

CaveDiggers.com

The End is Our Beginning

Cave Finder

Features

4 Interview with John Ackerman by Aaron Bird

11 Moving Digital by Mark Passerby

18 A Diggers Day
by Glen Ledbetter

19 Winkarst 10 by Garry Petrie

20 True North Electronic Compass

19 Winkarst 10 by Garry Petrie

**Cover Photo: Bob Kirk in
cave sketching**

John Ackerman with the "Cave Finder"

Caves.com

Interview with John Ackerrman July, 2003

Aaron: John, please tell us how you got into cave digging in Minnesota?

John: O.K. Well that's a good question. I guess the reason why I got into cave digging in Minnesota is because there are very few caves that have been discovered in this area. So really, cave digging became a necessity to find caves.

Aaron: How many caves did Minnesota have naturally before people started digging?

John: Well, you know, even though we may have thousands and thousands of sinkholes, we have very few caves that are known, documented, and surveyed. I would guess that realistically you could count them on one hand. So the caves that are suitable for visitation are maybe two or three. Not to say that we don't have some significant caves in this state but what we do lack are cavers. We have very few cave explorers in this state, but on the positive side we have very many sinkholes that are waiting to be excavated because that's where you're going to find your caves.

Aaron: Was Spring Valley Caverns an open cave before you got involved with it?

John: Spring Valley Caverns was discovered by a young farmer who had just purchased a large farm in southeast Minnesota. He was out looking for a calf on horseback one spring morning after a heavy rain and found that a sinkhole had formed on the edge of a ravine. Subsequently he entered the cave with his wife and two little kids and thought it was so spectacular that it needed to be commercialized. So he ended up commercializing this cave which was about a half a mile long in the late 1960's and that commercialization effort failed after one or two seasons.

That cave sat empty until I came

around, which was about 1987. By then the land had changed owners three or four times and the current owner had invited me out to this property, not only to visit this cave once again because he was naturally curious, but to also determine if any other caves could be found in one of forty-five or fifty sinkholes on his property. So I ended up buying roughly half the farm from him back then and expanded Spring Valley Caverns from a half a mile to over five and a half miles.

Aaron: Was that all from one entrance or did you dig open other entrances?

John: I found over five miles by sticking to one project within the cave for almost a year. We had all the right "cave signs" and up here when you want to find a cave it's not like ridgewalking and finding a deep pit and just rappelling down. This is called "Persistence" with a capital P. So my partner and I spent about a year opening, enlarging a crevice and found mostly all of it just after one breakthrough. There were other small breakthroughs in the cave after that, none of which required any rock removal, maybe a small amount of sediment removal, but we actually found large walking passages, large rooms. Most of the new find is 70% walking. So it was an exciting time. That was in about 1990.

Aaron: Have the caves in Minnesota traditionally been developed in the water table or do they have streams flowing through them?

John: To find a cave in this state, you'll need to dig in a sinkhole. Typically when we excavate a sinkhole, we find that the cave typically allows us to enter it about fourteen feet down from the bottom of the sinkhole. From there it usually brings us into the main level in the Dubuque Formation, which is probably forty to sixty feet below the surface of the land. From there we typically find ourselves at the contact zone between the Dubuque Formation and the Stewartville [member of the Galena Formation].

The Stewartville will lead you effectively down to the water table because that's about as low as you will go. You'll usually find a stream or a river at that level and so, in most of my seventeen caves that I've discovered on my property, you will find a river or stream passage down below them.

Aaron: What age are these rocks?

John: 400 - 600 million years old. Ordovician aged.

Aaron: Are there formations in these caves?

John: Oh yeah, we have one formation that was found recently that's considered the largest column in this state. It's so big that two or three people could not get their arms around it and it's probably twelve feet tall. It's an amazing column. We call it the Leaning Tower. But yes, we have a multitude of formations just like any other state does.

Aaron: You said seventeen caves on your property?

John: Well, we're working on our eighteenth cave now.

