



# Oklahoma Geology Notes

A NEWSLETTER OF THE OKLAHOMA GEOLOGICAL SURVEY

The University of Oklahoma MEWBOURNE COLLEGE OF EARTH & ENERGY

Volume 72, No. 4 • 2012

## IMPROVEMENTS MADE WITH CUSTOMERS IN MIND AT OKLAHOMA PETROLEUM INFORMATION CENTER (OPIC)

*Gene Kullmann, Vyetta Jordan, and Jonathan Green, OGS Staff*

If you have not been to OPIC in a while, you will be pleasantly surprised. The new climate controlled layout area with improved lighting that was designed to make core viewing a more enjoyable experience is now available for customers. Wi-Fi has been added, helping customers keep in touch with the office or to pull up that missing core log. Roll-around tables with pull-down electrical outlets allow for laptops and other electronic devices to stay with you while you are working. New Zeiss Stemi 2000 microscopes with many great features also are available on request. Two new forklifts have been added, consisting of an order-picker with a platform for pulling core and a new electric fork lift for use within the layout area, eliminating fumes associated with the gas lifts. All these additions were made possible by a generous donation from Devon Energy.

Other improvements include a new state-of-the-art fire detection and alarm system for the safety of visitors and staff, and a re-roofing project for the entire facility. Three out of the ten separate roofs were completed last

year and another three are in progress this year which should be completed within the next couple of months.

Usage at the OPIC facility is steadily increasing as companies are realizing the amount of data and materials that are available for use and the wide variety of core preparation services offered. This past year, 32 companies from across the region utilized our core and cuttings collections for exploration research. Seven United States Universities and one from as far away as Australia used our collections for both lab classes and research projects. Companies have reserved the entire core viewing room for core workshops in which all 15 layout tables were full of core and



the room was full of people. On one occasion, not only was the viewing area full, but additional tours were given of the facility for approximately 180 company employees. Last year, the Oklahoma Energy Resources Board (OERB) and the National Aeronautics and Space Administration (NASA) each brought groups of teachers for tours of the facility, with OERB's group consisting of over 100 teachers and NASA's meeting serving as an annual event with teachers from across the country.

OPIC is a facility the size of four football fields with 3/4 devoted to core and drill cuttings. We have two full-time employees and up to five part-time students to handle all requests for core services which includes pulling/restocking materials, layouts, core orienting, slabbing, plugging, photography, and core gamma logging. In addition to these services, our staff is busy working on other various projects, such as logging in new material and scanning core data and reports. Wells added to the database last year include 5094 Oklahoma and 441 Texas well cuttings, three Oklahoma cores, and 184 wells from several other states. Starting in 2011, new requirements were created

to ensure the return of data and material sampled from our well collections. This has created a new sample collection available to customers for future testing. At this time the collection consists of over 280 wells and helps to reduce oversampling of cores and cuttings in order to preserve valuable materials.



## From the Director...

G. Randy Keller, Oklahoma State Geologist



The last quarter of 2012 turned out to be a time for changes and farewells. Two staff members of the Oklahoma Geological Survey recently retired — Jane Weber and James (Jim) Chaplin. Jane and Jim's contributions to the Survey are most appreciated and they both will be missed.

We are also sad to report that Charles Mankin, former Director of the Survey, passed away in November. We have included an article on Dr. Mankin in this issue of the Notes.

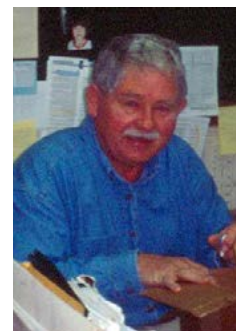
Jane Weber joined the Survey in 1982 as a chemist and computer programmer. Most recently Jane was involved with working in the library of OGS' OPIC facility.



Jane Weber

Jim Chaplin joined the OGS in 1984 as regional stratigrapher after 20 years of teaching geology at Morehead State University in

Kentucky. In recent years, Jim was very active with Oklahoma science teachers, serving as a resource of information on geology, publishing teaching aids, and holding workshops for the teachers.



