### **Geosciences Program Newsletter**

for alumni and friends of the geosciences program. **Autumn, 2015** 



DEPARTMENT OF PHYSICAL AND ENVIRONMENTAL SCIENCES



#### **CMU Geology in the Grand Canyon!**

Three CMU geology students and Professor Andres Aslan had a once-in-a-lifetime experience this past summer in the Grand Canyon, or "The Big Ditch" as it is sometimes known. The group spent 14 days (May 12-25) rafting through the Canyon as part of Univeristy of New Mexico's (UNM) Advanced Field Camp course. Not bad schoolwork if you can find it! UNM Professors Karl Karlstrom and Laura Crossey have been running this program for more than 20 years and have helped train several generations of geology students from around the country. In fact, two former CMU students (Candice Long, '03 and Max Schultz, '14) participated in the UNM field camp in years past.

This year's 16 participants included myself, CMU students **Barb** Allen (B.S. '15), Michael Hale, and Jaron Ragsdale, Professors Karl Karlstrom and Laura Crossey and 6 graduate students from UNM, Professor Carol Dehler and two graduate students from Utah State, Dr. Mike Timmons from New Mexico Tech, and one undergraduate student from Harvard. The trip involved a wide range of activities and adventures. Students who took the course received four of the necessary six credits needed to complete CMU's Field Camp, and the Grand Canyon projects involved mapping faults, measuring stratigraphic sections, interpreting fluvial terraces, mapping travertine deposits, and deciphering the Precambrian geology of the Inner Gorge. In addition, everyone helped several of the graduate students collect data for their theses, which included studies of sedimentary rocks that record the breakup of the "Snowball" Earth. The group also helped collect water and gas samples of cold springs as part of Professor Laura Crossey's ongoing studies of mantle-surface water connections in the western U.S.

The trip was fast paced, but we always had fun. Highlights included the Proterozoic sedimentary rocks of the Chuar Group that are almost one billion years old, but don't look a day older than the CMU Geology students and Professor Andres Aslan take a break in the Little Colorado River on their recent float trip through the Grand Canyon

Cretaceous! The Chuar Group outcrops in the Grand Canyon represent one of only three locations in the western U.S. where sedimentary rocks of this age are preserved. Other amazing features include the lava flows of the western Grand Canyon, and the history of lava dam failures and catastrophic flooding. The outcrops of travertine were also stunning because in some cases they form cliffs up to 50 m tall (!). The travertine deposits have formed entirely during the Quaternary as spring waters degas  $CO_2$ . Lastly, we had a spectacular view of the turquoise-blue Little Colorado River at the confluence with the Colorado (see front page photo). This location is the site of a proposed (and controversial) gondola to the rim (boo!) that would be built on tribal land.

Getting to see and learn about the Grand Canyon from some of the world's experts was truly special. Even the boatmen had Ph. D's in geology! It was especially fascinating to learn firsthand about some of the recent geological controversies involving the age of the Grand Canyon. While conventional wisdom suggests that the Colorado River became fully integrated through Grand Canyon within the past six million years, some researchers argue that portions of the western Grand Canyon may be as old as the late Cretaceous! While this idea if quite controversial, it was fascinating to learn how much has yet to be resolved about the canyon's history. This is actually not too surprising – it is a big place!

Needless to say, this was a great experience for our students. **Jaron Ragsdale** says "We saw areas that few people experience in the Grand Canyon. It was a great learning experience and involved lots of knowledgeable people. It was also good to be involved with the graduate students' work and to see what it would be like to go to graduate school. It was exciting to be on "the front lines" using our skills to do research and to answer questions. And it was great to learn the science behind all the incredible views and features. I'm

so glad I did it. I'd like to do it again someday. It was an incredible experience." **Michael Hale** echoed many of Jaron's impressions. Michael says "As a longtime boatman, the Grand Canyon has always been an inspiration. Getting the opportunity to work in one of the 8th Wonders of the World with experts on the Grand Canyon and their

graduate students inspired me to think of grad school for the first time." This was an unforgettable adventure that will perhaps inspire us to offer future geology field trips to the Grandest of all Canyons.

— Andres Aslan, Jaron Ragsdale, and Michael Hale

#### **Coordinator's Corner**

Thanks to all our alumni and friends who continue to offer encouragement and support for the Geology program at CMU and the newsletter. As always, we would like to re-connect with even more of our alumni and friends — so when you receive this newsletter — please forward it to friends or colleagues that we may have missed!

