

Cave and Karst Systems of the World

William B. White *Editor*

The Caves of Burnsville Cove, Virginia

Fifty Years of Exploration and Science



 Springer

Cave and Karst Systems of the World

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The Caves of Burnsville Cove, Virginia

Fifty Years of Exploration and Science

A Contribution of the Butler Cave Conservation Society

 Springer

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Cave and Karst Systems of the World

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*This book is dedicated to the memory of friends and members of the
Butler Cave Conservation Society who are no longer with us.*

Carl Butler
Nevin C. Davis
Thelma Davis
Richard J. Ganjon
Lester V. Good
I. Kennedy Nicholson
Ronald W. Simmons
John A. Stellmack
Fred L. Wefer

Preface

Way back in the 1940s, William E. Davies, pioneering cave geologist, best known for writing *Caves of West Virginia*, casts about for the best locations in the Appalachians where exceptionally large caves might be found. He announced that the most potential was to be found in a small synclinal valley in west central Virginia called Burnsville Cove. The Tonoloway and Helderberg limestones reach their maximum thickness in the Cove, or the order of 800 feet, before they facie into sandstone farther to the south. The geologic structure wraps the limestones around the anticlinal and synclinal axes in such a way as to permit extensive cave development. Most obvious, and requiring less intricate geological reasoning, was the observation that Sinking Creek, the main drainage of the Cove, is underground for most of its route.

A number of mostly small caves were known in Burnsville Cove in the 1940s, but an exception was Burnsville Saltpetre Cave, later known as Breathing Cave, certainly a very large cave by the standards of the day. Cavers from the Nittany Grotto at the Pennsylvania State University became interested in Breathing Cave in the mid-1950s and took on the project of producing a high-quality map. One of the Nittany cavers, George Deike, decided to write his masters thesis on a geological interpretation of Breathing Cave. While Deike's thesis research was underway, I. Kennedy (Ike) Nicholson, his sons, and their friends were searching the Cove for Davies' hypothetical giant cave system. In May of 1958, as the Breathing Cave work was drawing to a close, the searchers found air blowing from beneath a sandstone ledge on the side of a large sinkhole. The Butler Cave-Sinking Creek System had been discovered. Nittany cavers teamed up with the Nicholson family and their group to produce a map and further explore this spectacular new discovery.

The sinkhole containing the only natural entrance to Butler Cave lies on the flank of Jack Mountain, half a mile west and on the opposite side of a ridge from the public road in Burnsville Cove. Access was always somewhat problematic and depended on the good will of land owners whose property must be crossed to reach the cave. There was also the question of controlling access and thus protecting the cave as its size and location became more widely known among the caving community. To solve both of these problems, the Butler Cave Conservation Society was formed in 1968, formally incorporated as a legal entity in the State of Virginia. The BCCS could then lease the cave from the owner and legally install a gate to control access.

As time went on, BCCS purchased the Butler farm and became involved with the exploration of other caves in the Cove. There were further major discoveries on the Chestnut Ridge side of the valley, and in due course, additional properties were purchased. Thus, the year 2008 marked the 50th anniversary of the discovery of

Butler Cave and the 40th anniversary of the founding of the Butler Cave Conservation Society. To celebrate the occasion, the BCCS set out to compile this account of the accomplishments of the past half century. The intent had been to complete the book for distribution at the celebration, but new discoveries outran the editorial process. The discovery of Helictite Cave, then the Subway Section of Water Sinks Cave, and then the large cave called the Wishing Well all required new chapters for the rapidly growing document. In the spring of 2012, BCCS purchased a property containing the sinkhole called Robin's Rift, the collapsed entrance has been dug open and stabilized, and now, exploration and survey is underway. But it is necessary to draw a line and publish the story to date. This book is a milestone in the exploration and study of the caves of Burnsville Cove; it is not the end of the story.

The book has three parallel themes. One is to tell the story of the explorations in Burnsville Cove and the discoveries that have resulted. The second is to document the BCCS organization itself, how it operates, and how it has succeeded in being a good steward for the properties that it owns. The third theme is scientific. It recounts the knowledge that has been gained by the study of the caves in Burnsville Cove.

Curiously, after 50 years of exploration, remarkably little has been published about the caves of Burnsville Cove. In 1982, BCCS members put together a collection of scientific papers that were published as a special theme issue of the *National Speleological Society Bulletin*. At that time, very little was known about the caves under Chestnut Ridge so the scientific discussion focused almost entirely on Butler Cave. Scientific papers are an important means of sharing knowledge, but the editorial custom in scientific writing makes the papers dry as dust for the general reader. Exploration stories are much more interesting. Although the BCCS has published an annual newsletter containing write-ups on many of the exploration trips, the circulation is limited. There is value in telling the exploration stories in more detail and in a more systematic fashion. Further, these chapters emphasize the human interest side of exploration. Butler Cave is big and therefore challenging, but it is not intrinsically difficult. There are few places in Butler Cave that are beyond the abilities of the moderately competent caver. The caves of Chestnut Ridge are an entirely different story. The exploration of the Chestnut Ridge System required strength of body and strength of will that very few cavers were capable of attaining. These exploration stories, therefore, take on a special significance. One may also note the increasing effort required to get access to the caves in the first place. Breathing Cave, the first to be mapped and studied, has a walk-in (or crawl-in) entrance. Opening Butler Cave required moving only a few rocks. Contrast these with the digging efforts required to open the Wishing Well to exploration.

The earlier chapters tell the exploration stories partly in historical and partly geographical order. Butler Cave was the first to be discovered and is documented in Chap. 2 which also includes some of the history of Breathing Cave. Butler Cave focuses attention on the caves associated with the springs which are described in Chap. 4. Then, the tale moves to Chestnut Ridge with chapters on first Bobcat, then Blarney Stone, then Burns, and finally what are referred to as the "pancake caves." Together, these make up the Chestnut Ridge Cave System. Barberry Cave (Chap. 10) forms a link between the Chestnut Ridge System and Butler Cave, a link that is tantalizingly close to completion at the time of this writing. The most recent impressive discoveries are in the downstream end of the Sinking Creek Valley and so the final exploration chapters describe caves found in the Water Sinks Depression and the most recent breakthrough into a large cave through the dig known as the

Wishing Well. Some of the chapters in this book are original. Others are based on previously published material (as indicated in the chapters). However, most of the previously published material has been edited, revised, and updated to various degrees. The maps of the large cave systems are included in electronic form so that all of the fine detail can be displayed without the necessity of large sheets of paper.

Acknowledgments

This book is a group effort of many BCCS cavers, many more than those whose names appear as chapter authors. It is an attempt to display, between one set of covers, what has been discovered over the past 50 years and also the very human effort that was expended to bring those discoveries into being. We must acknowledge the contributions of all members and friends of the BCCS, past and present.

Also acknowledged are:

The late Carl Butler who permitted access to his farm for many years and was willing to lease the cave entrance to the BCCS.

Landowners who have permitted BCCS members to prospect for caves on their land. Pancake weekends would not have been possible without these friendly landowners.

The National Speleological Society for permission to reprint sections of this book that have previously appeared in the *NSS News* and the *NSS Bulletin*.

The photographers, especially Philip C. Lucas, Nevin W. Davis, and the late Ron Simmons, for allowing their images to be used to illustrate the volume.

October 2014

William B. White

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Burnsville Cove

1

William B. White

Abstract

Burnsville Cove is a small limestone valley in west-central Virginia, Highland and Bath Counties. The presence of Silurian/Devonian limestones and the complex geological structure has permitted the development of at least 97 caves in the Cove. A geographical description of the Cove is provided as well as a short history of the settlement of the Cove over the past several centuries.

1.1 Introduction

Beneath a small valley in the rugged Appalachian Mountains of west-central Virginia lies one of the most remarkable cave systems in the United States. The discovery and exploration of these caves has occupied a large number of highly qualified cavers for more than 50 years. Exploration, survey and photography provide a physical description of the caves. Scientific investigations have revealed much about the processes that formed the caves and deposited the speleothems that now decorate them. Our objective in this book is to tell the entire story—the exploration, the discoveries, and the new scientific knowledge gleaned from the discoveries.

The chapter that follows introduces Burnsville Cove. It describes the landscape and a bit of the geologic framework in which the exceptional caves of

Burnsville Cove developed. It provides the backdrop against which the cave exploration takes place and explains why this has been such a time-consuming and challenging experience.