Jim Chaplin

### In This Issue. . .

Improvements Made With Customers in Mind at OPIC	1
From the Director...	2
Earthquake Report 3 <sup>rd</sup> Quarter 2012	3
Dr. Charles J. Mankin — the Unknown "Charlie" Mankin	5
OGS Calendar	8

OKLAHOMA GEOLOGY NOTES, ISSN 0030-1736, is published quarterly by the Oklahoma Geological Survey, 100 E. Boyd, Room N-131, Norman, OK 73019.  
 Director: G. Randy Keller; Editor: Sue Britton Crites  
 This publication, printed by Oklahoma Geological Survey Printing, Norman, Oklahoma, is issued by the Oklahoma Geological Survey as authorized by Title 70, Oklahoma Statutes 1981, Section 3310, and Title 74, Oklahoma Statutes 1981, Sections 231-238. 3,200 copies have been prepared for distribution at a cost of \$730 to the taxpayers of the State of Oklahoma. Copies have been deposited with the Publications Clearinghouse of the Oklahoma Department of Libraries.

# Earthquake Report 3<sup>rd</sup> Quarter 2012

Austin Holland, OGS Research Seismologist; Amie Gibson, OGS Research Scientist II

The Oklahoma Geological Survey (OGS) located **198 earthquakes within Oklahoma from July 1 to September 30, 2012**. There were 14 felt earthquakes in the third quarter of 2012 shown in **Table 1**. **55 earthquakes occurred in Lincoln County with the majority of those associated with aftershocks of the Nov. 2011 M5.6 Prague Earthquake sequence**. 71 earthquakes were located in Oklahoma County with most of those consistent with the ongoing Jones earthquake swarm.

Other counties that had significant numbers of earthquakes include **Seminole (19), Okfuskee (18), and Logan (10)**. All earthquakes located in Oklahoma for the third quarter of 2012 can be seen in **Figure 1 (on page 4)**. Current seismic activity continues to be concentrated within central Oklahoma. The largest earthquakes to occur

during this quarter were a magnitude **3.4** (July 30) and a magnitude **3.3** (August 18) located in Lincoln County. There was also a magnitude **3.4** earthquake on September 9 in Seminole County which is part of the ongoing activity south of Paden. These and other significant earthquakes in **Table 1** can normally be found in the "ev-reports" online archive at <http://wichita.ogs.ou.edu/evreports>. [Please note that as of press date, this site was down due to equipment failure—we hope to have it up and running asap!]

Download 2012 3<sup>rd</sup> quarter earthquake file and complete list of felt earthquakes (CSV):

[http://www.okgeosurvey1.gov/media/quarterlies/2012\\_qt3.csv](http://www.okgeosurvey1.gov/media/quarterlies/2012_qt3.csv)

