

# MAGS EXPLORER



Memphis Archaeological and Geological Society Youth Newsletter

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**Egypt Rocks!** The Egyptians were among the first human cultures to use Copper, but they were also one of the first to develop Bronze, a mixture of Tin and Copper, and usher in the Bronze Age of human history.

As early as 3900 BC, the Egyptians were developing Copper products that became more and more common and eventually showed up in common household items such as cooking pots. By 2500 BC, Egyptian jewelry makers had developed Copper working to such a level that they were creating crowns and headdresses made of the metal.<sup>1</sup>

And did you know that King Solomon wore Garnets during battle? Garnets have been found in Egypt that date back as early as 3100 B.C. Garnets were popular with early Egyptians in adorning amulets and talismans. It is believed that garnets were buried within the tombs of the dead, to provide light and protection for passage into the afterlife.<sup>1</sup>

Quarrying of limestone and granite was already an advanced technology by the time of the pyramid builders in Egypt.<sup>2</sup> One of the most notable and lasting achievements of the Ancient Egyptians are their pyramids. The size, design, and structure of the pyramids reveal the skill of these ancient builders. The pyramids were great monuments and tombs for the kings. The Egyptians believed that a king's soul continued to guide affairs of the kingdom even after his death. To ensure that they would continue to enjoy the

blessings of the gods, they preserved the pharaoh's body through the mummification process. They built the pyramids to protect the pharaoh's body, the pyramid was a symbol of hope, because it would ensure the pharaoh's union with the gods.<sup>3</sup>

In addition to limestone and granite, the Ancient Egyptians were using other stones, such as alabaster, diorite, marble and serpentine, for making statues and vases, basalt for making sarcophagi, and dolomite for hammers

to work hard stone. Thousands of objects made of these materials have been discovered

and are displayed in museums around the world. Early Egyptians mined precious stones, such as amethyst, beryl, lapis, lazuli, malachite, turquoise, and other minor precious or semiprecious stones. The oldest mining map in existence is one of an Egyptian gold mine drawn on papyrus. This map is now in the Museum of Turin, Italy. Today, gold is found in Egypt mainly in the Eastern Desert. Practically all the Egyptian gold mines known today