1.2 Location and Geologic Setting

Burnsville Cove is located in the Valley and Ridge Province of the Appalachian Highlands about 35 miles west of Staunton, Virginia in Highland and Bath Counties (Fig. 1.1). The villages of Burnsville and Williamsville are situated near the southern and northern limits of the Cove respectively. The northern hydrologic boundary of the area discussed here is the Bullpasture River, a tributary of the James River, which is part of the Atlantic slope drainage.

Burnsville Cove is a very rural part of west-central Virginia. To reach it by road or on maps, locate US Highway 250 which picks its way eastward from Elkins, West Virginia to Staunton, Virginia, more or less perpendicular to the long, parallel ridges of the Appalachian Mountains. Route 250 enters Virginia and crosses US Highway 220 in Monterey. Continuing eastward across Jack Mountain, the critical intersection is the village of McDowell in the valley of the

With a contribution by Judy A Marks.

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Fig. 1.1 Appalachian topography of the Valley and Ridge Province in west-central Virginia showing Burnsville Cove. Image from Google-Earth referenced to Williamsville, VA

Bullpasture River. East of McDowell, Route 250 crosses Bullpasture Mountain, the Shenandoah Mountains and reaches the Shenandoah Valley at Staunton. From McDowell, Virginia Route 678 follows the Bullpasture River southwestward to Burnsville Cove (Fig. 1.2). A key intersection is that of two narrow blacktop roads where route 609 branches from route 678. The continuation of route 678 goes through the Bullpasture Gorge to Williamsville. The gorge forms the northern boundary and is the location of the springs that drain the caves of Burnsville Cove. Route 609 goes south through Burnsville Cove to the village of Burnsville (Fig. 1.3). The southern limit of the Karst area is about a mile south of Burnsville.

Burnsville Cove is a synclinal valley underlain by the Tonoloway–Keyser–Helderberg group of Silurian–Devonian limestones. The Burnsville Cove karst is an interesting, perhaps unique, example of major cave systems developed in these limestones. There are three main cave-forming groups of carbonate rocks in the Appalachian Highlands: The largest caves are in the low-dip Mississippian limestones of the Allegheny

and Cumberland Plateaus. There is extensive karst and cave development in the folded and faulted Cambro-Ordovician limestones in the Valley and Ridge and Great Valley Provinces. The third group is more restricted. The Silurian–Devonian limestones are generally less than 300 feet thick. The stratigraphic relation of the limestones to the overlying Oriskany Sandstone determines that the limestone crops out as narrow, sinuous bands along the flanks of secondary ridges. Thus, although many caves are known in the Keyser and Helderberg Limestones in Pennsylvania, West Virginia and Virginia, many of them are small, there is little surface expression of karst, and developments of large, integrated underground drainage systems are rare. It is the structural setting of Burnsville Cove with synclinal and anticlinal folds as well as the increased thickness of the limestone that permits exceptionally large cave systems to develop.

The synclinal and anticlinal folds that form Burnsville Cove plunge to the northeast. The cavernous limestones rise to the southwest and have been destroyed by erosion just southwest of Burnsville, thus

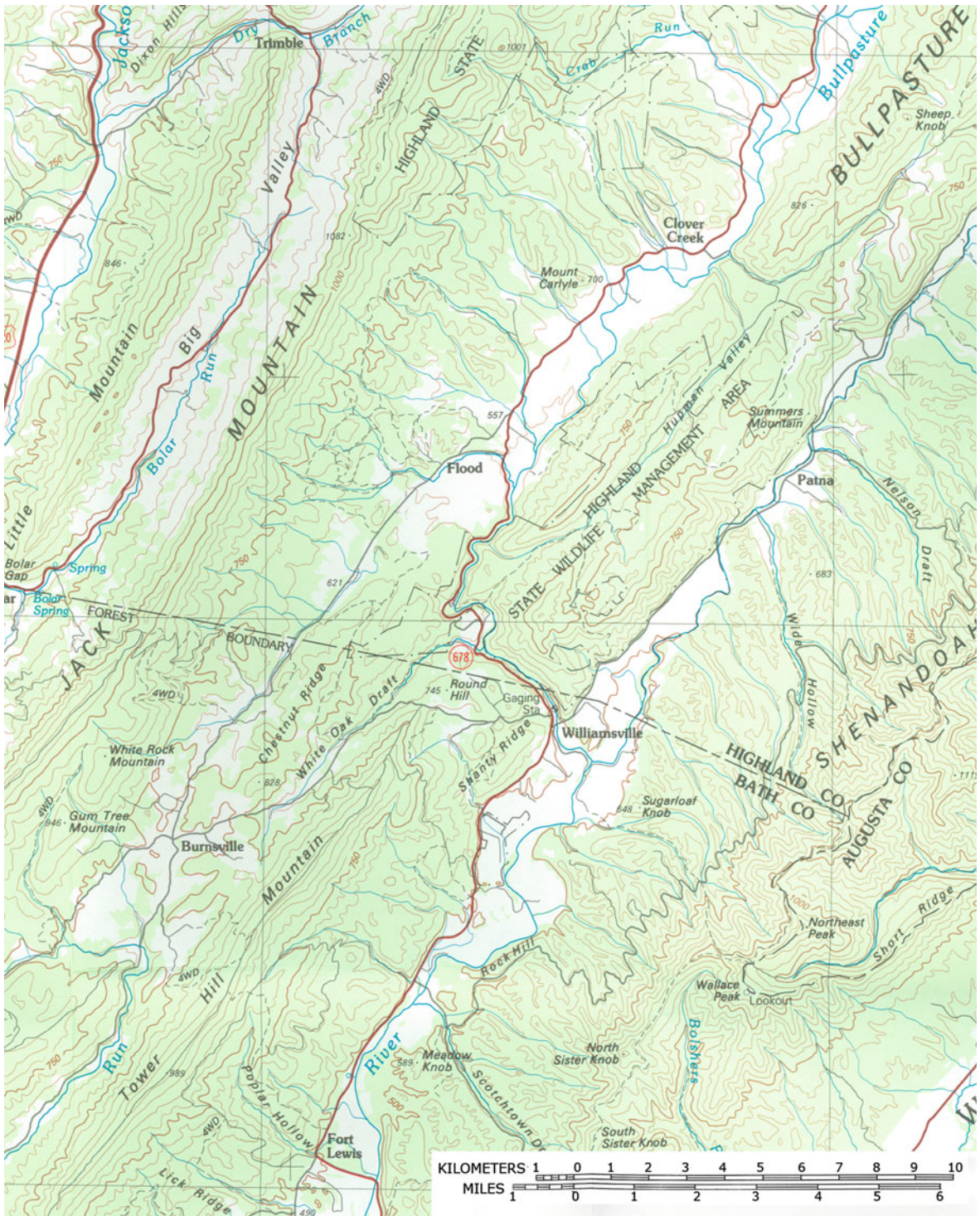


Fig. 1.2 Topography and drainage in the Burnsville Cove and immediate vicinity. Extracted from U.S. Geological Survey Staunton sheet, 1:100,000 map series. *Note* this map has a metric scale with a 50 m contour interval

Fig. 1.3 The Village of Burnsville. View to the east. WBW photo



terminating the possibilities for cave development. To the northeast, the plunge of the structure takes the limestones below impermeable shales and sandstones. The deep gorge of the Bullpasture River cuts into the limestones and provides outlets for the water as a series of springs. The result is that the downstream reaches of the cave systems are below the regional water table and can be explored only by divers.

1.3 Topography and Drainage

The dominant landforms of the Valley and Ridge Province of the folded Appalachians are long, roughly parallel mountain ridges with intermediate strike-oriented valleys. Figure 1.2 shows the arrangement of topography and stream patterns in the immediate vicinity of Burnsville Cove. The highest ridge top elevations are in the range of 3200–3800 feet; valley floors range from 1800 feet at the Bullpasture River to 2500 feet at the Burnsville divide.

