basis for this paper. The records follow:

TAZEWELL COUNTY:

Cassell Cave, Burke's Garden - 2 collected July 15, 1941 (ANSP Nos. 24744-45).

GILES COUNTY:

Cave, Sinking Creek, nr. Newport—1 collected July, 1935 (USNM No. 99106). (Specimens reported by Dunn, loc. cit.)

Cave, nr. Newport—1 collected 1938, alt. 2000 ft. (CM No. 13989).

New River Cave, Goodwin's Ferry—1 collected Feb. 14, 1943 (VPI).

Lucas Cave, Newport—2 collected April 11, 1943 (VPI).

Canoe Cave, Newport—1 collected April 15, 1943 (VPI).

Tony's Cave, Newport—1 collected May 9, 1943 (VPI).

Smoke Hole Cave, Newport—2 collected May 9, 1943 (VPI).

CRAIG COUNTY:

Two-mile Cave, nr. Looney, Meadow Creek.—1 collected May 30, 1943 (VPI).

Fish Hatchery Cave, nr. Looney, Meadow Creek—4 collected May 30, 1943 (VPI); 2 collected Oct. 31, 1943 (JAF No. 812).

ROCKBRIDGE COUNTY:

Buck Hill Cave, Natural Bridge—2 collected June 6, 1943 (N.S.S.); 5 collected Oct. 30, 1943 (JAF No. 813.)

Physiographically these records are representative of the Valley and Ridge Province of the Appalachian Highlands. Elsewhere the range of *E. lucifuga* also includes the Appalachian Plateaus Province of the Appalachian Highlands, the Interior Low Plateaus and Central Lowland of the Interior Plains, and the Ozark Plateaus of the Interior Highlands. Of these other provinces the Appalachian Plateaus Province (Kanawha section) occurs in Virginia. There are apparently no records for *E. lucifuga* from this province in Virginia.

So far as drainage is concerned, those records from Tazewell and Giles Counties are in the New River drainage, while those from Craig and Rockbridge Counties are in the James River drainage. The New River is tributary to the Mississippi River by way of the Kanawha and Ohio Rivers. The James River, on the other hand, flows east into the Atlantic Ocean. In this latter connection, the specimens from Craig County were collected in caves along Meadow Creek, a headwater tributary of the James River near the drainage divide between it and the New River. The specimens from Rockbridge County, also in the James River basin, extend the range of this salamander in Virginia considerably north and east. Moreover, the specimens from both Craig and Rockbridge Counties represent the only records for this species throughout its entire range from a stream flowing east into the Atlantic Ocean. Significantly, however, the James River, although

flowing east, arises west of the Blue Ridge and follows a course across it.

In view of the occurrence of *E. lucifuga* in the James River drainage, future collecting, particularly in caves and cavernicolous habitats, should help to determine the extent to which this salamander is established in this watershed, as well as to indicate whether or not it occurs east of Natural Bridge.

COMMITTEE ON HONORARY MEMBERSHIP

Report to the Board of Governors

So far as your committee is aware, no general principles have been established on which to base selections for honorary membership. As the reputation of the Society may depend to no small degree on the quality of its honorary members, studied consideration should be given to the choice. The committee felt the need of generalization for its own guidance. It did not feel that its first thought would be a final criterion. Nevertheless, it was moved to set up some kind of standard. These suggestions are submitted to the Board of Governors not necessarily as a final standard, but to be accepted, modified, or rejected as the Board may see fit, as a guide for future honorary membership committees:

1. An important consideration should be the publication of commendable articles on cave subjects by well educated persons. If the discussion is theoretical, emphasis should be placed on the reasonableness of the views.
2. A specialist in any branch of science who has applied special knowledge to some phase of speleology, or any one, who by his or her own efforts in other ways than by publication has advanced speleology, or the interests of this Society, is open to consideration.
3. Honorary members shall be chosen from members of the Society or from non-members who are exceptionally outstanding for their contributions to speleology.
4. Honorary members shall be carried permanently as such on rolls of the Society.
5. Honorary members shall not be chosen from the executive officers of the Society during the period of their incumbency.

With the above in mind the committee makes the following nomination:

Recommendation for Honorary Membership

ALLYN COATS SWINNERTON

For honorary membership in 1944 your committee nominates Allyn Coats Swinnerton, Professor of Geology, Antioch College, Yellow Springs, Ohio.

A graduate of Williams College in 1919 and earning the Ph.D. degree at Harvard in 1922, Professor Swinnerton has held his present position since 1922, and also was on the geologic staff of the U. S. Geological Survey 1922-

1936. He was elected to fellowship in the Geological Society of America in 1928. He studied caves in Bermuda in 1928 and published a report on them. He is selected for this present honor in recognition of his masterly theoretical paper of about 10,000 words on "The Origin of Limestone Caverns," published by the Geological Society of America in 1932, in which he discusses the genetic relation of limestone caves to the physiographic development of the region in which they occur.

Signed: R. W. Stone
Robert E. Morgan
R. J. Holden
Committee on Honorary Membership

ALLYN COATS SWINNERTON

The Director, Long Branch Signal Laboratory (N. J.), Army Service Forces, is a major, as shown by the accompanying official portrait, but in peacetime he is Prof. A. C. Swinnerton, for he has been professor of geology at Antioch College, Yellow Springs, Ohio, since 1922.

Born in New York state in 1897, an A.B. at Williams College in 1919 and Ph.D. at Harvard in 1922, geology became his forte. He did geologic work for the United States Geological Survey during field seasons 1920-36, taught geology at Stanford and at Harvard, has been consultant to the Tennessee Valley Authority, and held other important positions.

Swinnerton belongs to the A.A.A.S., American Geographical Society, Geological Society of America, Geophysical Union, and Ohio Academy. His scientific interest is largely in physiography, hydrology of limestone terranes, and caves, though at present his work is chiefly concerned with quartz crystals used in communications equipment.

As Swinnerton was elected to honorary membership in recognition of his paper of about 10,000 words on "The Origin of Limestone Caverns," published by the Geological Society of America in 1932, it was natural to inquire what started him off as a speleologist. He replied:

"It is a bit difficult to determine how I happened to develop an interest in caves. Doesn't everyone who has read *Tom Sawyer* and *Huckleberry Finn* have some curiosity about caverns? Actually, I believe my transition from New England to Ohio had something to do with it. In New England I studied geological structures as my special field. When I reached Ohio, the rock structures seemed to be persistently and permanently flat with nothing more interesting than fossils to satisfy my appetite. The Mammoth Cave region was within easy weekend distance, as were the caves in Indiana.

"A close friend, Mr. R. W. Sayles, investigated the fossil soils of Bermuda and related their history to the several stages of the glacial period. He aroused my interest in the Bermuda caves because of the changes of sea level which were indicated by his theory of the origin of the buried soils. It looked like a promising place to study the effect of changes of sea level on caverns.



Dr. Allyn Coats Swinnerton

"I have not had the opportunity of studying caves outside of the United States other than those in Bermuda. In this country I have visited something like 75 caves in 20 states. As soon as my services are no longer needed in the army, I expect to return to geological work. My interests are primarily with the ground-water hydrology of limestone areas, so continued study of caves is incapable."

Underground glaciers have been found under the ancient lava beds of Modoc, Calif.

Cave Log

NEW RIVER CAVE, A FIRST UNDERGROUND EXPERIENCE

"Underground!"

How often had I heard that word, but to me it was something that was unreal and unknown. My only conceptions were based on scenes from a few movies and news reels. Then came the time when I had the chance to see for myself—to learn by actual experience, not to mention a few hard knocks . . . that caving is a sport and an art.

By the time we reached New River Cave, after a long, breathtaking climb to the cave entrance, personally I was glad for the chance to rest and watch the last-minute preparations before taking off into the "unknown." Carbide supplies were checked, ropes coiled carefully, and final instructions given. My heart did "double time" when they came to the following gem of wisdom—"If you start to slide, just be flat, presenting as much of your body to the ground as possible. The friction will stop you—in most cases."

Still wondering about the percentages of those cases, I meekly followed the party in; once in the cave I merely followed the gleam of the carbide lamp in front of me. The darkness was so black that I could almost feel it.

At first the going was comparatively easy. (There were even a few crude stone steps at first to lull my suspicions.) Then we began to climb . . . scramble, dig in with your toes, cling to the helping hands offered, no time to think—just keep going. Finally the welcome word of "Rest" was passed back along the line and I immediately flopped down. After making sure that I was in no danger of sliding, I looked around for the first time. High above us stalactites, gleaming in the light of the lamps, hung like huge icicles—below us tiny dots of lights appeared, vanished and reappeared. Fireflies in a cave? No, it was the other party slowly working along the lower trail. The size of the room overwhelmed us. And this, they told me, was small compared to some of the others.

By the time we had reached the "Lunch Room," where the different parties separated, I had started to feel quite cocky—cocky enough to attempt a joke. The sound of trickling water echoed through the room and looking, I saw a thin stream of water gleam silver as it cascaded from a black hole in the ceiling. Laughingly I said: "Where do we go from here? Up that hole, no doubt." To my utter amazement, "Yes," was the answer; and in a few minutes our leader disappeared up the treacherous looking ascent. All was quiet for a second, then a rope

came hurling down and a reassuring voice called down, "O. K.; now, just take your time and be careful. Put all your weight on the rope 'cause it's safely anchored."

"Well, the rope may be safely anchored, but how can I anchor myself safely to the rope?" was the question in my mind.

From that point on my impressions are nothing more than a conglomeration of a jumble of incidents. That sudden silence that came over the group when someone dropped a flashlight. We watched it bounce from ledge to ledge for about 50 feet; the light went out, but we could hear the sound of it grow fainter and fade into nothingness. Then, too, I remember waiting my turn to go down a drop. The fellow in front of me was trying, rather unsuccessfully to play "China Town" by beating on stalactites with a handpick. All the time swinging his legs and feet which were nonchalantly dropped over the edge of the ledge.

Once when I was stuck—afraid to move my hands or feet because I was sure that even a mere echo would knock me loose from the wall—I asked what I should do. "Hang on with your eye-lashes," came the reply. That is one thing I learned: a sense of humor is one of the requirements for a caver; if you don't have one, the quicker you can develop it, the better it is for you.

By the time we returned to the Lunch Room—at this point I started humming "I Believe in Miracles"—I was more than glad to sink down and stretch out at full length to let my tired muscles rest. After eating three huge sandwiches, one slightly seasoned with sand, two apples, and washing down several cookies with caver's punch—that is, water flavored with carbide—the sound of conversations became coherent, phrases became distinct. "It was all right until the line got fouled and—" "No, when you come to the place marked 'dead end' you've gotta go back along the stream;" "You should have been with us. We found a place where the rocks . . .", "Hey, who has a pair of extra pants?" There it was a mixture of everything—caving, geology, all mixed in with adventure, tall stories, jokes, and a lot of good-natured kidding.

The food and rest did wonders for my spirits. After some serious thinking I came to the conclusion that nothing could be any worse than what we had gone over in the morning—so why worry? At that point I didn't know that we would be going up the "China-slide." It was worse. However, the slide became a challenge. Take it little by little, rest when you have a chance, "sound off" when you knock down a rock. Slowly I learned caving is an art and a sport, it demands a healthy physical condition and an active brain.

On the way out, my feet didn't seem to belong to me—they delighted in stumbling wherever there was the slightest excuse and even if there wasn't an excuse. The heavier my feet became the lighter my head got. Then just when I was sure we were going in circles, I saw daylight—burning daylight of a bright sun in a blue sky. In a few more minutes we were out.

Going home in the truck, I closed my eyes gloating over the fact that it was possible to relax and that I was out in the open again. Around me the talk continued, "Smoke Hole, Slusher's Chapel, Tony's Cave." The next thing I knew I was wondering when we would go on the next trip. The wind kept whistling in my ears, "Next trip—next trip—next trip."

(Miss) M. J. Wilson

FURTHER REPORT ON PIG HOLE

Re: Descent into Hess' Hollow, Giles Co., Va.

On April 15, 1945, the second descent into Hess' Hollow was accomplished. A party of five consisting of A. A. Bernhardt, Martha Ross, Helen Beavers, Warring Cowles, and myself rigged a rope ladder from the Bridge and explored the bottom. The ladder was fastened to a rock in the round flat depression which drops about six feet to the left of the Bridge on the far side of the Hollow from the entrance. Here are several holes leading down, and the rope ladder was put through the left one (facing the entrance).

Once through the hole, we found ourselves descending the face of an 80-foot cliff over about 30 feet of which the ladder hung free.

At the bottom was a large room, stretching perpendicularly to the Bridge. It was covered with the usual coating of guano, and somewhere above our heads could be heard many bats. The ladder hung in the extreme left end of the room (facing the entrance). Directly under the ladder was a small sink for a trickle of water coming from above. It led straight down and could be followed for about 15-20 feet before becoming so filled with debris as to prevent further progress.

In the right side of the room there is an overhang above which a ledge containing several holes can be seen. Since the face is smooth and the ledge is 20 feet high, we were unable to reach them. The whole room is roughly 100 feet long, 20 feet wide, and about 200 feet high.

At the left end of the room, and around to the right of a high, jutting blade of rock is a steep incline, 40 feet high, leading to a small hole just under a sort of overhanging roof. This hole, although small, leads to the bottom of a much larger room in which the passage turns at right angles to the left. Following this we found a drop

in the floor of the passage of about 15 feet, the walls and face of which were sheer. However, two small ledges permitted passage across this rock which was 20 feet wide. On the further side, the passage resumed for about 40 feet before being closed by some type of cave-in.

This place was explored once before by R. H. Hess in 1943, who was lowered from above on a single rope. His name was found smoked on the wall of the first room, and his footprints were found in the end of the passage mentioned immediately above.

This last area should, by rough guess, lie somewhere near just under the Queen's Bath.

Samuel C. Rainey,
Blacksburg, Va. (4/15/45)

TRIO OF PENNSYLVANIA CAVES

Hineman Cave

August 7, 1945

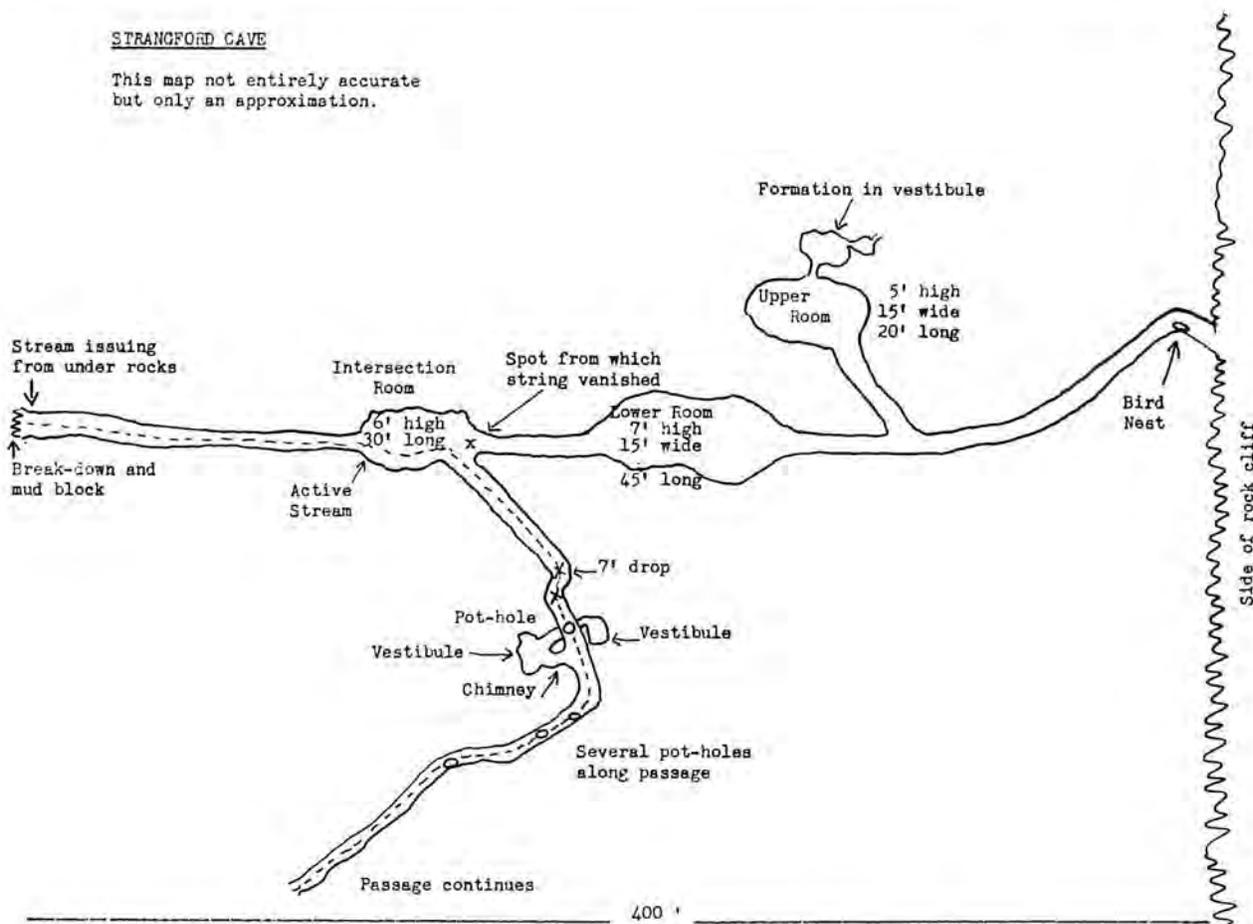
This cave is 13 miles east of Butler, Pa., on Route 422, .7 of a mile over the county line in Armstrong county. The property is owned by a Mr. Danesch, whose house is about 75 feet in front of cave entrance on the side of a wooded hill.

Arrived 2 p. m., got permission from owner, Mr. Danesch, who showed us the entrance. Changed clothes and entered cave by 3 p. m. by crawling into an opening two feet high and three feet wide which immediately expanded into a small room about six feet wide, four feet high, and 10 feet long, at the end of which was a vertical drop 10 feet deep; descended this without the aid of rope. From here the going is very wet, two passages lead off from this point, one almost straight ahead and a little to the left, and the other turns immediately to the right 180° into a maze of passages, the average being four feet high and about four feet wide. We took this route and explored for about 400 feet, then returned for more equipment.

Re-entered the cave at 4 p. m. and explored numerous passages, letting out string behind us. Maze of passages quite confusing, but general direction seems to be S. W. Passages extremely muddy all the way, although no appreciable creek present. Coal veins visible in most of passages. Several small rooms at intersections of passages. Followed one passage, paying out string behind us, stopped to take bearings; Risler lost compass while wallowing in mud—no bearings—continued down this passage on elbows and knees—ran out of string—used arrows on wall for the next 400 feet, stopped to change carbide, passage continued in a slight downward path, mud getting deeper, decided to turn back and returned to entrance. Cave appears to be solution formed. Saw one small salamander and

STRANGFORD CAVE

This map not entirely accurate
but only an approximation.



one cave cricket about 10 feet in from entrance. Emerged from cave at 8:35 p. m., well mudded from head to feet. Cave has some stalactites and flowstone. Air temperature in cave is 48° F., many passages left unexplored, made no attempt to map this maze.

August 8

Re-entered cave at 10 a. m. for photographs and to explore left side passage. This passage ended in a mud choke about 100 feet from starting point, but had a small passage here leading to what looked like a fair-sized room, but entrance to passage would have to be enlarged. Exit from cave at 12 noon.

Mr. Danesch says he hasn't been in cave in the last five years, but the last time he was in alone he found a good-sized lake which he says his light could not span, but he got scared after five hours in cave and came out, hasn't been in since. This may be true, but one would need a rubber suit to follow passages much further.

Changed clothes, packed up tent and thanked Mr. Danesch for his hospitality and headed for Strangford Cave.

Strangford Cave
August 8

Cave is located in an abandoned quarry between the town of Strangford and the Conemaugh River. Arrived at 7 p. m., set up tent and refueled our breadbasket.

Entrance to cave is gained by climbing halfway up the side of a rock cliff over loose debris. Entrance cannot be seen from ground below, cliff is about 75 feet high. Entered cave at 8:50 p. m. through an opening six feet high and seven feet wide, passage turns to left about 35° after entering. Observed a small bird's nest 11 feet in from entrance on left side wall about six feet from floor. Mud slope runs from floor to ceiling on right side of this passage, which gives the impression of walking on the side of a hill. One has to walk at an angle to avoid bumping the ceiling which follows the mud slope. Measuring this way, the distance from ceiling to mud slope is five feet wide and about 15 feet high.

This passage was followed for about 90 feet where a right side passage was visible at top of slope, climbed up and went through to a room five feet high and about 20 feet long, 12 feet wide, small passage from here to a vesti-

bule eight feet long, six feet wide and five feet high, with some formation; very tight squeeze getting through opening, but made it; passage slants down to vestibule with passage leading from here to a smaller vestibule and another passage from here leading down, but too small to get into.

Returned to main passage and followed to a room seven feet high, about 50 feet long and 20 feet wide, observed a mosquito flying around lantern—may have followed us into cave. Continued on, and passage opened into a room with a stream in it and which turned into a rather large side passage eight feet high, 10 feet wide. However, we followed the main passage for the time being, along the stream for about 200 feet more, where it ended in a breakdown and mud block, the stream issuing through the rocks.

Returned to intersection of left side passage where stream turns down. Risler decided to leave his measuring string here until we got back, and placed a small rock over the end to mark the point at which to start measuring again. We started down the side passage, which was eight feet high, 10 feet wide, for about 75 feet and came to a vertical drop of seven feet, got down with no trouble, passage much narrower here, passed a chimney with a small opening in side, crawled up seven feet to a small vestibule and over a pot hole three feet in diameter over the stream to another small vestibule.