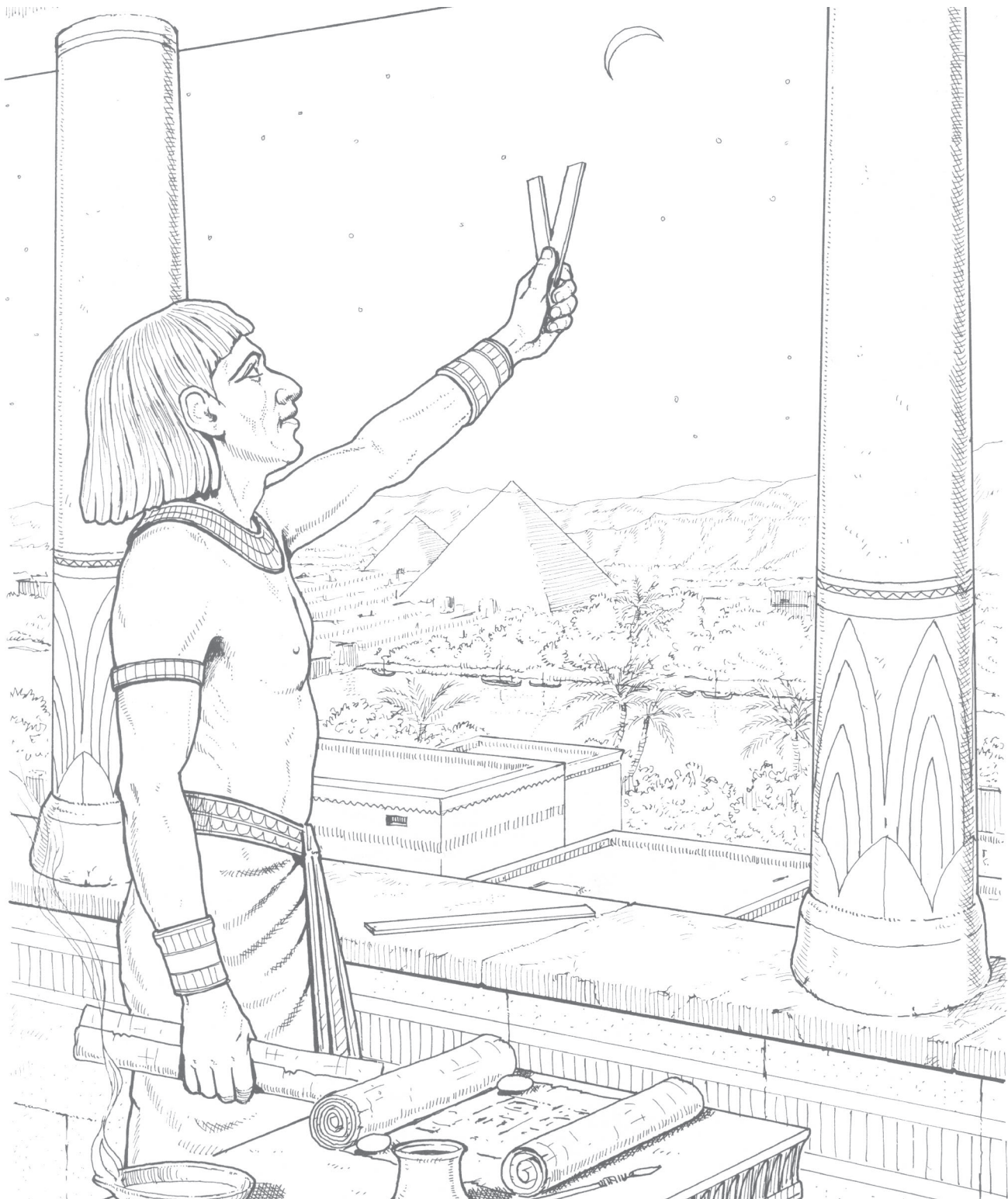
Stone palettes, like this one, were used about 3000BC for grinding mineral pigments for painting and cosmetics.

See Egypt Rocks! on page 3

MAGS Explorer is published monthly by and for the youth members of the Memphis Archaeological and Geological Society. Please send your comments and articles to Editor Mike Baldwin, 367 N. Main St., Collierville, TN 38017 or rockclub@earthlink.net. Youth can give articles, artwork, poems, puzzles, experiments, or stories to co-editors Jennifer Baldwin, Emily Randolph, Kelly Baldwin, or Abbey Randolph.

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# COLORING PAGE



**An Egyptian priest studying the stars.** Egyptian astronomy never became a major science, but priests did use the stars to develop a very complex calendar.

This page is from *Life in Ancient Egypt Coloring Book*, John Green, Dover Publications, New York, NY, 1989. Reprinted for educational purposes under the "fair use" provision of the U.S. Copyright Act.

## EGYPT ROCKS!

continued from page one

had already been worked by the Ancient Egyptians. A small, 15cm long copper serpent, with a golden head was discovered in a mining district in Sinai. It is believed that serpents such as this were used as amulets for those bitten by a serpent.<sup>2</sup>

Blue pigment, one of the dominant colors of Ancient Egypt, was an artificial frit that consisted of crystalline copper calcium silicate. This was made by heating together silica, malachite, limestone, and natron. Natron, naturally occurring sodium carbonate, also played an important role in Ancient Egyptian mummification.<sup>2</sup>

Lets take a look at some of the stones of Egypt:

[1] **Limestone**, mainly composed of calcium carbonate, contains small proportions of other ingredients such as, silica, clay, oxide of iron and magnesium carbonate. Limestone was not only used as building blocks for temples and tombs, but large number of tombs were cut directly out the limestone hills.<sup>4</sup>

[2] **Sandstone** is made of quartz sand, which has been cemented together by clay, calcium carbonate, iron oxide or silica. Sandstone was used for building foundations, pavements, pillars, arches, roof slabs and temple walls.<sup>4</sup>

