VACATION? Definitely Not.
Life-changing and Eye-opening? Absolutely.

WHAT'S INSIDE...

SCIENCE CENTER
PROJECT MORE THAN HALFWAY THERE

READY TO MAKE HIS MARK, BUDDING RESEARCHER PREPARES FOR LIFE OF SCIENCE

CAPPING CARIES IN KIDS: DENTIST’S VOLUNTEER SERVICES IMPROVE YOUNG LIVES
Albright College began construction on its new Science Center in spring 2008. The project is adding more than 41,000 square feet of state-of-the-art lab space to the existing Merner-Pfeiffer Hall of Science, which will be renovated, for a total of more than 78,500 square feet. The new-construction phase of the project will be completed this summer, while the renovations to the original building will be finished in spring 2011.

Karen Campbell, Ph.D., the P. Kenneth Nase, M.D. ’55 Chair of Biology, has helped guide the project since its inception. Fusion sat down with Campbell to discuss the building and what it means for Albright and its students.

Q&A

Fusion: Why did Albright need a new Science Center?

KC: The science faculty looked at how we engage students in the process of doing science that involves a lot of independent work. Our students could do that work only in the summer because we didn’t have a lot of independent research space. So that started the quest for space. We also looked at how we teach science in the classroom. Traditional labs had forward-facing benches, and there was much more lecture instruction. Today’s students do more group work at tables where they can collaborate with each other, because that’s how we do science. So we want to mirror that in the classroom and the labs.

There were also physical constraints. We’ve been very good at acquiring current instruments for our students, but we were running out of places to put it. One year we reached a point in chemistry where we couldn’t plug things in or we’d blow a circuit. It kept escalating, and it finally became obvious that there was a real need.

Fusion: How has the project affected classes and office hours?

KC: There’s been some noise and a little disruption of classes, but we’ve worked around it. IMC (the construction manager) and the people who work for them are amazing. We can give them a schedule telling them when and where we have classes and they won’t work in that area. They have a job to do, but they recognize that we do, too, and we’ve made it work pretty well.

Fusion: Why is lab work such an important part of the curriculum?

KC: We work very hard to show science majors and nonmajors alike that there’s more to science than just memorizing things. It’s a way of learning about the world, and you can become engaged in that process even if you’re not a science major. You can ask a question about something and then rephrase it as a hypothesis that you can test and gather evidence about. You have to do that to really appreciate it, so it’s very laboratory-driven.

Fusion: Why are non-majors required to take at least one laboratory science course?

KC: Part of the philosophy of the sciences is that the natural sciences provide a way of learning about the world that is distinct from the way students learn in the humanities and social sciences divisions. It’s not completely different, but we’re very focused on gathering information and formulating and testing hypotheses, processes that allow students to see whether something works.

Fusion: How will the new Science Center support interdisciplinary studies at Albright?

KC: By its very nature, science is interdisciplinary. For example, biology majors have to take chemistry, because the two are so intertwined. It will allow us more space to improve on interdisciplinary programs such as environmental science and crime & justice. It will also allow us to expand our contributions to existing programs, including microbiology.

Fusion: What science-minded students look at when considering Albright?

KC: Students are impacted by our instrumentation, our research projects and our buildings. We also go out of our way to make sure that students meet faculty from the beginning, and I’ve talked to many students who came here because of the faculty.

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Fusion: How will the new Science Center enhance the teaching of science at Albright?

KC: All of the equipment we use for research we also use for teaching. So students learn at least the basics of how to use different instrumentation and how it’s employed and what it does. Sometimes being able to incorporate that into the next step involves more independent research or an advanced class. For example, in an introductory course, students will learn how to use the electron microscope and how to prepare tissues for microscopy. Then they can take an advanced course in scientific imaging to see more applications of those principles. Some students will also use the instruments as part of an independent research project.

Fusion: What are you looking forward to most once the Science Center is complete?

KC: I’m looking forward to having a building that I’m proud of. We’re proud of the program, we’re proud of the students, we’re proud of the faculty and the type of education we offer. The building that houses it all is beautiful on the outside, and now we’ll be proud of the inside, too. n

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EACH WINTER, two-thirds of the North Pacific’s population of humpback whales journey to the waters around Maui, Hawaii, to mate and give birth. That’s why, since 1986, Marsha Green, Ph.D.’63, president of Hawaii’s Ocean Mammal Institute, has taken students there during interims for an ongoing field study of the effects that boating have on this endangered species.

Students taking Green’s general lab studies course, “Protecting Endangered Species: Field Study on Marine Mammals – Hawaii,” also explore other marine environmental concerns, including whaling, global warming, chemical pollution, noise pollution and over-fishing.

The data Green’s students collect has been put to use to protect the whales from human interference. For instance, research conducted on the 1989 trip helped pass a law banning parasail boats from December 15 to May 15, when whales are in the area. The law was passed after Green presented the Hawaii state legislature with data showing that the boats disrupt the whales’ mating and birthing habits.

Sophia Schuster ’12, an environmental studies and political science concentrator from Wyomissing, Pa., made the trip to Hawaii as part of Green’s course earlier this year. Following are her impressions of the experience.

CAPTAIN RYAN was talking about the history of humpback whales in Hawaii when I happened to look over his shoulder. At that moment, two humpback whales breached. Despite all of my training, I was rendered speechless. Never before had I seen anything so beautiful. All I could do was point and hope that my meaning was understood.