The principal surface stream in the region is the southwest-flowing Cowpasture River. One of its tributaries is the Bullpasture River, which flows southwest from its headwaters near Doe Hill along the axis of a shale-floored valley until it abruptly turns southeast, cuts its deep, narrow gorge through Tower Hill and

Bullpasture Mountains (Fig. 1.4), and joins the Cowpasture River near Williamsville (Fig. 1.5). The gradient of the Bullpasture is to the southwest while the gradient of Burnsville Cove is to the northeast. The Bullpasture maintains a well-developed flood plain throughout most of its length. The flood plain is at an elevation of approximately 1800 feet at the point where the river leaves the valley to enter the gorge. The Bullpasture channel deepens very rapidly and is a steep-gradient, rough-run stream on a boulder/cobble bed through the gorge until it emerges at grade with the Cowpasture River at an elevation of about 1600 feet. The Cowpasture River also has a well-developed flood plain at this elevation. Figure 1.6 shows the flood plain elevation of the two principal rivers, the summit lines of the mountains and intermediate ridges and the approximate gradients of the Burnsville Cove drainage.

Burnsville Cove is bounded on the west by Jack Mountain, which forms a continuous wall with no breaches in its Clinch Sandstone cap. Streams rising on the eastern flanks of Jack Mountain flow down into the Cove and many sink at the contact with the Helderberg Limestone.

On the east, the boundary is Tower Hill Mountain, also capped with the Clinch Sandstone. The northern hydrologic boundary is the Bullpasture River where it

Fig. 1.4 The Bullpasture River in Bullpasture Gorge during low flow conditions. WBW photo



Fig. 1.5 The Cowpasture River near Fort Lewis, several miles southwest of Williamsville. WBW photo



cuts through the Bullpasture Gorge. To the southwest there is a drainage divide separating drainage flowing northeastward into the Cove from drainage to the south along Dry Run. Beneath is also a ground water divide marked by the boundary between the Silurian Tonoloway Limestone and the underlying Wills Creek Shale. Several miles southwest of Burnsville, the complex folding caused by the arching of the Sinking

Creek Syncline axis, forms Warm Springs Mountain which has a north-facing nose directed into the Cove. The southern or Burnsville divide is considerably modified by karst processes.

North of Burnsville, Sinking Creek drains to the northeast and the valley thalweg joins the valley of the Bullpasture just upstream from the Bullpasture Gorge. Much of Sinking Creek is now underground although

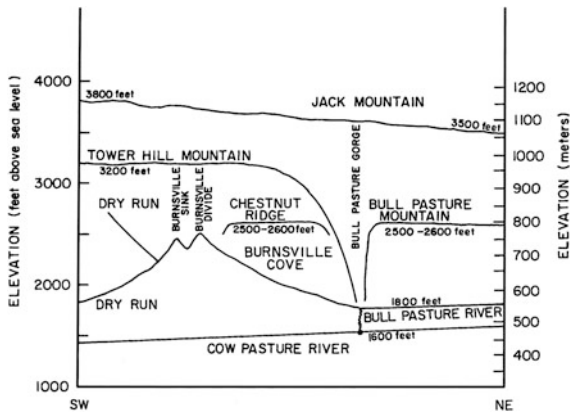


Fig. 1.6 River elevations, mountain summit elevations and valley profiles of Burnsville Cove and Dry Run Valley. From White and Hess (1982)

there is an irregular surface channel that is active during flood flow (Fig. 1.7). The surface valley profile is broken at Water Sinks where Sinking Creek and a major tributary from the west end in a blind valley. South of Burnsville, Dry Run curves around the nose of Warm Springs Mountain, flowing first north and then near Burnsville, flowing south to join the Cowpasture River around the southern nose of Tower Hill Mountain.

Burnsville Cove is divided by Chestnut Ridge, formed by the Oriskany Sandstone where it is brought to the surface by an intermediate anticlinal fold.

Fig. 1.7 The valley of Sinking Creek with dry stream channel. WBW photo



Sinking Creek flows north along the west side of Chestnut Ridge; the valley on the eastern side between Chestnut Ridge and Tower Hill Mountain is drained by White Oak Draft which also heads near Burnsville. Like Sinking Creek, White Oak Draft is mainly a dry channel.

Figure 1.8 shows the main surface features of Burnsville Cove. There is a surface divide in the form of a pronounced saddle that crosses the cove about a half mile north of Burnsville. However, the large closed depression of Burnsville Sink collects all surface runoff from an area extending to the line of hills across the valley south of Burnsville. The catchment of Burnsville Sink forms the headwaters of the underground streams in the Sinking Creek System. South of Burnsville Sink, Daggy Hollow and the next unnamed stream sink and emerge at Cathedral Spring. Further south, tributaries of Dry Run flow onto Silurian clastic rock, and there is no underground drainage.

Northeast of the Burnsville divide various tributary streams on the flanks of Jack Mountain flow into Sinking Creek. The large closed depression that contains the BCCS Homestead and the entrances to Butler Cave is located along the Jack Mountain flank (Fig. 1.9). Without exception these streams sink during dry weather along the limestone contact, and these and many smaller tributaries without surface expression form the various streams seen in the caves.

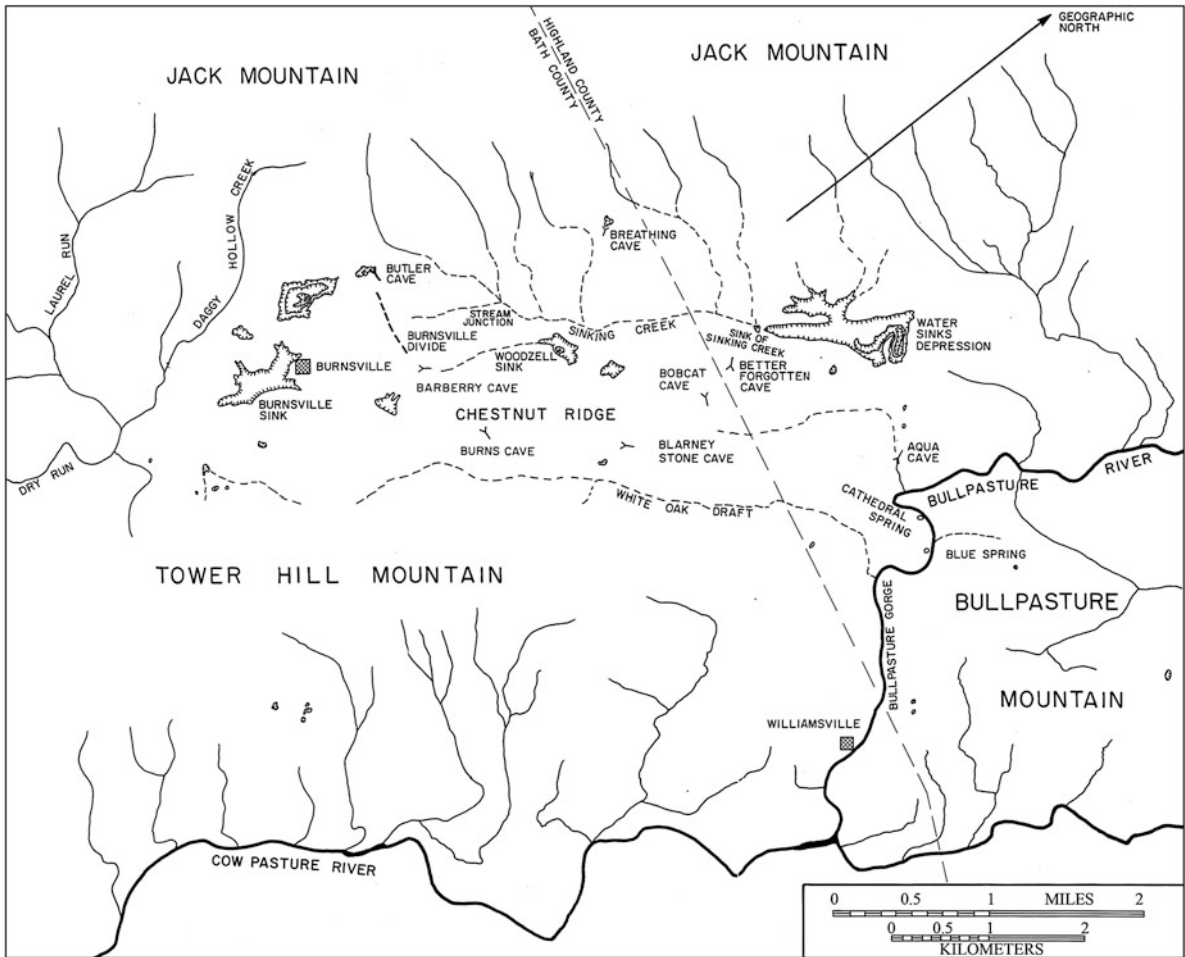


Fig. 1.8 Burnsville Cove, based on U.S. Geological Survey Williamsville and Burnsville 7.5 min quadrangles. Adapted from White and Hess (1982)