[3] **Granite** is a large class of crystalline rocks of ligneous origin, composed of a number of different minerals—chiefly quartz, felspar and kistite mica, and sometimes hornblende or augite. Granite was used as a lining material for chambers, passages and door frames. It was used to line the interior of the three great pyramids at Giza. It was the most common material used for making obelisks, and it was often used for constructing shrines, statues, and vessels.<sup>4</sup>

[4] **Alabaster** normally contains calcium sulphate (gypsum). The alabaster material used in Ancient Egypt was a very distinct material of similar appearance, which contained calcium carbonate, so from a geological point of view, Egyptian alabaster was calcite. Egyptian alabaster was used to line passages, rooms and shrines. This fine translucent stone was also used in the production of small objects such as vases, bowls and lamps. All but three of the seventy-nine stone vessels found in the tomb of Tutankhamun were made of alabaster.<sup>4</sup>

[5] **Basalt** is a heavy, black heavy rock composed of an aggregate of minerals. In Ancient Egypt, basalt was used in the construction of sarcophagi and pavements and it was also used for making statues and small objects.<sup>4</sup>

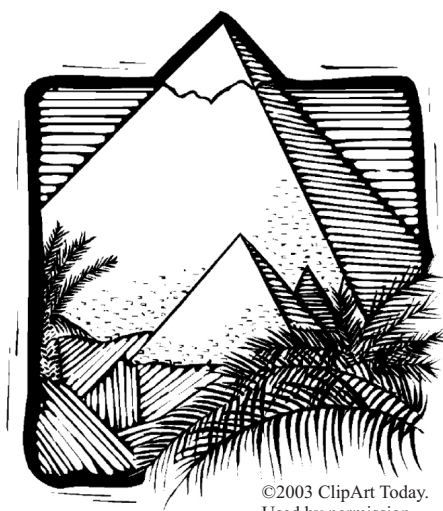
[6] **Quartzite** is a hard, compact variety of sandstone that varies in both color and texture, thus its color may be white, yellow, or various shades of red, and its texture may be either fine-grain or coarse-grain. Quartzite was used in making statues and sarcophagi.<sup>4</sup>

[7] **Diorite** is a white and greenish, felspar and black hornblende stone. It could be banded or speckled. Diorite was used in making statues, bowls and other fine objects.<sup>4</sup>

—MIKE BALDWIN, MAGS EDITOR

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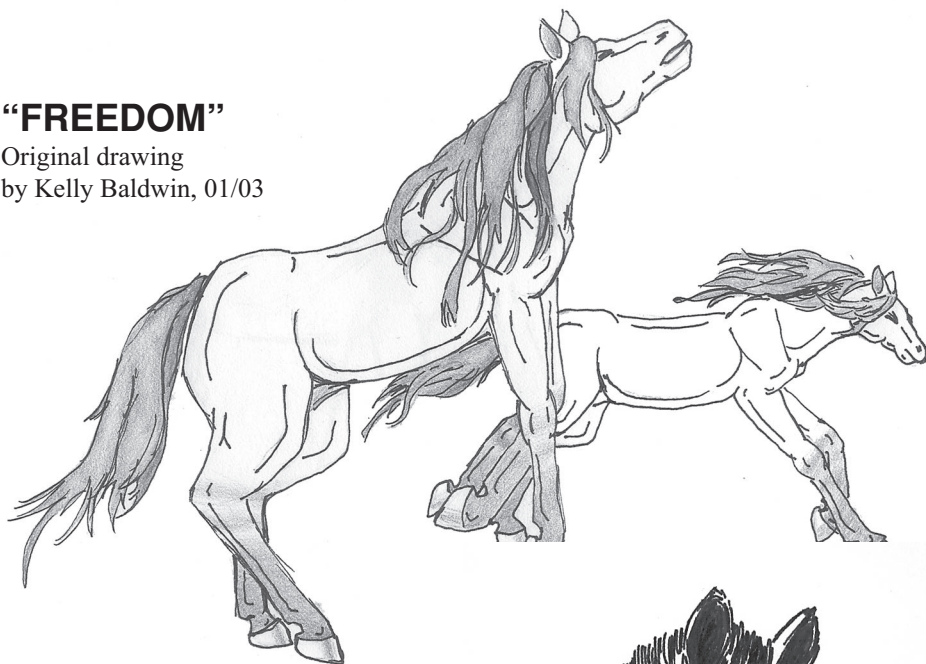