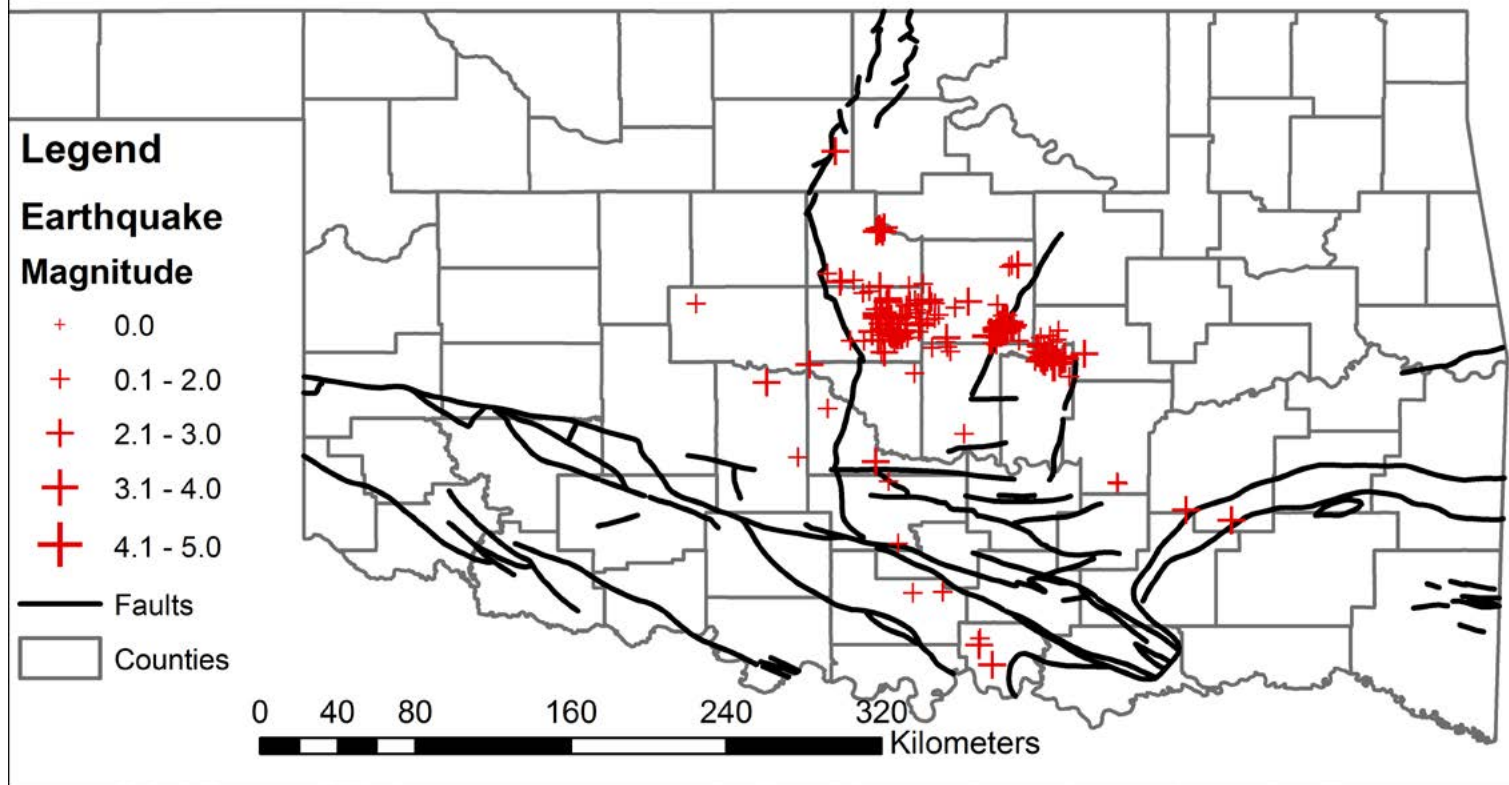
[http://www.okgeosurvey1.gov/media/quarterlies/2012\\_qt3felt.csv](http://www.okgeosurvey1.gov/media/quarterlies/2012_qt3felt.csv)

**Table 1 – Felt earthquakes for July 1 through September 30, 2012.**

*MMI is the maximum reported Modified Mercalli Intensity*

Origin Time (UTC)	Longitude	Latitude	Depth (km)	Magnitude	Type	MMI	County
7/2/12 3:30	-97.3419	35.4778	0.4	2.7	ML	III	Oklahoma
7/8/12 9:11	-96.478	35.3933	5.0	2.7	ML	III	Seminole
7/30/12 8:43	-96.5758	35.4022	5.0	2.8	ML	IV	Seminole
7/30/12 19:35	-96.8243	35.497	5.0	3.4	ML	IV	Lincoln
7/31/12 16:03	-96.7539	35.5582	3.0	3.1	ML	IV	Lincoln
8/1/12 23:35	-97.2543	35.5004	5.0	2.5	ML	II	Oklahoma
8/3/12 6:59	-97.2997	35.6581	5.0	2.3	ML	III	Oklahoma
8/6/12 5:24	-96.5021	35.3729	5.0	2.8	ML	III	Seminole
8/7/12 10:47	-96.5758	35.3805	3.5	3.0	ML	III	Seminole
8/18/12 3:30	-96.777	35.5304	3.2	3.3	ML	IV	Lincoln
8/24/12 18:52	-97.3139	35.422	5.0	2.6	ML	IV	Oklahoma
9/2/12 15:05	-97.5191	35.7486	5.0	2.4	ML	III	Logan
9/9/12 1:58	-96.5299	35.3722	2.5	3.4	ML	III	Seminole
9/30/12 19:17	-96.7785	35.5261	5.0	3.0	ML	IV	Lincoln

**Figure 1** 2012 3rd Quarter Earthquakes



# Dr. Charles J. Mankin — the Unknown “Charlie” Mankin

*Raymon Brown, retired OGS Geophysicist*

Dr. Charles J. Mankin, like a universal physical constant, was at the helm of the Oklahoma Geological Survey (OGS) for over 40 years. Indeed, “Charlie” was often thought of as one of those physical constants through his many leadership roles at the University of Oklahoma (OU). He always remained steady in his convictions. Like the universal constants in science, Charlie always remained on course to do the right thing, even during times of stress.