Aaron: That's great. How long are these caves that you've found on your property?

John: Like I said, the breakthrough at Spring Valley Caverns has brought us to over five and a half miles. I have another cave that I discovered on my property that's over half a mile long; another one that's not too far behind that one; and then the rest of them all are less than, I'd say, 1000 feet. Somewhere in there.

Aaron: Are they related hydrologically?

John: You know, we haven't done a lot of dye tracing yet, but I believe that they probably are. They're scattered in about a mile diameter area on my property. They each have

Continued on Page 5

their own special characteristic. Some of them have unique features that others don't. But probably the same water courses through most of them.

Aaron: You've been involved with caving in other states as well in the Midwest. What are some other areas you've been involved in?

John: I've traveled around the United States and gone caving virtually everywhere. I've been to Cheve Cave in Mexico. Once in while, when time permits, I'll go out to the Black Hills and go wild caving, and so I've traveled all over and cave all over, but stuck around close to home here primarily because we have caves that are so close. I'm an hour and a half away from the caves here in this state.

Aaron: Are there any special tools you guys have used in digging open these sinkholes?

John: Well, we're hard core diggers. Let's put it that way.

Aaron: Heavy equipment...?

John: Yeah, we do anything...we do whatever it takes. Back in the early 1980's it was very apparent that we were not going to get anywhere unless we could open up sinkholes. Even when you're in a cave, it's pretty apparent that if you want to find going passages, even if you have airflow and other signs, if you don't have the right digging equipment, you're not going to do it. So really what we're looking for are "cave signs," and if we can get the proper cave signs, the rest is just a matter of removing the fill or widening passages that are inaccessible. So yes, we've got our special hand tools, and drag boxes and all kinds of goodies that we use.

Aaron: What do you look for in "cave signs?"

John: Up here, I'm sure it's the same as in other states. We want to spend some time where we're feeling wind movement. Another thing

that may be unique up here is we're looking for little white dots. When we dig in sinkholes, we have a fairly reasonable expectation of finding a cave because that's why the sinkhole is there, but if we can uncover just one rock with little white dots on the back, we call it condensation corrosion, we know there's air movement down there, and then we're just going to pursue it with a vengeance.

Aaron: That's funny. I've seen that before and I've made a rough association, but now that you mention it, I agree, the white dots probably do indicate at least condensation if not air flow as well.

John: In the southern part of this state, we found that it really points to air movement.

Aaron: Yeah, I've seen that before also. Have you been involved with the Coldwater Cave activities of late? Is that something that you can talk about now?

John: I've discovered and explored other caves on southeastern Minnesota, and I've typically spent the bulk of my time right on my own property because the caves don't get any better than that. We have caves like anybody else. We have rivers. We have hundred foot tall pits and passages. We have lots of mud, too. Most of the caves are dry. So, we have a lot of exciting things happening in our caves, but I've been involved with other projects and the most recent project that has diverted some of my attention away from the Cave Farm has been Coldwater Cave.

Cold Water Cave is located right across the Minnesota border, which is probably thirty-forty minutes away from my farm. As you probably know,



Coldwater Cave was discovered in 1968 by cave divers and the State paid to bore a hole into the cave. They leased the property from a local landowner who happened to own the property right about above the main trunk line, but the state of Iowa was unsuccessful in obtaining enough money to commercialize this cave, so they turned the shaft and the small building back over to the landowner, after three years. Since then, this cave has been controlled by just a few key holders and access was not what it could have been, so about eight years ago I embarked on a campaign to create my own entrance into this cave and after many hard fought years, I was able to obtain 205 acres of that cave, so I have recently sunk a 30 inch diameter shaft into one of the side passages 188 feet down.



Continued on Page 6

Aaron: Wow. That's a pretty significant hole to dig.

John: It's a very large hole. There are a lot of similarities between it and Carroll Cave in Missouri. They had twelve miles of passage and drilled down about 118 feet, took about a year of blasting. That cave was also declared a National Natural Landmark. Coldwater Cave is a sixteen mile long cave. It's the 33rd longest in the United States. We were able to drill down 188 feet in just a couple of months. It was a very quick project.