Returned to main passage and continued down stream, passage narrows down to a tunnel four feet high and three feet wide with several pot holes along the way, looked up several more chimneys. Tunnel takes a sharp turn to the right, and followed for another 150 feet on knees and elbows. Tunnel has a general downward trend, and is possible to crawl here without getting very wet as there are many raised portions of rock out of the stream; however, we gave it up when the water got deeper.

Returned to main passage at intersection to resume measuring, and this is where the great disappearing act happened. About 45 minutes had elapsed since we left this point, of the original 15-foot measuring string only four feet was left with the rock still on the end and no trace of the other 11 feet! It was probably the work of a cave rat, although we hadn't seen any there was plenty of evidence in the way of feet prints. However, we put one over on the animal; we pocketed the remaining four feet and no doubt when he returned for it he was as much surprised as we were at first. From here we used a random length of string and measured it later.

Observed two bats, one large and one small.

Returned to entrance, emerged from cave at 12:05 a. m.

Temperature in cave is 52° F. Returned to tent, changed clothes and slept 'till 10 a. m.

August 9

Re-entered cave at 1 p. m. to take photographs; emerged at 2 p. m., packed tent and headed for Bear Cave. Stopped in Blairville, Pa., for food, papers, and a rest. Arrived at nearest point to Bear Cave at 7 p. m., set up tent and made a preliminary search for cave—no luck and getting dark, returned to tent and called it a day.

Bear Cave

August 10

Cave is located near the town of Hillside, near an old lumber camp (Camp Blair). It is about two miles up the side of a hill from Camp Blair—which one has to walk. The cave is at the bottom of an out-cropping of limestone ledge and has several entrances, all leading to the same main passage. As time was getting short, we only gave this cave a once over lightly—(very lightly, explored only about 400 feet, merely scratching the surface).

The cave seems to be both solution and water-worn, as the maze of passages resemble tunnels almost circular in shape and having a slight downward trend. Much evidence of other cavers here—such as string, carbide on rocks, and arrows pointing the way out.

Observed two salamanders—orange with black spots, one four inches long and the other about six inches long. These were seen about 40 feet in from the entrance.

Cave is probably extensive and will have to make a return trip. Spent about one and one-half hours in cave. No formation was observed in the part explored. Returned to car, packed and left.

George Risler and Al Mislav,

Cleveland Grotto

VPI SHENANDOAH VALLEY TRIP

The Cave Club has now been in four of the commercial caverns of Virginia. Normally visiting only undeveloped and unexplored caves, we decided for just this once to see how it felt to walk in and out of a cave, watch while somebody else turned the lights on and off, and listen to a guide spiel about the millions of years that went into the formation of that particular cavern. Consequently, we hired a truck and took this little trip to which we had long looked forward.

Leaving about 6:30 on Friday, May 25th, we had almost gotten well started when it began to rain. Since we were used to small temporary setbacks of this nature, we strung a tarpaulin over the truck to keep the rain off. It didn't work. However, after several stops, we managed to tie the canvas down securely, just as it stopped raining.

Darkness hid the splendid scenery of the Shenandoah Valley as we rode through. The trip passed uneventfully enough until we reached Lexington. Dr. Jackson, our faculty sponsor, had told us that we could not possibly turn off the main road to go through the VMI grounds, but by some curious coincidence we followed his coupe and noticed that the road became quite crooked and that an occasional barracks appeared before us. To make our passage known, we gave them a Hoky and sang a couple of choruses from "We Don't Give a Tinker's ——— for the Whole Town of Lexington." I think we almost broke up one crap meeting which we saw in progress.

Arriving at the Endless Caverns camping grounds about 1:00 a. m., we pitched camp and slept like so many logs.

When we awoke in the morning, we found that it was a beautiful day, and the liquid sunshine was pouring down on us by the barrellfull. After a breakfast of bacon and eggs, we piled into the truck and cast off for Shenandoah Caverns. The truck was a bit damp, but we didn't let that bother us, because we found that by taking turns on the bailing bucket, that we could almost keep ahead of the rain.

Shenandoah Caverns, the only cave in Virginia with an elevator, is justly proud of its rare and beautiful Diamond Cascade, and its response to varicolored lights was magnificent.

After leaving Shenandoah Caverns, we climbed back into the truck and drove over the mountain to Luray. Probably the most beautiful and the largest of all the caves we saw, it contained an astounding number of large sculptured formations in its tremendous cathedral-like rooms. We were fortunate, too, in arriving in time to hear the carillon of Luray ring out with its 47 bells.

Returning to Endless Caverns, we ate supper and entered Endless Caverns in the evening. This cave was the solution channel of an underground river; and, while it lacked the formations of the others, because of its comparative youth, it presented many striking and interesting features, among these being our guide. (For further information see I. R. Tannenbaum!)

Saturday night, in contrast to Friday, was beautiful, and the moon came out, finally. Since no one felt like sleeping, we sat by the fire and listened to Dick Southworth read Omar Khayam by the light of a carbide lamp.

After breakfast on Sunday morning, we packed and counted up our equipment (losing only one canteen cup), and started on our homeward journey.

We stopped at Grottoes to see Grand Caverns, the oldest commercial cave in Virginia. While there, we met J. S. Petrie, the secretary of our National Speleological

Society, and Capt. John Showalter, and were pleased to have their company in the cave.

Grand Caverns ranks almost equally with Luray, in its multitude of delicate and beautiful formations, and included many curious and unique shields of limestone.

Lunch consisted of hotdogs and wild strawberries, which latter grew in profusion below the entrance. The day was clear and warm and a perfect climax for the trip.

On the way back, three travelers—G. L. Jones, Southworth, and Petrie—left us at Waynesboro; but the rest sped back to Blacksburg, only stopping in Lexington to order a VMI special. We arrived about 7:30, after having two of the most wonderful days any of us could imagine.

Sam C. Rainey,
Blacksburg, Va. (May, 1945)

[A swell report, which *The Ed.* especially liked.]

SPRUCE RUN (ELM TREE) CAVE, VA.

A cave new to VPI Grotto was discovered this quarter, the weekend of the New River trip. Cowles, Krinitzky, Rainey, and Bernhardt set out Saturday afternoon, April 14th, to investigate Hog Hole, supposed to be the legendary Newport exit of the New River Cave. After several natives proved to be of no help in the location of this cave, one old fellow did happen to remember that there was what he supposed to be a small cave entrance nearby on the mountainside.

This was obviously not the cave we were searching for, nevertheless it proved a worthwhile find.

Briefly, that is what we found. A small rubble-slide entrance slanting down for 30 feet into the hillside, then about 30 feet of passage reducing from 8 feet high and 15 feet wide to another 30 feet of passage just large enough to crawl through. Up slightly, and to the right, at the bottom of the slide, was a small room with many small, pure white, and odd-shaped stalactites covering the ceiling.

The general strike of the cave thus far is northeast. At the end of the crawl we came to a small, quiet running stream flowing at nearly right angles through a passage large enough in most places to stand in. Continuing downstream 100 feet or so, we found that the stream, now flowing northeast, enters a large room at the end of the passage. This room, which has a mud floor, is over 60 feet in diameter and has a 20-foot ceiling. On the far side of the room is a wide balcony, the ceiling of which is encrusted with odd-shaped, pure white stalactites, and floor adorned with many small stalagmites and several columns. Several blind, short passages leading from this room in a northerly direction were explored. Each of these passages ended among tree roots, piles of walnut shells, and other trash. The stream also flows from the

room in a northerly direction, via a tiny opening, presumably reaching the surface at the base of a rock outcropping on the east side of the knoll.

One of the projects for the next quarter is the exploration of this cave upstream from the point where we first struck the stream. As we had to leave the cave and move on up the mountain, we regretfully postponed this investigation. Our object was to climb the mountain, investigate what appeared on the U. S. G. S. maps to be sinkholes on the south side of the mountain, camp, and join the rest of the Grotto at the New River Cave Sunday morning. The further results of the trek were negligible.

The exact location of the Spruce Run Cave is as follows: one-third of a mile east of Maybrook, on the highway between Newport and Pearisburg, leading back towards the mountain, there is a dirt road which runs on the west side of the most prominent of three or four knolls projecting from the mountain. From the house at the end of this road, the entrance is roughly 500 yards due east, under a 50-foot elm of the so-called "oak form," which stands alone save for several sumacs in the pasture.

A. Bernhardt,
Blacksburg, Va. (4/18/45)

KERN'S CAVE TRIP

We left Richmond, Va., on Saturday, January 29, 1944, to visit caves in Shenandoah Valley. The party filled two automobiles and consisted of Mr. Wm. Jones (driver), Elton Brown (leader and driver), Loretta Kurtz, Ann Richardson, Grace Dinsmore, Mrs. Wolfe, Nelson Fitzhugh, Morellians, Don Clements, Bill Foster, Bob Evans and Sam Wolfe.

Leaving Richmond at 2:15 p. m., the party drove to Zion Cross Roads on Route 60, turned right to Gordonsville, to Swift Run Gap, up Skyline drive to Panorama, and to Luray. After registering at hotel, we ate dinner and drove to Luray Caverns.

The usual charge for entrance to the caverns nearby is \$2.00, but the entire party was admitted free of charge. This was by previous arrangement between the members of the society and the management of the cave. An employee of the cave was our guide, and the party was conducted through undeveloped portions of the cave as well as through the commercially exploited parts.

The cavern is filled with stalactites and stalagmites of different hues and colors. Artificial lighting was installed by the General Electric Company and the lights are placed to show the interior of the cave to the best advantage. Gravel walks and concrete steps have been installed to accommodate the public.

A portion of the cave has been sealed off by a rock wall

having a trap door therein. Air from the sealed portion is drawn up by fans and used to cool the owner's house. Our guide opened the trap door (which he found with considerably difficulty) and we entered this portion of the cave.

This section was undeveloped and required crawling at various points. The walls and floors were damp and the coloring was not as beautiful. The guide explained that many years ago algae was brought into the commercial part of the cave, possibly on the shoes of visitors, and that it was responsible for the greater coloring in the commercial part. Mr. Brown, Jones and Foster were zealous in exploring many side passages.

This cave was the first cave commercially exploited successfully in this section of the country, and the guide stated that it had been a source of considerable wealth to its successive owners. It is easily accessible and located near an important highway. A total of about two and one-half hours was spent in the cave.

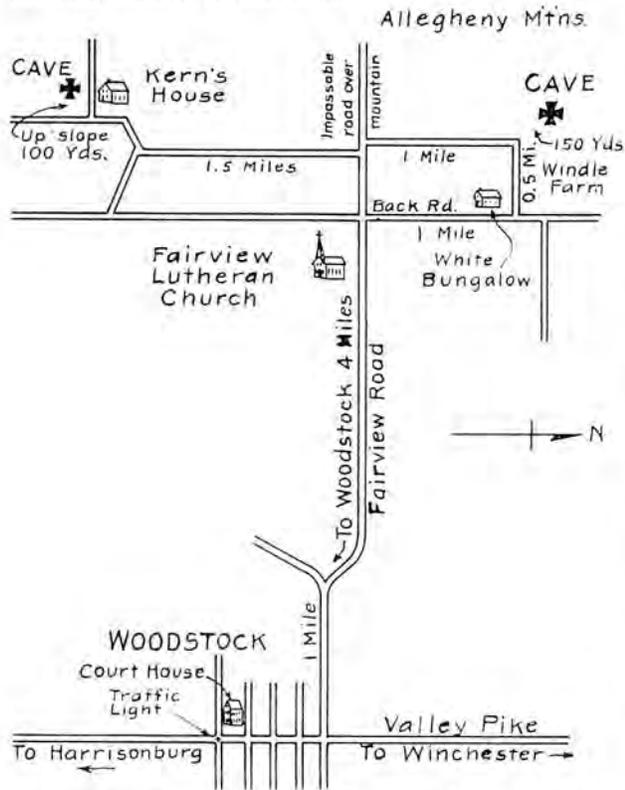
The party slept in Luray, and the next morning after breakfast drove over the Massanutten Mountain at New Market Gap to the town of New Market. Turning right, they drove to Woodstock, Va. Leaving Woodstock, the party took the Fairview road. This road leads toward the Allegheny Mountains and enters Woodstock through North Foundry Street. Driving four miles to Fairview (old name is Alonzaville), a right turn was made onto the Back Road. One mile was driven on this road and a left turn was made at a white bungalow. This road led to the mountain and was about one-half mile.

The cave was located in a field at the end of the road, and as it made a left turn to run along the foot of the mountain. It is at the rear of the Windle farm and is on the old Maury place (since sold). Stopping on the road we went to the cave's entrance. Mr. Brown, Jones, and Foster explored several crevices between the rocks, but found the passages plugged by mud and debris. A large area drains naturally to the cave. Old persons in the vicinity had told Mr. Evans that persons had entered the cave for 100 feet and had come to a vertical drop that prevented further easy penetration.

A careful survey over all the adjacent land was made for the purpose of finding other entrances. A small opening was found, but it was insufficient for a person to crawl more than five feet therein. This cave not being explorable, it was decided to go to the Kern's Cave.

Mr. Richard Wahl, formerly an examiner in the Patent Office, had suggested this cave to society members. Leaving the Maury Cave, the party drove a mile on the road running along the base of the mountain. The road passes

Charles Schwarz's place. Intersecting the continuation of the Fairview Road, the party crossed this road and continued on the road parallel to the mountain. About one and one-half or two miles down the road, and after coming down a hill of a couple hundred yards, we came to Mr. Philip Kern's house, or rather to the driveway leading thereto. The house set back 50 or more yards from the road toward the mountain.



Stopping in the road, Mr. Brown and Evans went to Mr. Philip Kern's home and asked permission to explore the cave which is in the middle of a field at the base of a walnut tree. The field is on the side of a hill about 200 feet high and the slope from the road to the cave is very steep.

The cave had an entrance hole about six feet in diameter at an angle of about 70°. After attaching ropes to the walnut tree, the party lowered themselves down the inclination to the floor thereof. This was a distance of about 50 feet. At about one-half the height of the cave, a lateral branch led to the left. This extended also for about 50 feet. Both passages were sufficiently high to stand up in, although the lateral passage ended in a crawling passage about six feet in length. A crevice extended from a side of the lateral branch to the bottom of the vertical passage. The cave had no other substantial passages.

Mr. Philip Kern and his sister, Mrs. Rice, came to the cave and invited the party to their home. After leaving

the cave, we went there, washed up, changed our clothes and drank hot coffee furnished by Mrs. Rice.

Leaving about 4 o'clock, we drove to Shenandoah Caverns, near Mt. Jackson. To reach Woodstock from Kern's Cave, we drove back over the road we had come to the Fairview Road and then to Woodstock on the Fairview Road. We drove south on the Valley Pike (No. 11) from Woodstock to Mt. Jackson. Because the bridge to the caverns across Shenandoah River was washed out, we had to take a circuitous route thereto.

Arriving at the Shenandoah Cavern, we met Mr. Chapman, the owner. After considerable discussion by Mr. Brown and Jones as to the aims of the society and its visits to other commercial caves, Mr. Chapman invited us to see his cave gratis. The usual charge was \$1.65. The cave is entered by an elevator and the cave floor is entirely on one level. It was a very beautiful cave and has many pretty formations. Lights were situated so as to present the scenes in the best possible way by illumination engineers.

Leaving Shenandoah Caverns about 7:30 p. m., the party drove to Harrisonburg and enjoyed dinner. The return to Richmond was by way of Elkton, Swift Run Gap over the Blue Ridge Mountains, and Gordonsville, Zion Cross Roads, and the Charlottesville Road.

Bob Evans

CARPENTER'S CAVE

Carpenter's Cave, on Carpenter place, Farmon, W. Va., was visited by the National Speleological Society on April 1, 1944. Directions for reaching it: Turn right from Route 42 between Petersburg and Burlington, W. Va., at small store, onto road known as Patterson Creek Pike. Follow that for 6.8 miles to a bridge. Then take a right angle turn at the bridge, and follow the road until you reach valley at the foot of Orr's Peak in Patterson Mts.

The party visiting this cave on April 1st parked the cars a short way beyond the farmhouse. Several of the party walked west across the pasture, and followed the crest of the hills that run in a rough semi-circle, until they entered the woods. The rest of the party followed the road down to the foot of the hill, and then right with it for about a quarter of a mile. When the road turned left, upward again, the party continued straight ahead over the wooden fence, for perhaps 300 yards or so, and then turned left uphill for several hundred feet.

The parties converged, and a hunt for the cave entrance began. It was finally located in a depression in the ground, quite lost to view under about two feet of dead leaves. It lay about 20 feet north of a large fallen tree, with nothing outstanding to mark its location.

After clearing away the debris and dead leaves, a hole a little over two feet in diameter was disclosed. A safety rope was lowered, Petrie was harnessed and well secured to a lowering rope. The following description was given by him to Chris Mansfield and Brown, over the portable telephone:

"The opening went straight down about six feet to a ledge with roots of trees showing all around. There the passage widened to about 10 feet. Under the ledge was a hole that looked like a small secondary entrance."

Petrie went over the ledge and down to about 30 feet where the passage closed up to the size of the entrance. Then it reached a slope he was able to stand on. The passage narrowed and was barely large enough to get through, and the ground very damp. At 50 feet down it bore off in an N. E. direction. At 65 feet it was still only a round hole about two feet in diameter, with walls of sharp rough rock. At 75 feet he encountered bottom, where he found a log about six feet long, and reported he was standing on boulders thrown into the cave.

Lead widened into a pit about 19 feet by three feet. There was a hole about eight inches wide still going down, passing an opening about four feet high, one foot wide at the top, and about two feet at the base. There was a crack in the opening that enabled him to see about 20 feet beyond, but much too small to enter.

He then followed the lead going off about 45 degrees N. E., at the end of which he could see a pit about eight feet in diameter. It was a total of 90 feet down to the top of the pit, and then a vertical descent of 12 feet to the base of the pit, circular in shape. There was a secondary chimney leading off the pit, but it was only a few inches wide. No leads anywhere.

There was an opening at the bottom of the pit about three feet wide, which widened out under overlapping ledges of about one and one-half feet. Below this was another opening about one and one-half feet wide. That appeared to be the end of the cave; but the rock looked undercut, so small leads of a few inches could go off. The cave was of limestone, contained some flowstone, and one big stalagmite. At the end of his exploring there was 110 feet of lead rope played out, but 12 feet of that was lateral, and not vertical descent.

Christine Mansfield

"Subterranean Wonderland," by Dorothy Ferrell Hayden, in *AMERICAN FORESTS*, for April, 1945, (p. 170). An Atlanta, Ga., writer and photographer, the author describes (accompanied with exquisite illustrations) the "grandeur beneath the forest floor of Lookout Mountain," near Chattanooga, Tenn.

TWIN CAVES OF CAVE MOUNTAIN

(Smokehole, W. Va.)

As hosts to our party, at Hermit Island Lodge, we are indebted to Mr. and Mrs. Charles Neville, of Franklin.

On Thursday evening, July 27, a group from the Summer Training Camp at Chestnut Ridge (near Cooper's Rock, Monongalia Co.) arrived at Hermit Island Lodge in preparation for a hiking and caving expedition for the next two days.

Rev. Alfred Lee Klaer, Student Pastor at Cornell University, Ithaca, N. Y., and founder of the Chestnut Ridge Camp, and the writer, were in charge.

Friday, July 28, this group hiked to the cabin home of Andy Ayres, Smokehole's oldest resident. Mr. Ayres, 94 years old, was found in bed under doctor's care. The group sang a number of hymns and folk-songs while there. That evening Mr. Charles Neville of Franklin was a guest at dinner. The young people, after dinner, entertained Mr. Neville by putting on various stunts around the camp fires. While the entertainment was proceeding, five members of the N.S.S. arrived from Richmond, Va.; Mr. William J. Stephenson, President; J. S. Petrie, V. Pres. and Secretary; Mr. and Mrs. Burton Faust; and Miss Loretta Kurz.

Early Saturday morning, with full cave equipment, the party of 27 people took the Cave Rock trail in the Recreational Park, arriving at Twin Caves at 11:00 a. m. The group was divided into three parties, headed by Stephenson, Petrie, and Robinson.

Petrie and party explored Cave No. 1 and upper passage of Cave No. 2. Stephenson and party explored upper and lower passages of Cave No. 2; Robinson and party explored lower passage of Cave No. 2.

Twin Caves are located at southeast end of Cave Mt. at 2,500 feet above sea level, 1,100 feet above the bed of the river. They open at the base of a limestone cliff, its bare face prominently exposed as one enters Smoke Hole from Upper Tract. The openings face due south. Cave No. 1 is the smaller of the two, and about 50 feet above the level of Cave No. 2, but about 200 yards downgrade along the edge of the cliff. From Eagle Rock, a prominent landmark opposite Eagle Grove, near Briggs Run, Twin Caves are approximately one-half mile southeast, and directly above Big Springs. From the beginning of the well-marked trail in the Recreational Park to Twin Caves, the distance is two miles. The trail cuts slantwise up the west face of Cave Mt. through a heavily-shaded forest. Even though the day was warm, the group did not tire, arriving at the top in good spirits, ready to undertake all hazards.

Twin Caves have been regularly visited for many years. The earliest date was seen in the lower passage of Cave No. 2, the date being 1769. It was burnt on—no one studied the figures to note if they were burnt on by carbide; if so, the date was phony. But there was plenty of evidence that torches had been used, and that fires had been made in various sections. Saltpeter, in years gone by, had been extracted. Names and dates were found in many places. One name and place was especially noted in Cave No. 2: A. A. Gowanns, London, England.

Mr. Stephenson, President of the Society, says that the caves have no connection, and are therefore two distinct caves. They have in common the same general formation—that is, long galleries, about 25 feet wide, and averaging from 12 to 40 feet in height, the roof uniformly that of an anticline. The floors are strewn with large boulders, making it necessary to move slowly and cautiously. Very little moisture was present. There were no separate rooms. Several funnel-shaped flues were observed.