Charlie remained one of the stalwarts for the State of Oklahoma and his tenure at OU proved that. He chaired the School of Geology and Geophysics; was the Director of the Energy Resources Institute and the Interim Director of Sarkeys Energy Center; and was the Director of the Oklahoma Geological Survey, the role for which he is mostly remembered. These titles, however, do not begin to tell the entire story about Charlie.

Charlie was a capable scientist as well. He studied clay mineralogy in graduate school and conducted clay minerals research as a professor; he was totally comfortable in any academic discussion. Many academics wondered why a scientist would follow the administrative career as Charlie had; they might have considered it a waste of a good mind. **Through his leadership roles, however, Charlie revealed both his care for Oklahoma’s natural resources and for the students of OU. Charlie always chose the path that did the most good for his adopted State and for its people.**

It is tempting to try to capture the essence of Charlie Mankin by listing all of his awards and accomplishments. At the March 2006 meeting of the University of the Oklahoma Board of Regents, Charlie was honored when the title of Regents’ Professor was bestowed upon him. OU President David L. Boren said, *“His scholarship, teaching, and research have left a lasting mark on our State, and its economy and energy industry.”* This award was the tip of the proverbial iceberg; any reader or biographer was quickly lost in the long list of Charlie’s achievements and awards.

The idea for this article came from a 2007 meeting of university and industry researchers on the OU campus, during which it was

my pleasure to meet Dr. Iraj Ershahi, a professor at the University of Southern California. When I told him that I worked at the OGS, he asked if I knew Charles Mankin. Ershahi proceeded to tell me his many personal thoughts about Charlie using many superlatives in the process: a first class citizen; a first class educator; always puts the interest of the country first; and, always considered the interests of students. Charlie’s friends and colleagues knew that he had learned certain basic morals and principles early in life, and then simply applied them throughout his personal life and professional career. It all started with his childhood in Ozona, Texas.

## The Path from Ozona to Dallas

Charlie’s maternal grandparents were German. His mother was Myla Boehmert. Both her parents migrated from Germany to Kankakee, Illinois, where they met and married. They were honest, hard working immigrants, who later migrated to Dallas, Texas. His grandfather began work there as a stock boy for the Arthur A. Everet’s Jewelry Store, where he worked his way up, retiring as floor walker after 50 years.

It was rumored that Charlie’s paternal grandfather, John Mankins, may have turned up on the wrong side of the law. He lived in Coleman, Texas, during the trail days of the cowboy (some say that it remains so). The Younger brothers, known outlaws at the time, spent an occasional night in John Mankins’ barn. Some believed, however, that the Younger brothers were Robin Hoods, who stole from the rich to give to the poor. John Mankins’ son, Charlie’s father, was named Coleman Young Mankin. He was born in Coleman and named after the Texas town and the Younger brothers.

Coleman Young did not get along with his father. When he was approximately 14 or 15 years old, Coleman Young and a friend named Buck McCain decided to take on the world and left home. With a couple of saddle horses and a packhorse, they looked for work, and wound up in Ozona, Texas.

They arrived in Ozona where Coleman began work as a ranch hand

## 11<sup>th</sup> Annual Osage Oil & Gas Summit a Success...

The Osage Minerals Council and the Osage County Producers sponsored their annual oil and gas summit in Tulsa, Oklahoma, at the Hyatt Regency Hotel on November 7<sup>th</sup> and 8<sup>th</sup>, 2012. There were over 300 attendees from across the United States who attend the summit and lease sale.

The Bureau of Indian Affairs conducted the lease sale on November 7, following the Opening Ceremonies, which included the Osage Drum and singers and Osage Princesses who signed the Lord’s Prayer while it was being sung by an Osage singer!

The Bureau of Indian Affairs held workshops on Wednesday afternoon and there were some very

informational classes on Thursday with noted speakers such as **Ted Beaumont, Brian J. Cardott, Stephen Trammel, Kurt Rottmann, Dennis Kerr, James O. Puckett, Don Unruh, S. J. Mazzullo, Shane Matson, Galen Schwertseger and Darin West.**

All of the speakers received great reviews and Chairman Whitewing remarked that the summit was the “biggest and best ever”. The next summit is tentatively set for **November 6<sup>th</sup> and 7<sup>th</sup>, 2013.**



wrangling horses on the Hoover Ranch. Known as a greenhorn, an insulting cowboy term referring to anyone new at the job, the name stuck. Thereafter he signed his name “Green Mankin” for the rest of his life.