**Student activities and accomplishments**. Spring 2015 was highlighted by our 1<sup>st</sup> Annual Geosciences Program Spring Field Trip. This year we spent a full day with Professor Rex Cole and about 60 students touring the geology of the Cretaceous from Grand Junction to Green River, Utah. Highlights included Sego Canyon petroglyphs and the old cemetery. The Spring semester was capped off by Commencement and the graduation of 10 students with B.S. degrees. This group and several of the underclassmen received their fair share of accolades including:

Mike Brink, Neal J. Harr Outstanding Geology Student Award

**Doug Nichols**, William C. Hood Student Research Award. Doug also received a Rocky Mountain Section, Geological Society of America Undergraduate Research Grant

Adam Trumbo, Verner Johnson Geology/GIS Student Award

Lisa van Kirk, Roadifer Field Camp Scholarship

Mickey Guziak, Mark Garman Scholarship

Lilli Clark, Association of Women Geologists Award

Jaron Ragsdale, Gem and Mineral Club Scholarship

**Dakota Lindsey, Doug Nichols** and **Thomas Spain**, Grand Junction Geological Society Student Presentation Awards

**Mike Brink, Barb Allen, Alexandra Price, Tyanna Eaton** and **Tim Gerken**, Grand Junction Geological Society Field Camp Scholarships

16 students presented at the CMU annual Student Showcase that features undergraduate research. Geology award winners were **Tyanna Eaton** and **Dakota Lindsey** 



Mickey Guziak, Steve Corr, Tim Gerken, Keegan DePriest, and Rob Gasnick take a break during Field Camp, 2015.

Student-faculty research remains an important component of our Geosciences program, and several private companies, foundations, and societies have generously provided funding (totaling ~\$240K over the past ~5 years) for the Mancos Shale project led by Dr. Bill Hood and Professor Rex Cole, the Williams Fork Consortium led by Professor Rex Cole and Dr. Matt Pranter (currently at University of Oklahoma), and the Colorado River landscape evolution project led by Professor Andres Aslan. Contributors include WPX, Anadarko Petroleum, BP America, Bowie Resource Partners, XTO, Black Hills Exploration, Running Foxes Petroleum, Endeavour International, the Lightner Family Foundation, and the Greater Denver Area Gem and Mineral Society. We greatly appreciate the support!

**Upcoming Events**. We hope everyone is well and it would certainly be nice to see more alumni at the 2016 Spring Geosciences Program field trip and barbecue (details are elsewhere in this newsletter). If you can't attend, we would still love to hear from you, so feel free to email **aaslan@coloradomesa.edu**, or simply stop by if you are in town. **Andy Darling** (B.S. '08) will be on campus on Wed. Nov. 18 presenting his Ph.D. research to the geology program. And lastly, if any of you will be at GSA, CMU geology student **Doug Nichols** and I will be at the Baltimore meeting in late October so if you do go, please let us know. We hope to hear from all of you soon.

Sincerely, Andres Aslan Geology Program Coordinator

# Faculty Profile: Dr. Richard Livaccari, Professor of Geology

University of New Mexico (B.S., Geology) State University of New York at Albany (M.S., Geology) University of New Mexico (Ph. D., Geology)

r. Rick Livaccari has been a faculty member in the geoscience program at Colorado Mesa University since the beginning of the Anthropocene, no, wait, that's Verner. Actually, I've only been here since 1997 (the previous millennium). During my tenure, the school has grown from a small college into the largest four-year college, I mean, university, on the western slope. I wish I could take the credit for that...

I am a transplanted easterner who grew up in White Plains, NY and then Delray Beach, FL. After nearly flunking out of high school in Delray Beach (going to the beach was way more interesting than high school), I moved to New Mexico with a friend. It was at the University of New Mexico that I found my true love in the form of rocks and also found the woman who would become my first ex-wife. The B.S. in Geology provided me with a deep curiosity into how geologic processes on the planet Earth operate, and I am still trying to figure the planet out.

