TEST TUBE

Communication for Tennessee Earth Science Teachers

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President-Elect's Corner

By Pat Royle

Are you **Lost in Space**? We'll help you find your way via the **TSTA Science Conference November 20-22, 2008,** at **Music City Sheraton in Nashville, Tennessee.** The "Early Bird Registration" is due before November 1, 2008. Register on-line at www.tnsta.com. TEST will have a day-long pre-conference session on Thursday, November 20th in the Belmont Room as well as several breakout sessions on Friday, November 21st.

Dr. Lionel Crews will be leading this year's theme – **Astronomy**. See below for session titles and a brief description. This will be a wonderful opportunity to network with teachers from across Tennessee, as well as the southern region.

Thursday, November 20th

Orientation of the Sky
Presenters: Tina Coleman, Fran Hamilton, Pat Royle, Rose Lummus
Level: 4-8
Out of this world student activities and demonstrations that cover moon phases, seasons, eclipses, retrograde motion, and characteristics and features of the sun and the planets.

Increasing Parental Involvement Using Models at the Middle School Level
Presenters: Patricia Royle, Bonnie Brooks, Tina Coleman, Rose Lummus
Level: 5-8
Come build your own model based on the Tennessee Standard 7.0 Earth and Its Place in the Universe. This session is designed to provide you with the information and confidence to run your own family-friendly workshop at your school. These models reinforce the standards and provide alternative means for assessment in the classroom while getting parents involved. **Free materials and door prizes**.

Going the Distance: Understanding the Distance Ladder
Presenters: Bryan Byrne, Dr. Lionel Crews
Level: 6-12
An in-depth look at how Astronomy measures distances of objects in space.

Objects in Space
Presenter: Dr. Lionel Crews
Level: 6-12
View a PowerPoint presentation prepared by Dr. Crews while participating in a stimulating discussion about various objects in space. Free CD

Interactive Notebooks
Presenter: Fran Hamilton
Level: 5-12
Wonder if the rumor about interactive notebooks is true? Come and see first hand how interactive notebooks relate to astronomy.

Cosmic Evolution
Presenter: Dr. Lionel Crews
Level: 5-12
Do you need to answer student questions about Cosmic Evolution? Stop avoiding the issue. Come and get the facts with Dr. Crews.

Q&A
Presenter: Dr. Lionel Crews
Level: 5-12
Still have questions about Astronomy? Then this is time set aside just for you to get those answers.

Friday, November 21st

Planetary Geology
Presenter: Dr. Bill Deane
Level: 6-12
Since the advent of the Space Age, our understanding of the Solar System has been revolutionized. We will tour the inner solar System and examine the diverse geology of Mercury, Venus, the Earth and Moon, Mars and Near-Earth Asteroids.

Going the Distance: Understanding the Distance Ladder
Presenters: Bryan Byrne, Dr. Lionel Crews
Level: 6-12
An in-depth look at how Astronomy measures distances of objects in space.

Increasing Parental Involvement Using Models at the Middle School Level
Presenters: Patricia Royle, Bonnie Brooks, Tina Coleman, Rose Lummus
Level: 5-8
Come build your own model based on the Tennessee Standards 1.0 Cell Structure and Function, 9.0 Earth's Features, 7.0 Earth and Its Place in the Universe. This session is designed to provide you with the information and confidence to run your own family friendly workshop at your school. These models reinforce the standards and provide alternative means for assessment in the classroom while getting parents involved.
Free materials and door prizes.

"Hi, I'm from the Government and I'm Here to Help You"
Presenter: Dr. H. Wayne Leimer
Level: 6-12
Perceived risk versus real risk for everyday items using geological examples including Asbestos, Fluorine, Calcium supplements, Iodine, and Radon.

TEST Meeting
Time: 5:00 p.m. – 6:00 p.m.
Are you a member or are interested in becoming a member? Come out and meet the gang!

Earth Processes Model Building

Earth Processes Model Building

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Evolution Corner
Entering a New Geologic Epoch: The Anthropocene?

Michael A. Gibson
(Fall, 2008)

In my *Evolution Corner* article from Spring of 2007 [Vol. 16, Issue 1], I wrote about changes in the geologic time scale that occurred with the publication of the *The Geologic Time Scale 2004*, specifically the addition of new geologic periods (Ediacaran) and shifts in the position of some of the boundaries and their corresponding start/end times. Recall that the term Tertiary is no longer considered official (replaced by Paleogene and Neogene). I indicated that the Quaternary Period was under debate, which I planned to summarize in a future article. In this installment of *Evolution Corner* I want to make you aware of a proposal to change the structure of geologic time that directly affects living humans and is one of the results of our intense scrutiny of global change. Are you ready to leave the Holocene Epoch of the Quaternary Period and enter the Anthropocene Epoch? No? Well it may be too late. You may have never actually lived in the Holocene; rather, you may have always been in the Anthropocene! Confused? Let me explain….

