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JULY 2013 | VOL. 23, NO. 7

Celebrating GSA's Legacy



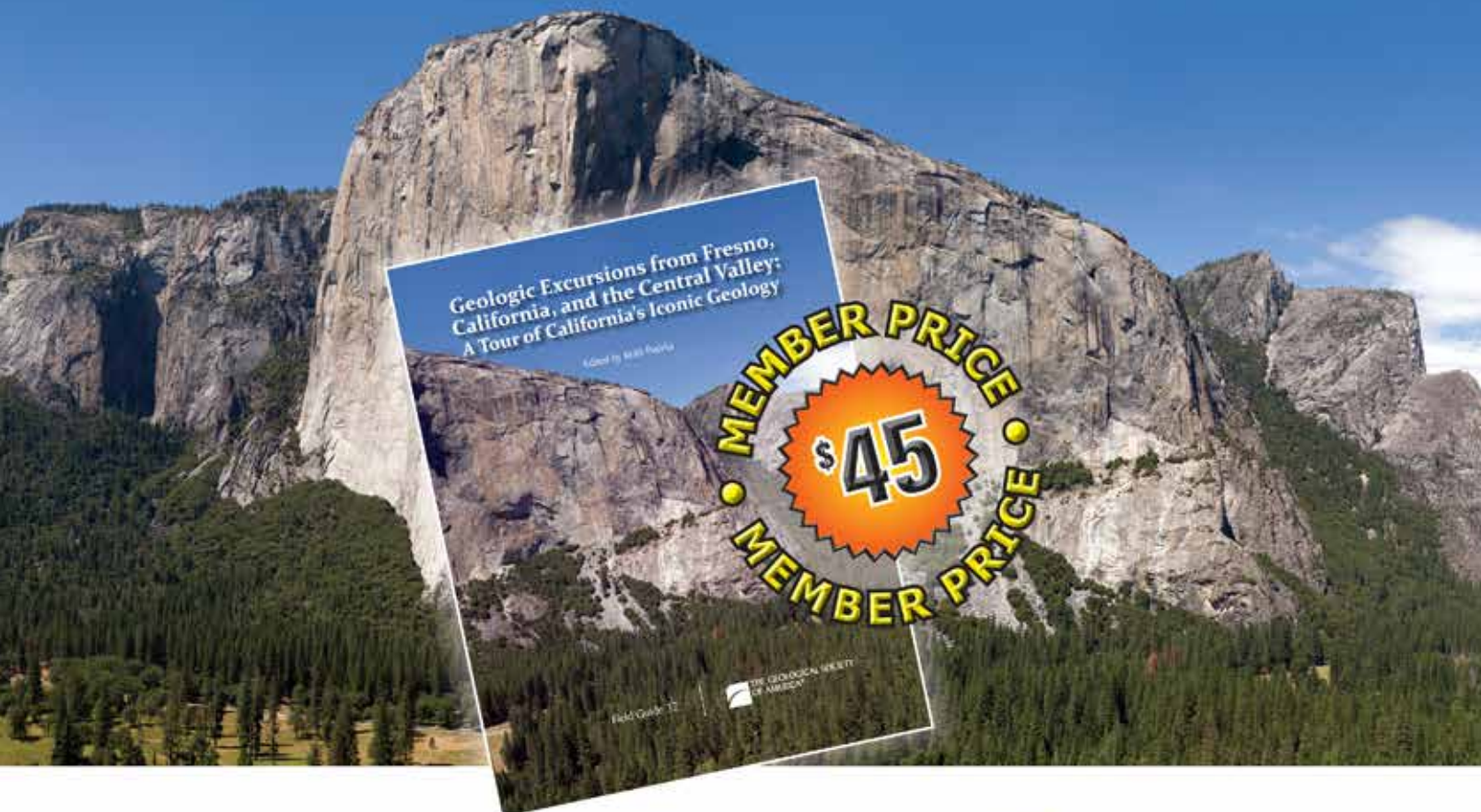
GEOLOGIC EXCURSIONS from Fresno, California, and the Central Valley

A T O U R O F C A L I F O R N I A ' S I C O N I C G E O L O G Y

Edited by Keith Putirka

This volume presents seven field trip guides that span the breadth of the geology of central California. The trips are associated with the 2013 Cordilleran Section meeting of the Geological Society of America, convened in Fresno, California. These trips provide guides to some of the most remarkable geologic localities, which are not only iconic, but form type examples of key geologic phenomena and include Yosemite National Park, the San Andreas fault, the Franciscan complex, and the Sierra Nevada Foothills near Fresno. The topics covered by these field trips include the nature of continental transform faults, the initiation of subduction, the origin of the Sierra Nevada batholith, the initiation of the Sierra Nevada arc, Pleistocene vertebrate fossils of the Central Valley, and debris flows triggered from burned watersheds.

FLD032, 162 p., ISBN 9780813700328 | list price \$55.00 | member price \$45.00



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THE GEOLOGICAL SOCIETY
OF AMERICA®

GSA TODAY (ISSN 1052-5173 USPS 0456-530) prints news and information for more than 25,000 GSA member readers and subscribing libraries, with 11 monthly issues (April/May is a combined issue). *GSA TODAY* is published by The Geological Society of America® Inc. (GSA) with offices at 3300 Penrose Place, Boulder, Colorado, USA, and a mailing address of P.O. Box 9140, Boulder, CO 80301-9140, USA. GSA provides this and other forums for the presentation of diverse opinions and positions by scientists worldwide, regardless of race, citizenship, gender, sexual orientation, religion, or political viewpoint. Opinions presented in this publication do not reflect official positions of the Society.

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GSA TODAY: www.geosociety.org/gsatoday/

Printed in the USA using pure soy inks.

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Cover: View from Marshall Mesa southwest toward South Boulder Peak, Boulder County, Colorado, USA. Marshall Mesa, a former coal-mining site, is now part of Boulder County's Parks and Open Space. Learn more at <http://bit.ly/RHPqtr>. Photo by Kea Giles.



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Celebrating GSA's Legacy



R.A.F. Penrose Jr.

EDITOR'S NOTE:

Richard Alexander Fullerton (“R.A.F.”) Penrose Jr. (17 Dec. 1863–31 July 1931) was an American mining geologist and entrepreneur. He served as the president of GSA in 1930, but perhaps his greatest contribution to the Society was his generous bequest of nearly US\$4 million upon his death in 1931. His bequest continues to support GSA’s research grants program and other efforts of the Society. Many say that without this bequest, the Society as we know it would not exist. For example, income from the fund enabled GSA to purchase the land it now occupies on what is aptly named “Penrose Place” in Boulder, Colorado, USA.

Penrose earned a Ph.D. from Harvard in 1885. He performed geological surveys in Texas and Arkansas until 1892, and then traveled the U.S. as a mining surveyor. Most notable was his survey of Cripple Creek, Colorado, for the U.S. Geological Survey.

After his father died in 1908, Penrose made a complete career change, using his knowledge as a mining geologist to succeed as a mining investor and as an entrepreneur in other areas as well. Penrose refrained from purchasing or investing in mines in the Cripple Creek area because of what he saw as his ethical responsibility as a USGS employee, but did purchase and invest in mines elsewhere, including silver and copper mines in Arizona.

Having amassed considerable wealth in these efforts, Penrose established the Penrose Medal of the Geological Society of America (GSA) in 1927, a top honor accompanied by a gold medal. Penrose was very active in GSA: he was elected as a member in 1889, served on GSA Council from 1914 to 1916, was GSA vice president in 1919, a member of the Finance Committee from 1924 to 1929, and GSA president in 1930.

Penrose’s 1930 Presidential Address to the Society was published in the 31 March 1931 issue of *GSA Bulletin* (v. 42, p. 393–406) but has not been easily accessible in print and online until now. A transcription of text of that article is reproduced in the following pages.



Note: This information was drawn from the 1982 GSA Memoir, *The Geological Society of America: Life History of a Learned Society*, edited by Edwin B. Eckel (Memoir 155, p. 14–24).

Geology As An Agent In Human Welfare¹

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INTRODUCTION

From the earliest times in human history the economic and industrial activities of man have been changing the natural features of the earth's surface in many different ways, such as by constructing dams, by diverting tunnels, by mining, by draining oil from the rocks containing it, and in many other ways modifying the natural course of geologic processes.

Much has been written concerning this material influence of man on the earth, but the opposite effect, that is, the influence of the earth on man, has received much less attention; and yet from primitive times it has been active.

Much has been written concerning this material influence of man on the earth, but the opposite effect, that is, the influence of the earth on man, has received much less attention; and yet from primitive times it has been active. It seems proper therefore to note the action of geologic phenomena on man throughout the ages in which he has existed. These influences may be either beneficial or detrimental to man's welfare; they may advance his physical and mental development and his grasp on life, or they may form obstacles in his progress, and at times threaten his very existence. Though periods of slow development and even times of retrogression have occurred in human history, yet throughout the ages as a whole the change, especially in mentality, has been forward, and indicates that man has been able to adapt himself to such geologic surrounds he has had to meet.

RELATION OF GEOLOGY TO PRIMITIVE MAN

The earliest well authenticated remains of human life as yet known are in late geologic times, in the Pleistocene Epoch, during the last Great Ice Age, and in what is known in prehistoric archeology as the Paleolithic Period of the Stone Age; but man or

his predecessors may have been active among the animal life of the earth before those times.² The Paleolithic [*sic*] Period was characterized by the use of flint, chert, jasper and other materials of a flinty character, susceptible to being chipped into sharp-edged weapons or fashioned into other utensils. Ivory and bone were also used in a similar way, while various hard rocks, such as granite materials, were often used for axes and heavy weapons.

Paleolithic man was a dweller in caves and other shelters formed by geologic action and is often referred to as the cave man. Had it not been for these retreats together with his flint and stone weapons, he might not have found protection from the elements and from his enemies in the form of other animals; and hence some of the early human races might have disappeared on account of the lack of assistance offered by geologic agencies.

In the caves together with the remains of Paleolithic man occur in different places those of the reindeer, the mammoth, the cave bear, the fox, the wild horse, the bison and other animals, mostly of forms now extinct. Drawings and paintings on the walls of caverns, as well as ivory carvings, indicate a degree of art among these primitive men which suggests an advance from a possible former less developed condition.

Previous to the Paleolithic times, in the Prepaleolithic or Eolithic Period, flint and other fragments chipped in a manner to suggest a crude human handicraft, are often found in alluvial or subaerial deposits. Such materials frequently occur in formations much older than the Pleistocene and even the Pliocene Epoch or earlier times. Many archeologists doubt their connection with mankind, while others believe that some of them at least are true artifacts. However this may be, it is a recognized fact that some undoubted artifacts occur in older geologic environments than those in which human bones have yet been found, and this suggests that the bones of remote primitive man who made them have decayed and disappeared, while his more resistant flint and stone implements remain intact.

Among the oldest human remains as yet known is a fragment of a lower jaw found in an alluvial deposit at Mauer near Heidelberg, Germany (*Homo heidelbergensis*) and supposed to belong to the beginning of the Pleistocene Epoch. This fragment as well as parts of a human skull found near Piltdown in Sussex, England (*Eoanthropus dawsoni*), are usually accepted as the two most ancient evidences of human life as yet discovered. A more complete skull, but vastly later date in the Pleistocene Epoch, was discovered in a cave in the valley of Neanderthal near Düsseldorf, Germany, and represents what is known as the Neanderthal man (*Homo neanderthalensis*). Somewhat later a complete skeleton of a similar human being was found in a cave near le Moustier, France.

¹ Read before the Society on 29 Dec. 1930; manuscript received by the Secretary of the Society on 9 Jan. 1931; originally published in *GSA Bulletin* on 31 Mar. 1931, v. 42, p. 393–406.

² The present discussion relates to only distinctly human primates, as distinguished from what in remote times may have partaken of the character of both the anthropoid ape and man, such as the remains of the so-called ape-man (*Pithecanthropus erectus*) found near Trinil in Java.

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Human remains and implements resembling those found with the Neanderthal or Mousterian man, have also been discovered in many other places in Europe, North Africa, Arabia, Asia Minor, China and elsewhere. He seems to have thrived particularly during periods of recession in the several alternating advances and retreats of the Glacial Period, when the milder climate favored his development. He did not make pottery and did not use metals; he had no cattle or other domestic herds; he was a hunter living by the chase.

The Neanderthal man was succeeded in the latter part of the Paleolithic Period and the beginning of the Neolithic Period of the archeologist by other races among whom the flint and other stone implements derived from geologic sources were more carefully finished and polished than in the preceding period. The Aurignacian, Solutréan and Magdalenian man thrived in these times. Copper implements made their appearance. Man began to emerge from caves, except where convenience made them desirable, he built shelters in the open, made pottery, and gathered together herds of cattle. Signs of civilization began to appear, and with it came the more and more modern races of man (*Homo sapiens*).

The caves which gave protection to primitive man depended largely on the character of the geologic formations which permitted the creation of these and other shelters.

The caves which gave protection to primitive man depended largely on the character of the geologic formations which permitted the creation of these and other shelters. They were formed in many ways, but mostly in calcareous rocks through which surface waters impregnated with carbonic acid gas from the decay of vegetation percolated into cracks in the rocks, and by their solvent action created openings varying from small cavities to larger caves, and frequently to great caverns. They are common throughout the world wherever limestone or other calcareous rocks exist. They often provide the early man not only with shelter but with water, for many such caves have springs or running streams within them; and sometimes they supplied him with food in the form of other animals which also had sought refuge there.

Caves which may at times have afforded shelter have also been formed by the beating of the sea on the rocks adjacent to the coast. This has occurred not only in limestone but in sandstone, granite, basalt and other materials which during the ages have succumbed in spots to the constant wear of the waters. In later times some of these coastal areas have been elevated, and the caves are found high up on the land. Other less frequent geologic influences may also have provided similar refuge for primitive man.

In North America caves and great caverns occur in many places, but they do not seem to have been used permanently as dwellings to the same extent as in Europe and Asia. The human remains sometimes found in them seem to be there as a result of accident or temporary habitation. This may be due to the fact that the ancestors of the American Indian when they migrated to this continent had reached a stage in civilization that enabled them to construct their own habitations without resorting to the primitive shelters of caves.

The cliff dwellers in the southwestern part of the United States and in Mexico represented in a certain way a class of cave man, inasmuch as their habitat was in the rocky cliffs of canyons, but they were of comparatively recent date, and in no way connected with the cave man of the Stone Age of Europe and Asia. Many archeologists believe that they date back only from several hundred to a few thousand years. They seem to have been an early part of the great family of Pueblo tribes which now inhabit the open country in the same neighborhood as are found the remnants of the old cliff dwellings.

These dwellings were sometimes in caves in the faces of cliffs, or were artificial structures built by man on shelves of rock in similar localities, or were combinations of both. Some of the caves were enlarged by man into capacious dwellings or even underground villages. Flint instruments and utensils are numerous, as well as bows and arrows, pottery, baskets, personal ornaments and other decorations, many of them unlike those made by the modern Pueblo tribes.

The cliff dwellings were used not only as shelters, but also for the storage of corn and other products of the field, as well as for religious ceremonies and for burial places. They are mostly high up on the cliffs, several hundred or a thousand feet above the lowlands, though some are down near the water level. The cliffs themselves consist of a great variety of rocks, including sandstone, various calcareous materials, shale, basalt and eruptive tufa.

Though we thus see that the cliff man had no relationship with the cave man of primitive times, yet his preservation, or at least his protection, was due to similar geologic conditions of environment, which supplied not only a shelter but flint and other materials for his utensils, and rock for the buttressing of his habitations.

EFFECT OF VOLCANOES ON MAN

Volcanic action has always had a marked effect on man and his destiny. It has generally been of tragic character, due to the sudden upheaval of volcanic materials and the destruction of human life and property, but often its after-effects have been beneficial to human welfare in returning desirable materials from great depths to the surface of the earth.

Volcanoes occur in many parts of the world, being particularly abundant in the regions of the Pacific Ocean. In the Malay Archipelago they are so numerous and enormous that it has often been called "the rookery of volcanoes," while elsewhere through the Pacific regions they are abundant not only on the land, but especially on the sea bottom. In Mexico, Central and South America, the West Indies, in Iceland, Europe and many other parts of the world they are among nature's most spectacular manifestations of unrest.

Mount Vesuvius has been studied in its eruptions for almost 2,000 years, and hence its history gives us more enlightenment on the effect of volcanic action on man than other regions where eruptions have only been investigated in later periods. Until the first century of the Christian era Mount Vesuvius had been considered an extinct volcano and had been inactive during historic times, so that the neighborhood with its salubrious climate and wonderful soil had become thickly populated.