# MEMBER PAGE

If there's something you've been working on, that you'd like to see printed in the Explorer, then send it in. Whether it's a drawing, a picture, a poem, a story, an experiment, a joke, a serious bit of writing, a game, or a puzzle, here's your chance to get it published. Email it to rockclub@earthlink.net or snail mail it to Jennifer and Kelly Baldwin, 367 North Main Street, Collierville, TN 38017 or to Emily and Abbey Randolph, 6578 Birch Walk Drive, Memphis, TN 38117, or bring it to the next MAGS meeting. However you decide to get it here, just get it here! And, remember, if it's a drawing, make sure you draw it in nice, dark ink. Have fun, go crazy, be creative, and don't forget to tell us who did the work, and when.

## "FREEDOM"

Original drawing  
by Kelly Baldwin, 01/03



Remember the families of the seven  
astronauts who lost their lives in the Shuttle

Columbia on February 1, 2003.

Commander **Rick D. Husband**

Pilot **William C. McCool**

Payload Commander **Michael P. Anderson**

Mission Specialist **David M. Brown**

Mission Specialist **Kalpana Chawla**

Mission Specialist **Laurel Clark**

Payload Specialist **Ilan Ramon**



## "ZEBRA"

Original drawing  
by Jennifer Baldwin, 12/02

## The Cave Boy

By Laura E. Richards  
*submitted by Abbey Randolph*

I dreamed I was a cave boy  
And lived in a cave,  
A mammoth for my saddle horse  
A monkey for my slave.  
And through the tree-fern forests  
A-riding I would go,  
When I was once a cave boy  
A million years ago.

I dreamed I was a cave boy  
I hunted with a spear  
The saber-toothed tiger,  
The prehistoric deer  
A wolf-skin for my dress suit,  
I thought me quite a beau,  
When I was a cave boy  
A million years ago.

I dreamed I was a cave boy  
My dinner was a bone  
And now I had to fight for it,  
To get it for my own!  
We banged each other o'er the head,  
And oft our blood did flow,  
When I was once a cave boy  
A million years ago.

I dreamed I was a cave boy  
The torches' smoky light  
shone on the dinner table  
A pile of bones so white  
I lapped some water from the spring,  
The easiest way, you know,  
When I was once a cave boy  
A million years ago.

I dreamed—but now I am awake;  
A voice is in my ear.  
"Come out and have a game of ball!  
The sun is shining clear,  
We'll have some doughnuts afterwards,  
And then a-swimming go!"  
I'm glad I'm Not a cave-boy,  
A million years ago!

# EARTH SCIENCE EXPERIMENT

## LINE-UP

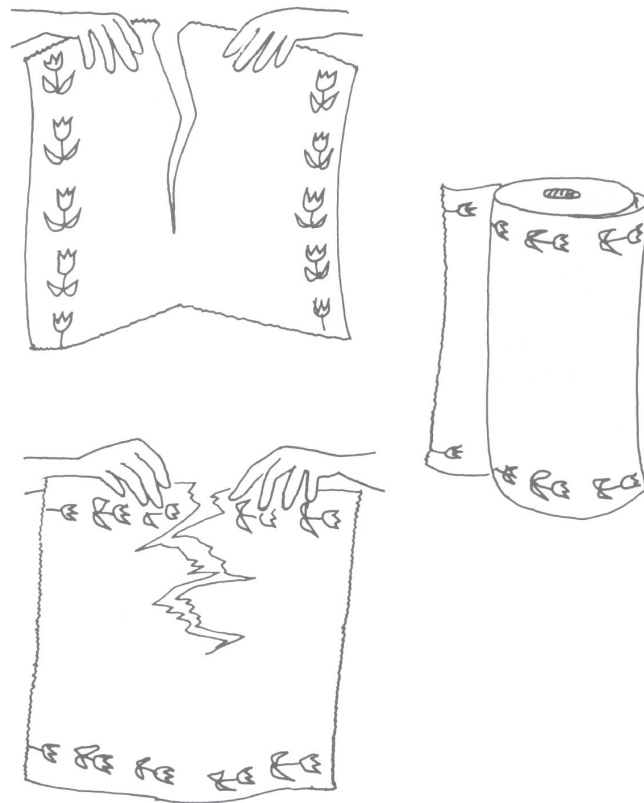
**Purpose:** To demonstrate that some minerals have a definite cleavage line.