Few people are given the opportunity to travel to Hawaii, let alone research humpback whales during their annual journey there for their breeding and mating season. Even more than that, few people get such a great opportunity to comprehend the insignificance of their own size and the magnificence of the world around them.

For those of us from Albright College, every day was a new experience that demanded our constant attention. And it didn’t take long for us to realize that this was not a vacation. Four hours of field research every day, two hours of night classes, and between four and five hours of data compilation left little time for daydreaming.

During each day’s four-hour field research session spent on the Pa‘i, an area of cliffs overlooking the ocean, one person worked with the theodolite (a surveyor’s instrument with a 30 power telescope), three people used binoculars, and one person collected the data. Whenever we located a pod of whales we would track their location as well as their behaviors, focusing on their reactions to the various boats, which ranged in size from kayaks to large whale-watching ships.

On average, the whales tended to stay underwater longer when boats were near, indicating that they avidly avoided the boats if they could. To gain a better perspective, it is important to understand that sound is amplified and travels much faster in water than it does in air. Unfamiliar noises, especially loud ones, have the potential to cause great amounts of stress.

Most college students are aware that stress can have a negative impact on their health. After all, it’s no coincidence that we tend to get sick at the worst possible times.

The same is true for the humpback whale. Studies have shown that increased stress caused by boat noises and staying underwater longer could compromise the whales’ immune systems and alter their reproductive behavior.

Noise pollution, however, is not the only threat to the whales or the oceans. Today, both face challenges on multiple levels. Some countries, including Japan and Norway, still barbarically slaughter whales and dolphins, justifying their actions as attempts to keep their cultures and traditions alive.

Krill, a major source of food for a variety of marine organisms, thrives in cooler waters. Therefore, increasing water temperatures affect the availability of nutrients for many along the food chain.

The humpback whale, an endangered species, is being attacked from all sides, with all of these conditions posing serious threats to their survival.

My final observation may come as a shock, but I believe that one of the most glaring errors we make as human beings stems from our decision to take wild animals captive. When we take hostage the free who live on this planet, we jeopardize their lives for the sake of our own pleasure. After all, it has been statistically proven that animals in captivity, as they are at Sea World, have shorter life spans than those in the wild.

I doubt very much that many individuals consider the impact that their decision to board a whale-watch boat or attend a show at Sea World has on the whales and other sea creatures. In fact, I have been one of those individuals. That said, I also doubt very much that many individuals consider the consequences of their everyday actions on the world around them. Supposedly the most intelligent creatures on this planet, we tend to forget that we share it with others who also have extraordinary capabilities in terms of mental capacity and survival.

When I signed up for the class with Dr. Green, I knew that I would be studying the humpback whale. I did not know, however, that my perspective on the world would change entirely. I did not know that I would feel such a strong, basic attachment and love for the subjects of my study. And, most importantly, I did not know that my life would be changed forever.

With that, I implore you to look at yourself, go outside, look around you, and realize how small you truly are. Then, and this is the most critical part, realize how much power and potential you have, as a single human being, have. I ask you to use your hands and your mind for the benefit of our world for future generations and for our fellow inhabitants as well.

Heaney counsels a quote from Rico O’Barr, a former dolphin trainer who’s now a leader in the fight against the captivity industry, who said, “You’re either an activist or an inactivist.” I ask that you be the former.

Above, Sophia Schuster ’12 uses a theodolite to locate whales. Photo courtesy of Sophia Schuster.
Capping caries in Morristown Hospital, Morristown, N.J.

Liberal arts college with a strong science program. He's also served two internships at a chemical company, he's completed an internship Albright Creative Research Experience (ACRE) project, he's assisted Hamann with his research, and he's presented his own research at the National Conference for Undergraduate Research, the National Organic Chemistry Symposium, and a National American Chemical Society meeting.

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BRAIN TEASERS

Time to brush up on your knowledge of physics. The first 10 readers to submit correct answers to the following questions will receive a prize! The answers will be provided in the next issue.

Q. What non-metallic element named for an ancient Greek deity found extensive use in photocopying machines?

Q. Before the development of the modern wave-particle theory of light, wherein the term "photon" has become predominant, what term was commonly used to refer to light "particles"?

Q. Where does the PE of a spring tied in compressed state go when dissolved in acid (ideal conditions)?

Q. You place a cup half full of water on a scale. If you put your finger into the water without touching the sides or the bottom of the cup, will the scale read a different weight?

Q. Protons are the positively charged particles in an atomic nucleus. What are protons made of?

Q. In 2001, scientists discovered that neutrinos, tiny particles given off by fusion in the sun, can change from one type to another. What did this prove about neutrinos?

Answers may be e-mailed to rshade@alb.edu or submitted via the Albright web site at www.albright.edu/fusion.

Brain Teasers Answers, Summer 2009


Q. Alchemist Hennig Brand attempted to isolate gold from urine, but instead discovered which element? Phosphorous

Q. To what class of drugs do oxycodone, heroin, and morphine belong? Opioids

Q. What is the resin identification code (“recycling number”) for polyethylene terephthalate? 1

Q. The supercritical form of which substance is used to decaffeinate coffee? Carbon dioxide

Q. What chemical agent did terrorists release into the Tokyo subway system in 1995? Sarin

Q. Apart from its use as an explosive, what other use does nitroglycerin have? It’s used to treat heart failure and angina.