About the year 63 A.D. numerous slight earthquake shocks were felt in the vicinity of Mount Vesuvius and these gradually increased until without warning, in the year 79 A.D., Mount Vesuvius itself broke out in a more violent eruption than it has

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ever developed in later times. The materials thrown out consisted mostly of volcanic ashes and dense clouds of steam and gases. The ashes overwhelmed the cities of Pompeii and Herculaneum and other places, and so sudden was the upheaval that many of the inhabitants were suffocated and buried in the volcanic materials. It is probable, however, that the loss of life was not so great as first believed, and we know from the letters of Pliny the Younger, that a large part of the population fled to the sea at the first dreadful shock of the outburst, and thus escaped the annihilation which befell those who were more tardy.

The uncle of Piny [*sic*], known as Pliny the Elder, a noted naturalist of his time, was then in command of the Roman fleet in the waters of that region. As soon as the volcanic outburst began he put into shore to rescue the refugees, but was overcome by fumes and ashes and died like many of his countrymen. The younger Pliny describes the occurrence in a letter to the Roman historian Tacitus, and tells how he himself refused to leave the shore because he wished to save his uncle, but when convinced that this was impossible, he led his mother and others out of the danger zone.

In other regions than Mount Vesuvius even greater catastrophes have befallen humanity as a result of volcanic action. In Iceland, in the year 1783, a tremendous eruption of the volcano Skaptar is said to have destroyed about one-fifth of the population of the island by the direct results of the outbreak and the famine which ensued. Even more loss of life and property has occurred in the great volcanic eruptions in the Malay Archipelago and other places, but their historic records are less definite than in the countries which have been longer studied.

The foregoing remarks have described only the disastrous effects of volcanic action on mankind; but there is another and more cheerful side to the problem.

In 1722 the volcano Papandayang in the Malay Archipelago broke out with such force that the upper 4,000 feet of the cone are said to have been blown off and thrown broadcast, destroying over 40 villages. The most enormous eruption known, however, was that of the volcano Tamboro on Sambowa Island, near Java, in 1815, when actually many cubic miles of material are estimated to have been thrown into the air, destroying life and property throughout the region, while the clouds of the ashes and gases obscured the sky for hundreds of miles distant. In 1883 the volcano Krakatoa in the Strait of Sunda, between Sumatra and Java, broke out in an enormous eruption throwing ashes to great heights and over vast areas. The atmospheric disturbance was felt around the whole world, and the seismic waves accompanying the eruption overwhelmed the coasts of Java and Sumatra, causing great loss of life. The volcanoes of the Hawaiian Islands are frequently in active eruption, and the spectacular outbreak of Kilauea in 1924 is well known to all of us, while Mauna Loa, the greatest of all Hawaiian volcanoes in size, is noted for the frequency and vastness of its lava flows.

The foregoing remarks have described only the disastrous effects of volcanic action on mankind; but there is another and more cheerful side to the problem, and that is, the beneficial effects. It has often been asked why the agricultural populations around Mount Vesuvius and Mount Etna, after being driven from

their abodes and after their villages and vineyards had been destroyed, have almost always returned when an eruption subsided. One reason for this is the natural reluctance of people, particularly in Europe, to forsake the salubrious climate and rich soil which have in previous days rendered them prosperous and happy; but a particular reason is that the materials composing volcanic ash and lava are remarkably rich in fertilizing substances, such as phosphates and various other salts of calcium, sodium, potassium, iron and other elements important to vigorous plant growth. In the warm, moist climate of southern Italy and Sicily the volcanic ash and lava rapidly disintegrate and the fertilizing constituents are set free, thus creating a soil often far richer than the one that had preceded it, which may have been more or less exhausted by continuous cultivation for generations.

The disintegration of lava on Mount Etna is often artificially assisted by encouraging growth of a large native cactus which rapidly takes root in the cracks and fissures of the rock and by its expansive power tend to disintegrate it and hasten its decay. On both Mount Etna and Mount Vesuvius the stone quarries worked on the hard lava form an additional source of income to the owners of the surrounding vineyards. Hence we find that the inhabitants of these volcanic regions flee in terror when eruptions occur and destroy all they own, but respond to the lure of the old home and return full of hope, with a knowledge that future prosperity awaits them.

Volcanic eruptions also restore enormous quantities of carbonic gas to the atmosphere, and thus replace that which has been absorbed by plant life and certain animal organisms. They also raise from deep-seated sources large quantities of water, often in the form of vapor, and thus return it to the surface.

In early historic times volcanic eruptions were regarded as something mysterious and uncanny, suggesting that the end of the world was approaching, or that the gods were angry, or that something altogether mysterious had occurred. In the flight of the population from Pompeii during the eruption of 79 A.D., the general outcry of the people was that there were no more gods, for they and the earth and its inhabitants were headed direct for everlasting ruin. In later times, however, man began to investigate volcanic eruptions in a more self-composed manner, and the modern scientist who has devoted himself to volcanism has shown that they are purely local manifestations which can even in some cases be anticipated.

EFFECT OF EARTHQUAKES ON MAN

The influence of earthquakes as a geologic agent affecting man is very marked, not only by the great destruction of life and property, but by the mental effect of shock and terror which often deeply impresses itself on the minds of those who escape with their lives.

The influence of earthquakes as a geologic agent affecting man is very marked, not only by the great destruction of life and property, but by the mental effect of shock and terror.

They occur in many parts of the world, in Europe, Asia, Africa, America and elsewhere, but are most notable in the region of the Pacific Ocean. Though they attract particular attention on the land, yet a far larger number occur on the sea-floors, especially in

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the Pacific, the West Indies region of the Atlantic and elsewhere. These submarine earthquakes often give rise to immense waves, popularly known as tidal waves, which however, have no connection with the tides. They are caused by sudden changes in the level of the sea-bottom, which either force vast volumes of water upward, or let similar quantities downward, in either case transmitting their motion to the surface and thus creating immense waves. The so-called tidal waves therefore are well termed seismic waves, as indicating their origin in seismic disturbances. They often roll onto the adjacent land, causing as much devastation as if the earthquake had occurred on shore, and sometimes more.

The destructive aspect of earthquakes has been manifested in many great seismic movements which have become records of horror in the history of human fatality. Among some of those familiar to most of us may be mentioned the great earthquake at Lisbon in Portugal in 1755 followed by an overwhelming seismic wave whereby the city was reduced to ruins, with the loss of 30,000 or 40,000 people. In Japan numerous earthquakes have occurred, and in fact most of that country is in a constant condition of greater or less vibration. The last of its great outbreaks was the terrible catastrophe of 1923 at Tokyo and Yokohama, in which 100,000 lives are supposed to have been lost. Almost equally disastrous earthquakes have occurred in many other places.

In regions closer to our home may be mentioned the series of earthquakes in 1811 in the Mississippi Valley, about 50 miles below where the Ohio River enters the Mississippi. The principal disturbances were near New Madrid, Missouri, but others also occurred on the east side of the river in Kentucky and Tennessee. In places the land sunk many feet, and for brief periods the Mississippi actually flowed backward in its course as a result of the collapse of its bed. The disastrous earthquake at Charleston, South Carolina, in 1886, is well known to many of us, and both it and the Mississippi earthquake were in regions where earth movements of such magnitude did not seem probable.

The great earthquake of California on April 18, 1906, was of all others in America in historic times prominently notable in its extent. The movement followed for some 270 miles or more a great fracture zone extending along the coast. It was mostly horizontal and the displacement varied from a few inches to over 20 feet. Fences, fields and roads were thrown out of line. In San Francisco the water mains were broken, and a large part of the city was burned from lack of water to quell the fires which started in many places. Here, as often in other earthquake disasters, the loss of life and property was due not so much to the earth movements as to the fires which were started as a result of them.

It has generally been found that the greatest destruction by earthquakes occurs in soft ground, either of an alluvial character, or such as is made in cities by filling up hollows with debris of various kinds, and known as made ground; while on the higher land, particularly on the rocky parts, catastrophes are much less severe. This is doubtless due to the fact that the amplitude of vibration in an earthquake movement is much less in solid rock than in loose material, so that a structure built on a mountainside may be only damaged, while one built below on soft material may be reduced to ruins. This feature was particularly noticeable in the earthquake at San Francisco in 1906. The principal destruction was on the water front along the Bay of San Francisco, while higher up on the hills where residences were built on rocky

foundations the earthquake itself produced much less damage, but the fire which followed the earthquake spread death and destruction in both the lower and the upper parts of the city.

The earthquake of Valparaiso, Chile, on August 16, 1906, only a few months after the California disaster, extended along the coast for some miles; and as in San Francisco, the greatest destruction was caused in the soft or made ground along the water front of the bay, while the structures on the hills back from the lower city were much less injured. The lower city was almost completely destroyed, and when the speaker visited it shortly after the earthquake, efforts to restore it had only begun. The estimate of the people killed varied from 4,000 to 7,000.

On a hill but little above the lower city in Valparaiso, a large cemetery was located where graves were thrown open and great numbers of coffins hurled down the hillsides into the streets below, causing fear and panic among the people, who thought the time of resurrection had come. The keeper of the cemetery is said to have gone insane at the sight. Rain was falling in deluges at the time, with much thunder and lightning, so that the scene was indeed terrifying to everyone, and even at the time of the visit of the speaker but few people would discuss the situation which had left such a lasting impression on their memories.

Mention might be made of many other earthquakes which have taken their toll of life and property, and have had a lasting and painful effect on those who survived; but just as a volcanic eruption, the scientific study of their nature has to some extent abated the feeling of terror and helplessness which they inspire. In earthquake regions man is learning to reduce the danger by selecting proper locations for buildings, suitable materials for their construction, and above all, by the endeavoring to provide water supplies that may survive earthquake shocks and thus be used to quell the fires which cause more loss of life and property than the seismic disturbances themselves.

EFFECT OF ALLUVIAL DEPOSITS ON MIGRATION OF MAN

The erosion of rivers has a twofold effect on man, one beneficial because it creates vast areas of alluvial soil available for agricultural purposes, and the other harmful because it creates floods, often accompanied by great destruction of life and property.

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In the upper course of a river the current may be swift enough to keep the channel clear of the lighter sediments, but in its lower parts the waters may move more sluggishly as they pass through a lower country before they enter the sea; and hence the sediments instead of being entirely carried on sink partly to the bottom of the river. This constant accumulation of silt gradually raises the level of the river bed and the waters overflow, often spreading over vast areas and depositing a rich alluvial soil wonderfully adapted to agricultural purposes.

Hence from prehistoric times large communities have grown up along the lower parts of many rivers, especially on the broad deltas

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at their mouths, and thus these alluvial regions have often been important geologic influences in the early migrations of man. Among such regions in Europe may be mentioned the thickly inhabited deltas of the River Po, the Danube, the Rhone and other streams, while the enormous delta lands of Africa and Asia are preeminent in size and historic interest, notably those of the Nile in Africa, and of the Euphrates, the Tigris, the Indus, the Ganges and the Brahmaputra in India. The great alluvial region in ancient Mesopotamia and Babylonia, lying between the Euphrates and the Tigris rivers, was once so widely populated that it was known as the cradle of civilization. It supported many ancient cities, such as Nineveh, Babylon, Nippur, Ur, Bagdad and numerous other once prosperous communities.

One of the greatest delta lands in the world is that of the Yellow River, Hoang-ho, in eastern China, which from remote ages has supported a vast population.

Though the streams which have formed great alluvial plains have at times brought happiness and prosperity to the inhabitants, yet they have only too often also brought great loss of life and property. Where agricultural communities and other settlements have grown up embankments have been made to restrain the river floods; but as the sediments continue to settle and the river beds continue to rise, the embankments have to be built higher and higher. Ultimately in time of high water the embankments may be broken down and the surrounding lowlands may be subjected to great floods. Hence the efforts of man to confine rivers to definite channels and thus to reclaim for agricultural purposes the fertile floodplains which were nature's provision to accommodate the excess water when the rivers rose, have often been accompanied by great catastrophes.

When the floods subside, however, the breaches in the embankments are often repaired, the people return and agriculture proceeds as formerly. This process of reconstruction is often repeated time after time as new breaches occur, and thus a somewhat precarious but highly lucrative agriculture is continued often for ages.

The frequent floods in the lower Mississippi River illustrate such occurrences. The first embankments or levees near New Orleans, about 150 years ago, were some 4 feet in height, but as the river bottom rose they had to be built up several times that high. The levees have been extended northward up the Mississippi River for many hundreds of miles and throughout this great distance numerous breaks frequently occur. Hence the disastrous floods and loss of life and property in the Mississippi Valley which shock the country at frequent intervals.

In other lands many similar results have attended attempts to confine rivers to narrow channels and prevent them from overflowing their natural floodplains. The River Po in Italy has been embanked for so many centuries that its bottom is many feet higher than the surrounding lowlands, and disastrous floods have at times followed breaks along its course. In China the Hoang-ho has often broken through its embankments with enormous loss of life, and many of us can remember the great flood of 1887 along this river, in which more than a million, perhaps several millions, of people were lost.

In ancient times in other parts of the world, many of the old embankments were abandoned and are now found only in a condition of decay. Their history of disaster is lost in the vagueness of bygone ages.

INFLUENCE OF MINERAL AND OTHER GEOLOGIC PRODUCTS ON MAN

The mineral products of the earth have probably been of more material benefit to mankind than any other single geologic influence. Even the men of the Stone Age were careful to open quarries where the best flints for their implements could be found. The character of different flints was closely inspected, and in fact this material was in many ways to primitive man what iron and steel are to modern man.

During the latter part of the Stone Age and following it, weapons and utensils of copper made their appearance among prehistoric man. Still later came the use of bronze and this was followed by the Iron Age, in which a greater impetus to human welfare than in all previous times started and still continues to be a dominant factor in man's progress.

The beginning of the use of copper, bronze and even iron is involved in greater or less obscurity in different localities, and doubtless the use of each was dominant at different times in different parts of the world. In fact flint or stone implements were often used by backward races after others had long since begun to make implements of metals. In Neolithic times copper began to be used before flint was discarded. The advent of the use of metals, however, has always supplied the necessary element for rapid human progress; more things, greater things and quicker things were accomplished by the use of metals than by the flint and stone implements of primitive man.

The modern age includes both the use of iron and of many other metals, so that we exist in a time which though preeminently one of iron, is also marked by extensive use of copper, lead, zinc, gold, silver, nickel, aluminum, tin and many other metals, while to these must be added the numerous alloys, such as brass and bronze, which are made from them. Hence the present times are characterized more by human handicraft in fabricating metals than by the use of any one of them, and may well be termed preeminently the age of manufacture.

Present times are characterized more by human handicraft in fabricating metals than by the use of any one of them, and may well be termed preeminently the age of manufacture.

To the metals now used must be added other materials of geologic character which have advanced human welfare, such as natural fuels, including coal, petroleum and gas, without which the efforts of modern man and his accomplishments would have been much retarded. We must also consider the stone for structural and ornamental purposes, and many other geologic materials which have affected human welfare, such as soils, springs and water supply, and the rapidly increasing and enormously important use of waterfalls and other moving waters in generating power.

Space does not permit a full description of the mode of occurrence of these geologic products, nor of the details of many other similar subjects that come close to man, but well can it be said that while the man of primitive ages developed only slowly in great periods of time, yet through the utilization of metals and other geologic products and geologic conditions, mankind in a

Celebrating GSA's Legacy

vastly shorter time changed from a savage living solely by the hunt to the civilization of ancient historic times, and thence to that of the present day. In the Stone Age his efforts were engrossed in a struggle for existence against the elements and the wild beasts that surrounded him; today, with his actual existence assured against these dangers, his efforts are devoted to constructive endeavors and to defending himself not against the beasts of the forest, but against the ferocious attacks of the hostile elements of his fellow man.

CULTURAL VALUE OF GEOLOGY

A knowledge of at least the general principles of geology is an important part of any liberal education and is essential in many scientific, literary, artistic, engineering and other pursuits of the present day. Nevertheless geology was the last of the great fields of research in natural history to receive scientific attention. Biology was well developed before the basis of geology on which it was founded received recognition. This was doubtless due to the fact that animal and plant life were more immediately noticeable to the casual observer than the nature of the rocks below, and thus scientific study began on the surface objects which attracted most attention; but as the spirit for research increased it tended to seek deeper and deeper below purely superficial manifestations, and thus revealed geology. Until the beginning of the last century the science of geology in its modern interpretation was hardly recognized as more than the vague conception of a few dreamers; today it demands the attention of the world as the basis of all human knowledge of natural history.

Those who have a knowledge of geology have a vast educational advantage over those who have none, for to them every continent, ocean, river, mountain, valley and even every creek, field or sand bank, has a meaning, which greatly increases their interest in the observation of nature. To the man who has no geologic knowledge continents and oceans mean only land and water, valleys and mountains mean only hollows or elevated spots on the ground, and the various minor details of the earth's surface are looked on indifferently as things that occur as a matter of course, and may be convenient or objectionable, according to his line of thought.