After graduating from UNM in 1977, my curiosity led me to graduate school at the State University of New York at Albany. At SUNY Albany I earned an MS in geology and published several papers, including one on the plate tectonic origin of the Rocky Mountains that is still commonly referenced. At that time (late 1970's), the SUNY Albany faculty was a misfit collection of world famous geologists that practically invented plate tectonic theory. Some of them actually coined the term 'Wilson Cycle' (my students know that term). At SUNY Albany I learned to appreciate the Earth in global (big picture) terms, rather than from a local perspective. If you have taken one of my upper division courses (especially Igneous & Metamorphic Petrology) you know that I have a tendency to harp on new ideas and baffling phenomenon regarding the evolution of our planet. My thesis was a mapping project in Newfoundland, Canada. Newfoundland has famous fiords and continuous outcrop along the coastline. We would camp out for the entire summer and access Newfoundland's north Atlantic coastline with a small 14ft boat with a 25 horsepower outboard motor. There were times when we got caught in a deep fogbanks and could not see land. Unexpected strong storms also made the work very dangerous.

After graduating from SUNY I accepted a job at Earth Satellite Corporation in Washington D.C. doing geologic interpretation of satellite imagery and air photos (just like field mapping, but without all the annoying hiking). I finally left the east coast for good in the mid-1980s when I got a job with the mining & petroleum consulting company MagmaChem in Phoenix working with Stan Keith (a Univ. of Arizona graduate). At MagmaChem, I did regional tectonic



Dr. Richard Livaccari

analysis of the western U.S. and grassroots field exploration for precious metals in Nevada. An interesting fact about Nevada is that there are many undeveloped, back country hot springs, and we always tried to end the day at one when doing field work.

When the petroleum industry crashed in the 1980's I returned to grad school to earn my Ph.D. in geology at the University of New Mexico. I did my all of my dissertation work and my post-doc work in southern Arizona. I worked in the South Mountains in the Phoenix area for my dissertation and on the Harcuvar, Harquahala and Buckskin Mountains of western Arizona for my post-doc. The focus of all this work was to use paleomagnetism to determine whether or not there had been any footwall rotation in the well-exposed normal fault structures that cover those mountain ranges. I found no footwall rotation and, hopefully, put that argument to rest. The conclusion is that low-angle normal faults can form as low-angle normal faults rather than being rotated to a low-angle geometry. Did you know that the original London Bridge is now located along the Colorado River in western Arizona at Lake Havasu City? Also, during WWII, Patton trained his tank divisions in the same area of western Arizona. Occasionally, we would find old shell casing and land mines, which I always liked to smash with my rock hammer;).

After having survived all of that, I just have one question to ask all of you: What is the name of the most common silicate mineral on the planet Earth? I bet you do not know because it was only recently (within the last year) discovered in a meteorite. If you want to find out, you should just re-enroll in Mineralogy. I know you miss it...

## Still Rockin'! Retired Faculty Profile: Dr. Jim Johnson

Mesa Junior College (now CMU) (A.S.) University of Colorado (B.S., Geology) University of Utah (M.S., Geology) University of Colorado (Ph. D., Geology)



Dr. Jim Johnson

r. Jim Johnson's roots are right here in Grand Junction, where he was born and raised. After high school, he attended and graduated from Mesa Junior College, predecessor of Colorado Mesa University. He continued with his formal education at University of Colorado, Boulder, with the idea of eventually teaching science. While at CU he joined the National Guard and after graduation went into the U.S. Army and was stationed in Germany. While in Germany, he

decided he'd rather teach than pursue a career in the Army, so he resigned his Regular Army commission and returned to Grand Junction, where he taught math at Grand Junction High School.

Some people were born with silver spoons in their mouths, but you might say Dr. Johnson was born with a pair of skis strapped to his feet. He openly admits that his love of skiing and snow guided most of his career choices. He enjoyed skiing during his Army service in Germany, and ended up returning to Germany as a civilian teaching military dependents in part so he could spend more time skiing the Alps. He has fond memories of weekends and vacations spent skiing in places like Zermatt and Val d' Isere. He taught in Germany for six years, and during that time he met a young lady teacher (skier, of course) who he eventually married. Their honeymoon was spent touring Europe in a VW camper bus.

Dr. Johnson decided he wanted to teach college and so returned to the States with his wife and a growing family to further his education. He accepted the fact that anyone who liked snow and skiing as much as he did should study snow, ice, and glaciers. An NSF Fellowship took him to the University of Utah, where he earned his M.S. in 18 months. His thesis was on how to use snow and ice to teach introductory geology, a novel concept then, and now.