The current Holocene Epoch (meaning "Time of Recent Whole") began 11,700 years before AD2000 (unlike other geologic time units, this one keeps getting longer every year). The term was proposed in 1833 by the iconoclastic geologist Sir Charles Lyell and adopted by the International Geological Congress in Bologna, Italy in 1885. The Holocene is defined as beginning with the current global climate warming event (ending the Younger Dryas Cold Event) and having more than 95% of all fossil species as still extant. The Holocene represents a global warming occurring within the 2 million year-long glaciation event you know as "The Ice Ages" that began with the Pleistocene Epoch. Regardless of the debate that occurs in political arenas about global warming, the geoscience community is in agreement….global change is real and has a long history (indeed, historical geology is all about documenting change)! The actual political argument is whether the current phase of change is human-induced (in other words…who is guilty). All but a minority of geoscientists agree that over the past three centuries, human activity has altered (1) terrestrial & marine ecosystems, (2) patterns of sediment accumulation & distribution, (3) atmospheric concentrations of greenhouse gasses, and (4) ocean geochemistry.

A proposal that has grown out of the revised geologic time scale (GTS 2004), and the increasing recognition that humans have altered the climate path of Earth, is to re-define the Holocene. Essentially we would acknowledge that the Holocene ended ~200 years ago (when human-induced climate shift begins) and we entered a new epoch that has been dubbed the "Anthropocene Epoch". Thus this new epoch would be "retroactive" to coincide with the onset of the new global condition, primarily indexed by increased CO_2 levels. There is debate among geoscientists as to exactly how to mark or define the actual boundary. With older geologic time units, a specific layer of rock strata can be identified as the standard and the actual layer of change (called a "Global Stratotype Section or Point" or GSSP) is marked by a "golden spike" at the change-over point in the physical world. How do we determine the Anthropocene's beginning point in the physical world? No agreement yet, but two proposals have been made. One is to find a place somewhere where the effects of the change are clearly seen and where the sediment beds can be easily correlated worldwide (difficult to do). The second is to just change convention, abandon the GSSP approach, and simply set a beginning calendar date (e.g., the year 1800).

The debate is not over and will likely continue for several years, but I predict that the geoscience community will settle on adding the Anthropocene to the geologic time scale and that we will have to accept that soon after the founding of this country, we officially changed from the Holocene, and the end of the most recent cold snap (remember that Valley Forge was during the Little Ice Age), to the Anthropocene, which means "time of human impact". Our namesake time unit may be starting out on a negative note, but hopefully it will not end on one. However… most time units end with mass extinctions of life. Hmmm, this gives me an idea for a later essay!

What is a Family Friendly Workshop You Ask?

By Pat Royle

If you are curious about the Model workshops offered by TEST for Thursday and Friday at the TSTA Conference in November, just take a look below. These are "fresh" pictures of the Earth's Processes Workshop that Camden science teachers ran recently for our eighth graders. We had over 200 parents, grandparents, teachers, students, and a few jealous siblings participating during this project night. Everyone was so busy learning about Earth's Processes that they didn't even realize how fast two hours can pass by! This was by far the best workshop we have put together. Since this is the third year in a row we have run this particular workshop (We also organize a Planetary Systems Workshop for 6th graders and a Cell Workshop for 7th graders.), we were so organized that I didn't have to run down the hall for a single forgotten item. This "time saved" allowed us to circulate and help answer any questions parents and students had during the workshop. I even joked with a few students making comments like, "I knew we could get your mother to do your project." I can't tell you how much easier our lives are when communicating with the parents who attend the workshops. Camden truly creates a more comfortable bond between home and school.

Planning, organizing, funding, and even cleaning up for these workshops takes time and energy but gets easier with each subsequent workshop. The rewards are many and are never more apparent than during the student presentations. The presentations offer an alternative to traditional assessments and can be individualized for all student abilities. The models are tangible and can be taken home to display for further reinforcement.

Workshop attendees will get the opportunity to make their own models for Planetary Systems during TEST's Thursday all-day session. If you can't attend Thursday's all-day workshop, you will have a second opportunity to make your own Planetary System model during the Friday breakout session. If you are a seventh or eighth grade teacher, you will have an opportunity to make models for a Plant or Animal Cell and/or a model of Earth's Processes during the same Friday session. But that's not all – we'll even include a few door prizes you can utilize in your very own classroom!

So…don't forget to mark your calendars – November 20th and 21st. TEST will see you there!

Masters of Education: Interdisciplinary Studies - Geoscience Education

The Masters of Education: Interdisciplinary Studies with Concentration in Geoscience Education is underway. The degree program consists of education-related courses offered through the School of Education and a minimum of 18 hours of geoscience content area courses from the Dept. of Geology, Geography and Physics. For those already accepted into the program, registration for spring classes begins soon. The spring courses are listed below. Additional information is available at: http://www.utm.edu/utonline/msed_geosci.php.