The geologist interprets his science in a form that makes clear the dependence upon the earth of man and his best attainments in civilization, and he realizes the fact that the problems of human life and living are bound up with the problems of geology. Geologic history and the great records of evolutionary processes which it embodies not only in physical and biological aspects, but in psychological, social and economic lines, carries a wealth of instruction unequalled in any other field of learning. As geology becomes rounded out to a still greater fulness [*sic*] it will teach the world profound lessons in the evolution of the highest products of life and thus will have surpassing value in the education of mankind.

R.A.F. Penrose, Jr.



Knowledge of at least the general principles of geology is an important part of any liberal education and is essential in many scientific, literary, artistic, engineering and other pursuits of the present day.



If you would like to follow in the footsteps of R.A.F. Penrose Jr. and help support GSA programs, please make your contribution through the

GSA Foundation

3300 Penrose Place, P.O. Box 9140
Boulder, CO 80301-9140, USA

Information about the programs your donations will support is online at gsafweb.org and you can also make your donation online.

Please contact
Christopher Tallackson
at +1-303-357-1007 or
ctallackson@geosociety.org
to discuss contribution possibilities.

Thank You

Why Does Diversity Matter to GSA?

Marjorie Chan

2012–2013 GSA Diversity in the Geosciences Committee Chair
Co-Chair, OTF Initiative

The Geological Society of America, our professional Society, has a stated vision to be the premier geological society, with a mission to advance the geosciences profession. GSA also has an official position statement on diversity (www.geosociety.org/positions/position15.htm) and a strategic plan that specifically includes the goal of **developing and fostering a robust, diverse, and sustainable professional geoscience community**. In order to be a premier Society and achieve these stated objectives, GSA must be a diverse society that encompasses variety in race and ethnicity, gender (including gender identity or expression), religion, physical and mental abilities, age, sexual orientation and/or marital status, national origin or ancestry, education, and class.

Have a look at GSA's demographics over the past 100 years (Fig. 1), and think about what we should look like in the future. The only way GSA will truly advance in innovative ways is to include many perspectives from the very best scientists from diverse backgrounds. We particularly need to attract students from diverse populations to address the most pressing and complex issues of Earth and our society as only geoscientists can. The demographics of North America are rapidly changing, much faster than the change in GSA's demographics. It is imperative to be **inclusive to be a sustainable professional society and to provide global leadership that will make a difference**.

WHAT IS GSA ACTIVELY DOING ABOUT DIVERSITY?

Diverse participation can be encouraged by positive, engaging experiences. The GSA Diversity in the Geosciences Committee put forth an "On To the Future" (OTF) initiative, which is now being supported and implemented by GSA leadership for fall 2013. The goal is to bring 125 students from underrepresented groups to the 125th Anniversary Annual meeting in Denver in October.

Timing is critical, and OTF will be GRASS ROOTS, needing much participation by society members to pull this off successfully. We ask and challenge individual GSA members to identify and to support OTF students to attend their first annual meeting, where students will (1) experience the richness of our professional meetings and interactions; and (2) receive recognition, meeting registration, and support for travel, food, and lodging expenses.

WHY NOW?

The time for encouraging diversity has to be now. This is an ambitious initiative that has never been attempted by GSA, yet this initiative can be a pivotal culture shift for our society. GSA President George Davis and the GSA staff are fully engaged in this initiative. YOU can help spread the word, encourage donation support, identify students, and volunteer to assist with OTF cohort activities during the meeting. Details of this OTF initiative are at <http://community.geosociety.org/OTF>. Here you can donate, nominate qualified diverse students, volunteer, or find answers to your questions. Some members may want to serve on the diversity committee to propose new initiatives for the future. More and better data on membership diversity are necessary for GSA to evaluate where we are going and what we need to get there.

MOVING FORWARD!

GSA is on a very positive trajectory, and students are the major growth area. A diverse membership is absolutely essential and is the future lifeblood of GSA. Please help us make the OTF initiative a huge success and produce a ripple effect through our society for the next 125 years. More diverse students will move GSA "On To the Future"!



Fig. 1. There is a dearth of demographic data on GSA's membership, but images capture representative populations. (A) GSA membership photograph from 1897 (GSA archive). (B) The University of Utah College of Mines and Earth Science faculty in 1983 (author in front with white vest), with demographics likely similar to GSA at that time. (C) A group of sedimentary geology participants purposefully selected to cover diverse age and gender representation for a 2013 National Science Foundation–sponsored workshop on EarthCube (photo credit: Stan Paxton, USGS). What should GSA's membership look like in the future? Current GSA diversity demographics still need improvement.



GSA's 125th ANNIVERSARY

Celebrating Advances in Geoscience—Our science, our societal impact, and our unique thought processes

Denver, Colorado, USA • 27–30 October 2013 (Technical Sessions)

<http://community.geosociety.org/2013AnnualMeeting/>

Register Today

1 Full meeting registration fees run from US\$40 to US\$460 through 23 September. Some travel grants are available—check online.

Timing is Everything

2 The **Icebreaker Party** officially opens the meeting on Saturday, 26 Oct., at 5 p.m. This was a lot of fun last year; this year we hope it's an even bigger get-together. The **technical program** begins at 8 a.m. on Sunday, 27 Oct., and runs through 6:30 p.m. on Wednesday, 30 Oct. Additionally, **field trips**, **short courses**, and some **business meetings** will take place before and after these dates. **Please plan your travel to make the most of the meeting!**

Our Sessions Have Something for Everyone

3 This year we'll have six Special Sessions, thirteen Pardee Keynote Symposia, and 259 Topical Sessions, as well as Discipline Sessions for your particular specialty. And the Colorado Convention Center makes for a fantastic venue!

Submit an Abstract—Oral, poster, or digital poster
Abstract deadline: 6 August



GEOLOGICAL SOCIETY OF AMERICA FOUNDATION

LAVA CAP Wines GSA is celebrating 125 years of geoscience innovation with Lava Cap wines, which are nourished by the prime volcanic soil of the Sierra Nevada Foothills. As geologists, the Jones winemaking family appreciates GSA's interest in Earth's history, processes, and resources. Here's to 125 years of ground-breaking geoscience and our passion for the never-ending mysteries of Earth!

Celebrating GSA's 125th Anniversary

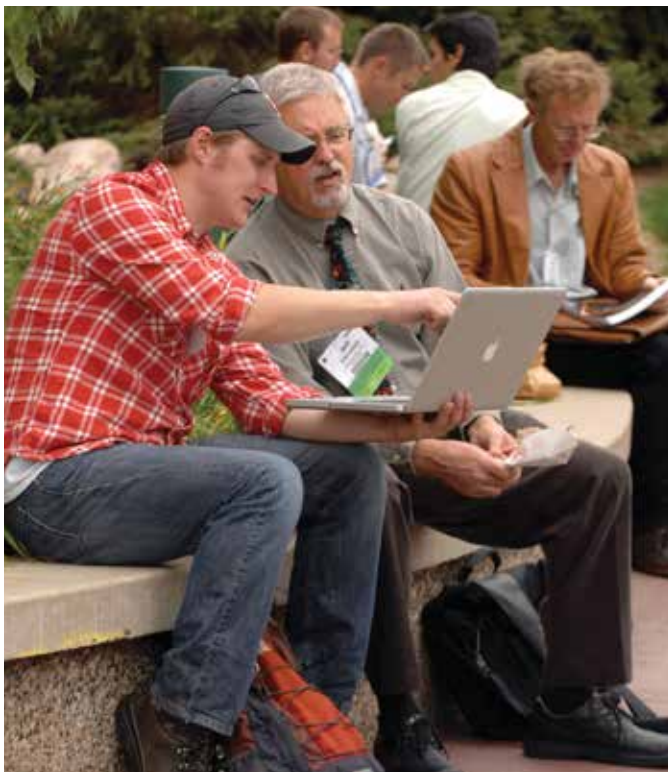


Learn more at www.lavacap.com/aboutus.html; order your special anniversary wine via the secure link at www.geosociety.org/125/.

4

GSA has been bringing scientists together for 125 years, and we're good at it. This year affords a special opportunity to reflect on how GSA and its members are building upon the Society's long tradition of achievements and laying the groundwork for future generations of geoscientists. GSA scientists are turning information into knowledge and discoveries into solutions.

- Learn what geoscientists outside your discipline are thinking and doing.
- Meet the people who have inspired you.
- Share your wisdom with someone younger.
- Invest in your future.
- Present your science.



5

GIVE 125

Are you wondering what to give GSA on such a momentous birthday? **Give 125!** Dollars, time, possessions—whatever works for you. Everything you give is an investment in the future of geoscience.

www.geosociety.org/125/

6

On To the Future

YOU can help bring 125 students from underrepresented groups *On To the Future!* With your help, GSA hopes to support the attendance of 125 students at the 125th Anniversary meeting in Denver.

<http://community.geosociety.org/OTF/Home/>



1929 GSA is legally incorporated
(Dec.) R.A.F. Penrose, Jr., elected GSA's forty-second president

1931 (31 July) R.A.F. Penrose, Jr., passes away, leaving GSA half his fortune



Red Rocks Amphitheatre. Photo by Ron Ruhoff. Denver Metro Convention & Visitors Bureau.

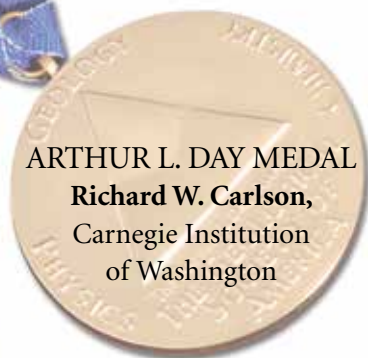
2013 GSA Medal & Award Recipients



PENROSE MEDAL
Steven M. Stanley,
University of Hawaii



**PRESIDENT'S MEDAL OF
THE GEOLOGICAL SOCIETY
OF AMERICA**
Edward Burtynsky, Photographer



ARTHUR L. DAY MEDAL
Richard W. Carlson,
Carnegie Institution
of Washington



**YOUNG SCIENTIST
AWARD
(DONATH MEDAL)**
Naomi E. Levin,
Johns Hopkins University

GSA PUBLIC SERVICE AWARD
Scott D. Sampson, Denver Museum
of Nature & Science

**RANDOLPH W. "BILL" AND
CECILE T. BROMERY AWARD
FOR THE MINORITIES**
Reginal W. Spiller, Allied Energy

**GSA DISTINGUISHED
SERVICE AWARD**
Jon Olsen, The Geological Society
of America
Stephen G. Pollock, University of
Southern Maine



**SUBARU OUTSTANDING
WOMAN
IN SCIENCE AWARD**
Whitney M. Behr, The University
of Texas at Austin

JOHN C. FRYE AWARD
Coalbed Methane Basics: Ten years
of lessons from the Powder River
Basin, Montana,
by **Elizabeth Meredith, John
Wheaton, and Shawn Kuzara;**
published by Montana Bureau of
Mines and Geology as Information
Pamphlet 6, 2012.

**AGI MEDAL IN MEMORY
OF IAN CAMPBELL**
Not yet announced (as of press time)



2013 GSA Division Primary Awards

RIP RAPP ARCHAEOLOGICAL GEOLOGY AWARD

Archaeological Geology Division
William I. Woods, University of Kansas

ISRAEL C. RUSSELL AWARD

Limnogeology Division
Kevin M. Bohacs, ExxonMobil Upstream Research Co.

GILBERT H. CADY AWARD

Coal Geology Division
Fariborz Goodarzi, University of Calgary

DISTINGUISHED GEOLOGIC CAREER AWARD

Mineralogy, Geochemistry, Petrology, and Volcanology Division
Gerhard Wörner, Georg August Universität Göttingen

E.B. BURWELL, JR., AWARD

Engineering and Environmental Geology Division
Luis Gonzalez de Vallejo (Universidad Complutense de Madrid)
and **Mercedes Ferrer** (Geological Survey of Spain), 2011, *Geological Engineering*: Taylor & Francis Publishers, 700 p.

G.K. GILBERT AWARD

Planetary Geology Division
Alan D. Howard, University of Virginia

OUTSTANDING CONTRIBUTIONS AWARD

Geoinformatics Division
Clifford A. Jacobs, National Science Foundation

KIRK BRYAN AWARD FOR RESEARCH EXCELLENCE

Quaternary Geology and Geomorphology Division
P.K. House (Nevada Bureau of Mines and Geology),
P.A. Pearthree (Arizona Geological Survey), and **M.E. Perkins**
(University of Utah), 2008, Stratigraphic evidence for the role of
lake spillover in the inception of the lower Colorado River
in southern Nevada and western Arizona,
in Reheis, M.C., Hershler, R., and Miller, D.M., eds., *Late Cenozoic
Drainage History of the Southwestern Great Basin and Lower Colo-
rado River Region: Geologic and Biotic Perspectives*:
GSA Special Paper 439, p. 335–354.

GEORGE P. WOOLLARD AWARD

Geophysics Division
Peter Bird, Univ. of California at Los Angeles (emeritus)

BIGGS AWARD FOR EXCELLENCE IN EARTH SCIENCE TEACHING

Geoscience Education Division
John G. Van Hoesen, Green Mountain College

LAURENCE L. SLOSS AWARD

Sedimentary Geology Division
Fred Read, Virginia Tech (emeritus)

MARY C. RABBITT HISTORY OF GEOLOGY AWARD

History and Philosophy of Geology Division
Leonard Gilchrist Wilson, University of Minnesota (emeritus)

CAREER CONTRIBUTION AWARD

Structural Geology and Tectonics Division
Peter J. Hudleston, University of Minnesota

O.E. MEINZER AWARD

Hydrogeology Division
Chunmiao Zheng, University of Alabama

2013 Section Primary Award

DISTINGUISHED CAREER AWARD

International Section
B. Clark Burchfiel, Massachusetts Institute of Technology



2013 GSA Fellows

Society Fellowship is an honor bestowed on the best of our profession by election at the spring GSA Council meeting. GSA members are nominated by existing GSA Fellows in recognition of their distinguished contributions to the geosciences through such avenues as publications, applied research, teaching, administration of geological programs, contributing to the public awareness of geology, leadership of professional organizations, and taking on editorial, bibliographic, and library responsibilities. Learn more at www.geosociety.org/members/fellow.htm.

GSA's newly elected Fellows will be recognized at the 2013 GSA Annual Meeting Awards Ceremony on Monday, 28 Oct., at the Colorado Convention Center. We invite you to read some of what their nominators had to say:

Stanley M. Awramik (University of California, Santa Barbara): Awramik is an internationally known leader in the subject of pre-Phanerozoic life and the microbial fossil record, with more than 100 publications spanning over 40 years. Specifically, he is most known for his work on stromatolites and microfossils: His work is highly regarded and widely cited in the literature. He has edited many key volumes for the geologic community, as well as organized international symposia. —Frank A. Corsetti

John Karl Böhlke (USGS, Reston): Böhlke was nominated for his insights into sources, transport, and reaction of inorganic chemicals in groundwater and surface water. Applying a broad range of experimental and novel analytical tools, he provided new understanding of processes affecting fate of nitrate and other chemicals from the site to the regional scale. —Isabelle M. Cozzarelli

Wendy A. Bohrson (Central Washington University): Bohrson is worthy of Fellowship in the Geological Society of America owing to her outstanding contribution to geology and petrology in research and published works, as well as owing to her tremendous service through editorial work, professional service, and teaching and advising of geology students. —Anita L. Grunder

Thomas M. Brocher (USGS, Menlo Park): Brocher has been at the forefront in the use of seismic methods to study evolution and tectonic deformation of both continental and oceanic crust. His work highlights how processes that mold the western margins of the North American Cordillera contribute to our understanding and assessment of seismic hazard. —David Okaya

Bernardo Cesare (University of Padua): Cesare is the recognized authority on describing and interpreting fluid inclusions in high-grade metamorphic rocks, from aqueous-carbonic compositions to melt compositions, including his discovery of nanogranites. He is a dedicated teacher and mentor and has organized a very successful, continuing program of specialized earth science short courses in Italy. —Lincoln S. Hollister

I-Ming Chou (USGS, Reston): Chou was nominated due to his excellent designs of high-*P* optical cells for hydrothermal experiments, development of experimental techniques for redox or humidity control, and research in thermodynamics for minerals and fluids. He has trained scholars, served in scientific organizations, chaired an Overseas Chinese Earth Science organization, and promoted scientific exchanges. —Juhn G. Liou

Rónadh Cox (Williams College): Cox has had an exceptional and productive career. Her research spans multiple topics, from sedimentology, geomorphology, and geochronology to planetary geology, and yields results that resonate with both the academic community and the public. Her role as a mentor to students, international and national, is exemplary. —Sandra J. Wyld

Robert V. Demicco (Binghamton University): Demicco was nominated for significant contributions in geologic research, especially in carbonate sedimentology, Phanerozoic ocean geochemistry, and the application of fuzzy logic in the geological sciences, for the training of many undergraduate and graduate students, and for the administration of the geological program at Binghamton University for many years. —Elizabeth H. Gierlowski-Kordesch

2013 GSA Fellows

Gerald Dickens (Rice University): Dickens was nominated for his transformative contributions to the fields of paleoclimate, paleo-oceanography, and earth systems science. His work on the importance of methane clathrates in driving carbon isotopic excursions and warming has changed our understanding of the exogenic carbon cycles. —Cin-Ty A. Lee

Stephen K. Donovan (Naturalis Biodiversity Center, The Netherlands): Donovan is a leading expert in the study of crinoids and Caribbean paleontology. He has published more than 450 papers on these and other topics. In addition, he has edited or co-edited 18 volumes and has served on the editorial boards of numerous journals. —William I. Ausich

John M. Eiler (California Institute of Technology): elected to Fellowship as the 2012 Day Medal recipient.