Aaron: How was it so quick?

John: It was quick as far as drilling. Like I said, it was in the planning for eight years. It took a team of attorneys to move forward with this thing because, obviously, we expected some resistance, but once we got the drill rigs out there, it went relatively fast. We were supposed to have this shaft drilled in about a week and a half. It took two full months because the well rigs kept breaking down due to the extreme density of the rock.

Aaron: Is that the same kind of rock that's in Minnesota on the Cave Farm?

John: Yeah, or even harder. It drops a few rock layers [into the lower Galena] as you go south, so it was very brittle, very hard rock, quite unexpected from the drilling company's standpoint.

Aaron: What diameter holes were drilled?

John: Thirty inch diameter.

Aaron: With one drill?

John: Well actually, because I didn't want any contamination going into the cave, I requested that they drill a fifteen inch hole all the way down until ten feet above the cave ceiling. They had to case the first twenty feet. Then when they reached that depth, they pulled out the fifteen inch casing and used a completely differ-

ent rig. By the way, there were four different drill rigs that it took to accomplish this. Another rig came in and installed a thirty inch steel casing. From there, they went down, utilizing a fifteen inch, twenty-four inch, and thirty inch bit all in one. They coupled them all together and went down through this fifteen inch hole until they were ten feet above the cave ceiling. Then they continued downward using this triple bit system. It was remarkable in the sense that it put very little slurry or what we call "findings" down into the cave passage.

Aaron: Wow. That is really amazing.

John: So we have recently installed a 188 foot ladder as a temporary measure to get up and down.

Aaron: Still a pretty tight hole, though, isn't it?

John: Well, thirty inches is optimal. That's the size that the State originally drilled at the other entrance, and that's the size I've chosen for all the entrances at the Cave Farm. Its small enough that you can be comfortable leaning against the side with your back, if you're tired, and large enough for the larger cavers.

Aaron: How high is the passage? Was the height of the passage a reason why you didn't want the spoil, or "findings," down in the cave?

John: The original entrance that the government created was right smack dab in the middle of the main river borehole passage. It is quite unsightly. They have a large dock system right above the water. I chose to create my entrance in a side passage away from the river passage, and not only that, we were able to create an entrance that skimmed right along the edge of the side passage, so it was very unobtrusive to the cave.

Aaron: Was that made possible because of exploratory drilling, or because of the accuracy of the survey?

John: We have a copy of the original survey, which we utilized for this project, but before we began our main drilling, we hired a separate firm to come and drill a test hole. It was a five and one-quarter inch test hole, which was very successful. Then we lowered a camera down the test hole and determined that there were some minor formations in the way, so we located the main shaft about fifteen feet away from them.

Aaron: That's great. So what are the current activities in the cave now?

John: You know, nobody from our group has been more than two or three hundred feet from the entrance because we've been spending our time making a lid and installing the ladder system. Like we talked about, most of our time is spent at the Cave Farm, so I haven't had a lot of time to devote to this project, but we have come a long way. We have a secure entrance now with a very nice, stable ladder, so we're ready to go.

Aaron: What is the potential for Coldwater Cave? Right now it's at 16 miles, I think you said, so is there potential for more cave there?

John: Well, I'm a caver, and primarily what I'm into is cave exploration, so that's where I focus most of my activities, and yes I feel there's potential for many more miles in this particular cave. It's a spectacular cave by the way.

Aaron: I believe I remember reading the NSS article... oh, maybe ten years ago, or more... and I remember being very impressed and excited by it.

John: Yep. We're starting to work on another project nearby in Minnesota where there is known to be a cave system probably three times as large as the Coldwater Cave system, and we know that based on dye tracing. The largest blind valley in the state

Continued on Page 7

is located between Coldwater Cave and the Cave Farm, and as yet, nobody has been able to gain access to it, primarily because there are very few cave explorers up here, so we're moving ahead with that project now.