The outstanding formations were knob-stones, coral, pillars, columns, and flake. In the latter were found imbedded numerous small fossilized sea-shells. Along the right side of the gallery in the lower passage about halfway to the dead-end was a bulged covering of the wall, reaching from the floor to the ceiling, looking like a "permanent wave" on the head of a giant goddess.

Local stories concerning Twin Caves are similar to those expressed elsewhere—that the caves have many passages which have never been fully explored; and that men have been known to come out at exits several miles distant from the entrance. What are the causes for such stories to arise and become widely circulated among the local inhabitants, is a question for the psychologist. According to the findings of the speleologists who studied and mapped Twin Caves on this trip, there is no reason to believe that the caves extend more than a quarter of a mile. It is reasonable to assume there are other passages back of the blocked ends, but no passages were discovered that were large enough for a man to squeeze through.

Bats were fairly numerous. Above the entrance of Cave No. 1, lying along a ledge of rock, the writer got a specimen of an unknown salamander which he sent to James Fowler for identification.

The three parties reassembled at the entrances and proceeded down the trail, arriving at Hermit Island Lodge around 5 p. m. It was a day in which both mountain climbing and cave exploring were combined. The view from the entrance of the caves was worth the trip. The officials of the Society were very much pleased listing Twin Caves among the largest yet discovered in West Virginia.

Following is the complete personnel of the group in

addition to those named: Fritz and Veronica Gieseler, Wilmington, Del.; Lois Parmelee, Pittsburgh, Pa.; Ariel D. Robinson, Arthurdale, W. Va.; Linda Martin, Westbury, L. I., N. Y.; Mary Ellen Propper, Forest Hills, N. Y.; Jeannette Zemer, Detroit, Mich.; and, from New York, N. Y., Charles West, Anne Lise Strauss, Joan De Keyser, Amy Scheuer, Ellen Sperro, Yurika Morikawa, Roger Baldwin, David Brisk, Thomas Marill, David Perrin, Robert Richter, Clive Schlossberg and James Finklestein.

Felix D. Robinson,
Arthurdale, W. Va. (7/29/44)

DULANEY CAVE, UNIONTOWN, PA.

Members of party: Dr. R. W. Stone of Pennsylvania, and the Cleveland group consisting of Mr. and Mrs. Wm. Blaha, Mr. and Mrs. Earl Gumz, Betty A. Yoc, Al Mislay, and George Risley.

We started our trip at Summit Hotel Sunday morning, 10 o'clock, in the middle of a terrific rain storm which lasted until noon. Taking the first road east of Summit Hotel, we turned south for three miles to the fork in the road. Taking the right fork for another mile-and-a-half, we then turned right on an old washed-out road for another one-half mile through the woods down the ridge.

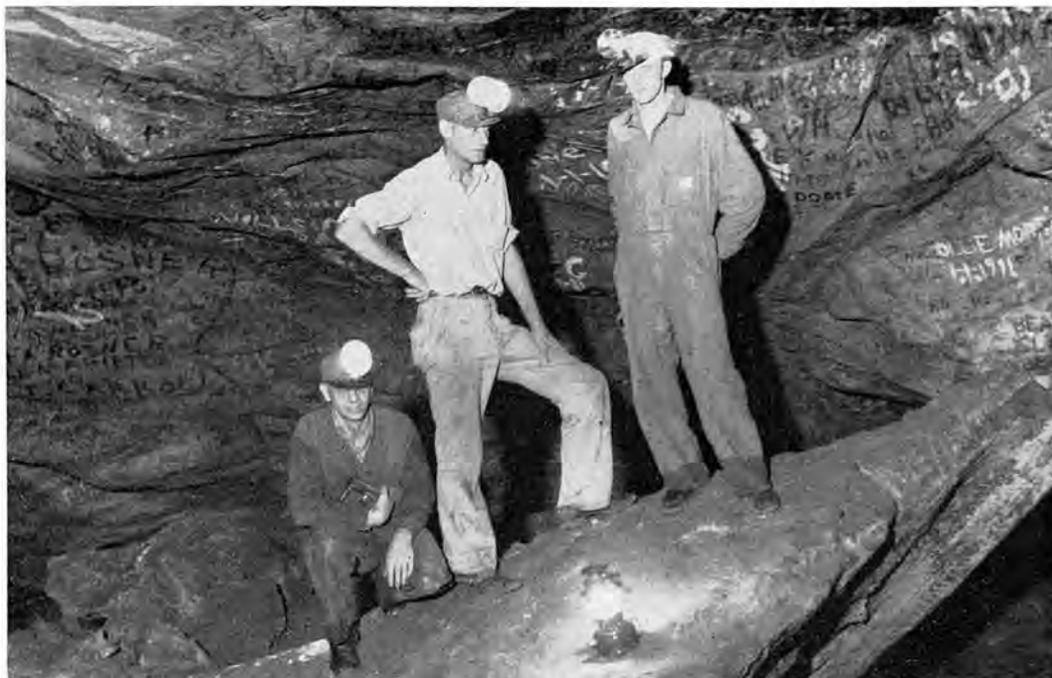
The cave is entered from the side of the hill. There are two entrances, the main entrance being the larger one, which we used. The first trip was led by Dr. Stone, who took a barometer reading at the entrance, to be used in determining the depth of cave at farthest point of penetration. We lit our Colemans and carbides, then proceeded down the main passage, which was a rather steep and rocky slope leading to the Dining Room, the first large-sized room in the cave.

Taking one of the numerous passages from the dining room, we continued downward until we hit one of the three streams, and followed the stream to the main passage, to the Ballroom, and continued downstream past the rock known as "Man's Head." At this point Dr. Stone took another barometer reading which showed that we were approximately 280 feet below the entrance.

While Dr. Stone and the girls were taking the barometer reading, the others continued down the passage to the far end of the cave, where the stream forks off the passage we were following. Here Al Mislay dammed the stream and re-routed it into another passage that petered out, then all returned to where Dr. Stone and the girls were waiting.

We returned to the cars after a fast trip out, as Dr. Stone had a 1 o'clock appointment. After a brief rest, we re-entered the cave with photographic equipment (including Al's movie camera) into the Dining Room, and took flash pictures. Because we were pressed for time and

George Risler, Al Mislay, and William Blaha (in usual order) "take 5" in Dulaney Cave, near Uniontown, Pa.



the equipment was cumbersome, Al and George returned the equipment to the cars. Then we proceeded to retrace our steps to the point where Al had dammed the stream, and he explored the former stream passage to its end, which peters out where the stream ran down a crack in the rock.

We returned to the main passage, took the right-hand fork, and about 200 feet in we saw quite a few bats and some large stalactites. This point seems to be the only section of the cave in which there is any appreciable amount of formation. Continuing on for about 600 more feet we noted that the time was getting short; and as the cave showed no indications of petering out, we decided to make a fast trip back to the cars. We left the cave at 5:30 p. m.

According to the available map of the cave we only covered about one-third of it, there were many more passages that looked inviting, but we couldn't explore them extensively due to lack of time.

The article in BULLETIN No. 4 mentioned that the map was backwards. We found that the original map is correct. We had the map with us and oriented the map along with the passages, and found the arrow pointing correctly on the map.

We took a temperature reading in the cave, which showed 54 degrees. Dr. Stone pointed out the cross-bedding of the limestone. We saw a live snail near the entrance, and an orange centipede far in the cave. We found some white fungus growth in the Dining Room. Repro-

duced here are two of the pictures taken in the Dining Room.

Betty Yoc,
Cleveland, O. (9/9/45)

FURTHER WORK IN BLOWING CAVE

The party which composed this trip was divided into three sections. The first section under the leadership of Herbert Vincent was designated as the Exploring Party. This party consisted of John Petrie, William Petrie, and William Jones, beside the leader.

The second section, under the leadership of Bill Stephenson, was designated as the Mapping and Utility Party, and was composed of Floyd Barloga, Gordon, Kohler, Sterns, and Drysdale.

The third party was under the leadership of Earl Porter, and was designated as the Leveling Party, and was composed of William Foster and Alvin Guttag. John Showalter, with three young boys, constituted an addition to the third party.

The purpose of the Exploring Party was to make its way as quickly as possible to the stream and to follow the stream down there and to explore the same as far as possible or until an absolute end was reached. The members were supposed to carry the necessary rope and other paraphernalia for their purpose. They were also to string ropes in the dangerous places to enable the parties to follow after them.

The Mapping or Utility Party had as its main purpose



Anne Blaba, Betty Yoe (Secretary of the Cleveland Grotto), and Ethel Gumz use the same spot for a shot, in Dulaney Cave.

to check the previously prepared map of the cave as far back as the stream for details, and note such corrections as were found. This party was also charged with the duty of taking temperatures and collecting any fauna observed. They were also to experiment with various methods dealing with the mud of Blowing Cave, such as the cutting of steps in the mud bank, the use of ropes, the possible use of clean cloths for wiping the mud off a person's hands, etc.

The Leveling Party's prime purpose was to run an accurate line of levels from the Cow Pasture river, which flowed 100 yards from the cave, in to the stream in the back of the cave. This line of levels was to be run with an accuracy within the range of six inches.

Results

The Exploring Party was able to work to a point about 75 feet further on downstream than had been previously reached.

They then turned back because a rope was required to go on further for safety. It later turned out that this party, by some oversight, had left the ropes provided for that purpose in the car outside and that the elaborate preparations previously made for their work accounted for practically nothing. In spite of the fact, the Exploring Party had pushed on 75 feet and was stopped only because of lack of proper equipment. All of the members on this party admitted that even with proper equipment they would not have been able to negotiate any further

before they would have been completely worn out and forced to turn back.

At the point where the Exploring Party was forced to turn back, the cave was composed of a large room, roughly 75 feet across and 20 to 30 feet above floor level. The side walls of the room extended downwardly from the roof approximately 10 to 20 feet, and then sloped toward the center of the room, similar to the sides of a funnel. This slope on each side is composed of a mud bank lying at an angle of repose typical to this kind of cave.

In the center of the room, the floor of the cave was formed by a pool which was about three or four feet wide and was five to six feet below the edges of the mud bank. The mud banks dropped vertically into the pool, or even could be said to be slightly undercut. These banks were so slippery that their traverse was thought to be too hazardous without a safety rope, or at least some means to pull one out should they have slipped and fallen into the pool. Steps cut in the mud bank gave good support for a few minutes and then gradually gave way under the weight of the explorer. Even had one person been able to cut his way by means of steps across the mud banks, it is doubtful whether the steps had held sufficient to permit passage of the entire exploring party.

The Mapping or Main Party generally attained all of their objectives. The previous map was corrected back as far as the stream, and the stream map completely done to the point where the exploring party was forced to turn

back. Several temperature readings were taken but no cave fauna was observed.

The Leveling Party was an outstanding success. They were able to run a line of levels from the Cow Pasture back to the stream. It is believed that these lines of levels were accurate to less than three inches. The leveling procedure was exceedingly slow, as it took considerable time to do the exterior leveling as the temperature outside the cave was down to 15° and the muddy condition of the interior of the cave prevented the attainment of any high degree of speed.

The party under Showalter experimented with the use of walkie-talkie outfits for cave work. The young boys under his direction served very well as assistants for his experiments. It is believed that these results, together with the other details, will be reported at some other time. At present, the walkie-talkie appears to be too large and cumbersome an instrument for use in cave exploration.

Summary of Results and Recommendations

The Exploring Party advanced the exploration of this cave some 75 feet. It is recommended that in future all exploration equipment be checked by the party leader before entering the cave to be sure that all items which are planned to be carried by the party are present. From the experience of this and prior explorations, it would appear that exploration in this type of cave can probably be done by degrees, and that an advance of 50 to 100 feet may be considered as set for an individual exploring party.

The corrected map and additional sections of this cave were completed by the Mapping Party. No serious errors were found on the first map, and only a few minor corrections were found necessary.

Temperature readings were found to be 18° at cave entrance, 42° at entrance to keyhole, 49° at entrance to "break-a-leg" room, 52° at "break-a-leg" room, 56° in stream room, and stream temperature was 57°. Apparently the entire flow of the air at this time of the year is into the cave, and the cave is cooled for a considerable distance back, due to the inrush of air. This great and steady flow of air appears to indicate the presence of some other opening for this cave which has not yet been found.

The flow of air was strong as far as the "break-a-leg" room, and was noticeable in all passages back as far as the stream room. Downstream, the air currents seemed to be blowing up the stream rather than down, but any air movement was so slight that candles blinked along the route downstream without any notice of flickering of the light.

The Mapping Party was able to follow as far as the Exploring Party. From this experience, it would appear

that mapping data can be taken efficiently wherever a cave can be explored. However, it appears much more efficient to separate the functions of the Mapping and Exploring Parties.

When the end of the explored portion had been reached, the instruments of the mapping party had become so mud-covered as to be practically useless. It is doubtful that the mapping could have been extended very much further without a fresh set of instruments. In muddy caves of this type, it appears that the mapping should be done in sections. The Leveling Party did not appear to suffer as severely from mud since they did not reach into the extreme muddy portions of the cave. There is no reason, however, to doubt that they will be able to run a line of levels through any portion of the cave if this line is extended only to a small way at a time.

Experience by all parties showed that it was practically impossible to carry sufficient rags to allow the party to clean up and keep its instruments clean once they were put in use.

W. J. Stephenson (1/9/44)

DOWN INTO THE VIRGINIAS

TO GRAND CAVERNS, VA.

The Davis, W. Va., trip celebrating Jack Preble's homecoming from the wars having fallen through, the week-end of May 27 bid fair to be speleologically barren except for Batcheller's student party to Breathing Cave. A copy of the VPI *Grapevine* scheduling a VPI trip to the Shenandoah Valley coming to Pete's attention Saturday morning was enough to set him off for Grand Caverns. Batcheller had room for him as far as Charlottesville, and a friendly couple motoring through took him on to Waynesboro. A telephone call to John Showalter arranged a meeting in Grottoes Sunday morning. A two-mile lift interspersed between about two hours' walking, partly in the rain, was succeeded by a truck ride the rest of the 16 miles into Grottoes by 9 p. m.

No lodging thrusting itself on the traveler, he rolled his own in a strawstack on a farm in the outskirts of the village for nearly as good a sleep as two weeks later at Valley View for \$7 including meals! An experimental self-included photo shot at early dawn was collected for evidence. Four store cookies constituted breakfast while waiting a few minutes for John Showalter, after the last 60 pages of Rainier's "Pipeline to Battle" had been consumed as brainfood waiting for dawn to mature in the strawstack.

John S. was prompt, and at Grand Caverns, finding no VPI gang, though shortly expected, the two N.S.S. members spent an hour exploring nearby Fountain Cave and taking a few pictures.

Emerging shortly before noon, they found Dr. and Mrs. Jackson and 22 VPI students arrived by truck waiting for the guide, then in the caverns, to take them through. Hot dog sandwiches with all the trimmings, thoughtfully provided by VPI, made a delicious lunch, after which the two Johns had their fourth trip through Grand Caverns while most of the VPI group had their first. For the first time in Pete's experience in this beautiful cave, picture taking was permitted, the young lady guide laughingly saying she had no objection to anything so long as the cave wasn't damaged.

Our student grotto is jealous of its reputation, and despite the abundant hilarity of the occasion was careful as usual of the innumerable irreplaceable features of wondrous beauty in their possession for the time being.

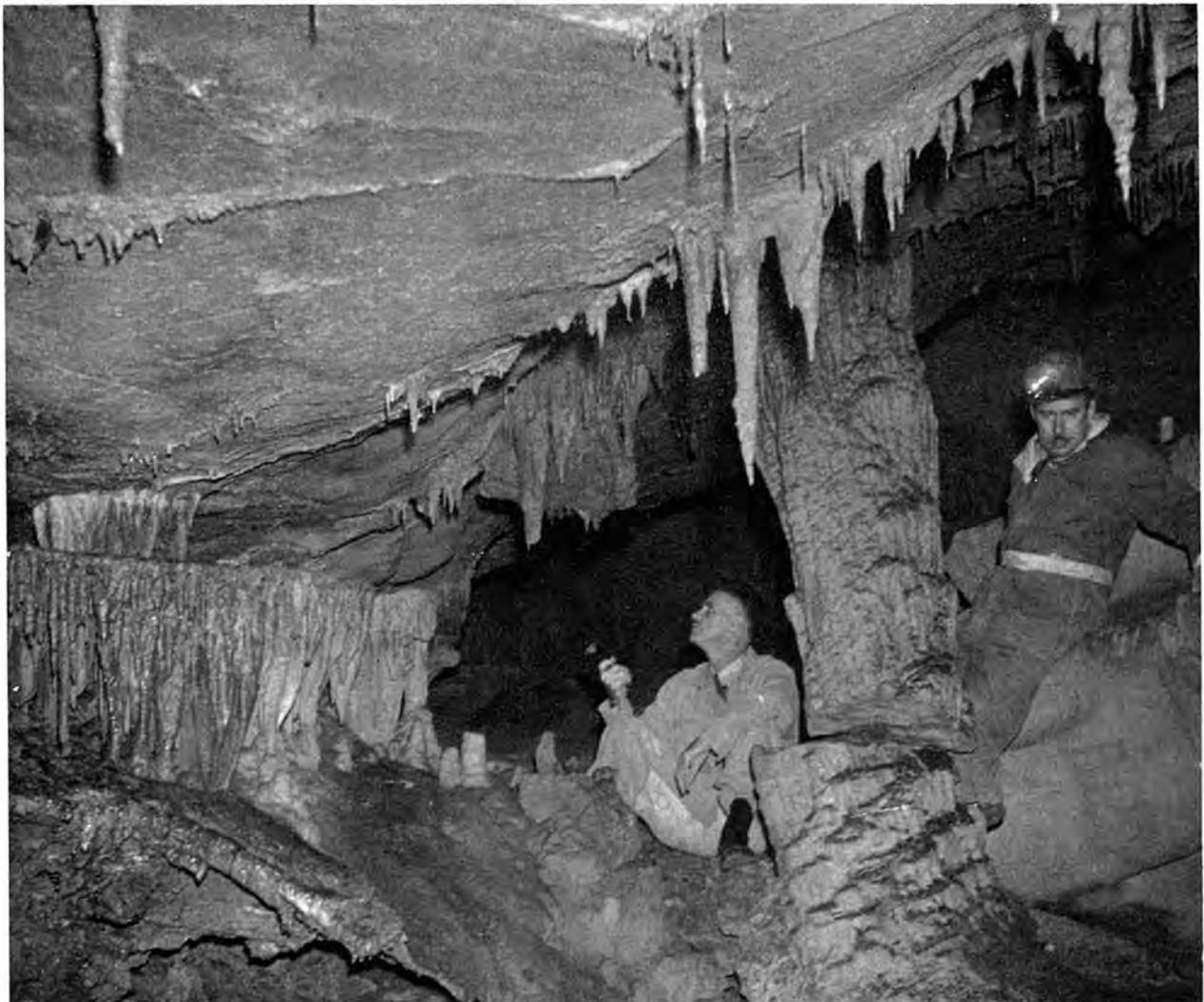
As has perhaps been said before, all good things come

to an end, eventually, and so did this visit to one of Virginia's (and of the world's) most beautiful caverns.

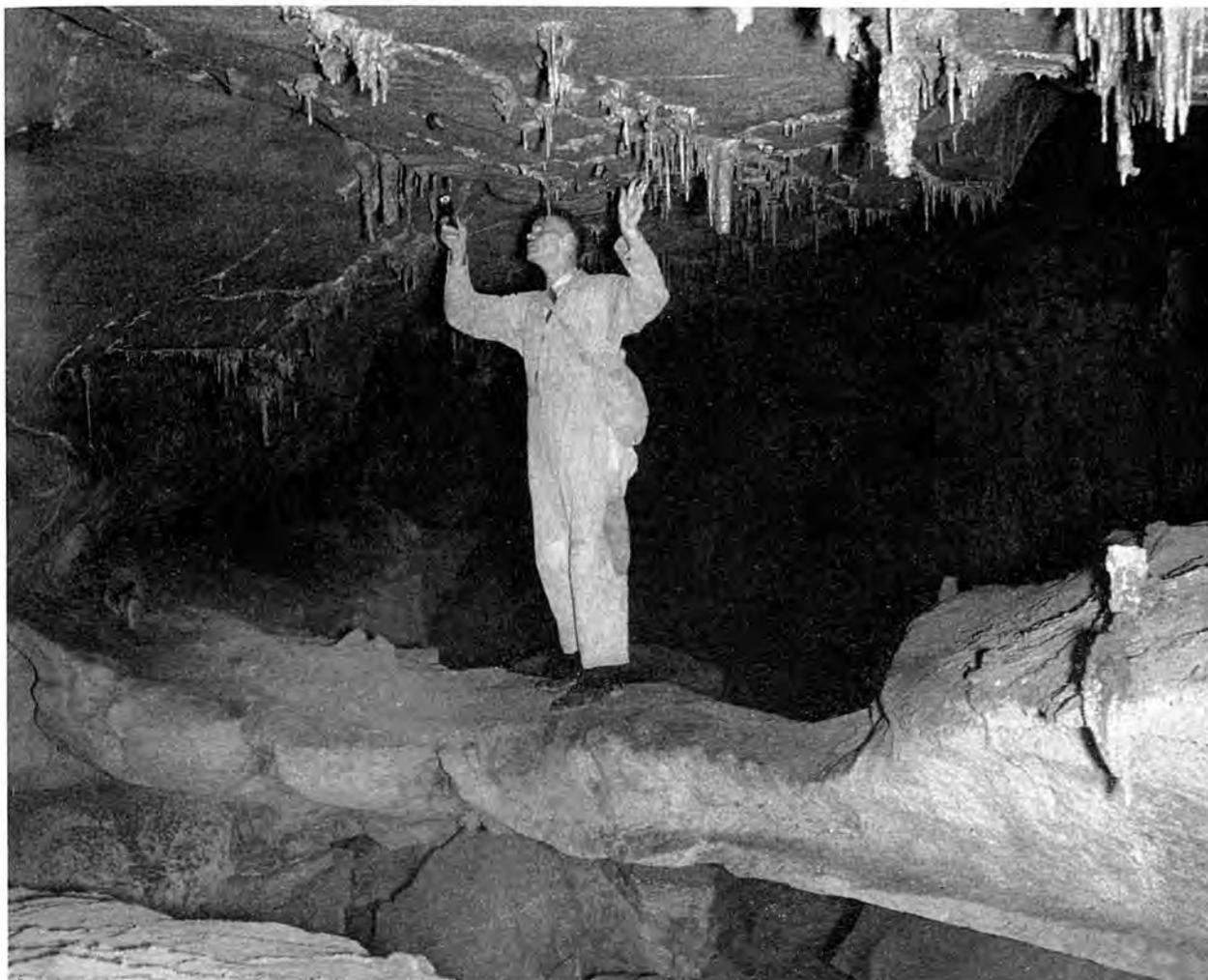
Hitchhiking home, even in company of Dick Southworth, an ex-member of the grotto and veteran on furlough from Eisenhower and Co.—of course in uniform—proving none too successful on this beautiful Sabbath afternoon, Pete finally got a Richmond bus around 8 p. m. between Afton and Crozet to end a well-nigh perfect day.