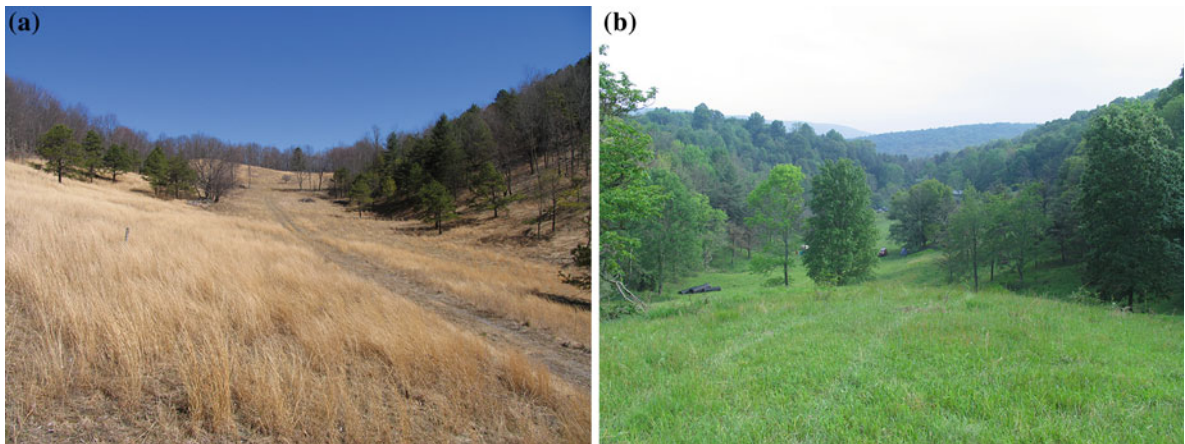


Fig. 1.9 **a** The closed depression containing the BCCS Homestead. View to the northeast from the Homestead. **b** View to the southwest from the hill at the northeast end of the depression. WBW photos

The surface channel of Sinking Creek, however, is maintained for a distance of three miles along the axis of Burnsville Cove (more or less the axis of the syncline) to the ultimate sink point at the southern edge of the Water Sinks depression. Other tributary streams flowing into Water Sinks from the west also go underground at this point. There is no surface channel downstream from the Water Sinks depression. The surface channel of Sinking Creek carries water only during periods of high runoff—spring snow melt or exceptional storms. Most seasons of the year the main stream bed is dry throughout its length.

On the east side of Chestnut Ridge, White Oak Draft also flows northward as a tributary of the Bullpasture River. This is a well-defined valley with a partial stream channel, but the entire upper reach of White Oak Draft is a dry or underdrained valley. The surface channel is degraded and the course of the valley is marked by a line of sinkholes.

Extension of the valley profiles of Sinking Creek and Dry Run suggests that most of the area now occupied by closed depressions near Burnsville formerly drained to the south through Dry Run. Development of underground drainage to the north has pirated this section of the Dry Run Basin and made it into the upstream catchment area for a subsurface tributary of Sinking Creek. The piracy was doubtless

enhanced by the dip of the shaley Lower Tonoloway Limestone. The Tonoloway crops out along the southern margin of Burnsville Sink and acts as a lithologic funnel causing all of the internal drainage of the sink to follow the syncline to the northeast.

1.4 Karst Geomorphology of Burnsville Cove

The surface expression of karst in Burnsville Cove is mostly in the form of closed depressions on various size scales. There are a few exposed limestone ledges which have been carved by dissolution but most of the area is soil-covered. There are no quarries or extensive road cuts to expose the epikarst so the soil/bedrock interface is generally obscured.

The most prominent surface features are the large closed depressions such as Burnsville Sink, Woodzell Sink, and the Water Sinks Depression along with a number of somewhat smaller sinks. The large closed depressions, shown in Fig. 1.8, have irregular ground plans and seen close-up are indistinguishable from surface valleys (Fig. 1.10). They range in depth from 50 to several hundred feet and in diameter from 300 to 3000 feet. There are many smaller sinkholes, typically 10–30 feet in diameter and often fairly deep in

Fig. 1.10 View into Woodzell Sink show irregular topography of the sink floor. WBW photo



Fig. 1.11 Small sinkhole in the valley of White Oak Draft. WBW photo



proportion to their widths (Fig. 1.11). The smaller sinks have often been chosen as digging sites and excavation of some have revealed underlying caves.

1.5 The Caves of Burnsville Cove

Considering the number of caves that nature has endowed on Burnsville Cove, she has been very stingy with entrances. Very few caves have classic walk-in openings on the hillside or on the river bank. In fact, many of the caves in Burnsville Cove have no natural entrances at all. Without continuous and intensive digging exercises, many of the caves would never have been discovered. One of the few exceptions, with a traditional entrance, is Breathing Cave. As a result, it is one of the caves that has been known for the longest time and was the only significant cave in the Cove at the beginning of the time period described in this volume. Some of the significant caves were known, but because of tight crawls and near-blocked passages, only a minor length of passage near the entrance had been explored.

There was no systematic compilation of cave description data in Virginia prior to the 1958 discovery of Butler Cave and the ensuing exploration. The first such compilation was that of Douglas (1964). The

Douglas compilation was augmented by Holsinger (1975). Since then, cave data have been collected by the Virginia Cave Survey. Table 1.1 lists 97 caves in Burnsville Cove that were known as of October, 2013. This list, like all cave lists, is transient. New discoveries and extensions of known caves are continually adding to the list.

Cave names have been changed from time to time over the years, a practice of great concern to Holsinger who, as a cave biologist and zoogeographer, wanted to be sure that biological data, particularly species distributions, were firmly locked to reliable cave names and cave descriptions. The names given in Table 1.1 are those used by the Virginia Cave Survey and should be considered the definitive names. The previously used names are listed in the table for reference to earlier literature but the obsolete names should not be used.

In the period up to about the mid-1980s, most of the caves of interest were on the Sinking Creek side of Burnsville Cove. Breathing Cave is there and the main development of the Butler Cave–Sinking Creek System is along the northwest axis of the valley. Few caves were known on Chestnut Ridge and White Oak Draft was just a line on the map. All of that changed in the mid-1980s with the discovery of what became known as Bobcat Cave. Bobcat was only the first and

Table 1.1 Caves in Burnsville Cove updated to October, 2013

Cave name	Length (feet)	Length (m)	Previous names
Almost Borehole Cave	50	15	
April Fools Pit	65	20	
Aqua Cave	9492	2893	Lockridge Aqua Spring
Armstrong Cave	1160	354	
Audreys Cave	22	7	
Baby Bottle Borehole Cave	39	12	
Backyard cave	400	122	
Barberry Attic Cave	30	9	
Barberry Cave	18,053	5502	
Basswood Cave	710	216	
Battered Bar Cave	7431	2265	
Bear Den Cave	60	18	
Better Forgotten Cave	4100	1250	
Bicentennial Cave	110	34	
Big Deal Cave	36	11	
Birthday Cave	148	45	
Black Cherry Cave	130	40	
Backdoor Cave	40	12	
Blackroot Cave	195	59	Busycon Cave
Blind Faith Cave	3723	1135	
Blue Spring Cave	48	15	
Bob Robin's Cave	100	30	
Bone Cave	87	27	Nevin C. Pit
Boneyard Cave	20	6	
Boundless Cave	1800	550	Burnsville Sink#2
Bowers Shaft#1	90	27	
Bowers Shaft#2	100	30	
BowWow Cave	96	29	
Box Turtle Cave	185	56	
Breathing Cave	32,525	9914	Burnsville Saltpetre Cave
Bridge to Nowhere Cave	64	19	
Brier Fox Cave	100	30	
Buckets of Smoke Cave	543	165	
Buckwheat Cave	2196	669	
Bullpasture Gorge Animal Den	13	4	

(continued)

Table 1.1 (continued)

