GREETINGS

Hello to you all from dear old Clark Hall. You will remember winter quarter at PUC as a time of extremes – sunny days in the 70s to the landscape brushed with a thin coat of frost and sometimes snow. On this particular day the sun shines through my west-facing window and the mustard is in full bloom. The Napa Valley practically glows!

It is our great honor to welcome you to another issue of the Biology Newsletter. Here we try to catch you up on what’s been happening in the last year. PUC continues to thrive and our department does the same. We had some growing pains as we added new faculty in the last few years but we are running along the best we have in years. The Biology Department is more diverse than ever and we continue to improve our curriculum to meet the needs of the modern student.

Please enjoy!
DEPARTMENT HIGHLIGHTS

BIOLOGY CHAIR

After eight years as the Biology Department Chair, Dr. Robin Vance decided to step away from the duties that he took on following Dr. Terry Towriff’s retirement in 2006. Robin has worked tirelessly on behalf of the Biology Department faculty and students. During his tenure, the department added a lab coordinator, grew from six to seven full-time faculty members, and added the environmental studies major. Robin managed the duties of administration with his teaching load and extensive advising duties. Though we know that he was always busy, he made it look easy! His years of administrative service strengthened the Biology Department and the campus-at-large.

When asked about his years as chair to be mentioned that he really enjoyed getting to know the faculty and students of the Biology Department. As chair he represented the department on various committees. The upshot of this was that he enjoyed meeting and interacting with faculty from across campus. He says that he won’t miss some of the more challenging aspects of the job, like dealing with academic integrity issues or mediating problems that can arise when a student is disadvantaged.

Robin continues to teach and advise students but will now be able to spend more time in the classroom and with students. His classes include systems physiology, histology, human physiology, and biological foundations.

Aimee Wyrick took on the responsibilities of Biology Chair in July 2014. The transfer of duties between Robin and Aimee has gone very well. She was pleased to introduce Stephanie Larson, who is our current lab coordinator and is originally from Phoenix. She graduated from PUC in June 2014 with a Spanish degree and a minor in biology. In the search to fill this position about a year ago, we were pleased to find that Stephanie had applied. She really impressed us with her clear organization skills, professional demeanor, and ability to adapt in difficult situations. Stephanie has been hard at work since last June and has done an excellent job. This position is demanding and requires an unusual schedule. Stephanie does amazing work behind the scenes, and often her work goes unnoticed by faculty and students since things run so smoothly! We are so thankful for Stephanie.

Do you remember Diana Chung, our very first lab coordinator hired in September 2008? She worked for us for 2 years and then went on to dental school at Loma Linda University. We are happy to report that Diana graduated with her D.D.S. in May 2014 and is currently in practice with her uncle in Dallas.

NEW ADJUNCT FACULTY MEMBER

We have added an adjunct faculty member to our department. Dr. Patty Sanchez-Moore earned her Ph.D. in cell and molecular biology from the University of Pennsylvania in Philadelphia. More recently she worked on a post-doctorate in the hematology/oncology division, also at the University of Pennsylvania. Dr. Sanchez-Moore recently moved to the area with her husband, Dr. Ryan Moore, a surgeon at St. Helena Hospital. The Moore family includes three young children. Dr. Sanchez-Moore studies cancer cells related to acute myeloid leukemia. In spring 2014 she took a class in cancer biology, which was very well received by our students. She will continue to teach this class on a contract basis. She also hopes to establish a research program on our campus. Whether or not this can happen depends on our finding adequate lab space and providing the appropriate equipment for this research.

NEW BIOLOGY LAB COORDINATOR

Haruka Hiro spent one year as the lab coordinator and made a huge contribution during her short tenure. You may remember from the previous newsletter that Haruka is a PUC biology alumnus. Because of her vast “behind the scenes” knowledge of our department, she initiated several major improvements: revisions of the general microbiology lab manual and protocols, implementation of a TA evaluation survey, creation of comprehensive criteria for hiring TAs, and the development of a computerized inventory of department supplies and materials. Haruka is currently earning a graduate degree at the National College of Natural Medicine in Portland, OR.

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FIELD BIOLOGY

Since 2012, our department has been sponsoring study tours for the course BIOL 328 Field Biology. Students may take the course for credit. Non-students, including our alumni, are always welcome to join the tours. The focus of the tours is to learn first hand about the biology of the region by visiting various ecosystems, learning about the plants and animals that live in each, and how they interact with each other. The students experience the joy of learning while exploring God’s creation.