TO SHEPHERDSTOWN, W. VA.

April 29 Pete organized a trip from Arlington, taking young Pete (on leave from N.A.S., Melbourne, Fla.), Roscoe Dwiggin, Bob Tanner, and friends, John Cory and Tommy Cataldo, to Shepherdstown area. Sheepshead Cave and a companion cleft along the Potomac just out of town were first visited. Each of these caves is only a little



1—While Petrie focuses on a broken stalactite in Porter's Cave, Stephenson puzzles on what Goliath pushed asunder the pillar at his feet.



2—Petrie lightly holds up the cave roof with his finger tips while looking for a lost soul, or bat, or something in Porter's Cave.

over 100 feet in extent; the first extends upward in a crawl; while the latter starts partway up the hillside and drops down between inclined, nearly parallel rock walls to a pool some 15 feet long and of indeterminate depth, somewhat undercutting the rock wall.

Then, on Bob's cousin's farm, a hole in the middle of a field was eventually discovered by aid of cousin after Bob's landmark identification system, perfect except for lack of the element of success, had been tried and found wanting. Several of the party dropped about 10 feet down the hole vertically, and then crawled another 10 feet down a slope between rock walls to a pool with no means of ascertaining its extent or depth due to blocking of the passage overhead.

Further investigation, in a perhaps drier season, might yield more information. But, for the present, "Tanner's Folly" was by unanimous consent chosen as the name for this cave.

After lunch the party found and penetrated a portion of the mysteries of Mohler's Cave. This was new to all the party but Pete who had spent the night in this cave once in 1941, but who found quite new or at least entirely unremembered paths this time. As the cave shows evidence of having been visited under widely varying water conditions, its general features may well change somewhat from time to time.

In view of the time, the party did not penetrate to any definite end of this cave but emerged after one and three-quarters hours to top off the day with Crystal Grotto near Boonsboro, Md. Here the managed "pulled" a rather novel one. Pete and son having been previously in, "of course will not be charged again," but newcomers pay the 75c fee plus 15c tax. Membership in the Society had no influence here, Tanner and Dwiggins faring no better than Cory and Cataldo. However, all including Pete (except young Pete who preferred the sunshine to a repeat

performance even though free to him) figured this pretty little cave worth the cost and a fitting "dessert" for the day's interesting bill of fare.

J. S. Petrie (1945)

Progress Report as We Spread Abroad

(Continued from Inside Back Cover)

I would like to know, also, if there is any objection on the part of your Society, as to translations which I could make of some of the articles published in your BULLETIN, for publication in reviews or the local press, with no other interest than divulging speleology, its methods, its results. For example, your article in BULLETIN No. 5, entitled "The 'Speleologist' Defined," is very interesting in this respect; and I would like to translate and publish an excerpt of it, if it pleases you. We have to first of all educate people regarding speleology, before any practical co-operation can be gotten, and for that nothing is better than publishing now and then some articles on the matter.

Awaiting your interesting answers to all questions pointed in this perhaps too long a letter, I remain,

Sr. Walter Dupouy, Director,
Museo de Ciencias Naturales,
Avenida Los Caobos,
Caracas, Venezuela, S. A. (6/17/44)

Sr. Walter Dupouy, Director,

It would be a pleasure to have you and Professor Cruixent as members of our Society. Application blanks are being sent you together with papers outlining the privileges attached to membership. The Society also provides for an institutional membership which would allow your museum to become a member as an institution. The cost of individual membership is \$3.00 per year and that of institutional membership is \$10.00 per year. While our Society is primarily concerned with caves in the United States, there is no limitation on nationalities of membership, and we feel honored that South American scientists are sufficiently interested in our work to consider membership. As we understand it, the South American caves have been even more neglected and constitute an even more fertile field for investigation than do the caves of the U. S. A.

We would be more than glad to receive any material which you could send us on the Venezuelan caves, or other caves in South America which you may know of. We expect to reprint portions of Humboldt's article on Guacharo's Cave in one of our coming BULLETINS. The partial index of "Caves of the World" in BULLETIN Five was, as the title implied, merely a partial index. It has brought forth much comment, especially in those regions

where we before had few records. In view of the great number of caves which have been called to our attention as omitted from the list, we have decided to make no consistent effort to list foreign caves until after our American listings are more nearly complete. An exception will be made as to English caves and foreign caves brought to our attention by our own members. When we feel that this project has been sufficiently advanced we plan on issuing a complete volume on American caves and then to devote our attention to listing foreign caves.

Our Society will be glad to co-operate with your museum in any way possible and would like to reprint as much of your reports on expeditions as possible. We would be honored to have copies of any of your cave reports or data for inclusion in our permanent files.

The first three numbers of our BULLETIN are practically exhausted. We will make an effort, however, to obtain copies and forward them to you as a start on our speleology literature. Copies No. 4 and No. 5 are being sent you under separate cover. As a member of the Society, you would of course have the privilege of borrowing material from the Society's library. This library, we hope, will some day be one of the outstanding collections of cave literature. At present there is much basic material which the library is lacking, foremost of which is "Spechela," published by the French Speleological Society (now disbanded), and "Caves and Caving," the journal of the British Speleological Society.

It is amusing to find that you run into the same conditions with your promotion of science of speleology that we did; however, this is the history of every new idea, science or invention. Throughout the ages they have all practically met with universal public indifference if not with actual opposition. Speleology as a science can expect no better reception than was originally accorded to physiology, geology, and our other sciences in their infancy. We find here in the United States that we get a better welcome and a greater interest from the zoologist than we do from the geologist. [Italics ours. Ed.]

There will be no objection whatsoever to your translating and republishing any portion of our BULLETIN or other published works provided credit is given as to its source. In fact, we would like to have our speleological information spread as widely as possible.

While the day may be quite distant, I hope that someday a Latin American speleological society can be organized. The language barrier is probably too great to warrant our society serving any great portion of the South American laymen and scientists interested in speleology.

3—Weird stone statues and fantasy in rock background this lake in Grand Caverns, at Grottoes, Va. (The Editor's idea incidentally, of exquisite cavern photography.)





though we of course welcome into our membership all those who care to join. If a Latin American society is ever organized, we could perhaps provide for reciprocal membership privileges so that members in each society could receive all benefits accruing to those of the other. This, however, is now only a dream. I raise the point at this time so that you will know that there will be no hard feeling if and when our South American members decide to establish their own society. By joining our Society at the present time, a nucleus of South American scientists may be built up which may some day constitute the nucleus of the Latin American association.

If I have omitted answering specifically any of the questions raised in your letter, I hope that you will call them to my attention in your future correspondence.

Wm. J. Stephenson (7/14/44)

CAVODDITIES

In the Jug-hole caves of Matlock, Derbyshire, lay the ghost of a mad dog; a ghost that 100 years ago stopped the area's lead-mining.

Old mining records tell the tale of the mad dog which barked when miners "workings" broke into the vast openings in the hill and so scared the workers that they struck and never went back.

A party of rock climbers who heard the barking recently when exploring a disused lead mine took up the "challenge" and decided to explore the Jug-hole caves.

The party found an opening and a passage, hung with stalactites, that sloped steeply downwards. They made their way along it, and suddenly they heard it: a sound like a dog barking, coming from about 1,000 yards away.

When the barking stopped they moved cautiously through the caves. It led to a chamber holding a shallow lake, and through this the party waded and sat down to rest by the far wall of the cavern.

Suddenly it happened. Across the far side the placid surface of the lake began to move, mysteriously, the lake began to boil violently, and then, from its depths, came the most startling intermittent explosions.

The last explosion ended in a sudden, long drawn out roar. In a few moments the flooded cave was empty, and they saw a round tunnel in the floor, down which the cave water had gone.

Then the incoming stream, after running into it like a great waterfall, started to fill, and they saw that it was the twisted neck of a double-turned tunnel, which had become a vast natural syphon in the rock. A choking sound was caused by the confining of air inside the second bend which was compressed by the water as the cave filled, then expelled in violent explosions as the lake water got too high.

The lake took one and one-half hours to fill, then the "barking" began again.

Arizona's "playboy" creek—the one that went wandering to parts unknown instead of attending to its duties of

providing one of the essentials of life to the people and livestock along its banks—was recently recaptured, harnessed, and the hole through which it escaped sealed off. In effect, the erring water flow was severely rebuked and steps taken to see that it doesn't wander again.

The stream is Horton Creek, and is among those that Arizona is very fond of and watches carefully. When, without apparent cause, the lower stream just simply ceased to flow, it was reported "lost." Such was the case. In search of adventure, or merely taking the easiest course, Horton Creek was found to be disappearing down an aperture in the stream bed only 18 inches wide and three feet long. This opening led into an underground cavern and another underground outlet from that, for the stream simply lost itself from all knowledge after entering the cavern.

Drastic measures were determined upon to capture the flow and force it to remain in its proper place. The flow was detoured around this escape route, the cavern filled with boulders, and the opening plugged with concrete. Then the bed of the stream was packed with a good clay dirt.

It is hoped this will keep Horton Creek in its place.

—*The Record Stockman*, 1945 Annual Number, page 116

With Army Engineers in Palau Islands—(AP)—A little luck plus Yankee ingenuity has given this army engineering unit a coral swimming pool of fresh, cool water, in which to seek surcease from the burning heat.

The engineers were blasting out postholes, and when their trained ears detected a strange note in a blast, they investigated. Far below they saw the gleam of water.

Lieut. Col. Alan E. Gee, their commanding officer, was lowered by rope to investigate. He found a cavern 100 feet long and 50 feet wide, filled with water, cold, clear and deep.

"Coolest place on the island," he reported on emerging. "Blast the opening bigger and we'll make a swimming hole."

So 200 servicemen of all branches disport themselves daily and find life on this tropic isle a little more bearable.

Lucerne, Switzerland—(AP)—Five Lucerne mountaineers have cleared up the mystery of the "Hellenloch," or "Gate to Hell," a cavernous hole in the Nierderbauernalp near here.

The cavern—from which the roar of subterranean cataraacts emerged—was discovered years ago by a party of Alpine climbers, but only a few days ago did scientists venture to descend into it. Using a rope 850 feet long, a windlass and crane, three of the party of five were lowered into the stygian hole. At a depth of 300 feet they found themselves in a "glacier-mill" or "giant's cauldron," said to be the largest ever discovered. It was an immense hollow 36 feet long and 23 feet wide with azure-colored walls that were smooth as glass and that shone weirdly in the glow of flashlights.

Letters

From Members in Uniform—

Cave Calls From Overseas

Your *Newsletter* and note arrived. Thanks for them and the BULLETIN which closely followed. The newsletters are coming in splendidly, and I have just received the compilation of new memberships. I sure miss the activities I read of, and hope that soon I shall be back rappelling on the old ropes again.

It's been a rugged life, and although I have quite adapted myself, I would still prefer sleeping somewhere in the States near a cave entrance—and that's putting it mildly. The work and activity of the Society during the war seems ever increasing and not decreasing as might be anticipated. I offer my utmost felicitations to the great job you fellows are doing under such trying times. The fine Society is becoming quite a prominent organization. Keep up the good work and let me hear from you when the time allows.

H. C. Allnut, Tec. 5,
Co. "D," 4th Med. Bn. (4-22-45)

Another Old Caver Comes In

During the years 1939-41 I was fairly active in the study of caves in New England, having accompanied Clay Perry of Pittsfield and Roger Johnson of Springfield, Mass., on several field trips. Since that time I have explored a good many large non-commercialized caves in the Mid-Western United States, taken notes and made photographs. Clark Gallager, geology professor at Iowa State College in Ames, has helped me with my study of Arkansas caves.

Since I'm in the army now, I naturally haven't had the time to pursue my hobby, but would like to keep informed of any work being done along this line. I would like to apply for membership in the Society.

Lt. Donald F. Haskell,
LAAF, Lincoln, Neb. (9/28/45)

Book Note from London

Today I mailed you *Wookey Hole*, by Balch. A wonderful book. You may already have it—hope not; and *Cave Hunting*, by Dawkins—a very old book. Also, a very small book—forget its name: I just thought it was amusing and shows the fear people of old had for caves.

I am trying my best to get *The Netherworld of Mendip*—a lovely book, replete with cave stuff. Hope you get a list over to me of what you already have on British

caves so I'll know when I'm duplicating. I have now written to a number of people Frank Solari gave me many months ago. I had a nice letter from several, especially Peter Wild. In due time, different ones will give me names of books. I then get a used book man here to circulate the British trade, and he usually can find them. Have an engagement to go out to Chisellhurst caves next week. Approximately 5,000 people nightly slept in them during blitzes, and many valuable paintings, etc., hidden there.

Some books on caves in Europe can be had here, too, but so far I haven't bothered with them. You will see in *Wookey Hole*, that for hundreds of years they didn't get very far in it until they dug out a passage or two—now they've gone a long way and found beautiful stuff.

Capt. T. T. Perry,
London (3/15/45)

Newsletter Delights Price

I have just finished reading the October *Newsletter* which reached me in good time on this Armistice Day anniversary. Too bad it can repeat, but apparently the enemy doesn't know when it is beaten. The Americans serving with the British have all now been returned to their American units for Military Government. This is my first opportunity to write you since your last interesting letter.

I landed in France D-24 with the British army, and stayed with them through Caen, Argentan, Falaise Gap, Amiens, and Lille. Some of it was pretty tough, but the last two months at Lille (the coal center) were very interesting. Unfortunately I have had no opportunity to do any caving; and I was disappointed in not seeing any of the caves in the U. K. In the army there seems to be little opportunity for self-enlightenment.

I read the *Newsletter* with eagerness. I am mentally with you on your many trips. I should have enjoyed the late one to Greenbrier county.

I note with pride your increased and expanded activities. It is remarkable to me the influence and interest a comparatively few earnest and energetic workers like yourself and Petrie and a few others, have developed throughout the country. Keep up the good work.

Please remember me to all my friends.

Paul Price,
France (11/11/44)

? Who is "George"?

Don't get any chances at caving work. What few I get a shot at are usually volcanic and have been used as forts by the Japs. Don't like finding pieces of Japs or booby traps so don't bother them much.

Stay pretty busy on the ship. Am executive officer and am breaking in a new skipper and a new fourth officer. That doesn't leave me too much chance for play. The new captain is okay and I am really glad. Hope to have my own ship before too long. Have been recommended for command ever since July. Hope it's a good ship and soon.

The American Society of Agricultural Engineers is doing some work on underground water, and I recently wrote Mr. Olney, the secretary. Thought it might be advantageous to both societies for him to contact you and pool our information. I'm enclosing his reply. (Ed: We don't have it.) Believe it might be a good idea. Some good work might result and the publicity would certainly be favorable to N.S.S. ASAE is a well-established technical group and have a large circulation for their journal. What do you think of it?

George ——— (?)
U. S. S./A. P. O. 33 (8/1/45)

Wilson's Wanderings

Since coming to this division, I have been living in dirty little villages that are supposed to be French, but the people speak and act German. While there was plenty of snow and cold weather it was not too bad—just picturesque. Now we have had a lot of rain and warmer weather, all of which adds up to very gooey mud. The same sort of stuff I lived in all last fall.

I don't know what the cave situation is around here as it is not practical or safe to wander around cross-country. Keep hearing of the natives hiding out in caves to escape shelling, but have not yet seen any of these places.

Have just had a letter from John Meenehan, indicating he is in Puerto Rico and trying to get out and do some exploring.

France (2/6/45)

As you probably know, we have practically no opportunity to get out and around the country for such purposes as looking into caves, etc. However, I did notice one opening in some rocks just behind a little town called Urspring, on the road between here and Ulm. At the time I was on a truck going down to Munich, but made a mental note of the place and hitch-hiked back there at the first opportunity. There was an outcropping of well-eroded limestone, a couple of false entrances, and one real cave entrance just about big enough to walk through. About 10 or 12 feet in, it opened up in a pit about eight feet deep and eight feet across. There were absolutely no hand holds, and at the bottom was the wreckage of an old decayed ladder. My flashlight showed openings in the floor to the left and in the ceiling to the right, as well

as another directly overhead, but out of my reach. After unsuccessfully trying to find a way into the pit I scouted around the woods looking for a pole or something to shinny down on. But these Germans pick up every stick in the woods, so had to come away empty-handed.

Over the entrance to this cave there is a concrete slab moulded onto the rock, with the words "Cave of Urspring," some more German writing, and the sign of the SS. The following Sunday I got some rope and three other fellows with flashlights and candles and we went back in a jeep. We all got down into the pit without much trouble and I proceeded to go down the shaft to the left. There was a very narrow and flimsy ladder down this almost vertical shaft, so kept a safety rope on and descended about 15 feet. It was a plenty tight squeeze, and at the bottom it leveled out and went for another 15 feet before being stopped up with mud. Getting back up was a terrific problem because it was one of these places too tight to use your elbows and knees in. We then climbed up the shaft on the right and got into a passage where you could walk for about 30 feet. It then went straight up in a narrowing chimney that did not look practical. There were one or two other such openings in the ceiling, but we did not make any attempt to get up them and probably would not have been able to, so came out again well covered with mud, although not nearly as much so as from some of the American caves we have visited.

This is the only cave I've been able to uncover around here. However, did have a pass to Lyon, France, for five days and spent most of the time getting over to Grenoble and Chamonix to see the Alps. When you approach the Alps near Grenoble you can count numerous cave entrances along the highway. Of course, I don't know if they go anywhere, but they certainly looked as if they did. Being on the inside of a charcoal burning bus, I did not have a chance to investigate. There are snow-covered mountains around Grenoble, and I stayed there a couple of days before proceeding to Chamonix, which is at the foot of Mt. Blanc, the highest point in Europe. Spent one night there at Mt. Blanc, just living on scenery and then had to start back. It was good climbing weather and numerous parties were going and coming. It is a three-day trip to the summit and back, and takes all kinds of equipment as well as a competent guide. I realized the necessity of this when I first saw the mountain towering up to 15,700 feet. In fact, got a stiff neck just looking at it. Everything from about 7,000 feet on up is ice and snow, except where the rocks jut straight upward for a few thousand feet at a time, such as the Aguille du Plan, the Aguille du Midi, the Grepons, and the Aguille Verte. These all stick up in a row above the town of Chamonix,

and any one of them will make you reconsider wanting to be a rock climber.

In the one evening I was there, I climbed up to the base of one of the great glaciers (Glacier du Boissons). It was really just an uphill walk through the woods for about 1,000 feet, then out onto the moraine below the glacier. I was climbing up over this tremendous pile of rock and gravel when I slipped and scooted about 50 feet down a slope. It turned out that I was on the ice and didn't know it because it was covered with all this debris. Up ahead though, the ice was white and clean and about 100 feet or more thick. Since it is full of crevasses and fantastic formations of giant proportions, there was no sense in trying to go out on it alone without an alpenstock and crampons, so had to admire it from the sidelines and then start back before it got too dark. All in all, it was quite an adventure though, and did much to refresh my interest in climbing.

Meenehan's letters came along regularly and he keeps me supplied with Spanish literature. Am getting to where I can read it fairly well.

Jack Wilson,
Geislingen, Germany (6/24/45)

Notes from Nebraska

I have been especially interested in lapidary work in the past and have a fine home shop at Alliance, Neb. That is closed for the duration, however, as my Uncle Sam sent me a very definite greeting nearly two years ago . . . since that time I have spent most of my time at Fort Leonard Wood. During this time I have turned to the caves and various fields in the surrounding area for an outlet for my Earth Sciences ambition. I have in connection with my shop a small museum of cut and polished stones, and a great many Indian artifacts from that area of western Nebraska. I searched these hills for materials suitable for cutting, but found nothing; thus it occurred to me that this area should be ideal for prehistoric relics, and I began hunting some of the nearby fields and immediately began to find artifacts.

It was on one of these trips that I finally sized up the area in which I was hunting, and noticed the cave which seemed to me to be an ideal place for a shelter. I have done enough hunting with experienced people in the past to know it is not wise to molest any suitable place such as this without keeping a good record of what is found and under what conditions. Thus we started to work in the Spring Creek Cave and, before removing any of the dirt in the bottom of the entrance, we laid it off into squares and kept a written account of all we found. I also spent

some time and drew some small maps of the cave which I am sending you along with an account of our findings. This is the only cave we have molested at all, as I am not in favor of tearing them up when they may be of so much future value in reaching a clearer understanding of just what the pre-historic life was like in America. I have some fine Yuma specimens from my area of western Nebraska, but I have not had the good fortune to find any that I would term genuine Folsom points as yet. I had hoped that the lower levels of this cave might show some signs of the Folsom but none have been encountered.