Cave name	Length (feet)	Length (m)	Previous names
Bullpasture Gorge Rock Shelter	18	5	
Burnsville Sink Cave	20	6	
Butler-Sinking Creek System	88,234	26,903	
Butternut Cave	550	168	
Bvideo Pit	651	198	
By-the-Road Cave	2085	635	
Carpenter's Cave	500	152	
Cathedral Spring Cave	952	290	
Cave 609	450	139	
Chestnut Ridge Cave	15	5	
Chestnut Ridge Cave System	111,250	33,909	
Counterfeit Pit	Shaft		
Coyote Crevice Cave	40	12	
Crevice Pit	40	12	
Cycle Sink	110	34	
Disappointment Hole	78	24	
Divined Disappointment Cave	30	9	
Dragon Hammer Cave	76	23	
Fractured Falls Cave	1713	522	
Fuhl Paradise	450	137	
Gags Gig Cave	15	5	
Haroufs Hole	150	45	
Helictite Cave	38,516	11,740	
Hill Top Cave	110	34	
Jackson Cave	1100	335	
Judy's Find Pit	85	26	
Julian Burns Cave	25	8	
Knotts Cave#1	340	104	
Knotts Cave#2	250	96	
Leap Yer Pit	160	49	
Lockridge Water Sinks	15	5	
Mighty Sarlacc Death Pit	94	27	

(continued)

Table 1.1 (continued)

Cave name	Length (feet)	Length (m)	Previous names
Moravian Cave	50	15	
My Favorite Cave	474	144	
Nevin C. Pit	Shaft		
Owl Cave	3145	959	
Pancake Disappointment Cave	55	17	
Pill Box Cave	19	6	
Pond Drain Cave	40	12	
Rat Hole 1180	499	152	
Rat Hole 1181	Shaft		
Rat Hole 1182	80	24	
Robin's Rift Cave	1787	545	
Round Hill Shaft	65	20	
Sandstone Surprise Cave	338	103	
Sinking Creek Cave	66	20	
Snow Melt Hole	15	5	
Stephenson's Cave#1	175	53	
Stephenson's Cave#2	75	23	
Stephenson's Cave#3	180	55	
Stephenson's Cave#4			
T.S. Pit	35	11	
Thirty Foot Pit	30	9	
Twisting Sister Cave	30	9	
Un-Noticed Cave	10	3	
Water Sinks Cave System	11,885	3623	Siphon Cave#2
Waterfall Cave	110	34	
Wildcat Cave	166	51	
Wishing Well Cave	27,067	8250	
Woodzell Ledge Cave	20	6	
Woodzell Pit	60	18	
Woodzell Sink Cave	35	11	

List compiled by Philip C. Lucas

there have been ongoing new discoveries strung out along Chestnut Ridge. Then some of the caves were connected internally so that instead of individually named caves, these became entrances into the Chestnut Ridge Cave System. Although many of the other caves have not—at the time of this writing—been connected, they are clearly related geologically. It makes sense to talk about the greater Chestnut Ridge System although many of the caves are disconnected fragments strung out along the ridge.

Two names that appear in the Douglas and Holsinger reports are Burns Chestnut Ridge Cave and Chestnut Ridge Blowing Cave. Both were small caves consisting mostly of tight passages and stream crawls and appeared to be of no great consequence. Indeed the original name given by the Nicholson's to Chestnut Ridge Blowing Cave was "Rat Hole 1179." Cavers in the 1980s pushed Chestnut Ridge Blowing to map out the half mile descent through the tight, miserable entrance series and discovered major cave below (Chap. 5). To mask the location, the discovery was referred to as "Bobcat Cave". Later Blarney Stone Cave was discovered and in due course connected to Bobcat forming the Chestnut Ridge Cave System (Chap. 7). Burns Chestnut Ridge Cave was explored independently over a more than 20 year period and again an extremely difficult entrance series broke through into significant cave (Chap. 8). The most recent effort has connected Burns Chestnut Ridge Cave to the Chestnut Ridge Cave System. There is now a single cave system with three entrances: Bobcat (or Chestnut Ridge Blowing), Blarney Stone, and Burns (or Burns Chestnut Ridge). The length listed in Table 1.1 is the aggregate length of the three interconnected caves.

The principal caves, as they were known at the time of writing are shown in Fig. 1.12. How these came to be discovered and how they are linked together will be described in the next set of chapters.

1.6 The People of Burnsville Cove by Judy A. Marks

In the early 1700s the main area of population in the country was along the coast from New England south. As early as 1727 the lands west of the Blue Ridge

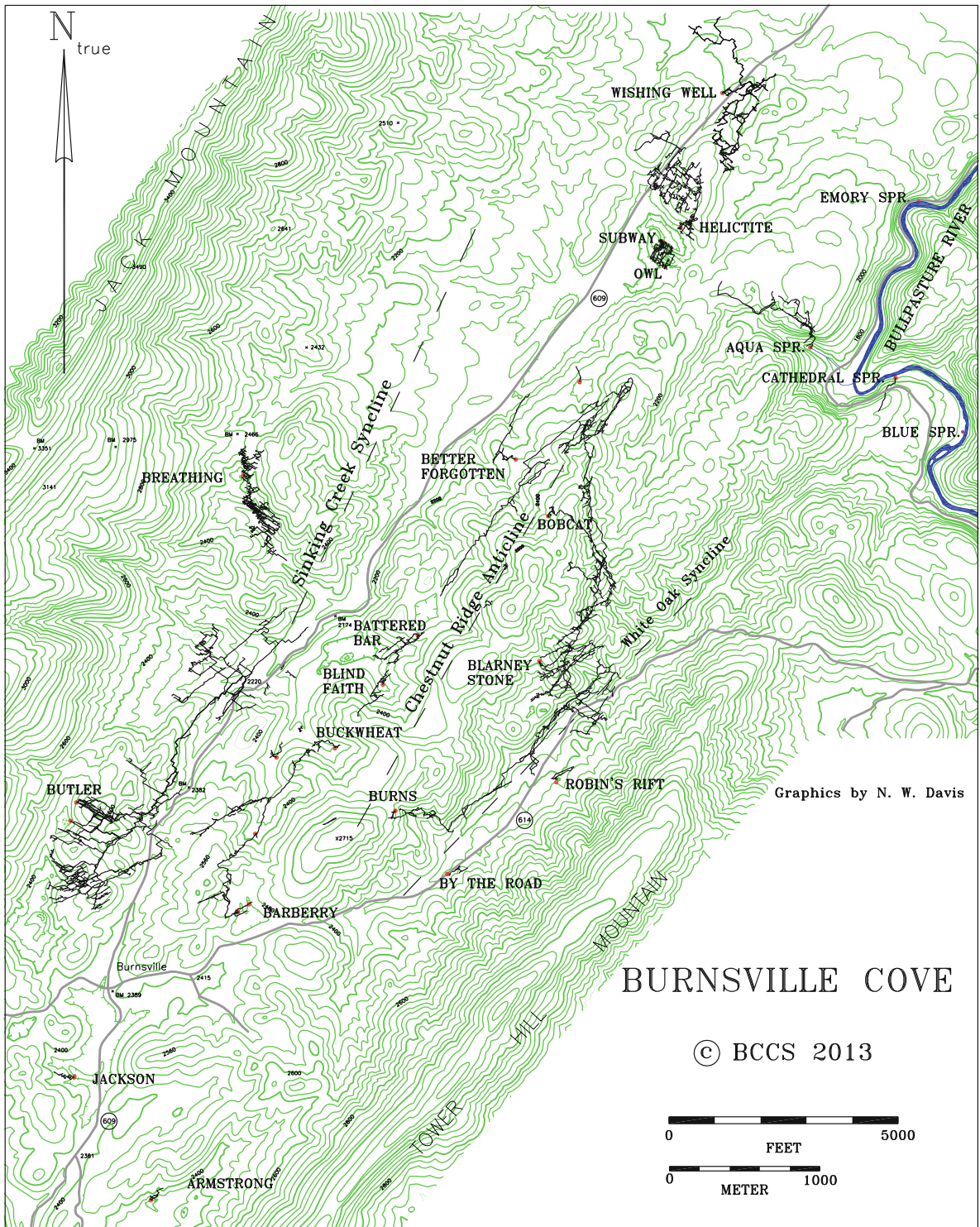


Fig. 1.12 The principal caves of Burnsville Cove. Map compiled by Nevin W. Davis

were virtually uninhabited. Historically the area was used by the Indian nations as hunting grounds and as a military highway. Shawnee from the west, Cherokee from the southwest, Seneca and Delaware followed the well-worn paths that followed the winding rivers. The influx of German and Scotch Irish immigrants in the 1730s helped to open the settling of the Bath County area. Most of the immigrants who came to the area entered it through Panther Gap about 30 miles southwest of Staunton in the Shenandoah Valley.