Aaron: Wow, that's sounds exciting. Now, the Cave Farm caves... do they have their own hydrologic system that's unrelated to Coldwater and the new area you mentioned?

John: Totally unrelated.

Aaron: So these are three separate hydrologic systems.

John: Yes, totally three separate systems.

Aaron: What are the current activities on the Cave Farm?

John: Well, right now we're hoping to open our eighteenth cave. Last year was the first year we were able to utilize what we refer to as the "Cave Finder," which is our nickname for an excavator. In the past I have hired out contractors - a local construction company- to help out with back-hoeing, and finally we just made the decision to purchase the excavator ourselves. I was able to find a 1996 CAT 312 Excavator in Utah, and had it shipped to Wisconsin, where I had the stick and the boom extended so it will easily dig 25-feet down. [Aaron chuckling in surprise] It's a very, very good tool.

Aaron: [Still chuckling] That's great! How many caves has that thing gotten you into?

John: We found a couple last year using it, and I suspect we'll find many more. It sure beats the old bucket and pulley system with wood shoring.

Aaron: I bet it does. Heavy equipment is the way to go, if you can get a hold of that stuff. Well what is the total potential of the Cave Farm?

John: I just keep purchasing more land as I can. Land is getting pretty scarce because Rochester, Minnesota, which is the home of IBM and the Mayo Clinic, is just mushrooming out. People are looking for hobby farms and so land is being gobbled up, and I've been lucky enough to expand the Cave Farm to 325 acres. I also own over 200 acres of underground rights beyond this property, but I would like to continue purchasing property, if and when I can. I would suspect there are at least 15 more caves left to be discovered on my farm based on the amount of sinkholes. I have no doubt that will continue to become a reality if we continue to do what we're doing.

Aaron: O.K., let me get this straight: you have 17 caves, and an 18th on the way. Do these each have their own entrance?

John: Yes, after I excavate a sinkhole and locate the cave entrance, it is usually necessary to create a



more suitable artificial entrance into the cave. The problem with allowing the sinkhole to become your permanent entrance is the fact that the cave will become flooded with copious amounts of mud and water that will drain down into the sinkhole

entrance, making it very unstable and unsafe to keep such an entrance.

I have a cave radio that we use to find a suitable man-made entrance site, and we create that entrance and after we're done creating the man-made entrance, we permanently close the sinkhole by using rebar and concrete and crushed rock. We really insist on restoring the sinkhole and surrounding ground to the original condition before found it... or even better.

I know there are parts of the United States where if a sinkhole is opened up and a cave is found, that may be a suitable entrance due to the different rock strata. You might not have the problem with copious amounts of run-off from the nearby farm fields down into the cave, but here that's not a possibility because the sinkholes act as underground water conduits, we really need to create an entrance that is high and dry.

Aaron: What are the characteristics of your permanent entrances?

John: Well, we utilize 30-inch culverts. For the most part, I purchase culverts with a rubber membrane so they will last indefinitely. Usually those culverts are thicker gauge steel than the average road culvert. We'll pick a spot with cave radio where it won't damage the cave environment, and then typically what I do is pull away all the soil and, kind of similar to what they did in Carroll Cave, I drill thin diameter holes in a 30-inch diameter circle and just work my way right down into the cave ceiling. Typically we use a 200-grain det cord, and just create our own way down. When we're down inside the cave, we remove any rock shards that may have fallen down into the cave, and after that procedure we install the culvert right on top of the bedrock. We'll backfill the whole area, and then we'll put on a special lid we make that has safety releases from the inside in case someone decides to play a little joke

Continued on Page 8

on you while you're inside the cave. Then we'll restore and seed the area around the work site and few months later, you'll walk by and never know that anything have ever been done there. There'll just be a two-foot high culvert sticking out of the ground with a lid on it.

Aaron: And you have 17 of these around the cave farm?