The Maxey Cave mentioned in the newspaper article has been dug up badly by people years ago, as is the York Cave just a mile below the Maxey. The farmer who owns that land said that they have gotten lots of arrowheads from the York Cave. I found 26 fine points on a field just below this cave last Sunday. I send all my artifacts home and have them all labeled so I can have an accurate history of all of them when I again set up my little museum. (Let us hope that will be soon.) Inclosed you will find a written account of our findings in the one cave we have excavated. There can be more work done in this cave but we have worked the main part of the front opening where it is dry.

I hope these maps and this information will be of some use to you. I have wanted to get in touch with someone for some time now who knew about this area, and any information you can give me will be appreciated.

S/Sgt. W. R. Zieg,
Ft. Leonard Wood, Mo. (6/14/44)

[The Editor received this letter too late to go with the article "Spring Creek Cave (BULLETIN No. 7, p. 17)" by Sgt. Zieg, so reprints it here for its interest. Sgt. Zieg is now a member of the N.S.S. His article on Maxey Cave, etc., was in the St. Louis (Mo.) *Globe-Democrat* for May 20, 1944.]

An American in France

As a new member of the National Speleological Society I feel that I ought to send along something for the *Newsletter* as a token of my interest. In spite of being overseas, my interest in archeology has not waned, and I am taking every opportunity to visit sites or museums in this area. When I heard of a cave (or "grotte") near here, I decided to look it over in hopes of finding some indication that ancient man had used it. While I was disappointed in this respect, I did spend a very enjoyable half-day underground.

The cave is located on the south flank of a large forested hill called the "Montagne de Reims." The hill is a solid chalk, identical to that of the "White Cliffs of Dover." England, and lies about eight miles south of

this city. The entrance to the cave is at the edge of the town of Trepail, the mayor of which guided me through the trip. The cave entrance is sealed by a brick wall through which an iron door opens into a man-made passage into the cave proper. The underground stream which carved the cave is tapped by a large pipe which lies along the floor of the artificial passage for about 100 meters. The stream is used as the town's source of drinking water. The water temperature was about 50° F. and, as far as I could find out, contained no animal or plant life. The original mouth of the cave had collapsed so that I could not examine it.

At the place where the pipe ended the natural passage began. We followed this back into the hill for another, estimated, 700 meters. The cave was not over six meters wide at any point and was usually about two meters. The height varied from five to 20 meters. The stream was only about 50 cm. deep in most places, but occasional potholes were over a meter deep. In several places large falls of the cave roof obstructed the passage. We crawled under several of these, but two we had to climb over. One of these was six meters high and we had to use artificially notched steps in the sidewalls and a rope to surmount the vertical sides of the mass. We finally reached the point from which the water bubbled up out of a bed of soft sand, indicating the end of the passage. After retracing our steps we finally reached daylight again after about three hours underground.

No bats, snails, fish or other forms of life were encountered at any point. Undoubtedly the sealing of the cave many years ago to keep the water supply unpolluted has also served to prevent the entrance of bats, though the absence of aquatic life is more difficult to explain.

The rock foundations are all chalk, in some places covered with a glistening, siliceous coat. Stalactites and other structures were scarce. No fossils were observed and no crystals of sufficient size to recognize were found.

This is the only cave I've been able to locate so far, but I'm continuing to inquire about them and if I find more, I'll let you know about them.

I am looking forward to a return to the States in October, when I hope I'll be able to resume my archeological work there in Virginia. Here's hoping that I can get to go on a few of your field trips there. My home was in Washington, D. C., before the war, but I expect to settle near Staunton, Va., after the war, where I'll continue my researches.

Howard A. MacCord,
Rheims, France (8/1/45)

Note from the Philippines

I am in the Philippines and have been shuttling from one place to another and covered half the damn islands! It used to rain continuously, night and day, keeping everything wet and muddy; hard to keep dry, especially when the sun did not show for days. Really was miserable.

I was with the XI Corps for a couple of months and now back with the division. Glad for a change once in a while.

The people here were in terrible shape at first, and for that matter are none too well off at present; they had very little clothing or food. Sackcloth was used for clothes, and in some places they were almost starving. The Japs took everything and issued paper money—just junk.

Will be glad when this is over; gets worse all the time—was not too pleasant the last few months.

Frank Ruocco,
U. S. Army (3/14/45)

"Nurse" Miller on Kwajalein

Certainly nice to receive your Christmas greeting. I certainly wasn't forgotten during the holidays even though I'm thousands of miles away from the mainland.

Really had a nice holiday season here in spite of the tropical heat and lack of vegetation. A little of the "West By Gawd" Virginia mountains would go good here. See very little of anything green.

For our nurses' quarters we did have a real fir tree that was sent to us from Oahu. Had a few store ornaments but for the most, were homemade.

I'm tanned so brown I scarcely look like a white person. Have a daily sunbath, usually for half-hour front and back. Ultra violet ray's so intense here one has to be quite cautious or a sunburn will result. Yesterday I was exposed to sun three-quarters hour front and back and I got red as a lobster even though I'm accustomed to being out daily. Had a tender spot here and there and my face felt a little parched.

Received a holiday greeting from a total stranger, a Mrs. S. H. Gillette, Muscoda, Wis. She wrote a note on back of it stating: "In looking through my cave material I found listed your name and I take it you too are cave-minded. This is just a friendly greeting from cave folks in Wisconsin." Enclosed with greeting was an advertisement of "Eagle Cave, near Muscoda, Wis., Mr. and Mrs. S. H. Gillette, managers." I did think it a very nice gesture for her to send me a greeting.

Have missed our cave safaris and hope sometime not too distant future, all the old cavers with the new can resume where we left off.

The nearest thing to a cave on this island is a foxhole carved from the sand. As far as vegetation is concerned, it is the barest place I've ever seen. Can have fun here though—only 18 of us nurses among the multitudes of males.

When I was on Oahu I heard there were caves there, and one supposed to be quite beautiful but I never did get to see any of them.

Lived in a tent from January 16 of last year until June 5, on Oahu so I've experienced a great deal of outdoor living since I left West Virginia. Was stationed in Louisville, Ky., before coming overseas, but never any time off while there to see Mammoth Cave or any others.

The one and one-half years I've been in service, the only leave I've had was three days, previous to coming overseas.

In addition to being a Spelunker, I'm also a Short Snorter, having come down here from Oahu by plane.

2nd Lt. Lila G. Miller,

Kwajalein Island, Marshall Group (1/22/45)

Cove Cave (Ga.) Disappointing

You may be interested to know that a few weeks ago I took a trip to northern Georgia and visited Cove Cave, near Jasper, Ga. The local people there claimed that it had never been fully explored and people had been "lost in it for days"; but, as usually is the case, it was not a large cave and only took a few minutes to go through the whole thing.

My friend whose home is near there insists that there must be another cave, as he had heard stories about it for years; but we hiked all over and didn't find another one. The cave is located at the bottom of an old marble quarry which has not been worked for over 40 years. It was discovered about Civil War time when they blasted in the quarry, and my friend's grandfather said he worked there about 40 years ago. It is quite probable that at one time the cave was much more extensive, but the passages are now filled with clay. There are a few formations in the cave and many of them near the entrance have been hacked off.

S/Sgt. George H. Pooler,

Macon, Ga. (1/14/44)

BULLETIN Ed. Feels Hurt

Well, again I have changed locations. I have been up here at this "soldier's paradise" since about the middle of August. This place is heaven compared to the hot-box Mississippi! It was nearly down to 40° this evening, and did it feel good! We should be having some snow pretty soon. We have been wearing our winter uniforms since I arrived.

I guess you know that Denver is known as the "Switzerland of the U. S. A." We are in the foot-hills of the Rocky Mts., and this part of the country is unbelievably rich in geological interests. I shall undoubtedly spend most of my time (spare time, that is) on field trips. I hear there are several caves near here that are just waiting to be explored, so if conditions (and Uncle Sam!) permit, I'll be "caving" in the near future. The mountains themselves are first on my list.

Since I haven't my list of members here, I am wondering if you could tell me if there are any N.S.S. members in or near Denver. I would like to contact them, if so, and get together for a trip.

C. Sid Morse,

Denver, Colo. (9/12/45)

"Rudy" Hess Heard From!

You haven't heard from me for quite a while I guess, but that doesn't mean that I've forgotten N.S.S. and caving. I've traveled quite a bit since I left V. P. I, last December. First, I went out to southern California in January to work for Douglas Aircraft at Long Beach. While there I tried to find caves in that area, but the only ones that I heard about were on Catalina Island which is closed up now.

The draft board called me back home in May, and on June 9 I started my army career. I've just finished 17 weeks of basic training on the flat sands of Fort Bragg, N. C., in the field artillery. As we were restricted to a 75-mile radius at Bragg, I was unable to take advantage of the caves of the western part of North Carolina.

However, things are looking up now for more caving. On Nov. 5 I report to Camp Chaffee, Ark. From information that I've been able to gather about the locality of Chaffee, there should be caves in that area. And so I get to the main purpose of my letter. I wish that you would send me all of the information that you can on the locations of caves and N.S.S. Grottos in the following counties of Arkansas: Sebastian, Scott, Crawford, Franklin, and Logan. And in Oklahoma: Sequoyah and Le Flore counties.

If there are caves close enough to camp, I plan to try to start an interest in cave exploring among the G. I's there. I already have several fellows who were with me at Bragg interested and, if things work out, maybe the Army Special Service will be interested enough to help out. Don't know whether or not anyone else has started any G. I. clubs, but I have heard of non-N.S.S. members spending leaves exploring caves in Europe.

I certainly did enjoy reading BULLETIN No. 6. I think that the *Glossary* compiled by Martin and Kay Muma is a

grand contribution. I got a kick out of reading the V. P. I. articles (I feel like the V. P. Grotto is "my baby").

I was with Tommy Watts on the exploration of Slusser's Cave and still have the notes we made.

I hope that this will make up somewhat for my silence. If everything works the way I'm "dreaming" them up, you'll be hearing from me quite often. I certainly hope to be able to send in reports on "G. I. Caving" in the future.

Pvt. Ralph S. Hess, Jr.,
Fort Bragg, N. C. (10/26/44)

Here and There with Meenehan

I took a station wagon trip across the island to Ponce this past week. The roads are narrow and the mountains here in Puerto Rico make "W. By God," Virginia look almost like flatland. The valleys are all young and really resemble canyons more than they do valleys. Of course the roads have no guard rails, but then the drops off the road are only from 500 to 1,000 feet down so you really don't need them. I've been taking a number of color pictures and added a few more on this trip.

I missed out on a trip down to Dutch Guiana next Monday. I think you'd like Martinique. It is highly picturesque with the natives running around with turbans and banana stalks on their heads and the farmers in the markets selling string beans in lots of a dozen beans. I saw Mt. Pelee that blew up in 1902 and killed 30,000 people. The lava flow is still plain.

John Meenehan,
Puerto Rico (10/29/45)

Through Europe with Bischoff

Your *Newsletters* are being forwarded to me—and although they are quite old when they reach me, they are nonetheless read and re-read and thoroughly enjoyed.

Since my last writing the war has taken me, first to several states on the eastern seaboard—and then to England, France, Belgium, Holland, and Germany. But so far it has been my misfortune to always be located in a particular area that is completely devoid of subterranean phenomena. But I still have hopes of seeing one or two of the famous European caves before returning to the States.

I did pass, albeit quite rapidly, through a speleological paradise of limestone grottoes on the Seine River below Rouen. The war does not allow much time for sight-seeing or the pursuit of hobbies!

How is my old love—the Exploration and Location Committee—getting along! I suppose war rationing and transportation problems curtail its activities greatly. But there is hardly a committee which has *more* work awaiting it after the war.

Cave-hunting over here in Europe is now not a hobby, but a grim necessity for a great many of the civilian populace. It appears that the simple cave, so important to primitive man for shelter and protection from danger, still retains its usefulness and importance in the modern world. At any rate, the necessity of a nation knowing the location and extent of its caves now becomes apparent.

Let me hear from you—and keep those *Newsletters* coming.

Germany (2/11/45)

Although the war is temporarily preventing my *active* participation in speleological interests, I am, nevertheless, using a great deal of my spare time in trying to puzzle through some of the perplexing problems I encountered in pre-war days. I am somewhat handicapped by not having my notes and records with me, but at least I can work on the more general questions.

In this connection, I would like to submit the following two "ideas" for your comment and criticism—and for that of any other of the cavers who may be around.

You may remember the short debate I had some time ago with Martin Muma on the question of classification and definition. This subject is still of great interest to me, and I consider its solution quite necessary to any worthwhile future work in the speleological field. The necessity of arriving at a definition of what is, and what is not a cave, is apparent the moment we even begin to think of classification. And that there is a necessity for classification if we are to bring order out of the chaos of subterranean phenomena, I believe you will agree. I am not acquainted with the results of Mr. Muma's questionnaire on definitions, and it may also be that something has been done in this connection since my leaving for the wars. But in the absence of such information, I must suppose that things remain as they were.

First, for my proposed definition: A "cave" is: any naturally formed opening in the earth, capable of providing shelter from the outside elements, and accessible to man. This definition supplies, I think, the three main requirements of a cave (1) that it is a natural phenomena, and not man-made; (2) that it is large enough to be accessible to man; and (3) that its depth, size, and formation be at least of a degree sufficient to provide shelter from the ordinary outside elements of wind, rain, heat and cold. This third point is necessary or we shall be forever confused over the question of "pockets," "hollows," "crevices," and spaces under overhangs of cliffs or large rocks. I am still not at all satisfied with this definition, however, and I look forward to your comment. Should the word "rock" be substituted for "earth" to make it more specific? Is there something missing?

Second, for my proposed system of classification. After discarding most of the other systems of classification I tried, with some success to classify according to type of rock. But even under major headings, this system threatened to become too long, contained too many combinations and exceptions. I also came to feel that the "process of formation" was, after all, the most important factor in determining any cave's type and peculiarity. The result is on the attached sheet. Please give me your opinion of it.

Somewhere in Germany (2/15/45)

[I am glad to see that you are able still to think a little about caves.

From your letter of Feb. 15, I take it that you have not as yet received your copy of BULLETIN No. 6, wherein Muma's glossary was published as a special article. He did a fine job, but it is just a start. Many of the definitions will have to be revised later in light of how the membership accepts them and how they stand the test of use. Anyway, we have at least our present definitions of most of our commonly-used cave terms. You will note that Muma's definition of a cave is practically the same as yours, but I like yours better as it is shorter. I still wonder, especially in view of the now common practice of calling any hole in the ground a cave by the newspapers (as "Japs driven out of their cave by U. S. Marine," "Jap sealed in cave"), if the term "cave" is not really generic and should be modified for our use by the word "natural"? Also, young boys often dig caves; abandoned mines have been referred to as caves and are studied by the British and New England Speleologists with the same vigor as natural caves. Many English caves are associated with mines. In many British Speleological reports it is hard to determine if they are speaking of a true, natural cave or abandoned mine. Also many caves are enlarged for the purpose of mining both in England and here in Virginia—as Ansalt Peter Cave. Lost John, one of the most famous of the British wild caves, is half mine and half cave.

I am sending a copy of your classification of caves to the chairman of our committee in general geology and on Formation and Mineralogy. It looks O. K. to me.*

W. J. Stephenson.]

Holland must be the place where all bad speleologists go when they die. For, to the best of my knowledge, after considerable research and traveling about, there is not a single natural cave in all of the Netherlands! For a while I had imagined it would be a cave-hunters' paradise—especially Limburg province and the "Realm of the 77 Caves" stretching from Maastricht to Heerlen. But

*See page 56.

alack and alas, every one of these caves has been dug out with human labor—and not one of them natural! Recently I ran across the following statement in a book, *This Is Limburg*, by Mathias Kemp (Lavigne translation): "Some years ago, mysterious sketches were discovered in one of the few natural caves under the ruins of Netherlands' only hoogburcht (mountain castle), the Diingel, at Valkenburg." So this week I paid another visit to the Netherlands to check on the Valkenburg cave. I talked to Father Wolf, the local priest who is an authority on the caves, and he said flatly: "What the book says is a lie—there are no natural caves in Valkenburg, and none in Limburg." He went with me to the cave in question, and others in the area, and satisfied me that they could not have been, even originally, natural caves.

But every disappointment has its bright side—and my tour through the Limburg man-made caves proved as interesting as any exploration of natural caves could have been. Begun by the Romans under Caesar, and since developed by thieves, artisans, religious refugees and even political refugees of the Dutch underground during the recent German occupation, they are of a complexity and largeness that would amaze you. The soft marlstone in which they exist is, of course, an easy medium. Artifacts and bones of prehistoric animals have been found in the stone. The walls of the caves are decorated by charcoal paintings made by various artists throughout the centuries. So extensive are the caves, that one could wander for days in the maze if one got lost.

So far bad luck has dogged my footsteps in European cave-hunting. I paid a visit recently to the "Teufelshohle" (Devil's Cave) near Steinau in Germany, a cave reputed to be quite extensive and filled with beautiful dripstone formations—only to find after penetrating about 50 feet of the entrance tunnel that the ceiling of the tunnel had collapsed, blocking further progress. This collapse was evidently the result of concussion from nearby bombing, as the field near the cave is pockmarked with craters.

I have map locations and statistics of some 30 other German caves, so if I am here long enough perhaps I shall get into some of them. If I am lucky, I shall let you know.

Wachtersburg, Germany

There are two famous caves in Belgium which I have always wanted to see—the one at Remouchamps and the one at Rochefort. I had to make a choice, so I picked Remouchamps—and I'm not sorry. This cavern, "La Grotte de Remouchamps," is one of the best I have yet seen.

It is located in the little village of Remouchamps—about 10 miles from Spa, and I have spent the better part of

the last three days wandering about in its complicated interior.

Before the war the cave was quite a tourist attraction. There is a hotel and restaurant at the entrance, and the cave itself is well developed with graded paths, staircases, bridges, etc. There also was an extensive electric lighting system.

Now everything is abandoned—the guides are gone; the lighting system is broken; and while the cave is still owned by the "communal," there is no one in charge or responsible for it. Consequently, I had to do my own exploring, aided by two gasoline lanterns I borrowed from an army post near here.

After the first day I had sufficiently traced the main passages so that I would not get lost. I contacted the American Red Cross, and they sent out several truckloads of soldiers. For the following two days I guided them through the caverns in groups of 13. Always wanted to be a "cave guide"—and this was my chance to have some fun!

My equipment, of course, was too limited for any exploration of the more difficult passages, or for a survey of the main part of the cave.

The entrance is not spectacular, the opening being 15 feet high by 20 feet wide. The passage turns sharply left and down to meet the waters of an underground stream. This stream empties into the Ambleve River in the valley beneath. There are old wooden boats there (now broken) formerly used for navigating the underground river. The passage then turns up and away from the river, passes through many large chambers, and then dips steeply down to meet the river again in an immense chamber. I could not see the ceiling even with my two lanterns or a flashlight!

There are numerous side passages, some of which were blind alleys, and some continued for so far I had to turn back.

The cave is full of excellent formations—notably stalagmites, fluted ribbons, and masses of flowstone. Predominant colors are gray, white, and tan. There was an unusual absence of stalactites—I did not find one well-developed one.

The cave is otherwise a typical limestone solution cavity. It exists in well-defined strata, the tilt of the strata being about 45°.

This is truly one of the best caves I have seen. I wish I could spend another week here.

The person responsible for the exploration of the present known portion is "M. Rahir"—noted for his surveys of the "chantoirs" in this area.

Since I expect to be returning to the U. S. this month, this is apt to be the end of my European cave-hunting.

Good luck to you in your own caving, and "keep 'em crawling.

Erwin Bischoff,
Spa, Belgium (7/14/45)

From Members at Home— Even for Insects It's Bad!

Getting down to business about caves. The specimen I brought home from the last trip was taken from Trout Cave. It was a fossil rock taken from the ceiling about half way through the main passage. It was composed of shells imbedded in limestone. The reason for my donating it to the nature club was to create interest in our work. I think it has done what it was intended to do, as I will explain later.¹

If you think it should be turned over to the Society for identification just say the word and I will see that it is done. I collected some spiders and crickets also while on that trip. The most of these were turned over to Petrie to be given to Martin Muma. The remaining few were left in Sam Allen's car by mistake. When he found them they were in rather bad shape. I had no alcohol therefore I used carbon tetrachloride. I find this has the tendency to dismember the specimens if handled roughly. I haven't tried to buy alcohol lately, but if it is anything like the whisky we have to drink nowadays it would burn up anything one might put into it.²

Sam Allen gave a lecture at the nature club last month. He used Duckey Thompson's pictures. He put the Society over in a big way. At that time we talked of a trip to the caves of West Virginia. It is our plan to start Saturday, May 12, about noon, spend the night in Davis, then take in some cave not too rough for the first. Then, if possible, one that has not been explored.

I had a letter from Lila Miller last week. She thinks the training she is receiving now will make her a better cave explorer. She is stationed in the Hawaiian Islands.

Jim Beard,
Pittsburgh, Pa. (3/13/44)

Maybe a Grotto of Girls?

We recently took a group of Bryn Mawr students, ranging from freshmen to graduate students, to Aitkin Cave in Mifflin county, Pa., and spent three days mapping the more accessible portions, by way of a mapping problem. Interest in spelunking is now running high here, though we're rather distant from any good caves.

Eugene S. Richardson, Jr.,
Bryn Mawr College,
Bryn Mawr, Pa. (1/5/45)

¹The Society desires to keep track of all specimens collected on trips. Such disposition as Jim here made is excellent, so long as proper record is made of the disposal.