James E. Faulds (Nevada Bureau of Mines and Geology): Faulds is recognized for fundamental work on the tectonics and structural geology of the Basin and Range province. An accomplished mapper, Faulds has integrated detailed geologic mapping into nearly all his work, which has had direct applications to earthquake hazards, industrial minerals, metallic ore deposits, and geothermal resources. —Jonathan G. Price

Carl W. Gable (Los Alamos National Laboratory): Gable was nominated for his seminal contributions to computational geosciences, through his research in 3-D mantle convection, geodynamics, fluid flow in porous and fractured media, and computational mesh generation for geological applications. —Barbara L. Dutrow

Luis Gonzalez (University of Kansas, Dept. of Geology): Gonzalez has a strong and consistent record of scholarly publication and training of students in the geosciences. He is particularly distinguished by his abiding and genuine concern for colleagues, and especially by his role as role model and mentor for minority students. —Rex C. Buchanan

Dennis L. Harry (Colorado State University): Harry has made significant contributions to the understanding of continental rifting, passive margin formation, and the opening of the Gulf of Mexico. —Kevin Lee Mickus

Ralph P. Harvey (Case Western Reserve University): Harvey has ably directed the U.S. Antarctic Search for Meteorites Program for more than two decades, ensuring a resource essential to planetary geosciences. His own research on meteorite petrology, meteorite concentration mechanisms, the history of polar ice sheets, cryogenic weathering, and biologic activity has significantly advanced the discipline. —Harry Y. McSween

Benjamin P. Horton (University of Pennsylvania): Horton deserves recognition for (1) being an exceptionally thoughtful and prolific researcher in applying micropaleontology, sedimentology, and dating to understanding Holocene sea-level and land-level changes on tectonically active as well as passive coasts; and (2) for developing, with impressive speed, a high-impact, societally relevant, sea-level research program with global reach. —Alan R. Nelson

Qinhong Hu (University of Texas at Arlington): Hu was nominated for fellowship for his outstanding contributions to understanding of fluid flow and mass transport processes in porous and fractured media, and to development of innovative techniques for pore structure (both geometry and topology) characterization in tight rock formations. —Chunmiao Zheng

Warren D. Huff (University of Cincinnati): Huff was nominated for his research contributions to the study of K-bentonites and their significance in the stratigraphic record, most notably for their use in defining stratigraphic timelines and gauging the size and frequency of explosive volcanism throughout Earth's history. —Lewis A. Owen

Katharine W. Huntington (University of Washington): elected to Fellowship as the 2012 Donath Medal recipient.

Stephen T. Johnston (University of Victoria): Johnston is nominated for his provocative and innovative research, which has recognized a new class of mountain belts, as well as his sterling geo-citizenry as demonstrated by his ongoing commitment to professional organizations, editorial duties, outreach, and the education of his students. —Brendan Murphy

Michael S. Kelley (NASA): Kelley has a long list of service to the public and the GSA. His activities as a discipline scientist in NASA's Planetary Science Division have advanced the research of many investigators. He also made significant contributions to understanding asteroids and the early history of the inner solar system. —Michael J. Gaffey

Shari A. Kelley (New Mexico Bureau of Geology & Mineral Resources): Kelley was nominated for her application of fission-track thermochronology to solution of geologic problems along the Rio Grande rift and southern Rocky Mountains. By sharing her data, she has aided projects from tectonics to quadrangle mapping. She has authored or coauthored 50 papers and 27 quadrangles while also teaching and directing theses. —Charles E. Chapin

Harvey M. Kelsey (Humboldt State University): In a career spanning more than 30 years, Kelsey has used field investigations of coastal environments to make important contributions to our understanding of the history and processes of great subduction zone earthquakes and tsunamis in Cascadia, Indonesia, New Zealand, and Japan. —Ray E. Wells

Ed Landing (New York State Museum, Albany): New York State Paleontologist Ed Landing is nominated for his decades of meticulous research on Avalonian biostratigraphy, lithostratigraphy, and paleontology as well as his involvement in establishing global stratigraphic standards for the Cambrian and Cambrian-Ordovician boundary. —John W. Geissman

Denis R. LeBlanc (U.S. Geological Survey, Northborough): LeBlanc has made fundamental contributions to hydrogeology and contaminant transport through his sustained study of a vertically complex contaminant plume. His innovation of creating and maintaining a field test site that has been host to hundreds of investigators and produced numerous graduate theses has profoundly advanced scientific hydrogeology. —Janet S. Herman

William P. Leeman (National Science Foundation): Leeman was nominated for his extensive and significant contributions to the scientific literature in petrology and geochemistry, his key role in strengthening the petrology/geochemistry community in the U.S. through his work at NSF, and his active engagement with numerous professional organizations (MARGINS, GSA, MSA, IAVCEI). —Diane R. Smith

Eric M. Leonard (Colorado College): Leonard has distinguished himself in the fields of Quaternary and glacial geology, geomorphology, and tectonics over the past three decades. But, more important, Eric has been the quintessential mentor of undergraduate geology students at Colorado College and elsewhere, with eight of his former mentees now college or university professors. —P. Thompson Davis

Tim K. Lowenstein (Binghamton University): elected to Fellowship as the Limnogeology Division's 2012 I.C. Russell Award recipient.

Joyce Lundberg (Carleton University): Lundberg was nominated for sustained and significant contributions to the understanding of paleoclimate, landscape processes, and speleothem chronologies, and for exceptional education of undergraduates. —Ira D. Sasowsky

Francis Magilligan (Dartmouth College): Magilligan merits Fellow status based on geologic and applied research. Magilligan has (co)authored 52 peer-reviewed publications that span basic and applied fluvial geomorphology, with a focus on flood hydrology, watershed response to climate change, human impacts on watersheds, river restoration, and sediment dynamics. —Ellen Wohl

David H. Malone (Illinois State University): Malone is nominated for his outstanding mentorship of young geologists in the art and science of geologic field work and mapping and for his administration of the geology program and field camp. He is the chair of the Illinois Geologic Mapping Advisory Committee. —Robert S. Nelson

2013 GSA Fellows

Robert J. McLaughlin (U.S. Geological Survey, Menlo Park): McLaughlin was nominated for using and defining fundamental principles of geology and tectonics to illuminate the inner workings of a highly complex plate boundary zone, the northern San Andreas fault system. This work has led to fundamental insights into the mechanics and temporal evolution of plate boundary faulting, deformation, and hazards. —Tom Parsons

Andrew J. Meigs (Oregon State University): Meigs' generous contribution of thoughtfulness and time to sustain a university and professional organization and his research on the interplay of rock uplift, erosion, and climate change, started well before this research was identified as a transformative science, are deserving of recognition as GSA Fellow. —Jeffrey Lee

William N. Mode (University of Wisconsin–Oshkosh): Mode has distinguished himself through his many outstanding contributions to geology, especially in the realms of teaching excellence, a long-term administration of a department, and in the accreditation of professional geologists. His research on Quaternary geology concentrates on the Arctic and in mapping landforms and sediments in Wisconsin. —John T. Andrews

Michael A. Murphy (University of Houston): Although Murphy is perhaps the only prominent Filipino-American in GSA, his scientific contribution is disproportional. His work has revolutionized the studies of the Himalayan-Tibetan tectonics. As a survivor of two recent brain-cancer surgeries, he inspires colleagues and students to pursue geology with passion and optimism. —An Yin

Shinya Nakamura (University of the Ryukyus, Japan): elected to Fellowship as the Environmental & Engineering Division's 2012 E.B. Burwell Award recipient.

Lisa Norby (National Park Service, Denver): elected to Fellowship as the 2012 Distinguished Service Award recipient.

Karl F. Nordstrom (Rutgers): Nordstrom has helped create and define the discipline of coastal geology that examines the effects of humans on coastal processes and environments. From his

work on the geology of low-energy beaches to his classic books on developed coasts and dunes, Nordstrom has been a prolific author and pioneering investigator. —Joseph T. Kelley

Randall C. Orndorff (USGS, Reston): Orndorff is Director of the Eastern Geology and Paleoclimate Science Center of the USGS; Secretary General, N. and Cent. Am. Sections of the Geologic Map of the World; Chair, USGS Geologic Names Committee; a NACSN Commissioner and former NACSN Chair; and has expertise in bio- and lithostratigraphy, structural mapping, and karst geology. —Norman P. Lasca Jr.

Brent E. Owens (College of William & Mary): Owens is an exceptionally strong and creative teacher who has influenced generations of students. He has also excelled in mentoring undergraduate research students, many of whom have presented their research at GSA meetings. He is a noted textbook author who also works with K–12 teachers and students. —Heather Macdonald

David L. Parkhurst (USGS, Denver): elected to Fellowship as the Hydrogeology Division's 2012 O.E. Meinzer Award recipient.

Eric W. Peterson (Illinois State University): Peterson is a distinguished researcher, teacher, and leader in hydrogeology. He has published extensively on karst hydrology and surface-groundwater interactions, taught courses at introductory, majors, and graduate levels at Illinois State University, advised scores of graduate students, and provided leadership for his university and the GSA Hydrogeology Division. —Madeline E. Schreiber

Mantha S. Phanikumar (Michigan State University): Phanikumar has made outstanding original contributions to hydrogeology and limnogeology by developing novel, mechanistic models of contaminant fate and transport in different hydrologic domains and applying them to problems of high societal relevance. This nomination recognizes the quality of his work as evidenced by his publications in top journals. —David T. Long

Roger A. Pielke Jr. (University of Colorado): elected to Fellowship as the 2012 Public Service Award recipient.

John P. Platt (University of Southern California): Platt was nominated for GSA Fellowship based on seminal contributions to structural geology, tectonics, and geodynamics, including key papers on exhumation of high-pressure metamorphic rocks, extensional orogenic collapse, ductile structures in shear zones, oroclinal evolution, subduction initiation, and lithospheric removal beneath mountain belts. —John Wakabayashi

Roy E. Plotnick (University of Illinois at Chicago): Plotnick has made substantial contributions across a range of topics in paleontology and stratigraphy. He developed improved methods for stratigraphic model-data comparison, pioneering the use of fractal approaches and lacunarity analysis; discovered the earliest definitive fossil insect ears; and challenged the existing orthodoxies with novel interpretations of trace fossils. —Neil C. Sturchio

Charles C. Plummer (California State University, Sacramento): Plummer's distinguished 33-year career and his extensively adopted textbooks, including internationally, make him a leader in university-level, general earth-science education. His 1975 textbook *Physical Geology* (Wm. C. Brown, McGraw-Hill), now in its 14th edition, has had exceptionally wide usage. —Arthur B. Ford

Dallas D. Rhodes (Kennesaw State University): Rhodes has provided 20 years of visionary leadership as chair of two geology departments and as an advisor to many others. He has influenced the lives of students and faculty through his academic leadership, his teaching, and his research on the interaction of tectonics and geomorphology. —Ramon Arrowsmith

Nancy R. Riggs (Northern Arizona University): Riggs has been an exemplary geological educator, with an enviable record of student engagement and mentoring and a commitment to

diversity. She is a recognized leader in her research area and has served her professional community through leadership in editorial activities and active memberships in professional societies. —Shanaka L. de Silva

Uwe Ring (Stockholm University): Ring was nominated for his long and distinguished research contributions to resolving the tectonic evolution of Greece and Turkey and the Franciscan of California. Ring has also organized two very successful Penrose Conferences on exhumation processes. —Mark T. Brandon

Jason B. Saleeby (California Institute of Technology): elected to Fellowship as the MGPV Division's 2012 Distinguished Geologic Career Award recipient.

Randall J. Schaetzl (Michigan State University): Dr. Schaetzl is known for his careful study of soils and Quaternary issues, most notably in the Great Lakes, Michigan, Wisconsin, and bordering regions. Of his two books, the one on Soil Genesis and Geomorphology is outstanding. He has also produced chapters for seven other books and 81 peer-reviewed publications. —Donald L. Johnson

Peter H. Schultz (Brown University): elected to Fellowship as the Planetary Geology Division's 2012 G.K. Gilbert Award recipient.

Wayne C. Shanks III (U.S. Geological Survey, Denver): Shanks was nominated in recognition of his outstanding and innovative career contributions and leadership in the study of stable isotopes, economic ore deposits, and hydrothermal systems during his 35-year career in academia and the U.S. Geological Survey. —Stephen S. Harlan

Carol A. Stein (University of Illinois at Chicago): Stein is a world leader in integrating marine heat flow and other geophysical data to explore oceanic lithosphere thermal structure, hydrothermal circulation in the sea floor, and other important topics in marine tectonics. Her work provides synoptic insight into first-order lithospheric-scale processes and Earth's thermal budget. —Stephen Marshak

2013 GSA Fellows

Paul J. Sylvester (Memorial University of Newfoundland): Sylvester has made fundamental contributions to a wide variety of important scientific questions in the earth sciences, including the origin and evolution of Earth's crust, petrogenesis of post-collisional granites, precious metal geochemistry, and the development and application of laser-ablation ICP-MS to chemical and isotopic analysis of rocks and minerals.
—Mohamed I. Sultan

Berry H. Tew Jr. (Geological Survey of Alabama): Tew has served the geologic profession for more than 30 years in academia (University of Alabama), the private sector (Cities Services Oil & Gas Company), and state government (Geological Survey of Alabama). He was president of the Association of American State Geologists and is president-elect of the American Geosciences Institute. —James M. Robertson

Marta E. Torres (Oregon State University): This nomination is in recognition of Torres' seminal contribution to the study of convergent and transform margins, utilizing geochemistry as a tool for discerning fluid flow, authigenic mineral formation, gas hydrate processes, and global geochemical fluxes.
—Charles G. Wheat

Robert J. Varga (Pomona College): Varga's research in ophiolites and oceanic crust constitutes a unique family of highly original contributions to understanding seafloor spreading processes.

His studies of sheeted dike units have revealed a rich diversity of structures and processes through detailed, field-based observations and analyses that characterize his work.
—Jeffrey A. Karson

Gregory J. Walsh (U.S. Geological Survey, Montpelier): Walsh's papers and maps on the bedrock geology of most New England states span the Appalachian origin, from Laurentia through several peri-Gondwanan terranes to Avalonia, and have advanced our understanding of the complex tectonic history. He is a pioneer in digital geologic mapping and in GIS techniques.
—Douglas W. Rankin

Arlo B. Weil (Bryn Mawr College): Weil is internationally recognized for his data-rich and comprehensive studies of fold-thrust belts, including those of Variscan Europe and the North American Cordillera. —Robert F. Butler

Steven J. Whitmeyer (James Madison University): Whitmeyer has made outstanding contributions to geological teaching, research, and publication. He co-edited GSA Special Papers 461 and 492, and Field Guide 16. He directs JMU's residential Field Camp and supervises numerous undergraduate projects. He has offered several GSA short courses and convened many GSA thematic sessions. —Declan G. De Paor

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GSA Celebrates New **50-Year** Members for 2013

GSA salutes the following members and Fellows on their **50-year** membership anniversaries.
We appreciate their dedication and loyalty to GSA for all these years.

For a list of members and those who have *surpassed* the 50-year mark please visit <http://rock.geosociety.org/membership/50YearMembers.asp>; the list of Fellows is at <http://rock.geosociety.org/membership/50Yearfellows.asp>.

Asterisks (*) below indicate those members who have not yet been honored by election to GSA Fellowship. **GSA Fellows:** You can help maintain a dynamic vibrant cohort by nominating these and other deserving geoscience colleagues for Fellowship. Guidelines and nomination forms are online at www.geosociety.org/members/fellow.htm.

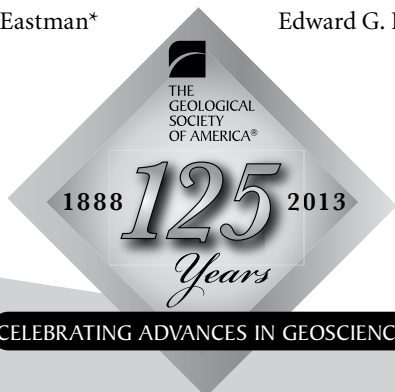
If you have questions, please e-mail awards@geosociety.org.