**Materials:** paper towels

- Procedure:**
- [1] Try to rip a single sheet of a paper towel from top to bottom.
  - [2] Turn another sheet of paper towel and try to tear it from side to side.

**Results:** The paper will tear easily in one direction but not in the other.

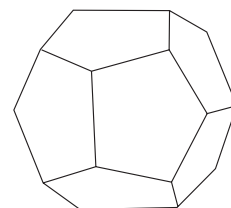
**Why?** Paper towels are made on a wire screen, creating a straight line in one direction. Pulling on the paper attacks the weakest point. The parallel lines on the paper made by the wire screen are thinner than the rest of the paper, and thus the paper rips easily down one of these lines. Jagged and irregular tears result when the paper is pulled in the opposite direction. This is like cutting minerals, such as diamonds, along cleavage lines. The mineral splits smoothly and easily along the lines where the molecules line up, but it can smash into irregular pieces if hit across the cleavage line.



## PYRITE

Pyrite is yellow.

Turn the page and cut out the Pyrite Specimen Card for your collection.



Janice VanCleave, *Earth Science For Every Kid: 101 Easy Experiments That Really Work*; John Wiley and Sons, Inc.; New York New York; 1991. Reprinted for educational purposes under the "fair use" provision of the United States Copyright Act of 1976.

### LOOK OUT BELOW!

Cave explorers are known as *spelunkers* and **speleology** is the study of underground structures such as caves.

# GEOLOGY CHALLENGE

## Chemical Weathering

Chemical weathering causes the minerals in rocks to change into substances that have different chemical compositions and/or structures by removing or adding elements. The most important agents of chemical weathering are water, carbon dioxide, and oxygen. Water decomposes rock in several ways. Hydrolysis is the reaction of any substance with water. Many minerals are water soluble, that is, they dissolve in water. Water molecules are effective dissolving agents because they are polar: one end of the water molecule is slightly negatively charged, while the other is slightly positively charged. If water comes in contact with an ionic mineral, such as halite [composed of sodium and chloride ions], the attractive forces of the water molecules pull ions away from the halite crystals and into solution, in effect, dissolving the halite.

Water also chemically weathers rocks because water molecules naturally split apart to form reactive ions of hydrogen. These hydrogen ions act on particular minerals by replacing the positive ions in the crystal structure and begin to decompose the mineral.

### CHECK IT OUT

The process of chemical weathering that occurs when water reacts with minerals in a rock is called:

- [a] rusting                      [c] reduction
- [b] hydrolysis                  [d] oxidation

Michael Bentley, *High School Review: Earth Science*; Princeton Review Publishing, L.L.C.; New York New York; 1998; pg. 127-128.  
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### February Field Trip

#### Nonconnah Creek, Memphis

February 15, 2003 is the date set for the MAGS Field Trip to Nonconnah Creek to collect agates, jaspers, petrified wood, and maybe even a few Ice Age fossils. The creek is low enough this time of year to expose some of the sand bars that are normally covered by water. This is your chance to check them out. Sign up tonight!

# NOTES FROM THE MEETING

Name:	Pyrite FeS <sub>2</sub>
Hardness:	6-6.5
Cleavage:	none
Fracture:	conchoidal; brittle
Streak:	greenish black
Crystals:	Isometric
Location:	Leadville, Colorado

1. What is the name of the February Specimen-of-the-Month?  
\_\_\_\_\_
2. Cut out the specimen card and put it with your mineral specimen.
3. Name some of the minerals you used to create your gem tree.  
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This is your newsletter. Put your name on it, and take it home with you.

Your Name \_\_\_\_\_