John: Yes.

Aaron: Wow!

John: For the most part it's a heavily wooded, rolling area, so it's somewhat difficult to detect these man-made entrances.

Aaron: Do some of the caves connect together?

John: A couple of them come pretty damn close, but for the most part they're spread out pretty far away from each other. It seems as though what we're finding is that if a person is very persistent in this part of the country, if you dig out a sinkhole, you will find a cave. The theory is that the sinkhole was caused by the collapse of a large cave passage that may be intersected by another cave passage, and so that's where we're going to the find the caves.

When you travel further south towards Iowa, you'll find that the sinkholes are poised directly over tall domes, perhaps over 100 to 150' tall, so you get quite a surprise when you open up one of those sinkholes and hear the rocks falling 150'.

Aaron: This is all really impressive. Now I do want to ask the question about how you got into this... because I'm not aware of anyone else who has done this type of work...

John: You know, I'm not sure how I got into it; I've always been caving. I have fond memories of roaring through the St. Paul mines late at night on my motorcycle with a 12-pack strapped onto the back and my girlfriend's breasts pressed tightly against my back. [Aaron and John

laughing]

That was in about 1971 or 1972, and shortly after that I actually cut off my pony tail and went through college and got a degree in law enforcement. After a short stint in that, I realized that I couldn't handle being broke all of my life, so I became self employed, and that'll bring us right up to the present.

Aaron: So it's a life-long activity then.

John: I don't really know where it all started, but as a little boy I just remember being fascinated by caves, and I've visited caves all over the United States and to this day can't lose the bug. I think it's just a hobby that got out of control.

Aaron: Well, I think it's done that for a lot of people.

John: It's almost a religious experience when you find a new cavern and stroll through it for miles. It truly is. It is an unbelievably overwhelming feeling that most of us in this small club have had a chance to experience. I guess along with that comes the responsibility of making sure that the discovery gets protected.

Aaron: That's a good approach. Does Minnesota have cave protection laws?

John: They do not. And they do not have what we refer to as a sportsman's law, which will guarantee that the landowner will not lose everything if somebody that he has invited onto his property has a serious accident. So our insurance in the upper Midwest has tripled in one year. For instance my own carrier canceled my policy last year for no reason, other than they chose to get out of the cave-liability policy, which forced me to search for insurance, and the agency I was with opened it up for bidding. Three insurance companies across the United States responded and in the end only one would entertain a bid. Subsequently the insurance premiums tripled in one year and I've been warned that perhaps

in a year or two, that particular carrier may not even want to become involved in cave-liability insurance. This is affecting a couple of the local commercial caves: one in Wisconsin and one in south-eastern Minnesota and they're very, very concerned and worried about this.

Aaron: Do the caves of Minnesota have any endangered species of animals, plants, fungus anything?

John: Not to my knowledge. We have four species of bats, and like everywhere bats are practically endangered. We're worried about they're declining numbers. I took great pains to design our main cave building (which rests over the top of the main entrance into Spring Valley Caverns) to incorporate a bat-accessible entry. There are some rare plants on some of the cliff faces near the cave entrances, but really there are no endangered species that I'm aware of that inhabit these caves.

Aaron: So there's no motivation in the State government to make any changes in the way that they treat the caves right now.

John: No, not at all.

Aaron: Is there any motivation [by the State or landowners] to fill them in? Perhaps to remove liability?

John: You know, the DNR has been in the habit of obtaining caves and protecting them. I would doubt that they would purposefully seal any of the sinkholes or caves, if they were known. In the Twin Cities, we have quite a few areas that have been mined out as storage facilities. Those have been backfilled and some of them have been heavily gated due to liability concerns.

Aaron: The insurance and liability issue sounds a very perplexing problem for you.

John: It's a problem. I was very happy to find out that my insurance

Continued on Page 9

carrier picked up the Coldwater property and combined it with my Cave Farm policy with only a \$300 increase. That was a very pleasant surprise, but I don't anticipate that is going to last forever.