After graduation, he stopped by Mesa Junior College to say high to old friends and was offered a teaching job. He accepted, moved to Grand Junction, and started building the house that he still lives in. To his surprise, he found out the offered job had not been funded and was not available, but he took that news in stride and accepted a job teaching remedial 8th grade math back in Grand Junction High School. The next year, however, the job did get funded, and in 1967 he joined Dr. Jack Roadifer and Bob Young in the Geology Program at Mesa Junior College.

In 1969 Dr. Johnson received an NSF grant to study glaciers on the Colorado Front Range working with the Institute of Arctic and Alpine Research (INSTAR) at CU Boulder. That project evolved into a Ph. D. candidacy that lasted 5 years and involved many winter trips over Loveland Pass to Denver in the winter because Dr. Johnson's advisors wanted him up on the glaciers collecting data in the winter, not just in the summer. He recalls the study itself as being a lot of fun, and the writing and defending of the dissertation as being "punishment". He also credits his wife with providing the impetus to finish...

Dr. Johnson pushed for a strong field emphasis for the Geology program during his years at Mesa. This was due in part to the outstanding natural field laboratory in and around Grand Junction, and also due to necessity: The department had no equipment or money or transportation! Over time, he was able to purchase some basic equipment and to convince the administration that vans were necessary for student field trip use, not just for athletics.

Dr. Johnson brought much more than just vans to the Geology program at Mesa. He and another faculty member organized the first Western Slope Field Conference, which was a huge success and continues to this day. When the Department of Energy office in Grand Junction closed, he was able to get the DOE office library donated to Mesa. He served in the Faculty Senate as Math and Science representative, as Vice President, and President, and was Chair of Science and Math. Late in his career, he returned from a sabbatical and was made Dean. One of his first requests as Dean was for a new science building, and to his surprise, the request was granted and Wubben Hall rose from the earth.

After four years as Dean, Dr. Johnson missed the interaction with the students, especially with the good students, and so resigned and returned to full time teaching. Soon thereafter, in 1999, he retired after 32 years on the faculty at Mesa.

Dr. Johnson still lives in the Grand Junction area and has had a busy retirement. He runs into many former students although he admits he does not always remember their names. He suspects they all remember his nickname "Mother Johnson". Apparently, this moniker was the students' reaction to Dr. Johnson's tendency to require students to pick up after

themselves. He has traveled to places like Fiji, the Bay Islands, and Costa Rica to enjoy one of his favorite pastimes, scuba diving. He took up mountain biking and has been involved with the creation of some of the local biking trails. He notes he now owns his 4th mountain bike. He still likes to camp and relax, and became an avid reader of science fiction when he retired.

But does he still ski? Well, about two years ago, an out-of-control snowboarder ran into and injured Dr. Johnson. Whether or not

he will ski again is not known, but his memories are sharp. His first years of skiing were at places like Loveland Basin, Cooper Hill, and Mesa Creek. The latter was near Powderhorn and originally had a rope tow, but upgraded to a poma lift before Powderhorn was developed. Dr. Johnson was a member of the National Ski Patrol for 43 years, and was one of the first volunteer ski patrolmen when Powderhorn first opened in 1966.

To Dr. Johnson, we can only say, "Rock on, and ski on!"

#### **Maverick Geologists (Alumni News)**

ndres ran into **Trevor Burrell** (B.S. '14) and was pleased to learn Athat he as well as **Scott Schindelar** (B.S. '12), **Ty Kipp** (B.S. '12), and Luke Davenport (B.S. '13) are currently working as geologists for Field GeoServices. Candice (Tellio) Long (B.S. '03) continues to work at Raven Ridge Resources in Grand Junction as a geoscientist and has made good use of her GIS skills. **Rob Rice** (B.S. '14) is currently working at Stoller (now Navarro Engineering and Research) and is also taking graduate Earth Science courses through Emporia State University while maintaining his job. Nikki Redden (B.S. '14) works for Elam Construction and oversees all lab testing and protocols for the company. Lilli Clark (B.S. '15) is following in Nikki's footsteps and recently joined Elam Construction. Dakota Lindsey (B.S. '15) is currently a geologist/intern at the Deserado coal mine and hopes to start graduate school in the Fall of 2016. Jeff Hrncir (B.S. '14) started his M.S. degree at University of New Mexico in the Fall of 2015 working with Prof. Karl Karlstrom and is a TA this semester. Max Schultz (B.S.