In 1738, Augusta County was formed from Orange County and named for Princess Augusta, wife of Frederick, Prince of Wales. They were the parents of King George III. The act of formation provided that the new county should remain a part of the county of Orange until there were sufficient inhabitants for appointing officers and organizing a county government. Following this ruling, the county of Augusta was not fully organized until 1748 and extended 240 miles along the Blue Ridge and westward to the Mississippi. Bath County was formed from Augusta, Botetourt and Greenbrier counties in 1791. Highland County was formed from Pendleton County and Bath County in 1847.

The life of the early settlers in the lands west of the Blue Ridge was not an easy one. The settlement at that time was part of Augusta County and it was there that Staunton, the county seat, was located. Any business, legal or otherwise had to be conducted at the county seat. Considering that the main mode of transportation in the early years of settlement was by foot or horseback, this made for very long treks across the mountains. Livestock had to be driven over the mountains to market, including the turkeys and cattle that are today trucked over the mountains. For the most part, people in this area have had to be self sufficient, raising their own food, making their own clothing and logging to build their homes.

A Google search on Burnsville, Virginia, reveals that it is a community or populated place with latitude 38.178, longitude 79.648, and elevation of 2379 feet.

It lies adjacent to the Bullpasture Valley, and not far within the Bath County line. It was originally known as the Red Holes, or Burnsville, settlement. The earlier name is derived either from the reddish loam exposed to view in the sinkholes or from the artificial licks, made by driving stakes into the ground, withdrawing them, and then filling the holes with salt. David Frame patented a tract here that nominally

covered 1150 acres. But when it was sold to Elisa Williams, John Burns, and James and Daniel Monroe in 1792, the lines proved to include 1363 acres.

John Burns moved into the Red Holes Valley (now Burnsville) about 1782 with his wife, Mary Shipe, and raised a family of five children (another source says that the year was 1791). Their son Joseph put up a log home across from the present location of the Burnsville Cemetery. For another 25 years or so rooms were added as needed and then in 1907 the present front of the house was built by Charles Wesley Burns for his large family. John Burns I died in 1805 at Red Holes. Sylvia Burns Sanger bought the property in 1945 and her son Julian used it for a summer home.

With the elections of 1860 concluded, the subject of secession became the main subject of meetings throughout Bath County where the residents were divided in their opinions.

At Red Holes (now Burnsville) citizens met Jan. 23, 1861, for the purpose of 'giving expression to their views with regard to the dangers now threatening this glorious republic and the means best calculated to meet or avert these dangers. After much discussion the following resolutions were adopted:

We, a portion of the citizens of the aforesaid county seeing no remedy in secession for the aggressions of the North against the South, believing that the constitution gives ample security to all sections of our country and needs to be obeyed rather than amended, be it therefore...

RESOLVED, that in our belief simply declaring our withdrawal from the General Government will not stay the hands of the Black Republican party in case they wish to oppress the South and trample it under foot.

RESOLVED, that we will take the Constitution as our guide and maintain our rights in the Union against the Aggressions of the North and any other section from whence they may come.

RESOLVED, that we direct our representative in the coming convention to do all in his power to prevent the secession of Virginia.

RESOLVED, that we deem it expedient that the action of the said Convention be referred back to the people for ratification or rejection.

RESOLVED, that we believe that every state having passed the ordinance of secession should speedily reunite themselves with the General Government and maintain their rights under the Constitution at all hazards.

The Virginia General Assembly, nevertheless, adopted an ordinance of secession April 17, 1861, which was ratified in a state-wide vote May 23, 1861.

Although no actual battles or skirmishes took place in Burnsville during the Civil War, there is a report that in November, 1862 Brigadier General Robert

H. Milroy was scouting in western Bath County and came across the cavalry company of Captain William H. Harness, 17th Battalion Virginia Cavalry in the Burnsville area and several of his troopers were taken prisoner.

Burnsville at one time was a thriving community with an elementary and high school, church, post office, and over the years, three general stores. Hevener's Grocery, which was also the local post office, was located at the intersection across from the high school (now the Burnsville Civic Center). Noah's Ark, which was operated by Wanda and Roscoe Roberts, was located on the south side of the intersection and housed the post office after Mr. Hevener retired. Robert's Grocery, operated after 1948 by Twila and Robert Burns, closed in the late 1980s and had been in either the Burns or Roberts family since it was begun in the early 1900s.

As was common in most small communities, the general store was the community gathering center. It was here that information was exchanged, directions given to travelers, checks cashed, and credit extended on faith. It served as the polling place, and sometimes, housed the post office. The Burnsville post office began operations in 1851 and closed in 1985. Postal patrons now are now served by the post office located in Williamsville. One of the first cars in Burnsville was bought by W. Henry Swadley in 1914.

At one time both Williamsville and Burnsville had elementary and high schools. These schools were later transferred to Millboro. Today, children from Burnsville travel to Millboro and Valley elementary school and to Bath County High School in Warm Springs for high school.

The first Burnsville Elementary school was a 2-room school. At some point, one of the rooms was moved on skids by horses to the Swadley Farm on route 614, which was later owned by Mrs. Willie Mackey. The structure for the one room school remains in Burnsville beside Robert's Grocery. The second school that was built was the high school first named Intermont Elementary School and its first principal was Mr. Seth Bennington.

It is believed that church services began as early as 1799 in the Burnsville area and were led by both Presbyterian and Methodist ministers. Services were first held in homes and eventually in a log school house along the Williamsville road near the present cemetery. About 1850–54 the schoolhouse became too

small for the congregation and a new building called New Hebron was built on land owned by C.W. Burns and John Burns. Forty years later, in 1890 the decision was made to erect a new building rather than repair the old one. In 1893 C.W. Burns deeded the land to the church. In 1894, the bell tower and bell were added. In 1983 two Sunday school rooms, bathrooms and a basement which served as a fellowship hall were added. In 1986 a kitchen was added to the fellowship hall. In 2003 a larger fellowship hall was added and was dedicated in 2010. A note to the caving community: "In 1929 a huge hole appeared in the ground directly in front of the church in the center of the church yard. It was an attraction for the children of the church who had fun climbing into the hole before it was finally filled up." This was remembered by Lottie Eagle Jackson in Hugh Gwin's book *Historically Speaking, True Tales of Bath County, Virginia*.

As of 2009 the population of Bath County was estimated to be 4482. Today, the population of the Burnsville area is approximately 150.

It is important to note that the majority of Burnsville area residents are direct descendents of the first settlers. Others who have moved to the area are retired, seeking peace and tranquility in the mountains and rivers. Some things have not really changed over the years. Residents still have to plan ahead for times when it's not convenient to run to the local grocery store. Most do regular shopping in Covington, Roanoke, Staunton or Harrisonburg, still traveling over the mountains to get to town. Neighbors are neighbors in the true sense of the word, helping out in any way that they are able; being there when they are needed.

Down the road a piece, about 3 miles north of the Bath County line along the Burnsville Road. (Route 609), are remnants of another small community. Originally called Poverty, the name was later changed to Flood in honor of Virginia Democratic Representative Henry D. Flood, who served from 1885 until his death in 1921. According to conversations with local residents, I was able to determine that at one time, although not at the same time, there were three churches, a school and a post office.