Aaron: So a liability release doesn't have any weight does it?

John: No, not really, although the insurance carriers have requested that anyone who visits my farm sign a liability release, the theory being that it may help somewhat, though they said in the end it never has.

Aaron: You have a little more controlled situation on your property: you know who is coming and going and those people are your friends, and they're not going to sue you, right?

John: That's correct. The property is well gated and anyone who has access is well known to the caving community. We do have visitation from the University of Minnesota and some of the local nature groups, and of course the local caving community.

Aaron: So the worst case scenario, it sounds to me, is that you would have to more tightly control access, if the insurance carriers decided it was too much liability for them, and then you would have to hope no one would sue you...

John: That's about it. Eight years ago there was a major scare in south-eastern Minnesota. The insurance companies were actually warning landowners not to allow cavers onto their property, especially to dig in sinkholes, due to the liability situation. For a while it was a tough sell for us to explore private property in that part of the state.

Aaron: Has this reason been a big a motivator for you to buy your own property and work on your own property?

John: Not necessarily, I would say it seemed as though the more time I spent on this particular farm, the

more I became ingrained in the possibilities. After you start opening cave after cave with no end in sight, it just kind of takes hold of you. The landowner [original] was a very gracious individual, and he was as curious about what was underneath his farm as I was. In fact he even encouraged me to use explosives on his land. [Chuckling] That was a rare individual indeed.

Aaron: Yes. Definitely. In West Virginia, where I do most of my caving, a cave-protection and landowner-protection law, which says that even if a caver is given permission to go on the property, the landowner can not be held responsible because the feature [cave, sinkhole, etc.] was there prior to the landowner. Therefore the person who owns shouldn't be responsible for it if he or she didn't have control over it. That's probably due to the fact that there are so many naturally open cave entrances.

John: Yeah, I suspect that's true. There are a few cavers in Wisconsin trying to deal with that problem and trying to approach the Legislature to slowly get the wheels moving so we can change things. Since Wisconsin is our neighboring state, we have hope that if the situation works out over there, then we can pick up on it over here, and try and force the issues: [the first one being] cave vandalism laws, and second the liability issue.

Like you say, karst is not a hot topic up here. We have very little in karst features, and what we do have is located in the far south-eastern part of the state, and so if you would ask the typical person, "What do you think about caves?" they wouldn't have a clue what you're talking about. Furthermore they don't even know what a sinkhole is. When you get down into south-eastern Minnesota, you suddenly encounter thousands of sinkholes, but most of the farmers don't even have a clue of what's underneath them. They're just thankful they can dump their garbage and pesticides in the sinkholes.

Aaron: Are there springs?

John: Oh yes. In fact, I discovered a total water-filled cave in south-eastern Minnesota. There was a spring coming out of the side of a hill, and I was able to gain access to that, dove in, and found a spectacular cavern in there, but it didn't go as far as I had hoped.

Aaron: How about topography? Are there hills, ridges?

John: This state is incredibly varied. We have over 15,000 lakes, 6500 rivers and streams, which translates to 900,000 miles of shoreline. The largest Federal wilderness, east of the Rockies, which is called the Boundary Waters, lies in the extreme north-west part of the state. It's almost 1.1 million acres. When you travel to the northern part of the state, it's heavily forested. When you refer to Minneapolis-St. Paul, it's mostly flat terrain, though there are significant pockets of woods. When you travel to the western part of the state, it's mostly all-out flat cropland, but the south-eastern part of this state is very unique because it's unglaciated. The glaciers retreated well before they met the south-eastern corner of this state, and so we have fantastic limestone bluffs, rolling hills, meadows; it's extremely varied and picturesque.

Aaron: I was going to ask what effect the glaciation had on the caves, but it sounds to me that since there was no glaciation, you still can get access to them.