Ozona is a remote town, 82 miles southwest of San Angelo on Interstate 10; 112 miles east of Fort Stockton; 76 miles south to Del Rio. Approximately 3,700 people live there today; about four times more than when Charlie lived there. Ozona is the only town in all of Crockett County, the fourth largest county in Texas.

Myla Boehmert, Charlie’s mother, was born and grew up in Dallas. She attended the College of Industrial Arts, originally established in 1901 as the Girls Industrial College, in Denton, Texas. Myla was fortunate to have attended college since the education of women was not a high priority at that time. After graduating, she made history by landing the first public kindergarten teaching position in the State of Texas. She must have created quite a stir in Ozona among all the cowboys when she started her teaching career. She met Green Mankin in Ozona and they married in 1930.

Charlie’s parents, the cowboy and the school teacher, played important roles in raising their son. Growing up on a ranch with a hard working father and a school-teacher mother provided some special chemistry in Charlie’s formative years. It is highly probable that Myla had strongly emphasized the importance of an education during his childhood.

### Dallas to Stoney, Texas

When Myla Mankin became pregnant, she lost her job as kindergarten teacher. She and her husband, Green, returned to Dallas to have the baby. Green gave up the life of a cowboy. Myla and Green lived with her parents for three years in Dallas, where Green took a job loading steel for a cotton gin. Charlie Mankin was born in Dallas in 1932. Afterwards Myla and Green saved enough money to buy a farm in Stoney, Texas, where Charlie’s sister was born in 1936.

The Mankin family spent the next four years in Stoney. Charlie attended school in a two-room school house: one room held grades one through four; the second room held grades five through eight. Charlie completed grades one through three, and then was “double promoted” one year when Texas went from an 11-years to a 12-years curriculum showing early signs of being very bright.

### Stoney to Ozona, Texas

When Myla and Green Mankin moved back to Ozona, Green partnered with Joe Clayton, setting up a Purina Feed Supply Store. At the time Charlie finished high school in Ozona, Joe and Green bought at auction some ranchland used by the Army during World War II to train an armored division for the assault on Germany. The ranch covered about 19 sections of land (69,960 acres) near Brownwood, Texas.

That first summer after graduating high school, Charlie worked on the ranch putting up fence with a crew of Mexican laborers. The work was hard; living and working out of two jeeps. The line crew erected 22 miles of three-strand, barbed-wire fence digging every posthole in the hard caliche soil with a steel bar, then excavating the loosened soil with a coffee can. Nights were spent under the stars. Every other weekend, Charlie brought the crew to a hotel in Brownwood, where they could clean up and take a break from the hot Texas sun. The Mankin ranch ran 600 head of cattle and 6,000 head

of sheep. Charlie recalled, “There were some good years and some bad years in the ranching business.” That part of Texas had a way of making people feel small, and it probably had a positive effect on Charlie’s approach to life.

One day while riding horseback through a pasture on the ranch, Green offered Charlie the chance to continue on the ranch building fence or going to college. Green said, “I heard that the University of New Mexico is a great school,” and suggested that Charlie should study chemical engineering. Charlie decided that college was a better option than long hours of putting up fence. A gifted athlete, Charlie was able to make the basketball team as a “walk-on” at the University of New Mexico (UNM). Unfortunately his basketball career ended when he had a serious knee injury. This trick of fate, however, led Charlie directly into the field of geology.

Walking around the Albuquerque area to strengthen his knee, Charlie hiked through arroyos and abandoned streambeds giving him a clear view of the geology of this beautiful place. The walks kindled an interest in Charlie for geology. He began inquiring about geology asking a friend, “How do you learn about rocks?” His friend pointed him to the geology department, where he met Sherman Wengerd, a geology professor. Wengerd recommended some geology books to Charlie that convinced him to study geology. (Sherman Wengerd received his master’s degree in geology from OU, where Charlie was to make history. Charlie never took a course from Wengerd, because he only spent his freshman year at UNM,.) Devoting himself to his geology studies, Charlie entered the University of Texas at Austin (UT), where he earned B.S., M.S. and Ph. D. degrees.

