

## **TYPICAL NEWS RELEASE**

for Professor John R. Marquart's talk/slide show entitled:

# **Caves – Worlds within the World: An Introduction to the Chemistry, Geology, and Ecology of Caves**

**The Hidden World Underground – Caves.** Explore caves with Dr. John R. Marquart, an experienced cave explorer and professional scientist. A lecture and slide show which is suited to a general audience (technical or otherwise and adults or children) and is dedicated to share with you his enthusiasm with these fantastic creations of nature.

### **Did you know that caves might be hidden underneath your feet right now?**

They may well be. About 20% of the U.S. consists of karst (cave) area and 25% of the world population lives over such areas. Karst areas are distinguished by the presence of underlying chemically soluble rock beneath the topsoil. These bedrocks usually consist of carbonate rock (limestone and dolomite), but may also include evaporates (gypsum or even rock salt). These soluble rocks were deposited hundreds of million of years ago when shallow tropical seas covered most of North America. A typical karst terrain can often be identified by the presence of sinkholes, karst ponds, rising springs, sinking streams, and cave entrances. In many areas, these more obvious features have been hidden from view by weathering, mountain building, and soil deposition, but the cave features often still exist deep underground, perhaps under you. We will find out.

### **How does karst impact us?**

From a positive point of view, karst supplies us with our fascinating caves to explore for sport or scientific investigation. Some caves are “show caves,” open to the public with a professional guide, but many times more are “wild caves,” where you are on your own. A decade ago, it was estimated that the U.S. had about 40,000 known and reported caves, but new and virgin caves are being discovered at a rate that doubles the count every ten years and a count of 80,000 is closer to the current number. Discovering such unexplored caves is the ideal dream of cavers, as stated so familiarly and appropriately from Star Trek, “To go where no man has gone before.”

The formations found in caves come in a variety of structures, shapes, and colors. The more familiar are stalactites (hanging down from the ceiling) and stalagmites (sticking up from the floor), but a huge variety of other fantastic forms, appearances, and colors abound. Some take on the shape of bacon rind or draperies, flowers, Roman shields, even helical forms that defy gravity. We will see many of these in the presentation.

From a negative point of view, karst areas are particularly vulnerable to destruction and pollution. Humans may intentionally or unintentionally destroy the unrenowned work of nature that took thousands and even million of years. Furthermore, in karst areas, groundwater immediately sinks underground carrying with it all the pollutants from industrial, agricultural, and residential activities. A spill or leak can result in severe contamination of ground water many miles away in a single day. Furthermore, the unstable nature of karst terrain can quickly damage or destroy buildings, roads, and other structure, as sinkholes suddenly appear overnight. We will see some of the ongoing projects to control these problems.

## **Is there life underground?**

Caves make up their own microclimate with a very delicate balance of living things depending upon each other. In this lightless world, the balance of organisms is extremely sensitive to disturbances and many cave creatures are listed as federally endangered species.

Probably the best known cave creature is the bat, the only flying mammal. Bats are fantastical animals with a solar guidance system that man can only dream of duplicating. They are “nature’s insecticides,” where a single bat can consume up to 10,000 mosquitoes and other insects in a single night. Bats also are critical pollinators of many plants in the deserts of our country. The huge saguaro cactus in Arizona depends heavily upon pollination by bats. Unfortunately, the population of bats in the desert and throughout the country is often dropping to critical levels. Many bats are now federally endangered species everywhere. Bats are finally getting their deserved appreciation and the misguided fears of them are disappearing. People are putting up bat houses to attract bats to keep down the bugs from their yards, farmers are replacing environmentally damaging insecticides by attracting bats to their fields, and caves and mines in which bats live are being gated and protected. However, as people continue to build outwardly and “civilize” the wild, the danger of extinction of bats (and other animals and plants too) is far from over. Some examples of efforts to save bats and other animals, especially those that are federally endangered species.

## **What will we learn in the lecture/slide show?**

The program will discuss caves from a multidisciplinary approach by mixing geology, chemistry, biology, and ecology. We will learn about the earth history that has led to the creation of caves and where they are and why. A chemical demonstration will show how a great deal of the nature of caves can be understood in terms of some rather simple chemistry. We will take a slide show tour of a number of fantastic caves around the country (mostly wild caves) and see the unique beauty that each offers. In our ventures, the necessity to protect the cave, our environment, and ourselves will be emphasized.

We hope that the program will give you a new appreciation of caves as one of our great natural resources and an understanding of how they came to be.

## **The speaker**

Dr. John R. Marquart serves as a Professor of Chemistry at Eastern Illinois University in Charleston, IL (25 years) and as a Visiting Professor and Adjunct Lecturer in Chemistry at the University of Illinois in Urbana/Champaign (31 years). Before that he taught at Mercer University in Macon, GA (10 years) and worked as an industrial chemist for Shell Development Company in Emeryville, CA (5 years). He also served the U.S. Army as an officer assigned to the Chemical Corp. while stationed at Dugway Proving Ground, Utah (3 years). His area of research involves the study of environmental problems, especially as relate to subterranean environments (caves and mines). He is active in a wide variety of field-based conservation and restoration projects in collaboration with many state, federal, and private organizations. He holds a B.S. degree in Chemistry from the University of Arizona and M.S. and Ph.D. degrees from the University of Illinois at Urbana/Champaign. Since he began as a tour speaker for the American Chemical Society (ACS) in 1995, Dr. Marquart has presented more than 100 society sponsored lectures on cave science in 40 states. His lecture/slide show has been well received by an audience having a broad range of interests, backgrounds, and ages. He aims at conveying his deep dedication to caves as one of nature’s most fascinating unrenewable resources.