During spring break of 2014, Dr. Floyd Hayes, along with Service and Missions Coordinator Fabio Maia, took a group of 15 students on a combined missions and biology trip to Manaus, Brazil. They traveled by river boat, which became their home, about 125 miles up the Amazon and Manacapuru Rivers to a remote village where they helped construct a health clinic. Dr. Hayes and five students taking the course awoke early each morning to explore the tropical rainforest along the bank of the river. They also visited an indigenous village and three nature reserves near Manaus. They observed lots of wildlife including spectacled caimans, green iguanas, Amazon tree boas, many species of birds, river dolphins, sloths, and monkeys. Dr. Hayes and a local missionary, Stephen Horvath, are collaborating on a research project studying the use of floating vegetation by birds.

In July 2014, Dr. Hayes and Dr. Scott Herbert took a group on a trip to Alaska, where they enjoyed traveling through magnificent landscapes by motor home and bus, riding on a ship out in the ocean, hiking in rugged terrain, and even engaging in some technical rock climbing and whitewater rafting. The highlights of the trip included watching salmon spawn while wading in a frigid river and seeing a variety of marine mammals, including Steller sea lions, sea otters, Dall’s porpoises, humpback whales and killer whales; a variety of seabirds including clown-like horned puffins; and a variety of terrestrial mammals including grizzly bears, moose, caribou, and Dall sheep. They also enjoyed viewing tons of ice calve off a rapidly receding glacier into the ocean, hiking to a spectacular waterfall, and gazing at majestic Mt. McKinley.

In 2015 Dr. Hayes will return with students to the Amazon River during spring break, and Professor Wyrick will teach field biology during the summer at Albion. Dr. Hayes and Herbert plan to lead another trip to Alaska during the summer of 2016.

BIOLOGY CLUB

This year the Biology club has reached even more students through its participation in several campus-wide programs. New students started signing up as members the week before school began. The club’s Fall Fest booth combined a photo shoot where students posed with Dr. Neis’ (nonmonrous) snakes and a planet at various PUC faculty members who volunteered for the job. Additionally, the club helped with pre-veepters at Dr. Backl’s Sanum’s home, where students mingled with friends and faculty alike. Mrs. Sung’s home-made Korean food was the highlight of the evening. Nearly 40 students enjoyed a weekend at Albion at the end of January. In the spirit of biology, students hiked to a waterfall, watched passing whales at Pt. Cabrillo lighthouse, enjoyed Glass Beach and the numerous tide pool animals. Many students also woke up early each day to canoe or kayak up the Albion River. Biology Club plans to do even more in winter and spring quarters.

UPDATED BIOLOGY OFFICE

Over Christmas break the biology office was modernized. The office space was looking drab and a bit cluttered. The purchase of a new desk, several work tables, and some wall art has spruced up the area. We have a more professional space to work in and invite you to take a look when you visit.
Lily Hufmann spent a lot of time working on the Pisco Formation.

I am Lily Hufmann and I am a Senior biology major. I plan to teach at the secondary level.

What did you do? I participated in research studying the geologic layers of the Pisco Formation. We collected rock samples containing coccoliths, which are calcium carbonate microfossils. I helped to prepare and label samples in Whirl-Pak bags for later uranium-thorium dating. The purpose of this research is to determine the geologic age of the layers of the Pisco Formation.

Where and when did you do this work? My research experience was through Loma Linda University. It was for two weeks in July 2014 in the Pisco Formation near Ica, Peru. I worked with Dr. Kevin Nick, an LLO geologist and several LLO graduate students.

What did you learn? I learned that fieldwork can be challenging. The Pisco Formation is composed mostly of sedimentary rock. When climbing up steep mountains, it felt that for every two steps I took forward, I slid one backward. I also learned a lot about geology. The last time I studied geology was in high school. During the trip I learned that scientific data and general chemistry probably helped me the most.

Why are you here? I graduated with a biology degree at Pacific Union College in 2014. I plan to work as a physician's assistant.

Matthew Cowans
study of the abundance of coccoliths in the Pisco Formation.

What did you do? I studied the abundance of coccoliths in the Pisco Formation. I used a microscope to count the number of coccoliths in each sample.

