

## WHY RESEARCH CAVES?

By Jerry Vineyard

The short answer—Why not?

The thoughtful answer—Because caves are more important than ever in today's world

The scientific answer—Because cave science (speleology) is a relatively new field offering unlimited research opportunities.

What is “Research” anyway? Webster says it's “...*careful, systematic, patient study and investigation in some field of knowledge, undertaken to discover or establish facts or principles.*” Now THAT covers a lot!

You may feel that “research” is far beyond your capabilities, but where caves are concerned, there is a fine line between “documenting” caves and doing cave “research.” Simply put, documenting caves means describing caves and the features they contain in words, pictures, and drawings. Research goes further to try to explain how and why what you have documented got that way.

Notice it does not say that you must be a scientist to do research. Of course, if you plan to do serious research in, say, the biological or geological sciences, you'll need appropriate academic and experience credentials in order to have any credibility with professionals in the field of study. But even the most qualified researchers must start SOMEWHERE, so press on, follow your dreams, and build your credibility one step at a time.

So how do you “break into” research? Actually, the opportunities are endless. Think of it this way: EMTs help doctors, paralegals help lawyers, and cavers help scientists and historians do professional-grade research. After a while, when you have earned degrees and gained experience, you can do your own research and recruit your own helpers. There are so many things to do! Many have helped Dr. David Ashley in his biological studies in various caves, generations of cavers helped the late Dr. Ken Thomson do mapping and dye tracing, and who hasn't been inspired by the restoration work pioneered by Jon Beard? Look around—chances are you'll find someone who is doing work that fascinates you, and chances are that person needs some help—your opportunity to learn by doing, the best way to gain the experience and expertise you need.

Caving and research are intertwined as no other activities I can think of. Consider the early days of exploring Carroll Cave. On one camp-in-the-cave trip, we set up base camp in a place called the Lunch Room. Caver Bob Starks put his sleeping bag down in what he thought was a nice, smooth place, but when he got in the bag, he felt a rock. That “rock” turned out to be part of the skull of an Ice Age animal called a Dire Wolf. Dr. Oscar (Oz) Hawksley, a biologist, identified the bone and later did an excavation and wrote a research paper that was the forerunner of a long series of paleontological studies in Missouri caves. Exploring in Carroll turned up a case of underground stream piracy in which Thunder River pirated Carroll River. That discovery led to dye tracing

research, which led to geomorphological studies, which led to sedimentological research, and so on and on. Now, half a century later, Carroll is being re-explored and seen by new eyes, leading to new research never imagined by the first explorers.

Research in cave history is also a challenging field of study, especially in Missouri, where the relationships between caves and people are so fascinating and highly varied. After all, what other state can boast of so many outlaws who were—so it's said—such active cavers? The history is there—all one has to do is “discover or establish facts,” and it only requires “careful, systematic, patient study and investigation.”

When I was a young caver studying to become a geologist (here it comes—the old story, “You had to walk 2 miles to the cave, and it was uphill both ways...”), there were no academic speleologists and very few respected professional speleologists to serve as role models. Moreover, there weren't that many known caves to study—less than 500 in Missouri—but today we have over 6,200 recorded caves with roughly half of them mapped. Speleology is being taught in many universities, and there are “supercavers” to serve as role models. Federal and state agencies employ cave experts, offering jobs to students who pursue careers in speleology. The same can be said of the private sector, where people with expertise in caves are in demand. And consider the wealth of data that has been produced over the past 50+ years, primarily by cavers who have accepted the challenge of documenting caves.

When my contemporaries and I tackled Carroll Cave in 1956, we had only carbide lamps and home-made helmets. We had zero rope skills and our ladders were made of hemp rope with oak slats for rungs (when those suckers got wet, they weighed a ton...). Our mapping compasses were Army surplus units. Worse, most of the topog maps available to us were 15-minute maps at a scale of one inch to the mile.

Now, when you research caves you have a bewildering choice of lighting units, compasses and laser distance measurers designed for caving, wet suits for cold, wet water crawls, and an amazing variety of other equipment. Cameras? Well, the new, rapidly changing world of digital photography is not only amazing, but less bulky and more rugged than the heavy, sensitive mechanical cameras of the past. Vertical technology? Name your device, and it's available. Maps? Topog maps are light years ahead of what used to be available, and GPS technology makes it easy not only to obtain precise locations, but also to find otherwise hard-to-find locations. And did I mention the Internet? All kinds of maps and space imagery are available, only key-strokes away. Just measuring the “vital signs” of caves—temps, airflow, water quality parameters, etc.—is immeasurably easier, thanks to instruments developed for environmental monitoring and adapted to caves.

So why not research caves? There are plenty of them, they're full of fascinating things, you have high-tech tools to use, you can get the training you need, and your efforts will be appreciated. Best of all, you'll find a much wider audience of folks who will be interested in what you've learned underground, and agencies who will be able to put your studies to work in protecting the environment. Cave owners in the 21<sup>st</sup> century are

likely to be more sophisticated than the “Joe Farmers” of the past, and more likely to encourage and support your work if they know it will be helpful to them.

Research can help build bridges to landowners, and we all know that without the good will between cavers and cave owners, caving as we know it simply would not continue. For example, helping landowners understand the natural drainage patterns beneath their land can lead to better land stewardship, and maybe—just maybe—counter the urge to throw trash in sinkholes, to mention just one positive outcome. Landowners also need to know about cave life in all its marvelous forms, because knowing about it and learning to appreciate it may lead to better surface land use practices that protect cave life. Research can help promote win/win situations, and that is good for all of us!

Did I mention the adrenaline rush that comes with making new discoveries and revealing new facts? It's very much like the feeling you get when you first enter a virgin cave passage, where no living person has been before. When you've done “careful, systematic, patient studies” and discovered something new about caves, it becomes a source of great pride. You can then say, “I've done something no one before me has ever done, and the world will be a better, more interesting place because of what I did.”

There's a familiar saying, “Caves are the last frontier.” One of the hottest areas for biological research involves so-called “extremeophiles,” organisms that live in extreme environments such as caves. The reason why “extremeophiles” are cutting-edge research is because of the eternal human drive for exploring space. People wonder whether life might exist on other planets, in some form of cave.

Closer to home, there are unlimited opportunities for researching caves. Why? Because of population growth, more and more people are affected by caves and karst processes. In the Springfield area alone, sinkhole collapses during just the past year have swallowed a house and garage—with a car inside—and contaminated a popular cave in a public park. But you ask, “Hasn't everything people need to know already been done?” NO, NO, A THOUSAND TIMES NO! Research is NEVER done [complete]. On the contrary, research almost always leads to more questions, so knowledge increases in the positive direction.

Well-known supercaver Bill Stone is a case in point. He began as an ordinary caver, polished his skills, became a cave diver so he could push deep, complex systems in Mexico, and invented a rebreathing device for cave divers that opens systems that otherwise would be unexplorable. Now he's looking toward someday going to the Moon and/or the planet Mars, to research caves!