²No doubt many specimens have had same experience.

Another One We're Waiting For!

I have already completed an article, quoting what Dr. White says of the paleontology of the Appalachians, connecting his observations with the findings of Frank C. Hibben in his article "In Search of Lost Americans" that was published in *Harper's* July, 1944. You will also be interested to know that I am making a study of folklore and caves from the standpoint of literature. I have completed my researches in Greek Mythology—and am now proceeding with the Scandinavian and Welsh. I am making out a card index listing all the standard poetry and prose that contains thematic and direct reference to caves. It is an amazing list. Also in the standard repertoire of sung operas four of them have cave scenes.

Felix G. Robinson, Pastor,
Arthurdale Community Church,
Arthurdale, W. Va. (8/15/44)

Neville Sets Us Right

BULLETIN No. 6 is a very interesting number. The "Glossary of Speleology" by Dr. and Mrs. Muma is very comprehensive, and something that adds to the permanent value of our hobby. It must have taken a great deal of time, and I know it took an immense amount of skill to prepare this. They deserve the thanks of every speleologist for their work.

Friend Clay Perry writes interestingly, but I am afraid he took rather a generous bit of "reporter's license" when, on page 52 of this BULLETIN, in referring to my cave work, he makes some statements which of course are preposterous. I never have cave-crawled for over 5,000 miles, and I never have traveled underground over 25,000 miles. The item about the number of cave photographs is about as correct, an understatement perhaps rather than an estimate too large. Again, on page 67, of this same BULLETIN No. 6, Perry goes off the deep end when he states that at a lecture at Westfield, Mass., I told my audience that kodachromes could not be taken in a cave. I never in my life made such a statement to an audience. I know better, as I have been a photographer, amongst other things, ever since I was a small kid. I have taken and I have helped take kodachromes in caves.

What I did say then, and what I have said to audiences many times, is that "colored movies are not at this time practical in caves." That's why I used hand-colored lantern slides of standard size. I do not like kodachromes for an audience showing. They're fine for home showing; but when you get before an audience of several hundreds or perhaps, two or three thousand, they just don't fill the bill.

That's my idea of it, at least. And I still stand on the

proposition that *cave movies* in color are not within the use of any ordinary individual at this stage of photographic development.

I will appreciate it if you will correct these erroneous statements made, I am sure in good faith by Perry. But they make my work look foolish to any one familiar with cave conditions and cave exploration work.

Mr. Perry published a very fine article, with the usual number of misstatements, but on the whole a very fine article, in the *Saturday Evening Post* a few years ago. We furnished him with much of the material he used at that time. We like Mr. Perry, he's our friend—even if his statements sometimes do make us appear foolish to knowing ones in cave work.

R. T. Neville,
Kewanee, Ill. (11/25/44)

Article to Come on Cavern Development

Some time ago I had a note, referring to some remarks by Erwin Bischoff, in which it was urged that I prepare an article on cavern development. I replied that I would make the effort, and submit it to you for possible publication in the BULLETIN.

I have quite a lot of data on subterranean drainage in relation to the karst areas of Indiana and Kentucky, and these data relate to cavernous routes of water discharge of diverted surface waters. My letter to Bischoff was written chiefly to give him information on the Sloans Valley cavern system concerning which he had sent out an inquiry. He had remarked, incidentally, that the system was supposed to represent an excellent illustration of the Davis concept of deep groundwater cavern development. Since I have made a careful study of the cavern system, I was able to give him some information on the system; and, in addition, I made a number of comments on cavern development which are adverse to the Davis concept.

In the article which I intend to prepare for the BULLETIN, I shall set forth the conception of cavern development by waters diverted from the surface to underground routes. I believe that I shall be able to make it of interest to the readers of the BULLETIN as well as present some aspects of cavern development which are in harmony with processes at work in cavern development and not so dependent upon theory dependent upon old, abandoned, and partially fallen-in caverns long removed from the process which developed them.

I am much interested in your section "Random Notes" in the BULLETIN. It should be an outlet for some very interesting items, whether considered alone, or as they may contribute to cavern features and relations as a whole.

Clyde A. Mallott,
Bloomington, Ind. (2/10/44)

Do You Spe-lunk or Spe-lunk?

(To Dr. R. W. Stone)

Wilson College has a new word and we owe it all to you. I received your two copies of the bulletins of the Department of Internal Affairs as I was on the way to class. The first paragraph on the caves was quickly read and the word "Spelunker" tickled me so much that I thought I would ask my class how they would pronounce it.

I wrote it on the board and asked for suggestions. Spe-lun'-ker' and spe'-lunker were the two methods of saying it which came out of the discussion. Now I am to ask you which is right or what it is, if not one of these.

Of course they wanted to know what it meant and I read them the second paragraph. Some were so interested that they wanted to tell of their experiences which took us a bit away from the subject of the lesson which was bacterial metabolism. When I reminded them of that they said that a study should be made of the bacteria in caves,¹ and now that I have had a chance to read the whole article, I see that no mention has been made of that aspect of speleology. Just a suggestion.

Elizabeth Peabody,

Wilson College,

Chambersburg, Pa. (11/18/44)

(To Miss Peabody)

Dr. Stone has passed on your class' suggestion regarding study of bacteria in caves and request for information on pronunciation of "spelunker."

Inasmuch as the last is a coined word, "I reckon" (acquired Virginianism), anybody may pronounce it as seems good in his eyes. Inasmuch as its root word has the accent on the "lunk," I keep it there myself and don't recall any general use otherwise. Anybody who prefers De'troit might like spe'lunker better. I believe Clay Perry, of our Folklore Committee, or some of his New England group, originated the term: at any rate he would be an excellent correspondent. Some of us proposed a disguised telegram once signed "S. P. Lunker.

J. S. Petrie, Sec.

Welcome "Report" Type Letter

I had a card from Professor Graybill and he has already started to get the folks interested up there in that county. He gave us a very good writeup in their weekly county paper. I am going to try to get up there this weekend and have a talk with him. Also talk with Mr. Argabrite and see if we can locate that cave with the saltpeter vats in them.

¹Here is another field for some of our Society to tackle. Back in 1940 Dr. (Bill) Welch was planning to start such a study. Wonder what happened to it.

If I can, then will get one moved into town and in the City Museum with our card on it. It will be a good boost for us, and keeps us in the minds of the people.

Mr. Cilly said something about a cave under his home at the cliff we looked at. Maybe that could be part of Davis Cave. I am going to find out one of these days and I will let you know. I think he is wrong about where the water comes to the surface.

Will tell you more later; will also give you a few more directions of caves. I am trying to follow a lead on an ice cave in Ice Mountain that I heard of this past week. Have a couple of letters out to those who are supposed to know about them.

George Dare,

Charleston, W. Va. (1944)

Stone County, Mo., Caves

Writes Dr. A. C. Burrill: "In rummaging around in the literature, I have noted these two articles which may not be in the Speleological Library, and are certainly not in my scrapbooks. The first is an article in the *Joplin Globe* of which a reference is given in the *Missouri Historical Review* for 1927. The article cited, 1927, page 317, is entitled "Traditions of Stone County Caves Recalled" in the newspaper for March 1, 1925. This article may also interest Mr. Clay Perry. Ovid Bell, a well-known editor of Fulton, Callaway county, Mo., writes an article entitled "Pioneer Life in Callaway County" in the *Historical Review* for January, 1927, on page 160. It says, 'Here in Callaway the pioneers made their own powder at the saltpeter cave near Portland.' This was the first I knew of a cave so near as five station stops, east on the other side of the Missouri River valley where we are. I don't have access of the first, but I have a magazine of the second."

An "Add" from Ward

I note in the latest *Newsletter* the comments regarding my Kentucky trip, from which I returned only recently. I left here on August 2nd by bus, arriving at the Caverns on the 3rd. Had a fine time there, but missed our old gang. The Doctor is very busy finishing the enlargement of his home near the caverns. Travel is very light, with only an occasional visitor to the cave. On account of the lack of labor, no work has been done in cleaning out the tunnel off Rock Hall. We got into the second room from the end of that tunnel the day after you folks left last August. The new cave can be seen far ahead, where the floor dips in elevation, beyond the present reach of man, all of which can be seen through a mass of shining stalactites in a wide passageway too tight to crawl through, even if the formation was broken away. The floor will have to be lowered, but before that is done,

the tunnel will have to be cleared of the present excavation now partly filling same, to make way for that which will have to be carried away from the new sub-avenue. All of this work will probably be done just as soon as labor is available; new tracks will have to be built, and a new dolly constructed, etc. At least, we know the new cave lies ahead and that is something to look forward to.

George Parke met me at the caverns Saturday, August 5th, and took the bus back home with me on the 8th. I sure was glad to see him, as were the Rowseys also.

Sunday, August 6th, was spent in exploring. We visited a new cave, or rather the "beginning" of one, near Mystery Cave. It was a very tight crawl and a tighter squeeze downward through a crevice, that brought us into a very interesting room, about 30 feet below the surface. Lots of formation and flowstone. A hole at the lowest elevation in this room, leading straight downward, with the aid of a rope, made possible the entrance of several members of our party into a lower room. Parke did considerable probing down there, and thinks he found the entrance way to a lower level. We lacked time and equipment, however, to make further progress. Work is being done at this site, however, by a couple of local boys, and perhaps sometime in the future, we may have the privilege of entering another such cavern as Mystery Cave, which I know you will never forget.

A friend of the Doctor's was visiting him from Omaha, and so of course we had to make another trip to Mystery Cave. It seemed wonderful to again crawl into that great room. It reminded me of our visit there last August, when you, Petrie, and Steve were with us; also the other folks from Richmond. The room was the same as when you visited it—such places are not subject to time or change, where ages pass unnoticed, in silence and in darkness and in hidden beauty.

Late that afternoon, we visited Dead Goat Cave at the top of the large hill, in back of the caverns. Parke discovered a new room while we were there, and we had a lot of fun in that most unusual cavern at the top of the hill.

Monday and Tuesday was spent helping the Doctor at his house. George and I did quite a lot of painting, which was of quite some help in these days of labor shortage. Every evening, however, we took a walk after supper, through the cave, and believe me we appreciated the 56° temperature after a day in 97° temperature in the upper-world.

The Doctor's copy of BULLETIN No. 6 was delivered the last day I was at the caverns. We all appreciate your publishing the story, and shall look forward to BULLETIN No. 7, when the continued portion will be also published.

We thought the glossary by Doctor and Mrs. Muma was most complete and enlightening. The BULLETIN was very fine and I believe it is one of the best yet issued. Please extend our congratulations to the editors.

L. E. Ward,
Toledo, O. (8/16/44)

All About Mark Twain Cave

Needless to say, anyone interested in caves and caving would not want to lose association with the N.S.S. . . .

My father, E. T. Cameron, for many years owner of Mark Twain Cave, passed away last January. He had been guide and operator of this cave for more than 50 years. We believe it was the first cave in Missouri, and one of the first in the country to be opened to sight-seers. Shortly after Mark Twain wrote *Tom Sawyer* in 1876, the cave which had long been explored by local enthusiasts began to attract visitors from a distance. Many were afraid to venture in without an experienced guide, and one John East began to conduct parties through the cavern. On this card you requested a story of Mark Twain Cave and I would be glad to prepare this any time you desire. It might interest you to know the cave was mapped by a geology class from the University of Chicago under the direction of Prof. J Harlen Bretz.

The writer discovered a cave near Mark Twain Cave in 1925, which was also mapped by three former students of Prof. Bretz who are now geologists for the State of Illinois. They are Paul Herbert, Mr. DuBois, and Mr. Johnson. This cave is several miles in extent and, like Mark Twain Cave, is a winding network of passages in which the uninitiated might well get lost.

I have shown the BULLETINS to many people. Also have approached several local men about becoming members of the Society.

Am looking forward to the next BULLETIN. It might interest you to know that I plan to use the article by Jo Chamberlin, entitled the "Netherland of Night," to entertain at a luncheon club to which I belong when it comes my turn.

Archie K. Cameron,
Hannibal, Mo. (11/6/44)

Our First "Proposition"

I will try to see that your party has a chance at the Knox Cavern. My health does not permit my work in it now; it was closed last year, and most of the time in '41 and '42. Will be glad to give your party free access.

I have a plan to turn a farm "said to have a cave" into a Spelunker's resort. My idea was to open the farm to the public for a small grounds admission, have N.S.S. mem-

bers to make it a summer camp, and open the cave for pleasure. The farm joins Knox Cave lands.

The story of this cave follows: Location upper Coeymans, dry cave, formerly entered by a pit, first room large with dry clay floor, rock shelf on left. An elderly man came to me and said that when he was 18 years old, the owner of the land hired this boy and his father with oxen to roll a large stone into the cave mouth to close it because the public was tramping down crops in going to the cave. The old man said that he visited the cave many times; and that the day they closed it, he counted 12 human skulls in the clay floor, saw the skulls of animals with horns not like cow horns (prehistoric bison by his description), and that there were a number of stone tools or implements on the shelf.

My idea was to have Clay Perry write it up. I meant to open a local museum in a barn on the farm, and charge admission to the farm. Then, after paying to go on the property, to let the public explore at will, picnic, see the museum, and do as they like until cave is actually open. If there is a worthwhile cave, an extra charge could be made to see it. The whole plan would be handled by the Spelunkers who were there on vacation.

D. C. Robinson,
Alramount, N. Y. (4/22/44)

News Notes on the Glossary

As a matter of interest to you and other Society members in the East, Kay and I have been doing some constructive thinking in regards to a revised glossary. We plan to:

1. Include foreign terms in our revised glossary. These will in all probability be in separate sections in the final form. To this end we have written John Hooper in England for information concerning speleologists in Europe who might be able to provide lists of terms. We will also, of course, follow up any and all library references in this country that we now know of or that may be suggested to us.

2. Include illustrations, in so far as possible, that will clarify definitions. More obvious illustrations will, of course, be drawings and pictures of formations, phenomena, equipment and so forth. Less obvious illustrations might take the form of diagrammatic explanation of theories. We would appreciate the assistance of specialists in the Society in this matter.

3. We believe that the revised, more extensive form of the glossary will best be published as a separate volume from the BULLETIN. We plan, in this respect, contacting a publishing house in New York City, whom we understand specializes in the printing of dictionaries and glossaries.

The above ramblings should assure you that we have not lost interest in the glossary or for that matter in some good old spelunking. The latter, we intend to indulge in, next fall during vacation.

Kay and I have taken advantage of an opportunity to duck into a small sandstone cave of particular historical interest here in Lincoln. We are writing a report of the cave for the next issue or two of the BULLETIN. Please give our regards and express our jealousy to every cave crawling friend in the East.

Martin Muma,
Lincoln, Neb. (9/26/45)

Data on Georgia Caves Coming

No doubt you have been interested in the caves of Georgia along with those of other states.

We should like to learn what detailed and published information may be obtained through you, as we are making a catalogue of this type of natural phenomena in this state.

Certainly we shall want to have Georgia caves listed, and a study is being made of this subject now. Within a few weeks we hope to have a complete list of Georgia sites with descriptive information to send you.

Lee S. Trimble, Panel Director,
Ag. and Industrial Development Bd. of Ga.,
Atlanta, Ga. (11/9/45)

Ala. Geologist on "Ground Water"

It was nice to read over the *Newsletter*. Maybe one of these days I can get back into normal things and be of some use to my favorite Society. I do expect to spend a week or two scraping off buttons in north Alabama during October. I shall attempt to corral some of the nearby speleologists as soon as I am able to work up a schedule for the trip.

One of these days I will try to make up a complete list of Alabama caves and send it in. I have more or less thoroughly explored 107 caves. I want to revisit a few of them. I have at least 50 others to get into. Each time I go to a new one, I generally find one or two more. Actually, I guess the business is an endless one, where infinity can only be approached and never reached. My interest in caves, of course, is more geological than zoological or esthetic. To me, the most important single item about any cave is the history of the movement of ground water which formed it in the first place. Through our study of caves we are getting a tremendous lot of information with respect to the movements of ground water. As you know, there is not as much water in the ground as formerly. We must first establish the trend

before we can inaugurate corrective measures. I know of no single way in which the record can be better completed than through a sustained study of caves. Therefore, in addition to the genuine pleasure which all of us get, we can point to a very practical application of our work.

Walter B. Jones, (Alabama) State Geologist,
University, Ala. (9/7/45)

Top Caver in N.S.S.—Who, Then?

Enclosed find check for life membership, cave knapsack, and insignia. I have enjoyed the *Newsletters* and *BULLETINS*. They bring back many interesting memories of the carefree days before the war when I covered most of the caves in New England and New York State, with several in Virginia and Pennsylvania and other parts of the country from little bears' dens to Carlsbad, with even a few old mines and a sewer thrown in.

I have not covered much abroad except in Bermuda, some of the grottoes in Italy, the most colorful caves in the world in England, and the huge grottoes of Han in Belgium.

Until the war is over I'm trying to save gas and spend my extra energy with the Red Cross, servicemen's hospitals, War Bond drives, and other efforts to speed the victory. Then hope to do some spelunking again.

Roger Johnson,
South Hadley, Mass. (10/7/44)

Excerpts on Several Matters

Here is a clipping from a local paper of two nameless (?) caves in Boone county (where Ashland is), bequeathed by an 85-year-old Negro (see p. 53) to the county for picnics and outings. Maybe this is nothing unusual, and the caves unimportant as scenic points, but furnish a roof from storms.

Doubt if Bob Morgan had a copy of commercial cave list sent you recently, so I enclose another for him or whoever needs it most.

From a letter of Nov. 5 from retired Curator of Wisconsin Historical Museum, Chas. E. Brown, I glean:

"Missouri Cave Bill No. 492 read with interest. Its provisions for cave inspection are very good and I trust it will soon become a law. It promises to be very beneficial both to cave visitors, cave owners, and employees. Other states should enact similar cave inspection laws."

He adds a term "subterranean museums." Has that been used before? Thus: "In our state we have at present but two caves which are open to the public as subterranean museums—the Cave of the Mounds, at Blue Mounds; and Eagle Cave, in Richland county. Both are well lighted; and provided with protective furnishings such as are mentioned in the Missouri bill.

"You may be interested to know that my good friend of many years' standing, Walter C. English, of Wyocena, Wis., has just died. He was our cave authority, having at some time or other, visited every cave of consequence in southern and central Wisconsin.

"You may also be interested to know that our friend, Dr. Alonzo W. Pond, has retired from the management of our very best developed cave—the Cave of the Mounds, at Blue Mounds. In its best years, before the war, this cave, rich in features of geological interest, entertained over 100,000 visitors annually. The cave managers, Brechler and Hannemann, are now running it themselves."

A. C. Burrill,
Jefferson City, Mo. (11/9/45)

Anybody Find a Jawbone?

(From a letter to William Bowman, Ruby Falls Cave, Lookout Mountain, Chattanooga, Tenn.)

It seems as if we will always have trouble with that man in the lower cave. I find that I must have left his jawbone which we dug up this last time, with you, as it was not in the car upon my return to Richmond. The last I remember concerning it was unwrapping it from the papers and showing it to one of your guides over by the glass top counter. I wouldn't be at all surprised if, in the rush, I went off and left it there. I hope you found it. If so, will you pack it in some raw cotton or the like and send it on to me.

Last week I checked with the Museum concerning the main skull, and they seem to have misplaced that—a regular comedy of errors. They are sure that it is there someplace, but is misplaced or wrongly identified. If we can forward the missing jawbone, it is very probable that they can locate and identify the skull by matching the jawbone.

W. J. Stephenson,
Richmond, Va. (11/21/45)

From Hell—to Hole

I am home for good—unless an atomic bombing carries me away again. (I am still searching for a very deep and fine cave in this country. It may be useful some dark day.) I've been in both wars and feel I've had enough.

I may get the postmastership in Charles Town. Have my hat in the ring.

I started my terminal leave on October 13th and took my time driving home from Battle Creek (Ft. Custer), Mich.

Several times passing through Ohio near Bainbridge, on U. S. 50, I had noticed signs telling of "The Seven Caves." So, upon leaving Cincinnati one morning, I determined to see them, as they are only a mile out of the way.

I drove in and found only Mr. and Mrs. A. G. Chaney, the owners, on the property. They said I was the first member of the Society ever to come their way. Chaney is a fellow member, and they were most courteous. After a nice chat, Mr. Chaney showed me 'round.

It is a fascinating spot. Just about everything nature has to offer is cooped up there in several hundred acres, huge chasms, a lovely river, cliffs, woodland, beautiful trails and an ideal place for a picnic and let the children wander and play.

They have a "serve-yourself" method of viewing the caves. Placards with press buttons tell you what that particular light will show and you do your own pressing. It's real fun.

The caves are small but interesting. There are some small unexplored holes Mr. Chaney has never followed up. I told him I hoped some members of the Society might come that way some day and look into them.

If they do go there, they shouldn't expect too much in the way of cave exploring; but I'll guarantee they will feel amply repaid by the natural wildness, beauty, and charm of the place.

Mr. Chaney is an ardent member and needs cultivation.

I'm trying always to locate some interesting holes and a real cave or two. Thought I had a huge one located recently. A man told me up near Middleway, W. Va., close here, that his iceman had been in a cave—hard to get in—but once in, a horse was needed to get 'round. Finally ran down this man shucking corn and found he had been in the Dead Dog Cave. Remember it? Not large at all.

The Ohio Caverns and this series could stand some looking into. When I saw the Ohio Caverns in '43, I thought some holes looked very interesting and that the cave proper might be back further under the hill.

Major Thornton T. Perry, Jr.,
Charles Town, W. Va. (11/12/45)

Notes on New Membership

Since the annual meeting last January I went courting, became engaged, married, went on a honeymoon, moved, and set up a new household. Since things have settled down a bit I have been giving more thought to N.S.S.