What did you learn? I learned about coccoliths. I had never heard of them before. I learned that coccoliths are small, single-celled microorganisms that live in the ocean and are important to the food web. I also learned that coccoliths are used in radiocarbon dating to determine the age of the Pisco Formation.

Brandon Painter studied the association between different threat levels and life history traits in the coral reefs of Kosrae, Micronesia.

I am Brandon Painter and I am a Senior biology major. I am passionate about medicine and will continue on to medical school to specialize in orthopedics.

What did you do? I worked on a project studying the associations of the small shrimp Ampharopus bulbifrons and anemones. I measured the abundance of shrimp and anemones at different locations in the coral reef. I also measured the size and shape of the shrimp and anemones to understand how they interact with each other.

What did you learn? I learned that scientists need to be patient and persistent. It takes a lot of time and effort to collect and analyze data. I also learned that scientists need to be careful and accurate when handling and collecting data.

Kristine Maxam studied the impact of sea anemones on the overconsumption of shrimp in the coral reefs of Kosrae, Micronesia.

I am Kristine Maxam and I am a Senior environmental studies major. I plan to do wildlife and plant conservation.

What did you do? I surveyed invasive plant species within the boundaries of Fort Greenly, a 265 acre military installation southeast of Fairfield, Alabama. I walked 10-15 miles a day locating invasive plants (weeds) designated by a priority invasive plant species list. I estimated the population size, recorded the location (using GPS), and noted the type of environment (i.e., animal related, roadsides) for each occurrence.

When and where did you do this work? My internship lasted for two and a half months, from May 1st to August 3rd. I worked on this project in Alabama at Fort Greenly.

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How did your experience at PUC help you prepare for this opportunity? The Biology Dept was very pleasant and helpful. I was able to do research in my field of interest. I was able to interact with other researchers and learn from them.

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A few examples of what faculty members are up to outside of their classroom and other campus responsibilities.

**BACIL SUNG, M.D., P.H.D.**
Summer is very special to me because I have traveled to Africa, Central America, and Asia. In summer 2015 I plan to go to visit Northeastern Asia. For me, summer is the time to share the love of Jesus with people whom I have never met before. During these mission trips I prescribe medications, perform surgery to remove masses in the skin, and instruct patients about how to improve their health condition. I have even come across a handful of patients with congenital heart disease who require urgent open-heart surgery and have helped these patients to find an NGO to provide the surgery as well. These trips are not easy and certainly exhausting, I participate in these mission trips to keep a promise that I made 20 years ago as a medical student. Seven years ago, my cousin asked me whether I had been on any mission trips to Africa. I felt ashamed when she asked this question because she knew how hard I had struggled in medical school. As a medical student, I told her that if and when I became a doctor, I would go on mission trips and provide medical care. Unfortunately, I forgot this resolution after I earned my degree. Following medical school graduation, I kept busy finishing my Ph.D. program in Seoul, Korea, and then postdoc in Minneapolis and Boston. Suddenly seeing my cousin and hearing her question wounded my heart. I was humbled because God had answered my prayer to become a physician, yet still forgave my “amnesia” about the broken promise to help people in need.

I prayed to God to find a mission oppor-
tunity that same year. My prayer was soon answered when I found a group that was going to Awassa, Ethiopia. During this first mission trip, I had many exciting experiences such as removing a mass on the scalp of a patient who had a difficult time lying on his back, learning about different cultures and various tribes, and making friends with the locals. Since then, I have been to Kenya, Haiti, the Dominican Republic, the Philippines, and Bangladesh.

I value the patience of God as He waited for me to remember and set on my mission trip pledge. In my day-to-day job as a biology professor I get to instruct students inside and outside of the classroom – academically and spiritually. It is a blessing to also have the opportunity to spend my summer vaca-
tion fulfilling my promise to God, practicing medicine, and helping those in need.

**JOHN DUNCAN, PH.D.**
We expect that our alumni and current students understand how diverse the subject of biology is. This science includes the study of living things, those with backbones, to those without bones at all. The varying fields taught under the umbrella of biologi-
cal science include topics concerned with organisms and habitats in our environment: marine science, animal behavior, and flower-
ing plants. Additionally, the department teaches health-related topics concerned more with the human organism: neurophysi-
ology, anatomy, and histology.