Franklin School, also known as Flood Colored School was not always a colored school. Originally it was attended by white children, and later by the colored community. Land for this school, according to, *The New History of Highland County, Virginia*, 1983, pg. 19. "There is a deed from Hamilton and Wright for

Fig. 1.13 Franklin School/
Flood Colored School on
route 610. Photo by Judy
Marks, April, 2011



Fig. 1.14 Black Methodist
Church on Route 610, now a
hunting camp. Photo by Judy
Marks, April, 2011

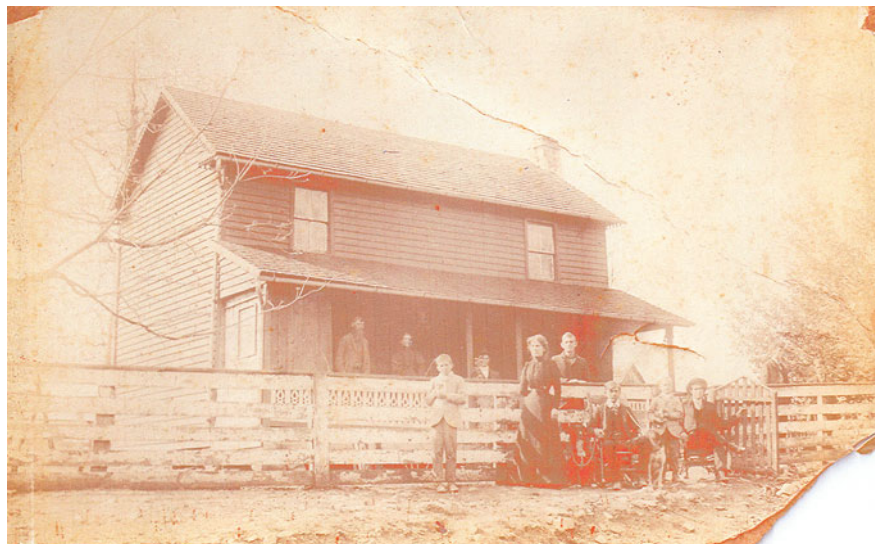


land in 1897. This was a colored school in the time of segregation. In 1948–49 it was decided to pay tuition and \$20 a month board for any child who would have gone to school there. The enrollment was too small to keep the school open. Most of the children went to Staunton and the families followed (Fig. 1.13).”

As you travel on Burnsville Road (Route 609), the white church on the hill is the Lockridge Memorial

Methodist Church. This church was served by the Burnsville charge and was built by Lee and Pinckney Lockridge as a memorial to their parents. It was dedicated about 1922–23. An earlier church in Flood was the Prospect Methodist Episcopal Church and it was located about a quarter mile from the Lockridge Memorial Church on land currently owned by R.D. and Sandra Robinson. Mount Zion Methodist

Fig. 1.15 Flood Post Office—current home of Joseph and Betty Jean Lockridge. Photo taken roughly 1900. Photo courtesy of Betty Jean and Joseph Lockridge



Episcopal Church was a black Methodist Church and is located on Job's Hill Road (Route 610); it currently is a hunting camp (Fig. 1.14).

The Poverty Post Office (first suggested name was Mulberry) was located in a log building about 10 miles from McDowell which would locate it near the present property of Jerry and Betsy Fairclaw. The Post Office at Poverty was established in 1889 and was to serve about 125 people. When the name was changed from Poverty to Flood in 1915, it was to serve about 40 people and it was relocated to the home of Lee Lockridge (the current home of Joseph and Betty Jean Lockridge) who was postmaster until he was called to service in WWI. It was then moved to the home of Bud and Annie Hamilton. On April 6, 1935, service was discontinued and mail was then sent to Burnsville (Fig. 1.15).

The historical review is based on Bath County Historical Society (1991), Gwin (2001), Highland County Historical Society (2000), Martin (1969–1985), and Martin (1990, 1996). Some information in this chapter was obtained from personal conversations with R.D. Robinson, Joseph and Betty Lockridge, Barbara Hall, and Dempsey and Joyce Hevener.

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Early Exploration: Breathing and Butler Caves

William B. White

Abstract

Prior to 1958, Breathing Cave was the only large cave known in Burnsville Cove. That changed in May, 1958 when air blowing from beneath a sandstone ledge guided explorers to the discovery of the Butler Cave-Sinking Creek cave system. The exploration of the Butler Cave-Sinking Creek system along with nearby Breathing Cave is described in detail. Breathing consists of a large network maze on the flank of the Sinking Creek Syncline. Butler Cave consists of a master trunk passage and underground stream that follows the axis of a syncline northeast to a series of terminal sumps. Connecting with the trunk passage is a series of network maze caves that extend up the northwest flank of the syncline. Overall, Butler Cave contains 16.71 miles of surveyed passages. The excavation of a new entrance in 1998 allowed easy access to the cave and in recent years exploration is being continued.

2.1 Introduction

This and chapters that follow present a detailed history of the exploration of the various caves in Burnsville Cove. The exploration of recently discovered caves such as Helictite and Wishing Well Caves can be described in what might be called “real time”—exploration logs that were written as the exploration proceeded. The present chapter deals with the earliest discoveries and is more of a challenge. It is being written half a century after the events. The historical

record is mixed. There is the author’s memory—that of a retired professor recalling his activities as a graduate student, there are field trip reports in old caving club newsletters, mostly the *Nittany Grotto Newsletter*, and there is an extensive published history that carried the story from the beginning to the late 1970s (Wefer and Nicholson 1982). In 1976 the Butler Cave Conservation Society (BCCS) began publishing an annual newsletter so from that time forward the historical record is much more complete.

In writing history, there is always the question of where to begin. Burnsville Cove was certainly known as cave country to the early settlers and the few caves with large and obvious entrances were known although it is doubtful if much exploration took place. In the absence of earlier written records, this exploration history begins with the first scientific and systematic surveys that begin in Breathing Cave just after the 2nd World War. This is followed by the discovery and subsequent exploration of the Butler Cave-Sinking

With an addendum by Philip C. Lucas.

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Creek System by I. Kennedy (Ike) Nicholson, his sons, and his colleagues in the late 1950s.

Oscar P. Estes, Jr. (July 18, 1913–December 14, 1981) was one of the Ike Nicholson's companions in the initial exploration of Butler Cave in the late 1950s. He accumulated a photo file of more than 100 images which passed to the Butler Cave Conservation Society after his death. These provide the best available photographic record of the early exploration. The photographs in this chapter are drawn from that collection. Many of these photos are the work of Huntley Ingalls but the exact photo credits have been lost.

2.2 Breathing Cave

2.2.1 Early History

Organized cave exploration was nucleated in the District of Columbia area in the late 1930s, then remained almost dormant during World War II, and finally sprang to life after the war. Cavers from DC and elsewhere spread out over the limestone valleys of eastern United States searching for caves. Very quickly information was collected for published descriptions of caves such as the books by W.E. Davies on West Virginia in 1949 and Maryland in 1950 and by R.W. Stone on Pennsylvania in 1953. There was no equivalent book on Virginia but cavers were active in the Shenandoah Valley and in the mountains to the west. They reached Burnsville Cove and found Breathing Cave, already well-known locally as Saltpetre Cave, at least as early as 1944.

The entrance to Breathing Cave is at the bottom of a sinkhole on the lower flank of Jack Mountain (Fig. 2.1). The entrance passage slopes steeply downward to end in a breakdown choke. Crawlways to either side lead to the otherwise independent North and South Sections of the cave. There was a strong air current moving through the crawlway leading to the South Section and, to the surprise of the early explorers, the air current reversed direction periodically. This “breathing” phenomenon ultimately gave the cave its name. The DC cavers were intrigued by the breathing phenomena and observed it over a period of years (Faust 1947). Cournoyer (1954) devised a fast response barograph and made at least one quantitative measurement of the air current oscillation. Apparently the DC cavers also began a map of the cave.

2.2.2 The Nittany Grotto Survey

Nittany Grotto, the caving club of The Pennsylvania State University, had been founded in 1948 but had gone through a short moribund period when it was reinvigorated in 1951 by William Devitt III. Devitt was a mining engineering major at Penn State and had, perhaps, a greater appreciation for the importance of accurate maps than many of his fellow cavers. Following his lead, the Nittany cavers were busy mapping many caves in central Pennsylvania. However, Pennsylvania caves tend to be short, small, and muddy so it became a Grotto custom to take occasional multiple-day trips to areas in West Virginia and Virginia where there were larger (and dryer) caves. The first Grotto visit to Breathing Cave was on one of these trips in January, 1954, when the group spent six hours roaming large and dry cave passages. It was George Deike's first visit to the cave and he was greatly taken by it. Mightily impressed by the cave, the Nittany cavers made Breathing Cave one of their primary objectives for their next winter-break trip south (Deike 1955). On this trip they spent an entire day exploring the cave and getting an impression of its immense size and complexity. For the first time, the Nittany cavers had come up against a cave that really seemed to be without end. They went back to Breathing Cave in April, 1955 and spent 17 h only to find more cave opening up before them. By this time they had accumulated about 10,000 feet of sketch map.