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George S. Austin
Jon C. Avent*
Philip O. Banks
Emery P. Bayley*
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Harold Bohmer Jr.*
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George Michael Clark
Joseph C. Clark
Emery T. Cleaves
Edward J. Cording
William R. Cotton*
Willard E. Cox*
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Jelle Zeilinga De Boer
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Ira Ellsworth Furlong*
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Malcolm Ross
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Timothy E. Saylor*
Harrison Hagan Schmitt
Henry R. Schmoll*
Lyle V.A. Sendlein
Calvin H. Stevens
George T. Stone*
Thomas C. Sutton*
John W. Trammell*
Neil L. Turner*
Tracy L. Vallier
Martin A. Vaughan*
Thomas A. Vogel
John E. Warme
Johannes Weertman
Philip R. Whitney
Robert A. Wiebe
Peter J. Wyllie



Thanks for your membership!



2013 GSA Research Grant Recipients

The 2013 GSA Committee on Research Grants awarded US\$582,340 to 307 graduate students (50% of the 615 who applied), with an average grant of \$1,897. The committee also selected 10 alternate candidates in the event that any grantees return all or part of their funds due to a change in their research project or receipt of funds from another source.

Committee members: Allen Gontz (Chair), Olivier Bachmann, Luis Buatois, Shanaka de Silva, Elizabeth Diesel, Amy Draut,

Diana Elder, Robert Gastaldo, Stacia Gordon, Madeline Gotkowitz, V.J.S. Grauch, Sarah Hayes, Micah Jessup, Stephen Johnston, Francisca Oboh-Ikuenobe, Frederick Partey, Lisa Park, Michael Pope, Philip Prince, Jacob Sewall, Dawn Sumner, Sarah Titus, Barry Warner, and Paul Wetmore.

The following 24 awards will be presented Monday, 28 October, at the 2013 GSA Annual Meeting in Denver, Colorado, USA.



2013 OUTSTANDING MENTIONS

(proposals of exceptional merit in conception and presentation)

Daniel R. Arnost

The University of Texas at Austin

Wenrong Cao

University of Southern California

Colleen E. Cassidy

Northern Arizona University

Richard P. Fiorella

University of Michigan

Colin Lindsay

University of Colorado Boulder

Colby J. Lubanowski

Northern Illinois University

Barbara C. Ratschbacher

University of Southern California

Swapan K. Sahoo

University of Nevada–Las Vegas

Timothy A. Shin

The University of Texas at Austin

Chris Yakymchuk

University of Maryland–College Park



2013 SPECIALIZED AWARDS

Sponsored by the GSA Foundation

Gretchen L. Blechschmidt Award

Yi-Wei Liu, University of Michigan

This award was established for women in the geological sciences who have an interest in achieving a Ph.D. in the fields of biostratigraphy and/or paleoceanography, sequence stratigraphy analysis, particularly in conjunction with research in deep-sea sedimentology, and a career in academic research.

John T. Dillon Alaska Research Award

Allen J. Schaen, University of Wisconsin–Madison

This award honors Dillon's work on radiometric age-dating in the Brooks Range, Alaska, USA. Selection of the awardee is guided by method of study, including field-based studies dealing with the structural and tectonic development of Alaska and/or studies which include some aspect of geochronology (either paleontologic or radiometric) to provide new age control for significant rock units in Alaska.

Robert K. Fahnestock Award

Natalie K. Anderson, Colorado State University

This award honors the memory of Robert Fahnestock, a former member of the Research Grants Committee. The grant recognizes the best proposal in sediment transport or related aspects of fluvial geomorphology, Fahnestock's field.

Lipman Research Award

Madison L. Myers, University of Oregon

This award, which promotes and supports student research grants in volcanology and petrology, was established in 1993 and is supported by gifts from the Howard and Jean Lipman Foundation. The current president of the Lipman Foundation, Peter W. Lipman, was the recipient of a GSA research grant in 1965.



2013 SPECIALIZED AWARDS

Sponsored by the GSA Foundation (continued)

Bruce L. “Biff” Reed Scholarship Award

Claire Forgacs, University of Kansas

This award provides research grants to graduate students pursuing studies in the tectonic and magmatic evolution of Alaska (primarily) and can also fund other geologic research.

Alexander Sisson Research Award

Paul Zander, Northern Arizona University

Family members of Alexander Sisson established an award in his memory to promote and support student research in Alaska and the Caribbean.

Harold T. Stearns Fellowship Award

Nathan Andersen, University of Wisconsin–Madison

Harold Stearns established this award in 1973 to support student research on aspects of the geology of the Pacific Islands and/or the circum-Pacific region.

John Montagne Award

Samuel E. Munoz, University of Wisconsin–Madison

This award was established in 2000 to support student research in the field of Quaternary geomorphology.

Alexander & Geraldine Wanek Award

Erik W. VanDusen, Northern Illinois University

This award was established in 2002 to support research dealing with coal and petroleum resources, mapping, and engineering geology, marine resources, petroleum economics, appraisal, and evaluation, and the geology of phosphate resources.

Charles A. & June R.P. Ross Research Award

William M. Longo, Brown University

This award was established in 2002 to support research in the fields of biostratigraphy, stratigraphy and stratigraphic correlation, paleogeography and paleobiogeography, interpreting past environments of deposition and their biological significance, and the integration of these research areas into better global understanding of (1) past plate motions (plate tectonics and sea-floor spreading); (2) past sea-level events, including their identification and ages; and/or (3) changes in climate and the effects of those climate changes on Earth’s inhabitants through geologic time.

Parke D. Snavelly, Jr., Cascadia Research Award

Kirsten B. Sauer, University of Nevada–Reno

This award supports field-oriented graduate student research that contributes to the understanding of the geologic processes and history of the Pacific Northwest convergent margin and/or to the evaluation of its hazard or resource potential.

DIVERSITY IN THE GEOSCIENCES MINORITY RESEARCH GRANT AWARD

Emily Hernandez Goldstein, The University of Texas at Austin

This award was established to promote and support minority students in the geosciences.

FAROUK EL-BAZ STUDENT RESEARCH GRANTS

These grants were established to encourage and support desert studies by students worldwide, either in their senior year of their undergraduate studies or at the master’s or Ph.D. level. Each student will receive a cash award of US\$2,500.

Michal Ben-Israel, Hebrew University of Jerusalem, for her study, “Tracing Saharan dust in Negev Desert loess sequences and implications for global dust provenance studies.”

Mohammed Ibrahim El-Shenawy, McMaster University, for his study, “Paleoclimate reconstruction of the Northeast Sahara based on speleothems from Sannur Cave, Egypt.”

THE MAURICE “RIC” TERMAN FUND AWARD

This fund provides one-year grants to support the Ph.D. theses and post-doctoral research of East Asian scientists in Cambodia, China, Indonesia, Japan, Korea, Malaysia, Papua New Guinea, Thailand, and Vietnam. The 2013 recipient will be announced in October.





2013 GSA Research Grant Recipients

(listed in alphabetical order by university)

Vincent Beresford, Acadia University

Nur Uddin Chowdhury, Auburn University
Christopher Marlow, Auburn University

Andrew Siliski, Ball State University

Sarah Feiner, Binghamton University
Nicholas Holsing, Binghamton University

Austin Nijhuis, Boston College

Brittany Trivisonno Muncy, Bowling Green State University

Toby Dossett, Brigham Young University
Johnathan Yaede, Brigham Young University

Samantha Bova, Brown University
William Longo, Brown University
Elizabeth Thomas, Brown University

Kiersti Ford, California State University–Fresno

Michelle Gevedon, California State University–Fullerton
Kelly Kathe-Vreeland, California State University–Fullerton

Daniel Tentori, California State University–Northridge

Ekaterina Lomtadze Jimenez, Center for Scientific Research and Higher Education, Baja California

Brittany Fagin, Central Washington University
Kaitlyn Nelson, Central Washington University
Brent Ritzinger, Central Washington University
Brett Shurtleff, Central Washington University
Rachelle Warren, Central Washington University

Robert Charnock, Colorado School of Mines
Ben Frieman, Colorado School of Mines
Evan Jones, Colorado School of Mines
Jesse Pisel, Colorado School of Mines

Natalie Anderson, Colorado State University
Karen Jackson, Colorado State University
Joseph Mangano, Colorado State University
Nicholas Sutfin, Colorado State University

Andrea Christians, Dalhousie University
John Evangelatos, Dalhousie University
Ryan Kressall, Dalhousie University

John Gartner, Dartmouth College

Christopher Seminack, George Mason University

Sarah Hazzard, Georgia College & State University

Philip Johnston, Harvard University

Mary Todt, Idaho State University

Kristen Theesfeld, Illinois State University

Heather Foxx, Indiana State University

Paul Farrugia, Indiana University
Agnieszka Furmann, Indiana University
David Riese, Indiana University
James Wallace, Indiana University
Ryan Wilson, Indiana University

Madelyn Mette, Iowa State University

Md. Golam Kibria, Kansas State University

Jennifer Schmidt, Lehigh University

Ashley Howell, Louisiana State University
Crawford White, Louisiana State University

Jessica Slomka, McMaster University

Nasser Al-Qattan, Miami University
Elise Conte, Miami University
George Daly, Miami University

Robert Haselwander, Missouri S&T
Zhixin Li, Missouri S&T

Jessica Peebles, Missouri State University

Travis Corthouts, Montana State University
Seth Mangini, Montana State University

Sarah Machin, New Mexico State University

Ellen Craig, North Carolina State University
Nathan Lyons, North Carolina State University
Nitin Singh, North Carolina State University

Olivia Barbee, Northern Arizona University
Colleen Cassidy, Northern Arizona University
Erin Donaghy, Northern Arizona University
Amber Gullikson, Northern Arizona University
Joshua Hale, Northern Arizona University
Jessica Jordan, Northern Arizona University
Taylor Labrecque, Northern Arizona University

Taylor Sanchez, Northern Arizona University
Paul Zander, Northern Arizona University

Steven Battaglia, Northern Illinois University
Colby Lubanowski, Northern Illinois University
Kathryn Quesnell, Northern Illinois University
Annie Shillaber, Northern Illinois University
Erik VanDusen, Northern Illinois University
Wilson Wiedenheft, Northern Illinois University

Jeremy Gouldey, Northwestern University
Matthew Jones, Northwestern University

Lena Cole, Ohio State University
Cole Edwards, Ohio State University
Joel Main, Ohio State University
Yue Zhang, Ohio State University

Jennifer Bauer, Ohio University
Audrey Blakeman, Ohio University
John Hils, Ohio University
Haley O'Brien, Ohio University

Eduardo Guerrero, Oregon State University
Adonara Mucek, Oregon State University

Ying Cui, Pennsylvania State University
Ashlee Dere, Pennsylvania State University
Robert Valdez, Pennsylvania State University
Jiuyuan Wang, Pennsylvania State University

Michael Farner, Rice University
Benjamin Slotnick, Rice University

Timothy Keenan, Saint Louis University
Patrick Luetkemeyer, Saint Louis University

Erik Haaker, San Diego State University

Emma Beck, San Francisco State University

Nancy Calhoun, Simon Fraser University
Jonathan Cripps, Simon Fraser University
Marco Jorge, Simon Fraser University

William Cherry, Southern Illinois University
Gerhard Heij, Southern Illinois University
Stephanie Jarvis, Southern Illinois University

Ian Hagmann, Stanford University
Anne Sanquini, Stanford University

David Moss, Syracuse University

Nicholas Swartz, Temple University
Logan Wiest, Temple University

Melodie French, Texas A&M University
Jonathan R. Fry, Texas A&M University
Mario Lira, Texas A&M University

Ashley Adams, Texas Christian University

Katie Gates, Texas Tech University

Veronica Anderson, The University of Texas at Austin
Daniel Arnost, The University of Texas at Austin
Owen Callahan, The University of Texas at Austin
Emily Hernandez Goldstein, The University of Texas at Austin
Jenna Kromann, The University of Texas at Austin
Edward Marshall, The University of Texas at Austin
Renas Mohammed, The University of Texas at Austin
Nicholas Perez, The University of Texas at Austin
Migdalys Salazar, The University of Texas at Austin
Timothy Shin, The University of Texas at Austin
Kaustubh Thirumalai, The University of Texas at Austin

Christopher Harper, The University of Texas at Dallas
Ranyah Kharwat, The University of Texas at Dallas
Bradon Lycka, The University of Texas at Dallas

Ian Cappelle, The University of Texas at El Paso
Jonathon Stautberg, The University of Texas at El Paso
Anita Thapalia, The University of Texas at El Paso

William Benson, Tulane University

Hillary Sletten, University of Alabama

Kristina Barclay, University of Alberta
Lauren Davies, University of Alberta
Darrin Molinaro, University of Alberta
Rui Wang, University of Alberta

Cullen Kortyna, University of Arizona
Ryan Leary, University of Arizona

Corbin Cannon, University of Arkansas–Little Rock

Tyler Ambrose, University of British Columbia
Anna Harrison, University of British Columbia

Sierra Anseeuw, University at Buffalo
Sandra Cronauer, University at Buffalo

Kaitlin Clare Maguire, University of California at Berkeley
Erik Oerter, University of California at Berkeley
Courtney Sprain, University of California at Berkeley
M. Allison Stegner, University of California at Berkeley

Mary Barr, University of California at Davis
Charles Trexler, University of California at Davis

Kevin Coffey, University of California at Los Angeles
Katherine Glover, University of California at Los Angeles
John Mering, University of California at Los Angeles

2013 GSA Research Grant Recipients

Jonathan Harvey, University of California at Santa Barbara
Janelle McAtamney, University of California at Santa Barbara

Rachel Brown, University of California at Santa Cruz
Alexander Steely, University of California at Santa Cruz
Priscilla Vazquez, University of California at Santa Cruz

Joseph Campbell-Walkowicz, University of Chicago

Matthew Vrazo, University of Cincinnati

Leif Anderson, University of Colorado Boulder
Sarah Evans, University of Colorado Boulder
Ulyana Horodyskyj, University of Colorado Boulder
Rachel Landman, University of Colorado Boulder
Colin Lindsay, University of Colorado Boulder
Taylor Mills, University of Colorado Boulder
Omero Orlandini, University of Colorado Boulder

Ellen Lamont, University of Connecticut
Mollie Patterson, University of Connecticut

Carly Manz, University of Florida
Sean Moran, University of Florida

Genevieve Holdridge, University of Georgia
Chelsea Jenkins, University of Georgia
Douglas John, University of Georgia

James Bishop, University of Hawaii at Mānoa
Alice Colman, University of Hawaii at Mānoa

David Birlenbach, University of Illinois
Spencer Hellert, University of Illinois

Ancira Emily Baca Marroquin, University of Illinois–Chicago
Kyle Cronin, University of Illinois–Chicago

Sierra Isard, University of Iowa
Kat Rocheford, University of Iowa
Matthew Tibbits, University of Iowa
William Ward, University of Iowa

Nicole Dzenowski, University of Kansas
Claire Forgacs, University of Kansas
James Golab, University of Kansas
Aaron Koop, University of Kansas
Britney Katz, University of Kansas
Anthony Layzell, University of Kansas
Jennifer Lowery, University of Kansas
Angela Thompson, University of Kansas

Clayton Brengman, University of Kentucky
Rachel Hatch, University of Kentucky
Alice Orton, University of Kentucky
Stephen Prosser, University of Kentucky

Deborah Shulman, University of Maine

Caitlin Brown, University of Maryland
Anna Statkiewicz, University of Maryland
Chris Yakymchuk, University of Maryland

Christine Brandon, University of Massachusetts–Amherst
Sarah Justus, University of Massachusetts–Amherst
Calvin Mako, University of Massachusetts–Amherst

Justin Paul, University of Memphis

Viviana Diaz, University of Miami

Carli Arendt, University of Michigan
Richard Fiorella, University of Michigan
Timothy Gallagher, University of Michigan
Ethan Hyland, University of Michigan
Yi-Wei Liu, University of Michigan

Jillian Votava, University of Minnesota–Duluth

Andrew Haveles, University of Minnesota–Minneapolis

Elizabeth Gammel, University of Missouri–Columbia
Michael Hilmes, University of Missouri–Columbia

Julie Bauer, University of Missouri–Kansas City

Alexander Brekke, University of Montana
Liane Stevens, University of Montana
Brett Woelber, University of Montana

Michael Blessington, University of Nebraska
Juanita Cruz Torres, University of Nebraska
Lucien Nana Yobo, University of Nebraska

Frederick Freudenberger, University of Nevada–Las Vegas
Alison Lacy, University of Nevada–Las Vegas
Swapan Sahoo, University of Nevada–Las Vegas

Kenjo Agustsson, University of Nevada–Reno
Chad Carlson, University of Nevada–Reno
Joel Desormeau, University of Nevada–Reno
Russell di Fiori, University of Nevada–Reno
Holly McLachlan, University of Nevada–Reno
Kirsten Sauer, University of Nevada–Reno

Elizabeth Huss, University of New Hampshire
Evangelos Korkolis, University of New Hampshire

Paulo de Sa' Rego, University of New Mexico
Scott Jasechko, University of New Mexico
Brad Jeffrey, University of New Mexico
Jason Ricketts, University of New Mexico

Kevin Quinlan, University of North Carolina–Chapel Hill

Casey Albritton, University of North Carolina–Wilmington
Nicholas Moore, University of North Carolina–Wilmington
Amanda Tedick, University of North Carolina–Wilmington

Shannon Dulin, University of Oklahoma

Helen Beeson, University of Oregon
 Mindy Homan, University of Oregon
 John Jacisin, University of Oregon
 Pollyanna Lind, University of Oregon
 Madison Myers, University of Oregon

Élise Cossette, University of Ottawa
 Jeremy Powell, University of Ottawa

Aubrey Hillman, University of Pittsburgh
 David Pompeani, University of Pittsburgh

Maya Pincus, University of Puerto Rico–Mayagüez

David Brink-Roby, University of Rochester

Shah Faisal, University of Saskatchewan
 Balázs Törő, University of Saskatchewan

Elizabeth Madsen, University of South Carolina
 Emily Osborne, University of South Carolina

Subhronil Mondal, University of South Florida
 Nathan Nushart, University of South Florida
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 Carlie Williams, University of South Florida
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 Barbara Ratschbacher, University of Southern California

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Taneisha Edwards, University of the West Indies

James McCarthy, University of Toronto
 Renjie Zhou, University of Toronto

Kendra Chritz, University of Utah
 David Wheatley, University of Utah

Manuel Bringue, University of Victoria

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 Benjamin Linzmeier, University of Wisconsin–Madison
 Zachary Michels, University of Wisconsin–Madison
 Samuel Munoz, University of Wisconsin–Madison
 Deborah Rook, University of Wisconsin–Madison
 Allen Schaen, University of Wisconsin–Madison
 Jody Wycech, University of Wisconsin–Madison

Ashley Dineen, University of Wisconsin–Milwaukee
 Zelenda Koch, University of Wisconsin–Milwaukee

Katherine Potter, Utah State University
 Kerry Riley, Utah State University

Christopher Myers, Vanderbilt University

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2013 GSA Division & Section Student Research Awards



Six GSA Divisions and four GSA Sections have recognized the following student research grant recipients who submitted proposals of exceptionally high merit in conception and presentation in their fields. These students will be honored at the 2013 GSA Annual Meeting in Denver, Colorado, USA.