'13) is in the second year of his M.S. degree program at Colorado State University focusing on copper ore deposits in Michigan. Max is often traveling to core repositories in Michigan and Wisconsin to complete his thesis work. **Marisa Boraas** (B.S. '14) received the 2014-2015 Outstanding Teaching Assistant Award in the Warner College of Natural Resources at Colorado State University. Marisa is in the second year of her M.S. degree program focusing on sedimentary geochemistry, and she came back to campus this October and visited with students about graduate school opportunities. **Andy Darling** (B.S., '08; M.S., University of New Mexico, and current Ph.D. student at Arizona State University) will visit campus in November and meet with CMU students about his research and life after graduation.

We always like to hear from our former students. If you can, please drop by or send an email and let us know what you are doing!

## Going With the Flow: Water-Related Activities in CMU's Geosciences Program

The Ruth Powell Hutchins Water Center at CMU has had a very active year in 2015. The annual water course in February focused on Water for Agriculture and was followed by fascinating evening with historical performer Clay Jenkinson who portrayed John Wesley Powell to a crowd of nearly 400 people at CMU. Other events have included the annual State of the Rivers seminar, a Vine to Wine tour in collaboration with the Colorado Foundation for Water Education and another collaboration with the Western Colorado Center for the Arts.

The Hutchins Water Center at CMU is getting ready for its biggest event of the year. The 5<sup>th</sup> Annual Upper Colorado River Basin Water Forum will be held October 28-29 in the University Center at CMU. The forum is an interdisciplinary conference drawing water professionals from a variety of disciplines and professions together to discuss challenging water issues in the Upper Colorado River Basin. The theme of this year's conference is *Managing for Extremes* and includes a panel of the four-corner state climatologists, a keynote speaker regarding the California drought



Field Camp 2015 in the Henry Mountains. From left, Tim Gerken, Rob Gasnick, Lilli Clark, Steve Corr, Barb Allen, Keegan DePriest, Bryan Ohm, Tyanna Eaton, Trey Nusbaum-Davis, Addy, Lisa van Kirk, Joe Mazza, Mickey Guziak, and Professor Verner Johnson.

and a special afternoon event about the Colorado River pulse flow and its impacts. For more information: http://coloradomesa.edu/watercenter/UpperColoradoRiverBasinWaterForum.html

Another exciting upcoming fall activity will involve a group of seven CMU students who will travel to Denver for the Water Diplomats program hosted by Metropolitan State University of Denver September 18-20. These students will spend the weekend in Denver learning about the Colorado Water Plan and will come back to Grand Junction armed with a wealth of water information to share with the CMU community.

As always, the fall Natural Resources of the West seminar series is open to the public and live-streamed on the web every Monday at 4pm. The theme this semester is Energy Resources and will include our own Dr. Rex Cole, who will talk about Oil Shale in the Piceance Basin. For more information: http://www.coloradomesa.edu/~grichard/WSS/Seminar2015.htm

The mission of the Ruth Powell Hutchins Water Center at CMU is to support and promote education, outreach, research, and dialogue to address the water issues facing the Upper Colorado River Basin.

— Gigi Richard, Faculty Director,
 Ruth Powell Hutchins Water Center

#### **Club Activities**

**Teta Nu Chapter of Sigma Gamma Epsilon.** CMU's Zeta Nu Lichapter of Sigma Gamma Epsilon will induct a group of new members during the October initiation. Environmental Science or Geology students are required to carry a cumulative GPA of 3.0 or greater to maintain their member status. SGE's current goal is to "use our academic excellence to enrich our community through endeavors inside and outside the classroom". Guest speakers are a large part of these endeavors. Speakers from the Bureau of Land Management, Colorado Department of Natural Resources, and other local agencies have come to campus to discuss career opportunities with students. This provides a connection between students and the real world so that students know what to expect post-graduation. Graduate school has also been addressed during these presentations, most recently by Marisa Boraas-Connors (B.S. '14), a former SGE officer and current graduate student at Colorado State University. Being a member of SGE not only entitles one to a great-looking resume item, but also the opportunity to be a part of a professionally motivated group of students who make an effort to become more involved in their field of study.