It has occurred to me that we have within our group a store of knowledge concerning membership which we might find very helpful in increasing our membership. I would like to ask every member how he heard of the Society and what influenced him to become a member.

Experience tells me that if such questions are put in a form requiring much thought or writing, the percentage of replies will probably be disappointing. Therefore, I

would like to suggest a questionnaire in a form requiring checkmarks only, while leaving some space for remarks concerning points not otherwise covered in the form. This questionnaire should be arranged so that it need only be checked, torn off, and mailed. A suggested questionnaire form is enclosed for critical comment*. I would suggest a folding postcard for the questionnaire if the necessary questions could be arranged in the limited space.

In the meantime, I am ready now to start corresponding with such prospects as you may be able to send me. It would be helpful to me to know all the actively functioning grottoes and their officers, particularly the chairmen of their membership committees, so that I can refer local prospects to the right people. I believe that a personal contact can be much more effective than any amount of correspondence. (This opinion might turn out to be wrong, but until we know it is, I intend to emphasize a personal contact whenever possible.)

We have hurriedly planned a field trip for the week-end of August 11-12 to get information needed to complete the mapping of Mystic Cave. You said that measurements had been completed in Blow Hole to the duck-under. I understand that you mean the first crawl in the stream. We'll tackle Blow Hole after we finish Mystic, probably on a later trip. This trip will be strictly a work trip, although I hope to make some contacts concerning membership in Elkins, either coming or going.

An article in the last *Newsletter* headed, "Information Wanted on Limestone Mines," suggests another sizeable job for our local group. We have a number of abandoned clay mines along the Ohio River Valley which appear to have been cut from solid rock and have no timber supports. No great changes are apparent in the years since these mines were active, and they will probably remain essentially unchanged for many years to come.

Sam H. Allen,
Steubenville, Ohio (8/3/45)

For Details, See Elsewhere

Dr. Kirby-Smith, Dr. McCrady and I have for some time intended to submit articles for possible publication in the *BULLETIN* but have neglected to do so because of the common human failing of putting things off. Dr. Kirby-Smith and I have short articles written which were read before the Tennessee Academy of Science last fall and have intended for some months to send these in to you but have been waiting for a companion piece by Dr. McCrady who did not have his talk typed at the time. All of the articles are on the caves of what we call the Sewanee Cave area, Dr. Kirby-Smith's concerning the formation of the caves, mine about cave formations, and

*Never reached Ed.

Dr. McCrady's to be about Cave Fauna. We will try to hurry McCrady on this and get these in to you soon*. I also intend to write an account of a very unusual, possibly unique, formation or rather type of formation which we discovered in Higgenbotham Cave some months ago. I may have to illustrate this with drawings as I don't believe photographs could show the structure.

We are beginning to photograph our finds but are not having a great deal of luck so far because we are not very familiar with photography under cave conditions.

We believe we have in the Sewanee Cave area one of the world's really great opportunities for original cave study because we have a large number of caves, possibly hundreds, of many types somewhat different from caves in most of the other cave areas. Our caves most nearly resemble those in the Missouri-Arkansas area, and exhibit a great variety of conformations—all of the known ones, and contain a relatively unknown fauna.

I suppose you have been told of some of our discoveries. To tell you the truth, I am a little afraid to write much more because you'll be sure to think I am making up all these finds out of my own imagination. Indeed, it seems unlikely even to me that we could have made all of the remarkable finds we have in so short a space of time: the helictites, the new genus and species of salamander, the incompletely identified skeleton of the Plistocene cat, etc.

Just to give you an idea of the opportunities we have here—day before yesterday we explored a previously unexplored section of a well-known cave. We found countless specimens of our common cave crawfish, including typical outside specimens and an interesting type about half-way between in color and conformation; dozens of our one known blind cave fish. In addition, we collected two specimens of a salamander which Dr. McCrady is certain will prove to be a new species of the same new genus mentioned above; and we saw a new blind fish which we could not catch. This fish was nearly five inches long, perfectly white, and will certainly be a new Tennessee fish if not a new genus or species.

The Plistocene cat mentioned above was at first identified as a sabretooth tiger, but latest information seems to show it to be *Felis Cetrox*, a much more important find. Of course, reports of such finds would be of extreme interest in the BULLETIN and I am very sorry I have been unable to make reports on them. While in a way the discoveries belong to the three of us, they really belong to Dr. McCrady; and, as a true scientist, he is very conservative about having anything published until he is absolutely sure of his ground. He has done an immense amount of work on the new salamander and will soon

have a report, probably in *Copeia*. The complete study of the cat remains will probably have to wait until the salamander question is settled, and this is now complicated by the discovery of the new species mentioned above. This is an attempt to explain why we are so slow in reporting these discoveries. Also, the fact is, we find so much stuff we are swamped and hardly know where to begin in either study or reports.

Dr. McCrady is, as you know, a new member of the Society and is very much impressed with the excellence of the last BULLETIN which is the only one he has seen. We can undoubtedly prevail upon him to give us some real articles for it, whenever he can find time, since he has such a high regard for it.

Harvey M. Templeton, Jr.,
Winchester, Tenn. (4/17/45)

On a recent cave trip (see Templeton letter above) we found what is apparently a subspecies of the New Salamander. In addition, in this cave, were innumerable blind crayfish and blind fish—*Typhlichtys*. We also saw, but did not catch, two six-inch white fish which were probably *Amblyopsis Spelaeus*. I don't believe these have ever been seen around here before.

As I sit writing this, by my side is an aquarium in which I have four *Typhlichtys* and three blind crayfish. One of the latter has just shed its old skin and is now beautifully white. Its heart beat is 72 per minute.

I certainly wish that some of the other speleologists could visit our cave country, for I can assure you that we have wonderful types of caves here.

Henry T. Kirby-Smith,
Sewanee, Tenn. (4/20/45)

"Sunday" Notes from Missouri

I think the last Board of Governors minutes show considerable progress going on. I was pleasantly surprised to find my name on the temporary committee, and straightway wrote Chairman Harry H. Wilson by way of introducing myself.

I wonder, does Capt. Hefferan of U. S. Army Air Forces know that President Roosevelt appointed a Committee on the Conservation of Cultural Resources, that they supposedly secured WPA or other help, and made a survey of mine and cave storage facilities in the U. S. Was this microphotographed on film, and stored in the WPA or other U. S. archives like so many of the WPA records?

A letter from Asst. State Geologist Groskopf informs me Dr. Buehler's cave measurements have never been organized, and this would be a good time for such a survey if our Society should initiate it. Supposing the army wants this data for another war, or to hide cultural objects

*Still waiting for it. Ed.

in, in case of atomic bombs or what not—why should we lag one step behind Germany or other countries in considering protection?

I inquired to find that our Park Board has some 25 to 40 caves on state property such as parks; the Mark Twain and other National Forests in this state have some more. Both services could report on their own. Then I talked to Commissioner Bode of the Missouri Conservation Department and he reminded me that army engineers have proposed numerous dams for Missouri that would drown many caves. So I enclose map, and my neighbor, Engineer Short's, report on present status of dams.

As you may recall, the government decided to choose three drainage valleys in U. S. as guinea pigs for intensive study of recreation and farms versus water power dams and flood control; and the only one of these being thoroughly studied is the Meramec River watershed (see map southwest of St. Louis county in Jefferson county) where Commissioner Bode believes a number of caves will be drowned in area to be flooded. It is also a big recreation area for the large city of St. Louis. He thinks now is the time for all good men to flock to the protection of caves from the army engineers, if it can be shown that caves may have great use, present or future. Yet, the Meramec has been known to come up to 50 feet in a few hours after heavy or prolonged rains, as measured at such places as Valley Park, southwest St. Louis county, flooding boating clubs, summer bungalows, bottom cornfields in crop, etc. Meantime, our legislative committee on flood control, after a 5,000-mile trip and many hearings on Missouri River watershed, has just reported with neighbor Short against a three-man MVA appointed by the President in favor of an interstate committee with powers to act. Note some dams flood more acres, if built, than farmlands they protect from flood. Let's claim caves useful for safe deposit vaults and hide-outs for non-combatants where deep enough, and big enough, and dry enough for use, and get ventilating equipment by army if need be.

Excuse these Sunday thoughts. I've just received and so notified Editor, Dr. G. G. Simpson's "Notes on Pleistocene and Recent Tapirs" (pp. 70-80, a new species of tapir from Missouri) from Enon sinkhole of 1942.

A. C. Burrill,

Jefferson City, Mo. (12/9/45)

Rambling Notes from Georgia

Monday, January 29th, I went over to the museum and talked with Dr. Morrison and then Dr. Harvey Jackson. Dr. Jackson has sent me 400 bands to use on bats.

A couple of weeks ago we went caving and I brought back some bats. Dr. E. P. Odum and I have identified

them as being 15 *pipistrellis* and one *myotis keenii*. We made skin specimens of four of them and after I get some more I'll send them up to Jackson so that he can identify them for my key. The weather here is up in the 60's; so, last night I saw a couple of small bats flying around town. I also caught a couple of amphipods which I'll send up. Also, a cave cricket.

I haven't any information on the skull—I would like a copy of a report on it from Dr. T. D. Stewart. Last weekend Bob Ingram went up to Ruby Falls Cave and Bill Bowman said that he couldn't let him in the lower cave. I don't know whether it is because of the skull or that Bill didn't know Bob. Bob said it was because of the skull: the owners of the cave are afraid of scaring customers away.

Elton Brown told me, on that Monday, that the Society had a letter which might be useful in getting gas . . . I'd like to be able to make more or less regular trips up to Chattanooga and start on the Knoxville section.

(2/6/45)

I'll write to Bill and Walter Jones. Thanks for instructions on mapping. They seem quite complete—now I'll have to try it. I'll make out a set of file cards on them, too.

We may go by a cave tonight or in the morning and look over a new section I found a couple of weeks ago; also, collect some more bats.

In about a month or so I hope to have a good cave article in the *Atlanta Journal* magazine section.

Please let me know about that gas letter when you send me the map of "Missing Cave."

Ernest Ackerly,

Athens, Ga. (2/14/45)

Idea From Al To Clay

I note that Clay Perry is revising "Underground New England, Etc." I would suggest that the Society handle obtaining copies for interested members. I, for one, would like a copy, especially since I've never been able to obtain the original edition. Possibly Clay could autograph copies for members if it isn't too much trouble. That would make a grand addition to a caving library.

In a matter of a few weeks I'll be deep in caving country—can hardly wait to do some crawlin' and wigglin'.

Al Mueller,

Blacksburg, Va. (3-19-46)

Data At Large From Bischoff

Thanks for the list of West Coast members. I am writing all of them in hopes that we can get together. I am also contacting Bill Petrie, who is at Camp Shoemaker near here.

You say you'd like to see me take another crack at those caves in Yosemite Park. I think you must mean Sequoia Park. Yosemite, despite the beauty and national publicity, has only one small, shallow cave. Sequoia has at least six fine limestone caverns. I hope to see some of them this summer.

But I may try Nevada first. That Northumberland Cave fascinates me. Rumored to be very extensive—it has never been explored, being about 100 miles from the nearest settlement or main road. Who knows—it may be another Carlsbad!

Erwin Bischoff (1/28/46)

Have just received my copies of the Society's last two BULLETINS—and they certainly were excellent. I got so absorbed in them I stayed up nearly all night! Each one seems to be better than the one just preceding—and that's a good sign. I hope that enough copies are being printed that members will be able to order back copies in bound form.

But I cannot resist putting in my two cents' worth in comment on some of the articles. In Jo Chamberlin's "Netherland of Night" (p. 12, BULLETIN 6), which is perhaps the best general article on caving I have ever read, I notice that he credits Jim White with being the first explorer of Carlsbad Caverns. This is a myth which seems very widespread—and perhaps needs some correction before it is accepted by everyone as an unassailable fact. Jim White made his exploration in 1901, and certainly did much to bring the cavern to the attention of the outside world. However, the cavern was well known as early as the 1870's, as the old trail of the 49'ers ran by it—and it was used as a landmark. The first known (or, at least, recorded) exploration of the cavern by a party was in 1885. This party included George Lucas, Bill Jones, Julian Smith, Lum Anderson, Bill Ward, and Sam Smith—several of whom are still living in the Carlsbad area. In 1901, when White made his exploration, a California company was already opening up the bat wing of the caverns for guano mining—and White was one of their employees.

In BULLETIN 6, page 63, a S/Sgt. F. Silver writes concerning the possibility of a 6,000-foot-deep cave in Mexico. This is undoubtedly the "Boca Del Diablo" (Devil's Mouth) located near Taxco in the state of Guerrero. It is near the hacienda of William Spratling, an American. The reason the state authorities closed the mouth of the cavern was because of its danger to travelers—it being just 10 feet from the main Mexico City-Acapulco highway. The other reasons were political—as many of the natives believe (with some justification)

that the cave was used to get rid of state political prisoners, and the closing of the cave has become quite a local political issue. Ezequiel Ordanez of Mexico City is the authority on the cave.

I am interested in knowing where the figure 6,000 feet was arrived at, as the best of my information is that the cave has never been sounded. The opening is 18 feet in diameter and of unknown depth. There is a ledge 300 feet down, but stones dropped from this ledge never have been heard to land below. The opening was closed by placing a framework of logs 100 feet down and then dynamiting the opening so that the debris covered the framework. Mr. Silver can derive consolation from the fact that another opening has been discovered by Spratling—a narrow crevice leading from the Spratling property. Six thousand feet sounds incredible. I have been thinking that a pit found in one of our California caves (known to exceed 1,200 feet straight down) was unusual enough.

Speaking of the unusual—here's one for your fauna committee: On the African continent, at Sinoia, 82 miles northwest of Salisbury (in northern part of Southern Rhodesia) are four caves inhabited by baboons!! It would be interesting to see the committee attempting to place those specimens in alcohol phials!

My letters to other California members have already elicited two interesting replies. One from Carl Hubbs at La Jolla, with some information on the La Jolla Caves—and a promise of cave reports on some others he has visited. Another from Dick Thompson at Bakersfield, who is a gold and silver miner in Mexico, and owns an entire town in the state of Sonora in Mexico. He has kindly offered co-operation and assistance to any of the Society members planning to explore in Mexico. I am now attempting to organize a party to take up his invitation—as he states there are some interesting caverns in Sonora. If successful, we would probably go down sometime in June of this year. Please pass the word around, and maybe other members of the Society would like to join us in a low-cost vacation in Mexico, with cave hunting—as well as good hunting for deer, antelope, wild hog, and tiger.

Erwin W. Bischoff,

Oakland, Cal. (2/13/46)

Our Beetle Trapper Talks

I would like nothing better than to get away from it all for a weekend with you in the holes. I have kept my nose a little too close to the grindstone, I fear, and am reaping some of the first harvests of the mentally-rutted in the form of nostalgia for old stamping grounds. A case of flu hasn't helped much. I am still under doctor's orders, so I'm afraid the best I can do for a cave trip is a wistful glance at a map.

I have been through four caves at and near Blacksburg, though I have never had the pleasure of meeting Dr. Holden. As a result of my survey, I discovered thereabouts, two new species and a new race of anophthalmid beetle. It is certainly a rich collecting ground. Do not fail to explore Tonies (or "Tommies") Cave at Newport; if you enter a cave on the New River west of Blacksburg (bootleggers kept me out!), keep your eyes peeled for the little yellow, running beetles. If you find any, I would appreciate your communicating them direct to me. My types always gravitate to the U.S.N.M., and it saves endless red tape if I have complete control of the specimens prior to determination. All such work as I do on cave beetles now must be done after hours anyway.

Manson Valentine,
McLean, Va. (1941)

Cave Hydrologist Says

The greatest interest of my life has been connected with cavern studies and the circulation of waters which produce them. Perhaps, if and when conditions return to near normal, I may be able to return to my cavern studies and prepare long delayed work in water diversions and cavern development.

I think you are to be congratulated in your efforts to continue the study of caverns, and I think your organization is a splendid one. I am glad to belong to it.

Clyde A. Malott,
Department of Geology and Geography,
Indiana University, Bloomington, Ind. (1943)

More on "Speleology"

From a letter from Clay Perry, from another to him in 1940 from (then) Corresponding Secretary A. C. Lewis (are you with us?), comes this paragraph:

"Your reference to your inability to discover a society like the District of Columbia Speleological Society (of national scope like the British Speleological Society) was one of the motivating factors that led to our forming such a group. There are plenty of tourists and sight-seers who go through the commercialized caves nearby, but we are interested in gathering together kindred souls who would find real pleasure in burrowing into every hole it was possible to discover, regardless of mud, water or personal inconvenience. In this we have been very successful . . ."

And from a 1945 letter from Walter B. Jones, Alabama State Geologist, to our *Newsletter* Ed. W. S. Hill, this pertinent paragraph:

"It appears to me that a summary of geologists' interest in cave exploration might be as follows:

"Practically all caves and caverns have been formed by solution in calcareous rocks. From such places the geologist can get valuable information with regard to quantity and movement of underground water, strike and dip of strata, accurate geologic sections of strata exposed in cave walls, and frequently excellent collections of perfectly preserved fossils. In conjunction with the biologist, much can be deduced from a study of cave faunas, bearing upon underground connection between caves. To a geologist, a hole in the ground, whether it be a cave, mine, or quarry, is a challenge. In Alabama we consider cave study to be as important as any other phase of our work."

From Members and Others Abroad

From the Yorkshire Ramblers' President

I had your letter of May 26 at a time when the prospect of our doing anything but staying put and working was very remote. However, we are beginning to think some day there may again be holidays; drastic cuts in trains have this week been replaced by something like a service, and evacuees will return to some towns and release rooms in the country to some extent.

Practically the whole of our 23 numbers (of the Yorkshire Ramblers' Club publication) are available, bar two perhaps. Very few of our last, 1938, remain. We shall publish the next as soon as decent paper is obtainable and when men begin to leave the forces and to inquire what happened in '30 and '40.

If you are publishing a journal not entirely devoted to archaeology and bone-digging (which does not interest our men) I have no doubt the committee will at once agree to exchange and to include back numbers to some extent.

Ernest E. Roberts,
Harrogate, Yorkshire, Eng. (10/3/44)

Anybody Have An Answer?

While reading an article in the *Magazine Digest* I came across a paragraph where the writer mentioned finding Runic letterings in a cave. It did not, however, indicate the location of this place.

To introduce myself, I have been trying to carry on some sort of a research on Viking travels in America. My interests in this matter were aroused when some relics were found in this vicinity, which were claimed to be part of the authentic equipment of a Viking warrior. Up till now there has been so little actual proof of these visits of the Vikings to America, that anything of further proof—such as this article hinted at—would be of great importance. My personal theory is that these travels occurred over a longer period of time and over a wider area than is at present known to history.

I wrote to the editors of this magazine and they suggested writing to you. Would there be any possibility of getting a photograph of these inscriptions? It would be interesting to know if they could be determined as to period of time inscribed, or what the inscription reveals when it is deciphered.

I hope I am not inconveniencing you by inquiring about this matter.

Martin Kaija,
Port Arthur, Ontario, Can., (2-12-45)

Excerpts from English Editor

I am very keen on any form of co-operation between cavers the world over; so, if anything is required by the N.S.S., just write and I'll do my best. The clubs I belong to over here are all tip-top, and will help, too.

Now and then, books on caving are offered for sale by second-hand bookshops over here. When anything good is offered, I will snap it up for your Society. My own library is pretty complete for English works, some 200 volumes: 50 French; nine German; a few Spanish; for U. S. A., I have Mercer's *Hill-caves of Yucatan* and Hovey's *Celebrated American Caverns*, and *Basket-maker Caves of N. E. Arizona*, Vol. viii, No. 2, Peabody Museum.

I like to include in each issue of my *B. C.* a "show-cave" booklet, or leaflet (one that will bind in well). It's an excellent addition, as the *B. C.* is read by experts, and copies go out to many public libraries and museums over here.

All the best and good caving,

Gerard Platten,
New Milton, Hants, Eng. (9/7/44)

Is Member in Argentina

For some time I hadn't been able to make up my mind about whether I wished to join the Society. Being out of the country for the past 15 months has made it easier to put off making the decision. However, as you know, I like caving a lot; and, as a result of this and your good letter of February 15, which reached me today, I finally decided to settle the matter once and for all by paying up for life; hence the enclosed check.

I originally intended to see if I could do a little caving out in the Cordoba province of western Argentina when I took a two-weeks vacation. Unfortunately I forgot the matter completely during the vacation, even though I had brought the essential equipment to Buenos Aires. Perhaps I'll get another chance.

John Fishburn,
U. S. Embassy,
Buenos Aires, Argentina (4/17/44)

Promise from Venezuela

I received your letter of Sept. 16th, enclosing my membership card for the Society. Many thanks.

Under separate cover and by ordinary mail, I am sending you four copies of the separates "La Cueva de Guaicai-puro. Contribucion a la Espeleologia Venezolana," of which I am author. This work, the first of its kind published in this country, appeared in *Revista Nacional de Cultura*, No. 46, Sept.-Oct., 1944, official publication of the Ministry of Public Education. One copy is for you personally, another for Mr. Stephenson, President of our Society, and the other two for the Library of the last.

I wish to know, also, if you please, the impression this modest work has caused you or other American Speleologists who may run through it. At present I am preparing a joint work with Mr. Walter Dupouy, Director of the Museum of Natural Sciences, about a very interesting exploration we made a few months ago of several other caves; and we shall publish it eventually, as well as other works on caves I have recently visited.

I am interested in receiving all or any of the available back numbers of your BULLETIN. Also, I would like to get the address of some houses that sell speleological equipment. This co-operation will be highly appreciated.

J. M. Cruxent,
Sociedad a Traposos,
Caracas, Venezuela (11/30/44)

Inquiry from India

As a member of the British Speleological Association in India, I am writing to try and establish contact with you to explore the possibilities of mutual assistance on caving topics.