DIVISION GRADUATE RESEARCH AWARDS

GEOPHYSICS DIVISION

Allan V. Cox Student Research Grant

Christopher G. Myers, Vanderbilt University

Geophysics Student Research Grant Award

Christopher Harper, The University of Texas at Dallas

HYDROGEOLOGY DIVISION

Hydrogeology Division Student Research Grant Awards

Kristen L. Theesfeld, Illinois State University

Scott Jasechko, University of New Mexico

Zackary W. Munger, Virginia Tech

Brett Woelber, University of Montana

MINERALOGY, GEOCHEMISTRY, PETROLOGY, AND VOLCANOLOGY DIVISION

MGPV Division Student Research Grant Awards

Emily Hernandez Goldstein, The University of Texas at Austin

Patrick Luetkemeyer, Saint Louis University

Kirsten B. Sauer, University of Nevada–Reno

Chris Yakymchuk, University of Maryland–College Park

QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

Arthur D. Howard Student Research Award

Claire Forgacs, University of Kansas

J. Hoover Mackin Student Research Award

Rachel D. Valletta, University of Pennsylvania

Marie Morisawa Research Award

Christine K. Brandon, University of Massachusetts–Amherst

SEDIMENTARY GEOLOGY DIVISION

Sedimentary Geology Division Student Research Grant Award

Latisha A. Brengman, University of Tennessee

STRUCTURAL GEOLOGY AND TECTONICS DIVISION

*Structural Geology and Tectonics Division Student
Research Grant Awards*

Lee McAuliffe, University of Southern California

Omero Orlandini, University of Colorado Boulder

Deborah Shulman, University of Maine

Rachelle Warren, Central Washington University

SECTION RESEARCH AWARDS

SOUTHEASTERN SECTION

GRADUATE RESEARCH GRANTS

Matthew Carter, Coastal Carolina University

Haley Gallo, University of Memphis

Nathan Katsiaficas, Vanderbilt University

Pilar Madrigal, Virginia Tech

Lowell Moore, Virginia Tech

Kristian Olson, University of Memphis

Erin Summerlin, Auburn University

Erik Thornton, East Carolina University

SOUTHEASTERN SECTION UNDERGRADUATE RESEARCH GRANTS

Jennifer All, Radford University

David Sublett, Radford University

ROCKY MOUNTAIN SECTION UNDERGRADUATE RESEARCH GRANTS

Lawrence Kellum, Utah Valley University

Brody Kunz, Fort Lewis College

Joel Lozano, Universidad Autónoma de Chihuahua

Miriam Moller, Fort Lewis College

Kristy Peterson, Brigham Young University–Idaho

Spencer Vokoros, Fort Lewis College

NORTHEASTERN SECTION UNDERGRADUATE RESEARCH GRANTS

Kim Bourgouin, Plymouth State College

Justin Coughlin, University of Pittsburgh

Jason Lively, University of Maine

Robert McDermott, University of Pittsburgh

Daniel O'Hara, Indiana University of Pennsylvania

Dannyelle Phillips, Bryn Mawr College

Lauren Schricker, Allegheny College

Ion Simonides, Allegheny College

Tracey Smith, Bucknell University

Daniel Wallace, Bucknell University

Robert Young, Yale University

2013 Cole Awards

The 2013 Gladys W. Cole and W. Storrs Cole Memorial Research Awards for postdoctoral research are funded by the GSA Foundation.



GLADYS W. COLE MEMORIAL RESEARCH AWARD

Thad A. Wasklewicz, East Carolina University, will be awarded US\$ 8,200 from the *Gladys W. Cole Fund for Research in Geomorphology of Semiarid and Arid Terrains* for his project, "Quantitative Debris Flow Risk Assessment, Phoenix, AZ." The award will be presented at the QG&G Awards Ceremony on Tues., 29 Oct., at the 2013 GSA Annual Meeting in Denver, Colorado, USA.

W. STORRS COLE MEMORIAL RESEARCH AWARD

Susannah M. Porter, University of California Santa Barbara, will be awarded US\$7,600 from the *W. Storrs Cole Fund for Research in Invertebrate Micropaleontology* for her project, "Reconstructing the morphology, ultrastructure, and biological affinities of acritarchs from the $>742 \pm 6$ million-year-old Chuar Group, Grand Canyon, Arizona." The award will be presented at the Cushman Foundation for Foraminiferal Research Awards Ceremony on Tues., 29 Oct., at the 2013 GSA Annual Meeting in Denver, Colorado, USA.



2013 Subaru Minority Student Scholarship Recipients



SUBARU

Subaru of America, Inc., in partnership with the GSA Foundation, has generously funded a scholarship program to benefit diverse undergraduates considering a degree in the geosciences. The Subaru Minority Student Scholarship Program provides US\$1,500 to one student in each of GSA's six North American regional Sections and to one student in a low-income country from GSA's International Section (nominated by a GSA Campus Representative). The students also receive free registration to attend the GSA Annual Meeting and a one-year complimentary GSA membership.

The purpose of this scholarship is to encourage minority students to continue studies in the geosciences as a degree choice. Nomination forms for the 2014 program will be e-mailed to GSA Campus Reps later this year. *Questions?* Contact Diane Lorenz-Olsen, awards@geosociety.org, +1-303-357-1028.

Joan V. Lopez, California State University–Sacramento
(Cordilleran Section)

Cristhian Gómez-Plata, Universidad Nacional de Colombia
(International Section)

Benigno Alonzo, Northern Illinois University
(North-Central Section)

Ashley Persaud, Hofstra University
(Northeastern Section)

Mishella J. Craddock, University of Montana–Western
(Rocky Mountain Section)

Mario Mata, Angelo State University
(South-Central Section)

Reynaldo Ignacio, Appalachian State University
(Southeastern Section)

2013 GSA/ExxonMobil Field Camp Award Recipients

GSA/EXXONMOBIL FIELD CAMP EXCELLENCE AWARD

Kurtis Burmeister, Wasatch-Uinta Field Camp



GSA/EXXONMOBIL FIELD CAMP SCHOLARS AWARD

Phoebe Azucena, Salem State University
Salvatore Candela, Alaska Pacific University
Barry Chew, California State University San Bernardino
Karly Clippinger, Beloit College
Andrea Creighton, Clemson University
Anna Downey, SUNY College at Oneonta
Elaine Flynn, Western Kentucky University
Alejandra Gaviria Reyes, University of Buenos Aires
Caitlin Herrera, University of Alabama
Tamunoisoala LongJohn, Hofstra University
Lindsey Maurer, Northern Illinois University
Rachel Medina, Fort Lewis College
Ernest Nunez, California State University, Fullerton
Casey O'Brien, Ohio University
Simran Sangha, Occidental College
Gabriela St. Pierre, New Mexico State University
Ryan Winter, Montana Tech



GSA/EXXONMOBIL BIGHORN BASIN FIELD AWARD

UNDERGRADS

Isaac Allred, Utah State University
Phillip Geer, Keene State College
Ryan Keeling, University of Arkansas
Lincoln Schick, Southern Methodist University
Daniel Sutton, Stephen F. Austin State University
Peter Laciano, Hamilton College
Andrea Creighton, Clemson University
Ashley Persaud, Hofstra University
Erin Wagner, SUNY Potsdam
Bryan Blackburn, Tennessee Technological University
Rebecca Rodd, University of California Davis
Nathan Appleton, University of Southampton
Bryan Petry, California State University Long Beach
Stephen Brennan, Florida State University
Bryan Nicholson, California University of Pennsylvania



GRADS

Mark Smith, University of Connecticut
Karew Schumaker, University of North Dakota
Kelsey McNamara, University of New Mexico
Marcus Kunzmann, McGill University
Rachel Lippoldt, University of Southern California



PROFESSORS

Don Wise, University of Massachusetts at Amherst
Derek Sjostrom, Rocky Mountain College
Sally Potter-McIntyre, Colorado Mesa University
Ranie Lynds, Wyoming State Geological Survey
DeBonne Wishart, Central State University

Welcome New GSA Members!

The following individuals submitted their applications for GSA membership between 1 Oct. 2012 and 15 Feb. 2013 and were approved by GSA Council at its April 2013 meeting.

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Jan Paul Acevedo
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Yuji Arai
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Lateef Anu Audu
Lea Aurelius
Pavlos Avramidis
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Daniel Batchelor
Olateju Olatunji Bayewu
Eban Bean
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Christian Beaulieu
Julie D. Bell
Adebisi Janet-Abioye Bello
Lahcen Benaabidate
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Patrick R. Cooper	Thomas James DeSalvo	Preston O. Enubuje	Nicholas Foster
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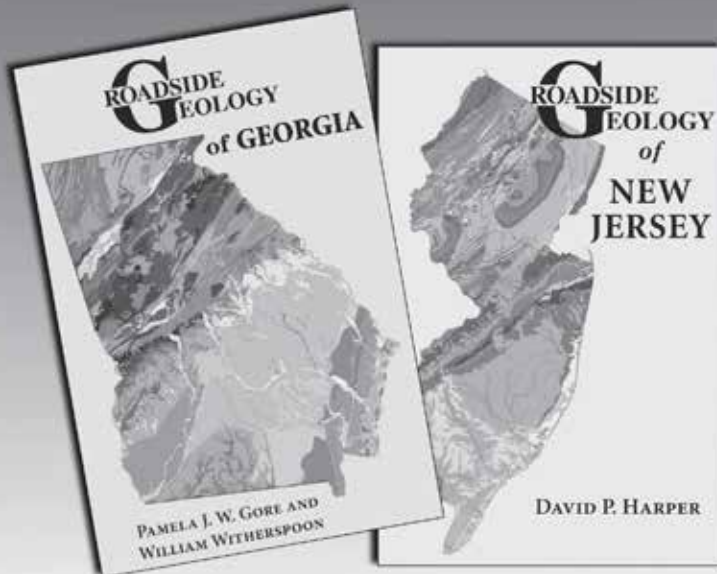


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Help Celebrate GSA's Role in Advancing the Geosciences through Your Gifts of Time and Talent

2014–2015 COMMITTEE VACANCIES

Deadline to apply or submit nominations: 15 July

GSA invites you to volunteer or nominate one of your fellow GSA members to serve on a Society committee or as a GSA representative to another organization. Learn more about each committee and access the nomination form at www.geosociety.org/aboutus/committees/. You can also download the form and send a hardcopy nomination to Pamela Fistell, GSA, P.O. Box 9140, Boulder, CO 80301-9140, USA; fax: +1-303-357-1074; phone +1-303-357-1044 or +1-800-472-1988, ext. 1044; pfistell@geosociety.org. **Terms begin 1 July 2014** (unless otherwise indicated).

COMMITTEE, SECTION, AND DIVISION VOLUNTEERS:

Council Thanks You!

GSA Council acknowledges the many member-volunteers who, over the years, have contributed to the Society and to our science through involvement in the affairs of the GSA. Your time, talent, and expertise help build a solid and lasting Society.

COMMITTEE	No. of Vacancies	Length of Term
Academic and Applied Geoscience Relations (AM, T/E)	three	3 years
Annual Program (AM, B/E)	two	4 years
Arthur L. Day Medal Award (T/E)	two	3 years
Diversity in the Geosciences (AM, T/E)	four	3 years
Education (AM, B/E, T/E)	two	4 years
	one	2 years
eGSA (AM, T/E)	two	3 years
Geology and Public Policy (AM, B/E, T/E)	one	3 years
	one	2 years
Joint Technical Program (T/E)	two	2 years, starts 1 Dec. 2013
Membership (B/E)	three	3 years
Nominations (B/E, T/E)	one	3 years
Penrose Conferences and Field Forums (T/E)	one	3 years
Penrose Medal Award (T/E)	two	3 years
Professional Development (T/E)	two	3 years
Publications (AM, B/E, T/E)	three	4 years
Research Grants (B/E, C)	eleven	3 years
Young Scientist Award (Donath Medal) (T/E)	one	3 years
GSA REPRESENTATIVES TO OTHER ORGANIZATIONS		
GSA Representative to the AAAS Consortium of Affiliates for International Programs (CAIP) (B/E)	one	3 years, starts 1 Jan. 2014
GSA Conferee to the AAPG Publication Pipeline Committee (B/E)	one	3 years
GSA Representative to the AGI Environmental Geoscience Advisory Committee (EAGC) (AM, T/E)	one	3 years, starts 1 Jan. 2014
North American Commission on Stratigraphic Nomenclature (NACSN) (AM, possibly B/E)	one	3 years, starts 1 Nov. 2014

AM—Meets at the Annual Meeting • B/E—Meets in Boulder or elsewhere

C—Extensive time commitment required during application review period (15 Feb.–15 Apr. 2015) • T/E—Communicates by phone or electronically

Call for Nominations & Applications

GSA

DIVISION PROFESSIONAL AWARD

■ 2014 Mineralogy, Geochemistry, Petrology, and Volcanology (MGPV) Division Distinguished Geologic Career Award

Deadline: 15 July

This award honors an individual who has made distinguished contributions in one or more of the following fields of research: mineralogy, geochemistry, petrology, and volcanology, with emphasis on multidisciplinary, field-based contributions. Send (1) a cover letter from an MGPV Division member, no longer than three pages, summarizing the nominee's most important accomplishments and describing how the nominee's published work demonstrates field-based multidisciplinary geologic accomplishments of a ground-breaking nature. The letter should also include nominator contact information and the names of those from whom letters of support can be expected; (2) the nominee's curriculum vitae; and (3) three letters of support to J. Alex Speer, Mineralogical Society of America, 3635 Concorde Pkwy, Suite 500, Chantilly VA 20151-1110, USA, jaspeer@minsocam.org. Nominees need not be U.S. citizens or residents, and GSA membership is not required. The award will not be given posthumously.

GSA

STUDENT DIVISION AWARD

■ The Kerry Kelts Student Research Awards of the Limnogeology Division

Deadline: 1 August

This award for undergraduate or graduate student research is named in honor of Kerry Kelts, a visionary limnogeologist and inspiring teacher. One award of \$1,000 in research related to limnogeology, limnology, or paleolimnology is available. To apply, submit a summary of the proposed research, its significance, and how the award will be used (five-page maximum) in PDF format along with your name and a short (two-page maximum) curriculum vitae to the chair of the Limnogeology Division, Amy E. Myrbo, amyrbo@umn.edu. Please include your name in all PDF file names.



Questions?

Contact GSA Grants, Awards & Recognition,
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Boulder, CO 80301-9140, USA,
+1-303-357-1028, awards@geosociety.org.