Spring 2009 Content Offerings:

Geoscience 700 Advanced Earth Systems Science (3 graduate credits) Investigations in Earth Systems Science using inquiry-based exploration of Earth's processes and environments including the lithosphere, atmosphere, biosphere, hydrosphere, and astrosphere. The course will focus on Problem-Based and Student-Centered learning techniques, so it will be especially applicable to anyone intending to or currently engaged in teaching science courses. The course is taught completely online, with the participants doing a combination of individual and group coursework via an asynchronous discussion board. An optional field trip for hands-on learning will be made available.

Geoscience 710 Advanced Physical Geology for Educators (3 graduate credits) A study of advanced physical geology intended to provide teachers with the foundation knowledge of earth's internal structure, plate tectonics, the rock cycle, weathering and earth materials; natural resources, geochemical cycles; and the basis for geologic time and the history and nature of science.

Summer 2009 Content Offerings:

Geoscience 740 Field Experience in Geoscience (1 graduate credit each) – Field experiences may include workshops or institutes, extended weekend field courses, travel courses, field camps, or extended field trips. Field experiences consist of a minimum of 3 graduate hours graduate credit for the entire degree. These courses are face-to-face, rather than online, and emphasize hands-on, in-the-field application of course concepts. Participants work with faculty to select from a menu of field programs offered by UT Online or other approved programs. Average duration of a single field experience is one week, emphasizing professor/teacher environmental interaction. Field experiences may be a combination of state, national, and international destinations.

- **May 31 – June 6 – Maps – Earth Landforms & Planets** – Basics of topographic and geologic map construction, reading, and interpretation. Includes recognizing landforms and processes of their formation. Includes field mapping activities. Evening sessions focus on mapping constellations and solar system features, including mapping the Moon's surface. **[Coon Creek Science Center & Horse Creek Wildlife Sanctuary]**
- **June 7 – June 13 – Fossils & Telescopes –** Basic identification of fossils with an overview of the fossil record and history of life on Earth. Emphasis placed on building classroom collections and developing content around these collections. Sites of study include the Devonian Ross marine fauna, Cretaceous marine Coon Creek fauna, and Eocene Claiborne terrestrial flora. **[Coon Creek Science Center & Horse Creek Wildlife Sanctuary]**

Tina Coleman (TN) OEST

Professional Biography

My teaching career began when I was 9 years old, while playing school with my little sister. I taught her to read, an experience I will never forget, but one that I took as a natural occurrence at the time. I was the student that loved to go to school, so it only stood to reason that it would become my favorite play time activity. We spent hours playing school and I spent years developing into what I knew I would be, a teacher. When we were not playing school I was exploring the banks of the Mississippi River where I grew up. Often frustrating my mother by bringing home every piece of rock or interesting piece of debris I could find. I continued to find excitement in exploring the world around me, the foundation for my love of science.

Throughout my school career I had teachers that instilled within me the desire to learn; I felt the satisfaction that came with learning and being successful. Coming from a poor family, academics were one area in which I could feel the power of success taking pride in my learning. It was during those times that the underlying desire for a lifetime of learning and a desire to share that learning with others began to grow. As I entered the University of Tennessee at Martin in 1989 I felt the drive to pursue my dream to make a difference in the lives of others by becoming a teacher. It was also while at the University of Tennessee at Martin that I began to build my science background. There I was able to find a niche where my love of rocks and earth materials actually made sense. From there I set out to pursue my dream of making a difference in the lives of students, enabling them to experience the same sense of success that I had come to find through learning.

It was during my second teaching assignment in a small rural school that I found my true love in teaching; I was assigned to teach science for grades 6 through 8. At first overwhelmed by the vastness of the science curriculum I was to teach, I strove to bring inquiry based science into my classroom. Through implementing real-life experiences my students were able to make real-life connections. Writing a Goals 2000 Grant for an integrated science and math lab I was able to secure the tools necessary to implement the inquiry based approach.

Working in the subject area of science I have had the opportunity to excite my students, tapping in to their innate sense of natural curiosity. My greatest sense of accomplishment comes when I can take the disillusioned student that comes through my door and open up the world of discovery for them. Through actively engaging my students in their learning process, I enable them to realize the power and freedom that comes through ownership in their learning experience. Through a variety of teaching strategies each student becomes successful in my classroom.

My science classroom centers around a discovery center where I have trays of fossils, rocks, minerals, sand, seashells, crystals and a variety of other items I have collected throughout my travels and professional development experiences. My students are enthralled with the various items in our classroom collection. Many of them have never experienced the feeling of running their hands through sand on a beach or the chance to examine volcanic rock in a natural setting. In my classroom I am able to give them a taste of what it is like, instilling within them a dream to one day explore on their own, instilling within them a life long love for learning.

My greatest accomplishments in teaching are not the resume that I have developed or the degrees and awards that I have earned, but the students in which I have instilled the success that comes with learning. My success is measured by the students I have encouraged to reach farther than they ever thought they could reach. My greatest contributions are in the students that find the success of learning within the walls of my classroom.

My greatest satisfaction with the person I am today comes from those students who cross my path later in their lives and tell me their life is better because I was their teacher. Those are the moments when I know my dream has been realized; the dream of helping students experience the power of success through learning.