I have, I regret to say, only recently heard of your existence and would greatly welcome the opportunity of receiving your journal and, if possible, becoming an associate or foreign member of your Society.

There are a lot of things I wish to learn about caving in America, and I wonder if there is much literature on the subject which you could perhaps suggest?

Unfortunately there are but few of us speleologists in India; but we have made a start on the huge amount of exploratory work to be done, and have got a small supply of necessary tackle. The caves in this part of the world are mostly in Ceylon, and in Himalayan mountains from Kashmir to north Burma and China.

There are numerous American troops in India; and if any of them happen to be your members and interested in caving out here, we would be only too glad to help them all we can.

The man who knows most about the subject in this part of Asia is Brig. E. A. Glennie of the Survey of India, Delhi, or Cecil Hotel, Delhi, and it would be best if you post his address to any of your members out here, since he is more accessible geographically and would be very pleased to meet them.

In communicating to me, please use my more permanent address, which is care Lloyds Bank, Hornby Road, Bombay, India.

Cpl. R. D. Leakey,
Chaklala, India (2/7/45)

Data and Advice from B.S.A.

One heartily agrees with your comment that the members of our two bodies should endeavor to co-operate in every way possible. We are at present living in abnormal times, but I can assure you that many of our people, once they return to civilian life, will be only too happy to become members of the N.S.S.

The questions inherent to your statements about recording caving data prompts me to offer you the following information and explanation:

Your first and most important work is to establish your system of recording. I am an old man now; but when I look back 40-odd years and think of the various ideas and methods tried out—from diaries to card index, before one achieved worthwhile result—well, at least, it was amusing.

You have got to allow for expansion—it is growing all the time—easy reference and etc. I am going to give you a minor example as I go along, of how I work and trust it will be of use to you. I wish you were here—a few minutes in the 400-odd volumes of records would give you a better idea than hours of writing.

First, obtain Ordnance Survey Sheets and rule the grid as enclosed.* That means quick reference any time as to location. Next, the surface survey. Get your people out locating all swallets, risings, caves, potholes, etc., marking same on survey sheets. Where you have lots and lots of shakeholes and you do not know where to open out, go over them in winter; some of them will be sure to be "breathing;" warm air coming up from the caverns below will have bored a hole right through the snow. Mark these out for future "digs."

Now we can commence on our card index—not for recording, but as an index to records. Every cave, anywhere, is put into this index. We may not even know its approximate locality—but it goes in, in the hopes it can be built up as time goes along.

*Several unreproduced enclosures came with Simpson's letter.

Records come next, and are loose-leaf binders, sheets from some I enclose herewith. Our British caves we are working intensively, and we have a volume or series of volumes for each drainage area. Yorkshire has 12 drainage areas and the records are expanded to 56 volumes!

As an example, let us take part of the Kingsdale drainage area:

First we have the gradual accumulation of data for records. The area is covered by six-inch O. S. sheets 80SW, 96NW, & 95NE. On the enclosed sheet (96NW) on the west side, is shown the major portion of the Kingsdale area. The Parish boundary line is along the watershed; the whole drainage to the east of that line is in the Chapel-le-dale area.

In the general records of each area are noted the geological data, surface, drainage, etc. You will note the millrace or watercut (A3. B2. C2. D1. E1. F1.), which is artificial and cut to bring down the water from high up the valley, to drive a watermill near Thornton. Leakage from this millrace is the water which is engulfed by various potholes—all the waters so absorbed come to light again at Keld Head (G2). At normal times, the whole of the bed of Kingsdale Beck (dotted blue) is dry—the stream following an underground course; after heavy rain, however, a great quantity of water follows the surface river bed.

Geological features show that the base of Yoredales follows roughly the line of the millrace, then Mountain Limestone to a depth of 50 feet below Keld Head (about 450 feet thick), the limestone resting upon Silurian. The floor of the valley is covered with Alluvial (over which the course of Kingsdale Beck is found) the site of a glacial lake. All underground waters come to the surface at Keld Head.

Next comes survey, photography, biology, etc., of each individual cave in the area. These each have their own sections; and everything that has been written about that particular cave is put into records, with a view to having everything known about any particular cave under one heading (see Jingling Pot Notes enclosed).

In Kingsdale, survey gave the following results to date:

	Depth.	Length.
Batty Pot	40'	300'
Yordas Cave	675'
Bull Pot	275'	407'
Jingling Pot	192'	180'
Jingling Cave	1178'
Rowting Cave	938'
Rowten Pot	355'	580'
Simpson Pot	392'	1470'
Double Three Hole.....	33'	25'
Swinsto Cave	395'	2394'
Hut Pot	28'	28'

	Depth.	Length.
New Pot	34'	15'
Sheepfold Pot	35'	65'
Thorney Pot	51'	53'
Little Pot	40'	62'
Marble Steps Pot.....	410'	1771'
Cellar Holes East.....	21'	36'
Pin Hole	42'	49'
Braidey Garth Pot.....	39'	18'
Lord Top Hole	41'	36'

The next problem was (and still is) where is the "master cave" which collects the water from each chasm and delivers it at Keld Head? Plans were plotted onto the six-inch O. S. sheets, and a section on what I called the Kingsdale Valley Fault made. It showed every pothole going down to saturation level with the exception of Jingling Pot. (Every one of the other holes ended in a syphon.)

Why "valley fault": Notice how the surveys in plan follow, to a great extent, parallel to the line of the valley. This fracture, in which all the deep cavities are situated, was probably formed by the heeling over—very slightly—of the rock after the valley had been deep cut and the support removed. We shall probably find the drainage follows a line parallel to the valley until the vicinity of Sheepfold Pot is reached, then meeting a proved fault from there through Keld Head Nook and delivering the water by this route to Keld Head.

I trust you will forgive this lengthy explanation and hope it may help you.

Everything pertaining to the Mammoth Cave is vastly important.

Sorry, Megger tester not much good; but you will have seen similar gravity balances at work in the States. If not, let me know and I will try and send you some dope along regarding same—that is, if our people have escaped bomb damage. I have not heard from them for a couple of years . . . But the real factor of new underground exploration is to get the two ends of reason: the sink or swallet; and the rising, or point of debouchure by colour or chemical tests. Yes, I know that underground pickup makes this tricky at times. Get all the sinks in an area that communicate with a rising. Once you do that a whole big field of research commences—just think, does the Mammoth Cave stand alone or are there others? Instead of thinking in terms of solution—think of tectonics, faults, and fissures plus erosive action of water and you will go some.

Had a letter from Norbet Casteret. He has come through all right and in 1943 discovered a new 1,800-foot abyss somewhere around the Pyrenes. Also heard from de Joly; he also is O. K.

E. Simpson, President,
British Speleological Association,
Settle, Yorkshire, Eng. (3/14/45)

Highlights from Hooper Letters

I was extremely interested to read about the National Speleological Society in Vol. 12 of the *British Caver*. I should, in fact, be most grateful if you could let me have full details of the Society, as I should like to become a member.

I am a life member of the British Speleological Association, and my wife and I have been engaged on the exploration and survey of the complex (though small, perhaps, by your standards) system of caves at Buckfastleigh, in Devonshire. We have been fortunate enough to discover and make the first descents of a number of entirely new caves in this area.

I hope that one day I shall be able to take a trip to America and visit just a few of the numerous caves about which I have read with so much interest.

(10/31/43)

A copy of BULLETIN No. 6 reached me safely last week. It is a fine journal and both my wife and I have found it extremely interesting reading. I hope to write to the Editor about it in a few days, as I have a number of comments which may or may not be of interest. I can, for example, add a few terms, which find common usage in this country, to the glossary of speleology. I am glad to note the scientific angle from which your Society tackles all these problems—it adds so much to the value of a cave trip if everything is properly recorded.

I congratulate the Society also on its attempt to index all the known caves of the world—truly an ambitious project. I suggest that when you come to deal with the caves in this country you contact E. Simpson, Hon. Sec. and Recorder, British Speleological Association, Duke Street, Settle, Yorks. I doubt if there is any man in this country who knows more about British caves. He also possesses a vast amount of written information (including many translations from the original accounts) on the caves on the European continent. I can also probably give you a certain amount of stuff on the caves in Devonshire which have not been recorded at all elsewhere.

My wife and I are doing what we can to collect information on cave formation and structure, the growth of helictites, etc.; and so we should be very grateful if you could put us in touch with anyone in your country who specializes in that line, or if you could let us know of any U. S. literature which deals specifically with that subject. The only paper which I have found that attempts to deal with stalactite formations at all thoroughly is by W. Prinz, on "Crystallisations in the Caves of Belgium" (1908). This paper goes into the matter in some detail; but unfortunately the translation I have is very

literal and, in many places, does not represent the true sense of the original paper, and so I have had to go through later and retranslate it.

I do not know whether you have seen the following definition of a speleologist. It appeared in the British Speleological Association journal *Caves and Caving* No. 1, under the heading "As Others See Us," as a suggested entry for the next Encyclopaedia Britannica.

"SPELEOLOGIST.—One of the (fortunately) lesser known mammals. They shun the daylight and, although only partially nocturnal, spend many daylight hours in holes in the earth. Although gifted with legs they prefer to crawl on their stomachs and, such are their dirty habits, that they are happier lying in the mud than on dry ground. When met in the dark they resemble huge glow-worms and, although scientists cannot find a reason, the light is at the other end! Gifted with vocal cords they make numerous sounds, but listeners will hear most frequently the strange call of one to another of 'Dam, o'ell, dam;' this call usually follows any bumping sound."
(4/23/44)

I have been bitten by the "Caving Bug" for just over eight years now. I noticed in the recent *Grotto Grapevine* sent me that somebody had totalled 170 "underground hours." This aspect had not occurred to me before; and so, out of interest, I went through my records and totalled up my own underground hours. I was surprised to find that it came to just over 400. My wife can claim a similar figure. At any rate, I should feel it a privilege to be a member of your Society, as although I realize that under present circumstances, I cannot hope to gain full advantage from my membership, it will be nice to keep in touch with caving activities in your country, and the BULLETIN will make a welcome addition to my growing library of cave literature.

I should be very pleased to get in touch with any of your members who are in this country, and if they were not too far away my wife and I would always be glad to offer them hospitality; and, better still, I might be able to arrange a cave trip for them. I am afraid, however, that transport difficulties, and flying bombs have rather curtailed our caving activities this year. In fact, I had my second real trip only just over a week ago—to Swildon's Hole in Somerset, which was, as usual, very wet indeed. However, it was the first time I had visited the cave for four and one-half years, so it all seemed quite new to me, and I managed to get some quite satisfactory photos. (Photography is one of my main interests, and I almost feel that a trip has been wasted if I do not return with some pictorial record of it. The trouble is that it requires a lot of will-power to cart a camera, tripod, flash powder, etc., into a cave, and sometimes laziness gets

the upper hand! If Platten has sent you his latest *British Caver*, [Vol. 12], you will find therein a frivolous article of mine on cave photography.)

The other cave trip that I had this year was of interest in that my wife and I and some rock climbing friends, made the first descent of a rather unexpected 120-foot deep pothole in Devon—it was just one vertical fault fissure—and we had an 85-foot rope ladder down, which is the biggest vertical we have so far found in Devon. However, as I believe I mentioned in my earlier letter, we are now mainly concerned with our exploration work in the caves at Buckfastleigh (in the same county), where we have a very complex system—an underground maze extending on to about eight separate levels, mostly inter-connecting—a real surveyor's nightmare. So far, we have mapped out well over 8,000 feet of passages in the largest caves, and a lot of it was real virgin territory.

Your trip in Hell Hole sounded very interesting, and I should like to have seen the main room there. The largest chambers I have been in in this country have been the Great Hall in Gaping Ghyll Hole (Yorkshire), where a pothole falls 340 feet sheer into the roof of a chamber 480 by 80 by 100-150 feet high; and the recently discovered G. B. Cave in Somerset, where the main canyon is about 100 feet high and 750 feet long, dropping 250 feet throughout its length. The biggest chamber I have ever been in is the Salle du Dome, in the Grottes de Han (Belgium). This is roughly 450 feet in diameter, and about the same in height, with a pyramid 168 feet high in the center.
(12/11/44)

Platten tells me that one of your members, Capt. T. T. Perry, is in London at the moment, and so I have written to ask if he would like to come over and see my wife and myself. If there are any other U. S. cavers in this country, please let me know as we should always be very glad to see them.

I managed to do a little caving over the Easter Bank Holiday weekend, and had a pleasant trip to Swildon's Hole in the Mendip Hills (Somerset). This is normally rather a wet cave, but for once the water level was comparatively low! I am particularly keen on cave photography, and used this trip to try my hand for the first time at stereoscopic photography. I have now developed the film, and one or two of the photos look quite promising. It seems, however, that not all cave scenes lend themselves to stereoscopic treatment, and next time I try I shall choose my subjects with rather more care. I imagine there are some photographic experts in the Society who could give me some useful tips on this particular subject.

(4/4/45)

I haven't as yet received the copy of Bretz's article on cavern formation. So, unless it has been lost in transit, I should imagine that it was not sent off. It is a most interesting article, and a copy of my own will be of much value to my wife and myself in our work on the Devonshire caves.

I appreciated your remark to the effect that all cave mud is quite the same no matter where found, and that it even smells the same. I would, however, go further and (from personal experience) say that it even *tastes* the same. A curious business, this fascination of crawling in the bowels of the earth—wonder if psychologists have a suitable explanation for it (a "cavern complex," perhaps).

I like your idea of an international competition for caves and hope it will come to fruition. I shall watch the *Newsletter* and the BULLETIN with interest in the hope of seeing some announcement on the subject. Whatever else may be proposed, I should certainly like to see (and enter for) a photographic competition. At the moment, I believe that you have the advantage over us in the field of color photography as color films have not been obtainable over here during the war years. I am looking forward to trying the new Kodachrome, and hope it will be available this side soon. All my slides have had to be laboriously colored by hand. Incidentally, it is always a nice point as to whether pictures of cave interiors should be given the true natural colors, or the colors which the caver actually sees, i.e., the "apparent" colors which the rocks, formations, etc., take on when viewed in the pronounced yellowish lighting of an electric lamp or candle? This would be a good subject for a speleologist "brain trust" to argue over.

I have not "been underground" since Whitsun, but I much enjoyed reading the May *Newsletter*. It helps one to keep in touch with the activities of the Society, so that one does not feel "out of it;" and having read so much about many members of the Society, I feel that I know them quite well although I have never met them!

I am much looking forward to seeing Volume 7 of the BULLETIN. I hope when I get settled in my new house I shall have time to write the two articles which the Editor has "demanded" from me. I gather that Vol. 8 is to include a list of British caves. Might I suggest that the following be added to the list, as they are not commonly known (except by my party which has been working on them) although they are quite as big as many of the caves in the better known areas such as Somerset or Yorkshire—caves at Buckfastleigh, Devon; Bakers Pit Cave, Reed's Cave, Partition Cave, Disappointment Cave,

Rift Cave, Bone Cave, Spider's Hole, Smugglers Hole, Rock House Cave, Rooster's Cave, Ware Cave, Bunker's Hole, Tucker's Orchard Cave, Pridhamsleigh Cavern.

John Hooper,
Ashford, Middlesex, Eng. (11/23/45)

University of Colorado Extension Division—Bur. of Visual Edu. Catalogue of Visual Aids, Boulder, Colo.: *Work of Underground Waters*. 1 reel—silent—\$0.60.

Caves, sinkholes, and natural bridges sculptured by underground waters.

Luray Caverns, 2 reels—sound—color—\$0.50.

A scenic trip through these beautiful caverns in Virginia, showing the quaint, curious, and wonderful formations, glittering stalactites, broad folded draperies, cascades, pools of crystal clear water, richly ornamented domes supported by giant fluted columns.

Carlsbad Caverns. 1 reel—silent—\$0.60.

The film starts with views of the semi-arid region showing plant life and improvements around the opening of the caverns. A seven-mile trip along well-built trails reveals the spectacular limestone formations of stalagmites and stalactites, magnificent beyond description.

New Zealand claims a most uniquely lighted cave. It is the Glowworm Grotto in the Waitomo Caves. As the name indicates, the natural means of illumination in this limestone cavern is the light emitted by hundreds of thousands of little insects of the glowworm species. These living lamps are known to science as *Bolitophila Luminosa*.

Colorado Magazine, p. 96; May, '42. "Hermit of Pat's Hole":

"When the (Civil) War closed, Pat (Lynch) was in Georgia. He went to Missouri and, for a short time, lived in a cave near Cane Hill in Polk county. He told Baker that he had left a knife there, after inscribing his name on the cave wall. If this record is still extant it probably will prove to be a sailing vessel, as this seems to have been his identification mark." P. 97: "In Hardin's Hole, located in the depths of Yampa Canyon between Pat's Hole and Lily Park, is a large cave. Local settlers have a legend that two of the women captives taken by the Ute Indians in the Meeker Massacre of 1879 were hidden here while the U. S. troops were searching for them. The records of this event make it extremely impossible that the women were ever near Yampa River, but the cave received its name, "Indian Cave," from this legend. Farrington R. Carpenter, state revenue director and authority upon northwestern Colorado history, states that there is the outline of a sailing vessel on the wall of this cave, which is attributed to Pat."

INDEX TO FIRST SIX NUMBERS OF THE BULLETIN

For the well-done portions of the following, you may write your thanks to Dr. R. W. Stone; for the rest—and all errors abiding—curse The Ed.

Bulletin of the Speleological Society of the District of Columbia

Vol. 1, June, 1940 (Unnumbered pages; mimeo., and stapled in blue, illustrated cover). This is the first number of our publication. For indexing, pages have been numbered arbitrarily beginning with page 1 and following inside front cover, through 68. Page 66 is blank, and there are 12 blank pages at the end; and pages 46 and 48 may be identical.

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For your convenience: Notes, Comments, and Criticisms

Progress Report As We Spread Abroad

(This inquiry and reply were so interesting we felt they deserved spotlighting. Both Senor Dupouy and Professor Crucent are now members of the Society, and results of their speleological work will be published in later issues of the BULLETIN.)

Wm. J. Stephenson, President

DR. ALEXANDER WETMORE, assistant secretary, Smithsonian Institution, had the kindness, upon my request, to send me your BULLETIN No. 5, Oct., 1943, informing me of the existence of your Society.

It happens that Prof. Jose Maria Crucent, of our Archaeological Department, and I have been carrying on some speleological studies of Venezuelan caves, with strict scientific methods. Speleology was practically unknown in this country, until Professor Crucent initiated it. He did work in this science in Europe, where he has visited and descended to over 100 caves and chasms. In our museum, he gave an interesting lecture on speleology during one of the meetings of the Local Chapter of the Inter-American Society of Anthropology and Geography, of which we both are members. During another meeting, I lectured on our expedition to the caves of Quebrada Seca de La Guairita, Estado Miranda, showing the numerous photographs, croquis and maps and the fauna and flora collected. On another opportunity, Professor Crucent lectured on his exploration of Cueva de Guaicai-puro, Estado Miranda, showing also the material collected, photos and croquis. His paper on this last work will be published shortly in *Revista Nacional de Cultura*, and *separata* will be printed, of which I will gladly send you a copy.

Although many of the known Venezuelan caves have been visited now and then, even by scientists, up to the present no specialized speleological study has been made of them—not even of the famous Gaucharo Caves of Caripe, Estado Monagas, which were visited by Humboldt at the beginning of last century. In fact, I was surprised to see that in the mentioned BULLETIN 5 of your Society, "Partial Index to All Known Caves of the World," Venezuela is not even listed. Also, Professor Crucent observed that many caves he visited in Europe, are missing in the index. We may claim, as far as we know, the priority in such scientific work in Venezuela; and it is our intention to develop speleology here, making a census of Venezuelan caves (we have listed already over 20), exploring them according to our possibilities.

As I said, the known caves have been visited now and then, generally by people without scientific training, rather for curiosity's sake or moved by desires of hiking.

But then, such visitors generally penetrate only to a certain extent, be it for lack of proper equipment or for fear. Our museum is preparing an expedition for the end of the month, to the Cave El Penon, near Ocumare del Tuy, Estado Miranda; and in July we will visit other caves near Valencia, Estado Carabobo, and possibly also the ones of San Juan de Los Morros, Estado Guarico. Of each exploration papers will be written, and duly illustrated.

Now, it is our desire—Professor Crucent's and mine—to become members of your Society, if it were possible, in order to co-operate with your program of activity; and if you think it of interest, collaborating with the BULLETIN graciously, sending you for publication, papers on the works we are developing, duly illustrated. At present, we can offer you a paper on our March exploration to the mentioned Cuevas de Quebrada Seca de La Guairita. Three caves form the group, and we drew the croquis of all of them and of many of their galleries, with measurements and registrations of temperature, humidity, altitude, etc. We photographed some of the crypts, using magnesium light.

You will kindly inform me, please, what are the requirements for becoming member of your Society, what are the annual dues and whether they include the privilege of receiving the BULLETIN. Also, whether you have all the back numbers, how many form the series up to the present, and the value of such back numbers.

I think you may be interested to know that Professor Crucent is preparing a paper entitled "Intra Terram," with illustrations, which will appear in a future number of *Acta Americana*, the review of the Inter-American Society of Anthropology and Geography. This work covers speleology as subject matter, and has the purpose of divulging this science which is not well known in South America.

In view of the fact that we are lacking entirely literature on speleology, we will appreciate highly any publications you may send us.

For the sake of curiosity, we would like to know if you speleologists have met with criticism, even on the part of scientists, while carrying on your activities there. We ask this question, because at our end people in general and even a few scientists have considered speleology as something useless, or of little value, and to some, as an activity that deserves even laughter. Of course, such individuals, you may be sure, would never dare to enter a cave under any circumstances! You will observe, therefore, that we are doing the pioneer in Venezuela. [Italics ours. Ed.]

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