AWARDED

GSA

COAL DIVISION

The Antoinette Lierman Medlin Analytical/Laboratory Award went to **Dan Ritter**, University of Arizona, who will receive US\$2,500 for his proposal, "Investigating the impacts of hydrologic conditions, coal maturity, and groundwater pumping on the process of microbial methanogenesis," and to **Michelle Johnston**, University of Kentucky, who will receive US\$1,500 for her proposal, "A petrographic characterization of the Leatherwood coal bed in eastern Kentucky,"

The Antoinette Lierman Medlin Field Award went to **Trent Garrison**, University of Kentucky, who will receive US\$1,000 for his proposal, "Coal fire emissions and water quality."

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BULLETIN



Todd Anthony Bianco

A Full Experience

One of the more interesting aspects of the early part of my fellowship year has been to be here during a presidential election, which was also an election cycle for my boss, Senator Sheldon Whitehouse of Rhode Island. Ethics rules prohibit staff from working on the campaign in the office, so I certainly wasn't involved in any conversations about Senator Whitehouse's campaign. However, this is "The Hill," and I learned a lot about the different operations of the Senate and House through conversations about what the election cycle could mean for legislative plans and staff positions. After the election, I was lucky enough to get tickets to the inauguration. The day was tiring, the lines were long, and my group didn't see much—but we were all happy to have been there.

Then the Senate was back in session, and things sped up quickly. Congress and President Obama were confronted with a number of deadlines that added up to the fiscal cliff. This continued to build until March, when Congress had to pass a continuing resolution to keep funding the government, followed by a budget resolution passed in the Senate the next week.

People like to say that the budget resolution is a messaging document. The Senate and the House both pass budget resolutions that lay out each chamber's blueprint for the federal budget (spending and taxes) for the next ten years, but the president will never sign them, and they will not become law. Appropriations bills, passed later, are what actually determines how much is spent on particular functions, like funding the National Science Foundation. But in determining the total spending and dividing that spending up between committees sends a strong signal about where lawmakers' priorities are, and that is why this is a messaging document. The budget resolution can do a lot more messaging beyond the basic spending blueprint. A number of amendments are offered that have the effect of stating a general point of view on a topic but that may never result in action, and some are not intended to cause any definite action. For example, an amendment might prohibit entering into a treaty, or might affirm support for the Second Amendment. More than 500 amendments were offered, and many received a vote, in an all-night event the media dubbed "Vote-a-Rama." During Vote-a-Rama, Senate staff was reading the growing amendment list, preparing talking points and

amendments of their own, and watching the Senate floor to help our bosses keep the budget-messaging in line with their politics. This was a late and fun night, and I had my second chance to draft an amendment that was later offered by Senator Whitehouse.

I have supported Sen. Whitehouse's other efforts on a number of energy and environmental policy issues that interest me, such as nuclear power and waste, home energy use, and the renewable fuel standard. I have had the opportunity to work on multiple state issues and meet with constituents and stakeholders from all over the country to discuss energy and environment policy. I have also had the opportunity to staff my boss for more than a few interesting events and meetings, like the Forward on Climate rally that attracted tens of thousands of people to Washington in February; a meeting with Dr. Ernest Moniz, President Obama's nominee for Energy Secretary; and the hearing on the nomination of Assistant Administrator Gina McCarthy to become administrator of the EPA.

I have also been able to help with Senator Whitehouse's discussion draft of a carbon fee bill, on which he was joined by Representative Waxman, Representative Blumenauer, and Senator Schatz. This bill would establish a "polluters pay" fee on emissions for large sources of greenhouse gases, and 100% of the revenue would be returned to the American people. The discussion draft asks what level the fee should be, at what rate it should increase, and the best way to return the revenue to Americans. These questions are prompting us to decide what policy will significantly reduce greenhouse gas emissions while protecting middle- and low-income Americans and American businesses. While the fate of this discussion draft is unclear, it has been rewarding to be part of the research and discussion that goes into policy that may have such an important and wide effect.

I would again like to close by encouraging anyone interested in the fellowship to contact me. While my fellowship reports have reflected a perfect placement and a full experience, the other fellows I know through the AAAS fellowship umbrella are also happy with their time here on the hill, and so I once again recommend all interested scientists to consider applying.

This manuscript is submitted for publication by Todd Anthony Bianco, 2012–2013 GSA-USGS Congressional Science Fellow, with the understanding that the U.S. government is authorized to reproduce and distribute reprints for governmental use. The one-year fellowship is supported by GSA and by the U.S. Geological Survey, Department of the Interior, under Assistance Award No. G12AP20120TDD. The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. government. Todd is working in the office of Senator Whitehouse (D-Rhode Island) and can be reached at Todd_Bianco@whitehouse.senate.gov.

2nd International EarthCache™ Mega Event

St. George, Utah, USA
Sat., 7 Sept. 2013

EarthCaching gets people out in the field to learn about their planet first-hand. Participants in this annual event will learn all about EarthCaching, interact with EarthCachers from around the globe, meet EarthCache developers and reviewers, find local EarthCaches, and engage in many other exciting and educational activities.

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Snow Canyon in St. George, Utah, USA. Photo by Mehmet Dilsiz.

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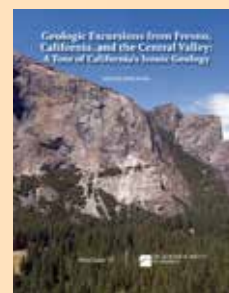
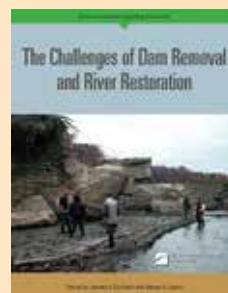
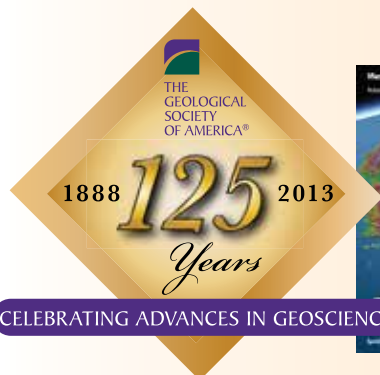
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Start reading at www.gsapubs.org, or contact us at editing@geosociety.org for more information.





GSA FOUNDATION UPDATE

P. Geoffrey Feiss, GSA Foundation President

GSA's Support of Research for the *Next* 125 Years

In the July 2012 *GSA Today* Foundation Update, I provided an overview of GSA's incredibly effective student research grants program. In 2012, GSA awarded 303 research grants, selected from 636 applications by the 24-member research grant committee. Funding for the research grant program comes from several sources. Among these is the U.S. National Science Foundation, whose support we match from annual gifts of members and corporations and income from named funds established in the past by GSA members.

In 2012, the GSA Foundation managed 20 named funds established by members to provide income in perpetuity in support of geoscience research. I am pleased that over the past year, GSA members have established four *new* named funds—a 20% increase in funds providing permanently endowed support for research! These are the Ian Carmichael fund, the John Black Award, and two James B. Thompson Jr. funds. Others are in the works.

Many of these named funds were established through a bequest to the GSA Foundation by a member donor who appreciated the importance of supporting early-career geoscientists and who had confidence in the GSA member-led peer review process that recommends funding. We all are regularly reminded by our favorite nonprofit organizations to think of them in our estate plans. But how often are we presented with such a proven and effective way to efficiently direct our philanthropy to the future benefit of our profession?

Ahead of the 125th Anniversary Meeting, I have committed to making arrangements for the GSA Foundation in my own estate plans. I feel a great sense of satisfaction knowing that my estate will support the profession that has so abundantly rewarded me over the years through its support of research, through the numerous personal and professional relationships it has nurtured and sustained, and through its service to society at large.

If such a prospect interests you, I encourage you to contact the Foundation for ideas on how your philanthropy can be part of GSA's legacy of advancing the geosciences.

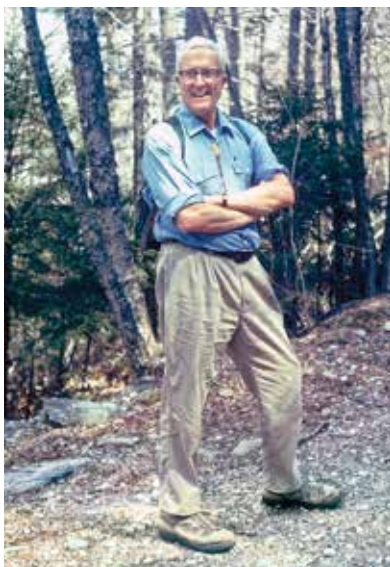
You can make a contribution to the GSA Foundation at www.gsafweb.org/makeadonation.html or by contacting Christopher Tallackson, +1-303-357-1007, ctallackson@geosociety.org.

Test your GSA knowledge!

- 1 The first GSA memoir in 1934 was made possible by the Penrose bequest. What was the topic and who were the authors?
- 2 What was the first associated Society and when did this association commence?

Please submit answers by the end of the month to gsaf@geosociety.org
One winner will be selected each month to receive a copy of *GeoTales V: A Collection of Stories & Memories Written by GSA Members*.

GSA Foundation Receives Large Bequest, Promotes GSA Programs



James B. Thompson Jr.

An enthusiastic group of New England geoscientists had the opportunity to celebrate a marvelous gift from the estate of James B. Thompson Jr. at the Northeastern Section Meeting of the Geological Society of America in Bretton Woods, New Hampshire, in March 2013. Jim Thompson (or “JBT” as he was lovingly known to his many students) died on 15 Nov. 2011. In late 2012, the Geological Society of America Foundation learned that it was the beneficiary of a bequest of nearly one and a half million dollars from Thompson’s estate.

A native of Maine, Jim Thompson was a giant among New England geologists. He retired as the Sturgis Hooper Professor of Geology at Harvard in 1992 after a career of more than forty years. He published seminal papers during his career on metamorphic petrology, mineral thermodynamics, structural mineralogy, and geochemistry. More to the point, he inspired several generations of colleagues and students who have since made significant contributions in a host of fields in the geosciences.

Thompson never lost his love of the White Mountains and New England geology. His creative insights and his penetrating field-based observations of metamorphic stratigraphy, structures, and mineral interrelationships, coupled with his towering intellect, deciphered many of the mysteries of New England geology that, when he began his career after service in the Army Air Corps in World War II, seemed intractable. His acumen as a scientist, blended with his love of hiking and skiing, created a life-long love affair with the geology of New England and equally long-term friendships with scores of New England geologists.

Thompson’s distinction as a geologist was well-recognized by his peers. In addition to membership in the National Academy of Science and the American Academy of Arts and Sciences, he

P. Geoffrey Feiss, GSA Foundation President

received an honorary degree from his alma mater, Dartmouth College. He earned GSA’s Arthur L. Day Medal in 1964 as well as both the Roebling Medal of the Mineralogical Society of America in 1979 and the Goldschmidt Medal of the Geochemical Society in 1985. Thompson served as the president of both the Mineralogical Society of America and the Geochemical Society. He held Ford Foundation and Guggenheim fellowships at various stages in his career and was a distinguished visiting scholar at both Johns Hopkins University and the California Institute of Technology.

In consultation with many of his former students, the Geological Society of America will honor the career and contributions of James B. Thompson Jr. as follows:

- Each year, GSA’s International Section will designate two James B. Thompson Jr. Distinguished International Lecturers. Each will be a scientist of great distinction—one from North America to give a series of lectures abroad and one from Asia, Africa, Europe, or Latin America to give a series of lectures in North America.
- In collaboration with GSA, the Foundation will provide seed money of up to US\$10,000 to the organizers of as many as four Penrose Conferences each year. For more than 40 years, the Penrose Conference program has brought together multidisciplinary groups of leading geoscientists and students to facilitate open and frank discussions of ideas in an informal atmosphere intended to stimulate individual and collaborative research. Seed money from the James B. Thompson Jr. bequest will increase the vitality and frequency of these critical research conferences.
- GSA will fund as many as three James B. Thompson Jr. Student Research Grants in Metamorphic Petrology and Geochemistry each year.
- GSA’s Mineralogy, Geochemistry, Petrology, and Volcanology Division will henceforth be able to award annually two distinguished scientist awards in memory of James B. Thompson Jr.—a Career Award and a Young Scientist Award.
- The Mineralogy, Geochemistry, Petrology, and Volcanology Division will also be able to support, through an allotment of funds from the Thompson bequest, travel for one or more students to attend a research conference, specialty conference, or field conference anywhere in the world.

These new and enhanced programs honor Thompson’s memory by increasing the interaction of scholars and students, by offering opportunities for scholars of the Earth to conduct their research and collaborate toward the furtherance of the disciplines to which he made so many lasting contributions.

In Memoriam



The Society notes with regret the deaths of the following members (notifications received between 4 Feb. and 30 Apr. 2013).

John A. Black

Sayville, New York, USA
27 Mar. 2013

Randolph W. Bromery

Peabody, Massachusetts, USA
26 Feb. 2013

Douglas R. Callier

Napa, California, USA
9 Feb. 2013

Ian S.E. Carmichael

Berkeley, California, USA
26 Aug. 2011
GSA notified 7 Mar. 2013

Harry E. Connors III

Washington, Michigan, USA
11 Feb. 2013

Roy L. Farnsworth

Auburn, Maine, USA
1 July 2012
GSA notified 18 Mar. 2013

Brian F. Glenister

Fort McDowell, Arizona, USA
7 June 2012
GSA notified 26 Feb. 2013

William F. Guyton

Austin, Texas, USA
2 Mar. 2013

L.W. Heiny

Evergreen, Colorado, USA
GSA notified 4 Feb. 2013

Leo J. Hickey

New Haven, Connecticut, USA
9 Feb. 2013

William P. Irwin

Temecula, California, USA
1 Feb. 2012
GSA notified 4 Feb. 2013

Lisle T. Jory

White Rock, British Columbia,
Canada
22 Mar. 2012
GSA notified 19 Feb. 2013

Mahlon V. Kirk

Toledo, Oregon, USA
19 Feb. 2013

Harry E. LeGrand

Crossville, Tennessee, USA
21 Mar. 2013

Charles J. Mankin

Norman, Oklahoma, USA
13 Nov. 2013
GSA notified 1 Apr. 2013

E.A. Noble

Reston, Virginia, USA
13 Jan. 2003
GSA notified 21 Feb. 2013

John W. Rold

Littleton, Colorado, USA
17 Feb. 2013

Arthur A. Socolow

Gloucester, Massachusetts., USA
25 Mar. 2013

Thomas W. Stern

Bend, Oregon, USA
GSA notified 28 Feb. 2013

Alan M. Stueber

Edwardsville, Illinois, USA
GSA notified 20 Mar. 2013

Karl K. Turekian

New Haven, Connecticut, USA
15 Mar. 2013

Susan Vajoczki

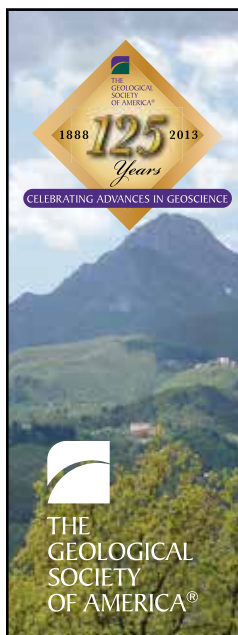
Hamilton, Ontario, Canada
GSA notified 19 Feb. 2013

Lauren A. Wright

State College, Pennsylvania, USA
6 Feb. 2013

Erratum: On p. 47 of the April/ May issue of *GSA Today* (v. 23, no. 4/5), the date of death for Aleksis Dreimanis was incorrectly listed as 30 Nov. 2012. Aleksis died on 8 July 2011.

To honor a friend or colleague with a GSA Memorial, please go to www.geosociety.org/pubs/memorials/mmlGuid.htm to learn how. Contact the GSA Foundation, www.gsafweb.org, if you would like to contribute to the Memorial Fund.



Celebrate GSA's 125th Anniversary!

Propose a Penrose Conference or Field Forum

Penrose Conferences bring together multidisciplinary groups for open and frank discussion of geoscience research and ideas in an informal atmosphere, on location in some of the most fascinating places in the world. Learn more at www.geosociety.org/penrose/.

Field Forums capture the essence of exciting discoveries or controversial topics via forays into the field for on the spot discussions. Learn more at www.geosociety.org/fieldforums/.

March 2012 Penrose Conference location: Castelvecchio Pascoli, Lucca, Italy.



About People

GSA Student Member **Kelly M. Deuerling** has been named the first recipient of the American Geosciences Institute's new Harriet Evelyn Wallace Scholarship for women in geoscience, which is dedicated to increasing the number of women in geoscientific professions. Deuerling was selected for outstanding contributions to her field, as well as her commitment to several extracurricular activities and strong participation in the geoscience community.