What quickly became obvious was that sketch maps were completely inadequate for a cave the size of Breathing. So, by the time of their visit in the spring of 1956, a new, careful, survey of the cave was underway. By the end of the trip, about 15,000 feet of cave had been surveyed. The big push was Christmas break, 1956 (Deike et al. 1957). Three teams of surveyors were assembled for a five-day stay in the cave. Following their usual custom, the group camped in the cave. After dragging their gear through the entrance crawlway, they set up camp using one chamber for cooking and other activities and a deeper chamber, Sand Alley, warmer and with a smooth sand floor, to lay out their sleeping bags. After breakfast, the three teams would split up and each go to its assigned area of the cave to continue the survey. The teams would reassemble in the Camp Room in the evening for dinner, to plot out their mapping accomplishments, and decide on objectives for the next day (Fig. 2.2).

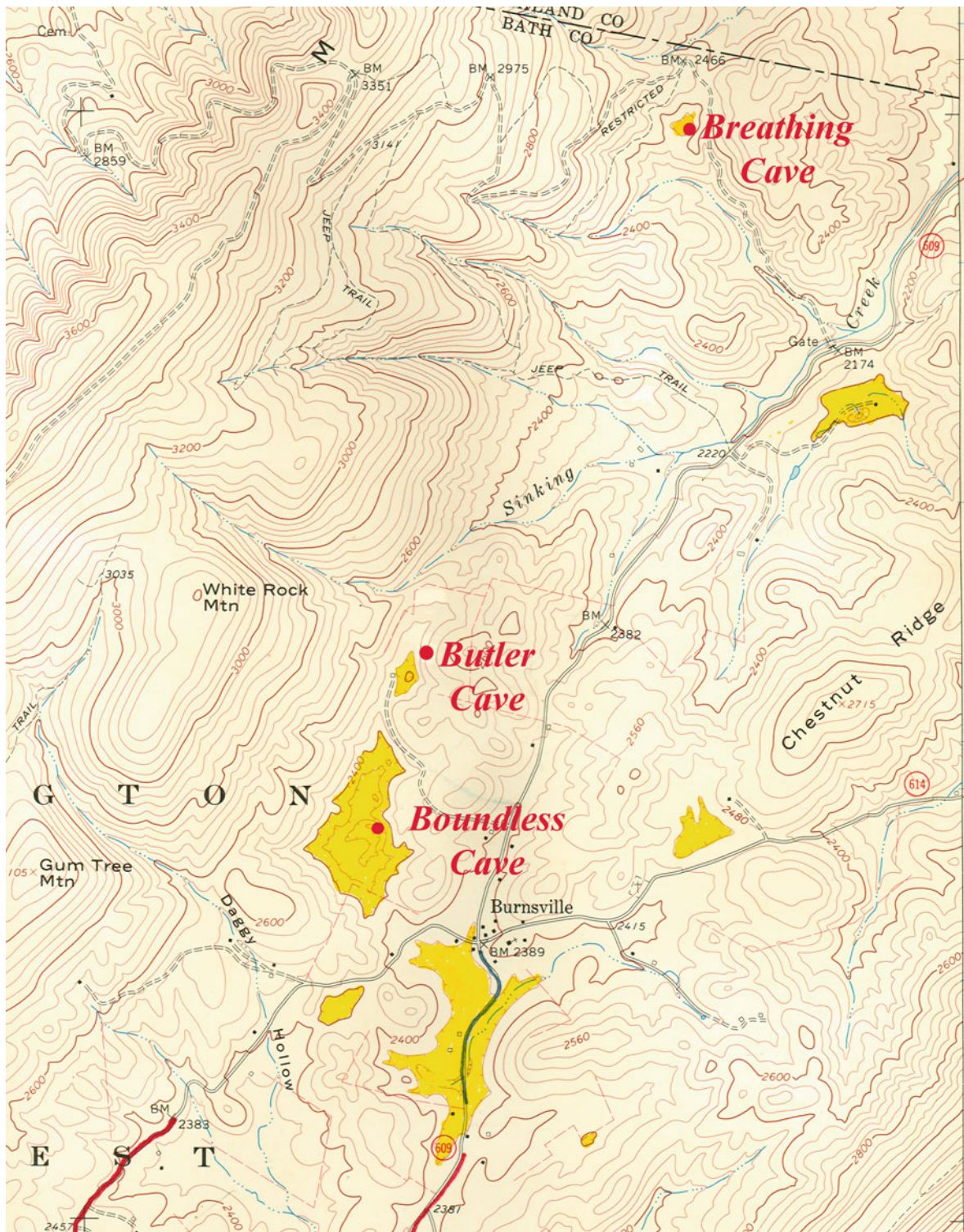
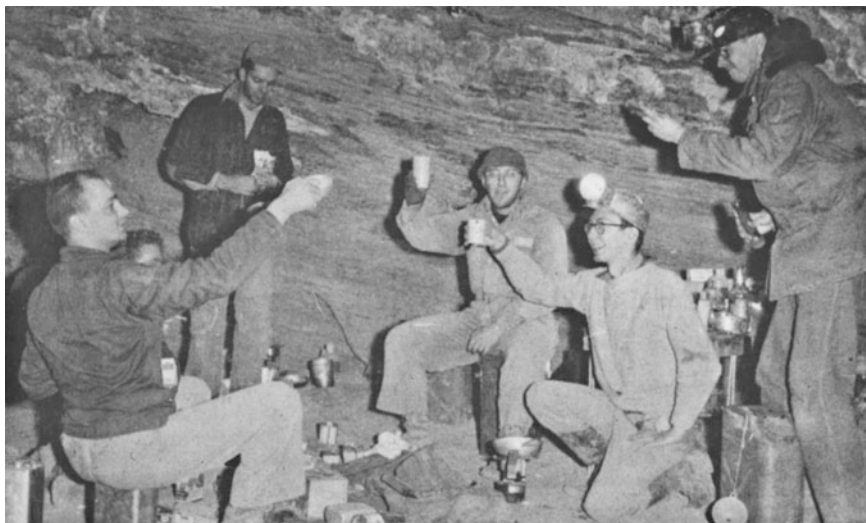


Fig. 2.1 Topographic map of the area near Breathing and Butler Caves. Extracted from U.S. Geological Survey Burnsville, Virginia 7.5 min Quadrangle. Yellow areas delineate closed depressions

Fig. 2.2 New Year in Breathing Cave. *Left to right* Herb Black, George Deike (concealed), Ken Graves, Jack Stellmack, Larry Matthews, and Harry Johnson. [Nittany Grotto Newsletter, Vol. 5, Number 3, Page 6 (January, 1957)]



George Deike expressed it this way: “Each morning the three parties split up and went into the darkness to their own areas. They might as well have gone a hundred miles away. All day they worked alone, without hearing from each other, as if no one else was in the whole cave. It was odd to reflect as you worked that somewhere in those thousands of feet of passage two other parties were laying their tapes through some seldom seen gallery or pit. At the end of the day it was very warming to come into camp and see a bright lantern and friendly faces.”

At the end of five days of mapping, most of the known cave had been mapped. More trips were made over the next year to complete various segments and to correct errors that surfaced when the final map was plotted. The compiled survey data were plotted and passage detail drawn into produce the final map. The total effort had required 14 separate trips made over a period of 6 years, involving more than 50 cavers and more than 3500 man-hours in the cave. The original map was reproduced at 20 feet per inch and resulted in a huge sheet of paper. Reduced copies of the map were prepared and widely distributed (Fig. 2.3). For its day, the Breathing Cave map is an altogether remarkable document. It was certainly one of the earliest large caves to be mapped in detail by project caving—a systematic approach to surveying the same cave on trip after trip.

2.2.3 Geological Investigations

George Deike was a geology major at Penn State and was one of the most persistent Breathing Cave mappers. He received his BS degree in 1957 and moved to the University of Missouri to study for a master’s degree. There he convinced the geology department that the geology of Breathing Cave would be an excellent thesis project. This, in itself, was an accomplishment because in the 1950s most geology departments considered cave studies to be completely frivolous. George and his wife Ruth spent much of the summer of 1958 at Breathing Cave completing a topographic overlay of the land surface above the cave, investigating the geology of the region, and examining cave passage cross-sections, profiles, and clastic sediment fills in considerable detail. The results were compiled into an MA thesis that appeared in 1960 (Deike 1960). A summary of these results appears as Chap. 18.

The detailed investigation of Breathing Cave marks something of an historical turning point. The classic papers on the origin of caves that had appeared in the 1930s and 1940s were largely based on intuitive reasoning with very little solid field data. Cave maps were not adequate and field observations were limited. The Deike thesis was one of the first to draw conclusions based on a comprehensive cave map, on detailed