John: You sure can, and that's a good thing, but we are always reminded that the last glacial retreat brought with it copious amounts of water and mud. The caves were well formed before the last glacier and unfortunately the last glacier filled a lot of these caves up with sediment. It seems that the caves we're finding now were reopened by the water mass that flowed back through that area and reopened significant cave

Continued on Page 10

passages. You'll find significant caves, but you'll also find that many passages are almost filled with glacier till, some of which came from Canada, [i.e.] granite. It's a very beautiful part of the state.

Aaron: So because when you're in cave, and you're expecting sediment, then you can have an anticipation that the cave will continue if you can get through the sediment choke, right?

John: That's exactly right. We utilize cameras that we can probe ahead, but for the most part, if we get "cave signs" we'll go ahead excavate it the old-fashioned way, if we're in a cave, and go ahead and use our drag boxes and other digging paraphernalia.

Aaron: What are some of the biggest passages?

John: I would say 40-forty feet wide, by probably 20-feet tall. Those are some of the larger passages. Most of the passages are about, I would guess, 8-feet wide by 8-feet tall. That seems to be the norm, though we have significant amount of cave passage that is very, very tall. I was in one passage in my cave a few weeks ago, and we actually had a cave radio and measured it and it was about 140' tall.

Aaron: Wow, that's very big by any standards.

John: ... and of course we have the rivers and streams that run through the lower levels with aqua-blue green, crystal clear water just waiting to be dove. So there's a lot of varied feature in these caves: there's lots of horizontal walking, and also a good share of vertical climbing that one can do.

Aaron: The caves are certainly developed along the joints, but are they developed primarily along the dip or strike of the limestone in that area? Is there any dip or plunge to the bedrock there that controls cavern development?

John: We have anticlines and synclines, but we haven't really encountered those in a cave yet. It's fairly clear that you can be in one rock strata in a certain part of the county, and a mile away it will drop 40 or 50 feet.

Aaron: So there is some angle of the bedrock, but not that significant... pretty flat-lying limestone, then.

John: You're right about the caves being joint controlled, but when you get to the lower levels, if you do find a river or stream passage, it will meander with [apparently] no rhyme or no reason. So the maps look a little strange.

Aaron: That's interesting.

John: We can predict where we're going to find new passages based on the joint-control history. We can predict that every 50 to 75 feet, for instance, we're going to hit a north-south passage, so if we're digging in an east-west passage, we know that we've got a certain number of feet to go before we'll probably get a cross joint.

Aaron: Do some of the caves have maze passages?

John: Only in the lower levels where the water meanders... at least in this part of the state. There are maze caves further to the east in the south-eastern corner. For the most part, where we're caving actively, there are no real maze caves.

Aaron: So, let's see... we've hit on a lot of topics, and we've been talking for about an hour. That's usually what we do. Is there anything that we've missed that you want to talk about?

John: We should touch a little bit on the Department of Geology and Geophysics at the University of Minnesota. They're really considered to be the most leading authority around the world regarding speleothem analysis. Dr. Calvin Alexander is heavily involved in this. They're attempting to understand the

causes behind the formation of the speleothem bands and the factors that control the thickness of these bands, whether these bands are annual, whether these bands can be used for dating speleothems, then finally to construct climate and vegetative history.

Aaron: So is this research ongoing on the Cave Farm?

John: Yes, it is.

Aaron: Ahh, good.

John: In fact, the University is sampling or testing speleothems from around the world. It's very exciting.

Aaron: Is there any other research ongoing?

John: Well, yes, there are dye traces that are going on all the time, and there are many factions of studies that are going on by different groups including folks from the DNR. It's very exciting to see that happening.

Aaron: Well, you have a perfect place for it to happen, certainly. I think without the involvement that you've had in there, it wouldn't be possible for people to be doing that kind of research.

John: I consider myself the temporary steward of these caves, and after I'm either killed in one of them or after I'm retired, the caves will continue to be there for the researchers and cavers, alike.

Aaron: That's good. That's great. Well, John, it's been nice talking with you.

John: Yeah, I appreciate it. I enjoy the magazine.