GSA Senior Fellow **Farouk El-Baz** is the recipient of the University of Alabama at Birmingham's 2013 Ireland Visiting Scholar Award. Each year the Ireland Award brings internationally renowned scholars in the arts and sciences to the University of Alabama at Birmingham to present a public lecture and participate in campus activities.

GSA member **Paul G. Marinis**, emeritus professor at the National Technical University of Athens, Greece, has been named "Chevalier dans l'ordre des Palmes académiques." The Order of Academic Palms is an Order of Chivalry of France for those persons with outstanding devotion and accomplishment in the areas of teaching, scholarship, and research.

GSA Member **Kristen Mitchell** has been named the 2013–2014 William L. Fisher Congressional Geoscience Fellow for the American Geosciences Institute (AGI). Mitchell is a research associate in the Ecohydrology

Research Group at the University of Waterloo, and her research focuses on assessing the utility of remote sensing to identify plastic debris in the Great Lakes and in oceans. Mitchell is looking forward to taking science out of the laboratory and working with policy makers on Capitol Hill.

GSA Fellow **Jonathan G. Price** has been awarded The Mining and Metallurgical Society of America's (MMSA) 2013 Gold Medal for his significant contributions to the science of economic geology in the minerals industry, academia, and government. The award citation notes that Price's "dedication to public outreach has improved our understanding and appreciation of the vital role played by mining and minerals in Nevada and the United States."

GSA Member **Carrie Schweitzer** of Kent State University at Stark has received Kent State's Outstanding Research and Scholar Award. The award, sponsored by Kent State's Division of Research, honors Schweitzer for her notable scholarly contributions that have brought acknowledgment to her field of study and to Kent State. Along with two other recipients, Schweitzer was selected based on the quality of her research and scholarship and its impact on society.

Learn more about the achievements of GSA members at www.geosociety.org/news/memberNews.htm, and send your stories to gsatoday@geosociety.org.

Classified Rates—2013

Ads (or cancellations) must reach the GSA advertising office no later than the first of the month, one month prior to the issue in which they are to be published. Contact advertising@geosociety.org, +1.800.472.1988 ext. 1053, or +1.303.357.1053. All correspondence must include complete contact information, including e-mail and mailing addresses. To estimate cost, count 54 characters per line, including punctuation and spaces. Actual cost may differ if you use capitals, boldface type, or special characters. Rates are in U.S. dollars.

Classification	Per Line for 1st month	Per line each add'l month (same ad)
Positions Open	\$9.00	\$8.75
Fellowship Opportunities	\$9.00	\$8.75
Opportunities for Students		
First 25 lines	\$0.00	\$4.75
Additional lines	\$4.75	\$4.75

Positions Open

ONE-YEAR TEACHING POSITIONS GEORGIA SOUTHERN UNIVERSITY

Georgia Southern University's Department of Geology and Geography invites applications for multiple full-time Temporary Instructors of Geology to teach physical and environmental geology classes during 2013–2014. Applicants must have a minimum of a master's degree in geology or a closely related geoscience specialty by the starting date of August 19, 2013. Up to three positions are available pending budget approval. Contact Dr. Jeffrey Underwood, Chair, Department of Geology and Geography, Georgia Southern University, Statesboro, GA 30460 (sjunderwood@georgiasouthern.edu, +1-912-478-5361, <http://cosm.georgiasouthern.edu/geo/>). Georgia is an open records state. Georgia Southern is an AA/EO institution. Individuals who need reasonable accommodations under the ADA to participate in the search process should contact the Vice Provost.

TENURE-TRACK INSTRUCTOR, CURATOR DEPARTMENT OF EARTH SCIENCES THE UNIVERSITY OF NEW BRUNSWICK FREDERICTON CAMPUS <http://www2.unb.ca/earthsciences/>

The Department of Earth Sciences at the University of New Brunswick invites applications for a tenure-track Instructor/Curator position to begin January 1, 2014.

The successful applicant will have a minimum of a master's degree in the Earth Sciences and a record of, or potential for, excellence in teaching. Experience in teaching first and second year geoscience courses would be an asset. The applicant will also be responsible for the operation of the Quartermain Earth Sciences Centre museum and the curating of the museum and departmental collections. Experience with museum curating and display development would be an asset.

Applicants should submit a cover letter, full curriculum vitae, and a statement of teaching experience and philosophy. Applicants should arrange to have letters of reference submitted by three or more referees familiar with their teaching experience or potential.

Applications may be sent by regular mail or email

to: Dr. Cliff Shaw, Chair, Department of Earth Sciences, University of New Brunswick, 2 Bailey Drive, Fredericton, NB, Canada, E3B 5A3; e-mail: lodge@unb.ca; Fax: 506-453-5055

The deadline to apply is September 15, 2013. Review of applications will begin immediately.

All qualified candidates are encouraged to apply; however Canadian citizens and permanent residents will be given priority. Applicants should indicate their current citizenship status.

The University of New Brunswick is committed to the principle of employment equity. This position is subject to budgetary approval.

FACULTY OPENINGS GEOLOGIC MAPPING SPECIALIST STRUCTURAL-ECONOMIC AND/OR QUATERNARY GEOLOGY NEVADA BUREAU OF MINES AND GEOLOGY UNIVERSITY OF NEVADA, RENO

The Nevada Bureau of Mines and Geology (NBMG), University of Nevada, Reno (UNR), seeks applicants for one or two faculty positions beginning on or after October 1, 2013, with expertise in field-based Structural-Economic Geology and/or Quaternary Geology. These openings are non-tenure track, 12-month faculty position(s).

We seek applicants with skills in state-of-the-art techniques in the following areas:

- Structural and/or Economic geology, with substantial experience in quadrangle-scale geologic mapping. Experience in analyzing mineral deposits, geothermal systems, and/or hydrocarbon deposits is highly valued.
- Quaternary geology, with expertise in geomorphology and neotectonics, as well as substantial experience in quadrangle-scale geologic mapping as applied to natural hazards, engineering geology, or environmental geology.

Quadrangle-scale (primarily 1:24,000) geologic mapping in support of elucidating Nevada's geological history and framework is a fundamental responsibility of these positions. Experience in ArcGIS, 3D modeling, and integration of multiple geologic and geophysical data sets is also desired. Applicants must have a Masters or Doctorate in geology or a related geoscience field.

One full-time or two half-time positions are available. Half-time positions would have at least 50% state funding, with full-time support assured for two years from start date and the expectation that the other 50% of support would be obtained through grants and contracts after the initial two years. Many funding opportunities exist (e.g., USGS STATEMAP program) for support. Nevada is one of the most exciting regions in the world to conduct research in the geosciences. Opportunities abound for research in structural geology, mineral deposits, geothermal systems, neotectonics, and natural hazards.

NBMG is a research and public service unit of UNR and the state geological survey. Managed as part of the Mackay School of Earth Sciences and Engineering within the College of Science at UNR, NBMG functions as an academic unit, and its principal scientists are faculty members at UNR.

For complete position descriptions and require-

ments, view the position announcement at <http://www.nbmgs.unr.edu> and <http://jobs.unr.edu/> or contact Geoscience Search, NBMG, Mail Stop 0178, UNR, Reno, NV 89557-0178. Applications received through <https://www.unrsearch.com/postings/12470> by **August 5, 2013**, will receive full consideration. EEO/AA. Women and under-represented groups are encouraged to apply.

OPEN POSITION BRIGHAM YOUNG UNIVERSITY

The Department of Geological Sciences at Brigham Young University invites applications for a tenure track Professorial Faculty position beginning as early as January of 2014 in the following areas: fine-grained clastic sedimentology, methanogenesis in unconventional reservoirs, and economic geology. An interest and ability to contribute to our summer field course is a plus. A Ph.D. at the time of appointment is required. Implementation of a vigorous, externally funded research program is required. The successful candidate will teach undergraduate and graduate courses in their area of expertise as well as introductory geology courses as assigned.

Excellent research infrastructure exists within the department, including laboratories and field equipment that support a wide-range of geophysical, geochemical, isotopic, petrologic and petrographic studies. Excellent computational facilities are also available within the Department and University.

The Department consists of 12 professorial faculty and 3 professional faculty, and offers B.S. and M.S. degrees. Research areas include petroleum geology, continental magmatism, geophysics (shallow and deep), structure and tectonics, stratigraphy, paleontology, planetary geology, mineral surface chemistry, hydrogeology, and climate studies.

Interested applicants should fill out an online application at <https://yjobs.byu.edu>. At this site, please also attach a curriculum vita, graduate transcripts, a statement of research experience and goals, a description of teaching philosophy, and the names and contact information for three references.

Brigham Young University, an equal opportunity employer does not discriminate on the basis of race, color, gender, age, national origin, veteran status, or against qualified individuals with disabilities. All faculty are required to abide by the university's honor code and dress and grooming standards. Preference is given to qualified candidates who are members in good standing of the affiliated church, The Church of Jesus Christ of Latter-day Saints.

Be a part of GSA's
125th Anniversary!



www.geosociety.org/125/

Echo Lake with Mount Evans in the background, photo by Richard Grant. Used with permission from Denver Metro Convention & Visitors Bureau.



125th ANNIVERSARY GALA

YOU ARE INVITED TO AN EVENING OF CELEBRATION IN HONOR OF
THE GEOLOGICAL SOCIETY OF AMERICA'S 125TH ANNIVERSARY.

TUESDAY, 29 OCTOBER

HISTORY COLORADO CENTER • 1200 BROADWAY, DENVER
BLACK-TIE OR VICTORIAN DRESS
COST: US\$125 PER PERSON

6:30 P.M. COCKTAIL RECEPTION AND VIEWING OF EXHIBITS

7:30 P.M. BOULDER PHILHARMONIC PERFORMANCE
OF SYMPHONY NO. 1, *FORMATIONS*
8 P.M. DINNER AND PROGRAM

**SPACE IS LIMITED, SO PLEASE RESERVE YOUR SPOT WHEN YOU
REGISTER FOR THE ANNUAL MEETING.**

**TABLE SPONSORSHIPS ARE AVAILABLE—FOR MORE
INFORMATION,
PLEASE CONTACT DEBBIE MARCINKOWSKI AT
DMARCINKOWSKI@GEOSOCIETY.ORG
OR +1-303-357-1047.**

QUESTIONS? PLEASE CONTACT MEETINGS@GEOSOCIETY.ORG.



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Photo by Bret Webster.

GSA's Connected Community is Gaining Momentum

By now you've probably read or heard something about our new *GSA Connected Community*—a communications platform that is poised to change the way we interact and build relationships within our geoscience community.

It's easy to find the community and begin to connect with colleagues and share information. GSA members (and non-members) can simply type community.geosociety.org into a web browser and click on "Help" for instructions on how to log in.

GSA members *already* have a profile in the Connected Community, populated from our member database; all you have to do is activate it. Your default profile shows only your name, city, state, and organization (much like the information on a conference badge). Once you've logged in, *you* decide what information to share and with whom.

Why Complete Your Profile?

Your comprehensive and interactive profile represents you both professionally and individually within the new **GSA Member Directory**. You have the option to search for other members by several key demographics, browse other profiles to identify potential contacts and groups of people with similar professional interests, and then reach out and connect with them. Your complete profile makes you accessible to other members of the geoscience community—*the people you actually want to network with!*

Your profile is similar to your online résumé, but with member connections. Users will be able to browse information and facts and also interact with you.

- If you're a student or early-career professional, this is the perfect platform to introduce yourself and showcase your assets.
- If you've been active in GSA, you've helped to build this Society, so be proud of it! Highlight your involvement with

the earth science community, your educational background, and publishing history. Your GSA service record is dynamically updated through the GSA member database.

- If your career is established, be a resource to a younger scientist just by making yourself visible and approachable.
- Reach out to alumni from your university, reconnect with colleagues from a former position, locate an author for the data behind a paper that you enjoyed, or track down a meeting presentation directly from the source. The possibilities are endless!

♦ **HOT TIP:** Be sure to upload a picture in your profile—it makes the community friendly and welcoming! Pictures are worth a thousand words, so make sure the image best represents you and what you want to accomplish. Consider using the same picture across all social media channels; this encourages recognition.

LinkedIn users can automatically populate their GSA profile with information from LinkedIn. A variety of security settings exist so that you can customize access to each part of your profile information and decide how it should be used.

Next month in *GSA Today** we'll talk more about how you can use the member directory to find the people you want to connect with and build a professional network you can access from anywhere in the world. As participation grows, this platform will become increasingly valuable as a resource and a tool for collaboration. Watch the GSA homepage for our next webinar on how to use the Connected Community.

*See the June *GSA Today* (p. 24–25; www.geosociety.org/gsatoday/) for an introductory article on GSA's Connected Community.

We Believe in the Power of GSA's Connected Community!

On To the Future: The Power of Community

The GSA Diversity in the Geosciences Committee is launching a grassroots initiative to provide partial funding for 125 students from underrepresented groups to attend their first GSA Annual Meeting this year in Denver, Colorado, USA, in honor of the Society's 125th anniversary. The steering committee for this initiative, titled **On To the Future (OTF)**, is using GSA's Connected Community to streamline their workflow and organize member volunteer sponsors for action.

The OTF program website (hosted within the Connected Community) provides a social network for OTF student participants to gain exposure to geoscience research and available career options. The Connected Community will also facilitate mentoring relationships and networking opportunities to help bring the OTF participants into the scientific and professional community.

<http://community.geosociety.org/OTF/>



ANNOUNCING

2014 GeoVentures and Teacher Field Camps!

GeoVentures

- **Hawaii** for educators: 6–12 Aug. 2014
- **Iceland:** 27 July–7 Aug. 2014
- **Australia** for educators and their families: Dates to be determined
www.geoventures.org



Contact Gary Lewis, glewis@geosociety.org,
for more information on GeoVentures.

Field Camps for K–12 Teachers

- **Rocky Mountain Field Camp:** GSA Rocky Mountain Section, 21–26 June 2014
- NEW** • **Illinois Basin Field Camp:** GSA North-Central Section, 16–19 June 2014
- NEW** • **Central New York Field Camp:** GSA Northeastern Section, dates to be determined
www.geosociety.org/geoventures/teachers/

Contact Davida Buehler, dbuehler@geosociety.org,
for more information on Field Camps.

Hawaii and Iceland GeoVentures and Rocky Mountain
Field Camps sell out quickly:

Register today to secure your place!

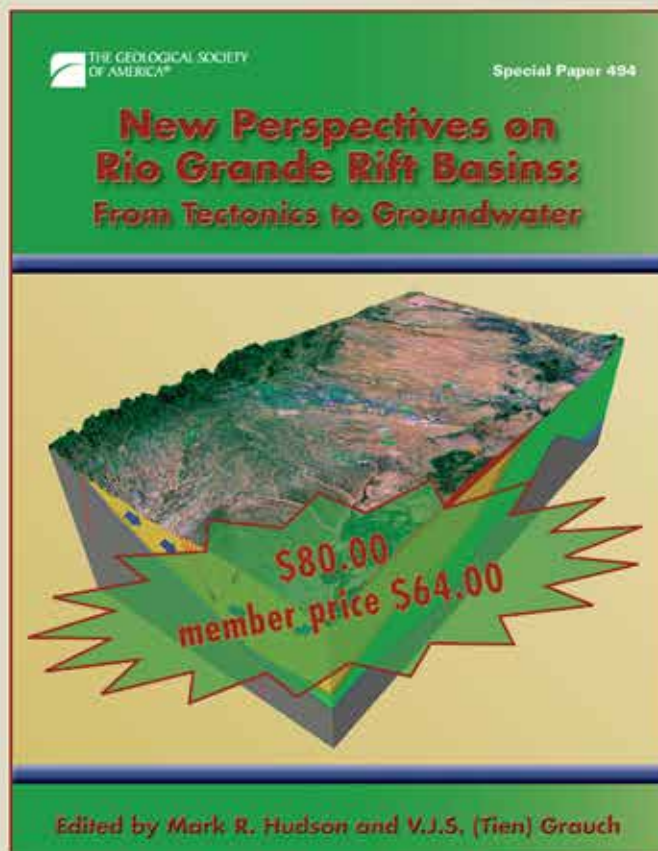


GeoVentures are also on Facebook at
www.facebook.com/GSAGeoVentures.



New Perspectives on Rio Grande Rift Basins: From Tectonics to Groundwater

Edited by Mark R. Hudson and V.J.S. (Tien) Grauch



Extending from Colorado, USA, on the north to the state of Chihuahua, Mexico, on the south, the Rio Grande rift divides the Colorado Plateau on the west from the interior of the North American craton on the east. This volume focuses on the Rio Grande rift's upper crustal basins and is organized geographically with study areas progressing from north to south. Eighteen chapters cover a variety of topics, including sedimentation history, rift basin geometries and the influence of older structure on rift basin evolution, faulting and strain transfer within and among basins, relations of magmatism to rift tectonism, and basin hydrogeology.

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ISBN 9780813724942
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