### Getting Educated...University of Texas (Austin) and Caltech

Charlie took it upon himself to learn more math and science in the latter portion of his undergraduate education to prepare himself for graduate work. His masters thesis involved geologic mapping along the Rio Grande between Texas and Mexico at Tierra Viaja. Field conditions there were primitive; graduate students resided in abandoned guest cottages; the nearest store was 50 miles away. To cross the Rio Grande to study the geology, only a cable with a wash-tub attached provided conveyance across the river. Students put their clothes in the tub to keep them dry, got into the river, and then pushed the tub across the river.

Charlie’s dissertation consisted of geologic mapping in a remote portion of northeast New Mexico. While there he became a local hero. A local rancher had drilled four dry holes, all on an anticline, on the advice of a water witcher. Charlie told him not to drill on top of the anticline, but to drill 200 yards either north or south off the anticline and there he would find the water he needed. When water was discovered, Charlie’s reputation as the local hero was assured.

Charlie did post doctoral study at the California Institute of Technology (Caltech) after he finished his doctorate. While Dr. Mankin was teaching several courses at Caltech, he got a call from Dr. Muehlberger, his dissertation advisor at UT, about a position at OU.

### The Oklahoma Experience

Charlie gravitated toward a more technical background (math and the more difficult sciences) while studying at UT. When he arrived at OU, he immediately began to improve the existing program by requiring geologists also to take calculus. This caused a furor among students and some alumni who were sending their children to OU. But the President of OU at the time was George Lynn Cross, who

backed Charlie’s proposal.

One day, in the very early part of Charlie’s OU career, a secretary in the Geology Department office asked him, “Why aren’t you in the faculty meeting with Dr. Cross?” He responded, “What faculty meeting?” His first thought was, “Oh-my-gosh! I missed a meeting with the President!” Just then, another call came from Ada Arnold, the secretary for George Lynn Cross. The President wanted to talk to Charlie immediately.

It was a long walk from the School of Geology to the President’s office that day. Charlie thought the worst: maybe he had pushed too hard for calculus. As he entered the President’s office, Ada said immediately, “He’s waiting to see you.” Charlie long remembered the apparently long distance from the office door to the desk of the President.

President Cross addressed Charlie: “Mankin.....,” he paused. Charlie said, “Yes, sir,” and took a deep breath while awaiting his fate. Cross continued, “This morning I had your colleagues over for a little visit, and I told them I was appointing you the director of the department. Let me know if you need anything.” That was it! Charlie had a hard time realizing what had happened. As he walked passed Ada again, she was smiling and said to Charlie, “Congratulations! I am sure you’ll do very well.” Charlie’s walk back was a little more pleasant. He had become responsible for the future of the School of Geology at OU, a big step from working on the family ranch in west Texas.

Three years after Charlie became director (1967), the School of Geology became the School of Geology and Geophysics, and he continued to push for more technical training.

### The Rest is History

In 1967, Charlie became the Director of the OGS; he also became an active voice for the State of Oklahoma. He came in contact with people at all levels: both officially and informally. In spite of his position, Charlie never failed to give people freely of his time. He was often seen at the phone, answering and entertaining the most trivial questions. Even though he was at the top of the hill, he always took time to hear what people had to say.

### My Account of an Interview with Charlie

After losing my job in the oil industry, I moved my family in with my parents in Dallas, Texas. Jobs were scarce at the time so when I heard about a job in Oklahoma, I jumped at the chance. I met Charlie at a gate in the Dallas airport, walking with him to another gate as he connected flights. Most likely he was traveling to Washington, D.C. to testify in front of a congressional committee. I was nervous, but once after meeting Charlie, there was no longer any opportunity to be nervous. We walked rapidly, discussing the job in Oklahoma. In what seemed like the blink of an eye, the interview was over. Charlie climbed onto the next plane with my resume. I thought that I should have said more with the time we had. Fortunately I had worked in Alabama with some of Charlie’s colleagues (my references). I got the job and worked in Oklahoma ever since. I will always remember that interview.

### Summary

Charlie Mankin walked with big men and small men. His place in the history of the University of Oklahoma system is well established. In spite of all this, Charlie never let any of his accolades change him.