The diversity found in the subject of biology is also reflected in the dedicated and talented faculty who teach in the department here at PUC. Within the department you can find interests and research including snake venom, tarantula genetics, the Lake County grebe colony population, cancer, rare plants, and jujitsu.

At this point you may be experiencing a similar feeling to when you were reading one of Professor Wyrick’s multiple-choice ques-
tions. You know the answer should be “all of the above” but then you can’t help but look at just one thing that just doesn’t seem to fit. So after reading the question that should have had an “easy” answer, you are left wonder-
ing, “What did I miss?” It’s that last subject, jujitsu, that has you scratching your head and asking, “Really?” How does jujitsu fit into the study of biology? I know Academic Dean Nancy Lencourt must have had the same slightly stunned look that you may be wearing now when she was first approached for support for this faculty development.

For the past several years, I have been doing jujitsu as a way to fulfill a lifelong in-
terest in the martial arts. At this point, I am studying Dandan Ryu Jujitsu. This martial art has philosophical principles set down by its founder, which require that the study of this art should lead to the development of the entire person to benefit oneself and those around you. These principles allow for the principle of yin and yang; if you train in the martial side of the art that can potentially cause harm, then you should also train in the healing side of the art. This mentality mirrors PUC’s mission: seeking wholeness and healing. Though I may not have an “easy” answer, you are left wondering whether I had been on any mission trips to provide medical care. Unfortunately, I forgot this resolution after I earned my degree. Thus, Adventism influenced the development of Seifukujitsu, and much of Chinese medicine’s emphasis on the perspective of a culture that has studied medicine practiced in China as early as 2696 BCE. Hopefully as you have read this, you can see that the department of biology maintains a diverse set of classes and continues to explore new ways of understanding the life around us and our interaction with it. Ad-
ditionally, we continue to examine differing perspectives in order to understand a memorable trip.

**BRYAN NESS, PH.D.**
I periodically receive requests to preach at churches in the Bay Area on the topic of origins and intelligent design, but usually this represents a drive of just an hour or two to reach the church. This last summer, to my surprise, I was invited, relayed to me by a PUC biology alumnus, to travel to the SDA Church in Whitehorse, Yukon Territory, Canada. The church has a strong community presence and often has as many non-
members attending as members.

I gave three presentations, two of which were to be held in a convention space in a local hotel, so that nonmembers would feel more comfortable attending. As with all such ventures, the pastor was concerned that not enough people would attend, but the meetings ended up being more successful than expected. A majority of the seats were filled and about half of those in attendance were not church members. The topics included the origin of life and intelligent design. A ques-
tion and answer period at the end of each presentation showed a strong interest in the topic of origins. Even the presentation given for Sabbath morning services at the church was well attended, so the pastor and local congrégation were pleased with the success of the meetings.

While there I was also able to visit with several PUC alumni. My wife, Judy, accom-
panied me on the trip and after the weekend series we traveled around the Yukon and parts of Eastern Alaska, which was a delight to us since we both have an avid interest in Klondike gold rush history. Since the trip was in late August and early September, we were also lucky to see the first display of the aurora borealis of the sea-
son from the shore of the Yukon River in Eagle, AK. It was truly a memorable trip.

**COLLEGE COURSES AT ALBION**
The past year has been a time of change at the Albion Retreat and Learning Center. For the first time in many years, the painting and digital photography workshops were canceled in summer 2014 because of low en-
rollment. Even though we attempted to or advertise the courses, especially to the col-
lege community, few people showed interest. We made a decision in early June based on the confirmed registrants, and there weren’t enough to make it cost effective.

A success was the return of a traditional college course at Albion. This past summer 2014 Biological Foundations (BIOL 113) spent a week in August at Albion. Morn-
ings were dedicated to lecture. The class met in the Field Lab building where they could look out the windows and see the Albion River. The lab activities focused on local insects, plants, and salamanders. For a week at Albion is now part of the summer BIOL 113 curriculum.

We are excited to offer two related college classes in summer 2015. Eco-theology (BELT 240) will be taught by Floyd Hayes and Field Biology of Coastal California (BIOL 235) will be taught by Aimee Wyrick. These classes are appropriate for both the general and science students. In addition, each class fulfills a different general education requirement. Eco-theology examines the relationship of religion and nature while Field Biology studies the unique plants and animals that live along the northern coast of California. The hope is that a set of general education classes will be taught each summer at Albion on a rotating schedule.