Colorado Mesa University Student Chapter, American Association of Petroleum Geologists. The AAPG Student Chapter at Colorado Mesa University is busy again this fall with monthly meetings, a weekend field trip, and a guest speaker. The club sponsored a field trip to the West Elk Mine near Paonia on October 10. On November 18, the club will host a meeting between students and **Andy Darling** (B. S., '08) who will discuss his Ph. D research and life as a grad student. Spring field trips are in the planning stages.

The Chapter is interested in hosting speakers, particularly those who would like to talk about local geology or who can provide job-finding guidance to geology graduates. The Chapter would also be interested in hearing from geologists who would like to guide students on local field trips. Interested individuals should contact AAPG Student Chapter president Trey Nusbaum-Davis: tjnusbaum-da@mavs.coloradomesa.edu.



Martians? No, this is the AAPG Student Chapter on a tour of the West Elk Coal mine. Coal mines are white, not black, because everything (apparently including the camera lens) is covered with limestone dust for safety reasons. From left to right, Kathleen Dykstra, Trevor Potter, Tim Gerken, Larry Jones (faculty adviser), Bryan Ohm, Trey Nusbaum-Davis, and Robert Gasnick.

### Alumni Facebook Page



Did you know Colorado Mesa University Geology Alumni have a Facebook page? You can access it by logging in to Facebook and searching "Colorado Mesa University Geology Alumni" or by going to Facebook.com/CMUgeology



A large crowd of mostly CMU geology students attended the 2015 Western Slope Field Conference in Gunnison.

#### **2015 Western Slope Field Conference**

This year's field conference (the 28th annual event!) was hosted by Western State in Gunnison, and was attended by 18 CMU geology students, Professor Andres Aslan, and alumnus **Mike Feil** (B.S. '14). The field conference featured Laramide structural geology of the Elk Mts in the vicinity of Almont and Crested Butte, CO as well as the volcanic history of West Elk Volcano near Blue Mesa. The group camped at Curecanti National Recreation Area along the edge of Blue Mesa reservoir, and unlike previous years, the weather was spectacular! Dinners featured Mexican night followed by the ever-popular "meat" night!

### **Donations to the New Geosciences Scholarships**

Two new scholarship funds were created last year to help worthy CMU students. The Geosciences program and students greatly appreciate the generous donations **Patricia Powell** and Site Development Consultants (**Barry Brinton**) to these two scholarships. This is a second donation from these alumni. Thank you very much!



Rockin' at Field Camp 2015. On top are Trey Nusbaum-Davis, Steve Corr, and Mickey Guziak. The smart ones in the shade are, left to right: Mike Brink, Tyanna Eaton, Alexandra Price, Lilli Clark, Keegan DePriest, Professor Rick Livaccari, Tim Gerken, Joe Mazza, Bryan Ohm, Doug Nichols, Lisa van Kirk, and Rob Gasnick.

## **Upcoming 2016 CMU Geosciences Spring Barbeque and Field Trip**

n Sunday, April 24, 2016, the Geosciences program will host a field trip to Canyonlands. The Geosciences program will provide vans that will leave from campus at 8:30am, and will host a post-field trip barbeque. We hope that alumni as well as current students will take this opportunity to re-connect with the faculty and the CMU Geology program! For further information, please contact Andres Aslan (aaslan@coloradomesa.edu; 970.712.3834).

#### Base Level: From The Editor

Welcome to the third issue of the new Colorado Mesa University Geology Newsletter. This issue includes a feature article on a float trip through the Grand Canyon with Andres Aslan and three lucky CMU students, a once-in-a-lifetime geological experience! This month's featured faculty member is Rick Livaccari, and featured retired faculty member is Jim Johnson who I'm sure many of the alumni remember fondly. This issue also contains also contains the Co-ordinator's Corner and other regular features. We welcome your input, suggestions, photos. We would especially like some group field camp pictures from "the early days"... As before, we are particularly interested in hearing from alumni — where are you and what are you doing? You can contact me directly at lajones@coloradomesa.edu or contact Dr. Andres Aslan, Department Coordinator, at aaslan@coloradomesa.edu.

Larry Jones, Newsletter Editor



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Autumn 2015

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