Despite the challenges, he remained true to his principles, always keeping the common good in mind. Certainly working long hours in remote locations played a role in his

early life. His mother, too, influenced Charlie, especially concerning the importance of education. Finally, I was tempted to downgrade the influence of the family tree because of its possible association with the Younger brothers; however, when you look at what his father and paternal grandfather accomplished, one realizes that there had to be more to those cowboys than what first met the eye. Charlie’s father was a successful businessman and rancher. In spite of only having a third grade education, he was an avid reader. Charlie’s father was “strong as an ox,” and taught his son how to work hard and finish a job. Once when asked why Charlie was not interested in going into ranching, he said, “...because I could never be as successful as Dad was.” **Whether you believe he inherited his character or developed it by working in isolated locations, there can be little doubt that Dr. Charles J. Mankin had a will of iron and a heart of gold. He cared about people and that never changed. He was truly one of the constants in the universe. What more can one say?!**

### Acknowledgements

**The author expresses his appreciation of History of the School of Geology and Geophysics, The University of Oklahoma by George G. Huffman (1990).**

### Oklahoma Geological Survey Mission Statement:

**The Oklahoma Geological Survey is a state agency for research and public service located on the Norman Campus of the University of Oklahoma and affiliated with the University of Oklahoma Mewbourne College of Earth and Energy. The Survey is chartered in the Oklahoma Constitution and is charged with investigating the state’s land, water, mineral, and energy resources and disseminating the results of those investigations to promote the wise use of Oklahoma’s natural resources consistent with sound environmental practices.**

*Created by the Oklahoma Territorial Legislature in 1890, the University of Oklahoma is a doctoral degree-granting research university serving the educational, cultural, economic and health-care needs of the state, region and nation. The Norman campus serves as home to all of the university’s academic programs except health-related fields. The OU Health Sciences Center, which is located in Oklahoma City, is one of only four comprehensive academic health centers in the nation with seven professional colleges. Both the Norman and Health Sciences Center colleges offer programs at the Schusterman Center, the site of OU-Tulsa. OU enrolls more than 30,000 students, has more than 2,400 full-time faculty members, and has 20 colleges offering 163 majors at the baccalaureate level, 166 majors at the master’s level, 81 majors at the doctoral level, 27 majors at the doctoral professional level, and 26 graduate certificates. The university’s annual operating budget is \$1.5 billion. The University of Oklahoma is an equal opportunity institution. [www.ou.edu/eoo](http://www.ou.edu/eoo)*





*Oklahoma Geological Survey*  
THE UNIVERSITY OF OKLAHOMA  
MEWBOURNE COLLEGE OF EARTH & ENERGY  
100 E. Boyd, Room N-131  
Norman, Oklahoma 73019-0628

Non-Profit Organization  
U.S. Postage  
PAID  
University of Oklahoma

*A State Agency Serving the People of Oklahoma*

## OGS Calendar

- March 14**      **GIS Day at the Capitol**; Oklahoma State Capitol Rotunda.  
Contact: Shellie Willoughby, 405/521-4828 E-mail: [shelliew@okcc.state.ok.us](mailto:shelliew@okcc.state.ok.us)  
Website: <http://www.okmaps.onenet.net>
- March 14-15**    **AAPG/SEG Student Expo**; University of Oklahoma School of Geology & Geophysics; Sarkeys Energy Center; Norman. Contact: Devon Harr, 405/325-0360 E-mail: [devonharr@ou.edu](mailto:devonharr@ou.edu) Website: <http://www.geology.ou.edu>
- March 19**      **Water Appreciation Day at the Capitol**; Oklahoma State Capitol Rotunda. Contact: 405/530-8800 Website: <http://www.owrb.state.ok.us>
- April 18**        **ScienceFest Oklahoma**; Oklahoma City Zoo. Contact: Andrea Melvin at 325-2652 E-mail: [andrea@mesonet.org](mailto:andrea@mesonet.org)  
Website: <http://www.sciencefestok.com>
- April 20**        **Oklahoma State Council of Mineralogical Societies Meeting & Swap Meet**; Couch Park, Stillwater.  
Website: <http://www.okmineralsocieties.org>
- April 23**        **Oklahoma Aggregates Association “Aggregates Day at the Capitol”**; Oklahoma State Capitol Rotunda. Contact: Jim Rodriguez, 405/524-7680 E-mail: [jrodriguez@okaa.org](mailto:jrodriguez@okaa.org) Website: <http://www.okaa.org>