UBRP STUDENTS PARTAKE IN THE SAGUARO HARVEST

It tasted nothing like chicken. I was quite relieved, really, I mean how often does one get to taste something new that is not at least vaguely reminiscent of the omnipresent fowl? The saguaro fruit that the Tohono O'odham people have harvested for generations looks something like pureed strawberries once the outer sheath is peeled away. They taste like kiwi fruit, but not nearly as sweet. How, you ask, was I, a mere university student, allowed to partake in such a rare culinary experience as this? Well, I just signed up for the saguaro harvest trip and showed up at Life Sciences South after work on June 28.

About 20 other UBRPers, outreach program participants, Dr. Sam Ward, Carol Bender and I set out for the Arizona-Sonora Desert Museum in the always interesting, albeit unpredictable and creepy, University vans. We picked up several docents from the museum and then pressed on in the aforementioned van to the Tohono O’odham harvest camp. Not much to look at, but elegant in its functionality. The docents and our Native American hosts wasted no time in getting us acquainted with the tools of the trade. The fruits (which grow at the top of the arms and the central trunk) are harvested with a long pole topped with a mesquite barb that is used to pull the fruit into the second tool of the trade, a really big plastic bucket. The harvesting poles (kuibits) themselves are made from two saguaro ribs wired together near the ends to make a surprisingly light and maneuverable implement about fifteen feet long. I thought it was great that they used a tool made from the very crop they intended to harvest, a kind of Zen-conservationist fantasy come true, but I digress.

The waning daylight permitted no further delay, so we and our guides set out into the desert in search of fruit. We did not harvest near the camp because the blooming saguaros are a beautiful sight, and the harvesters wanted to keep the camp looking good since they would be there for some time to come. We split up into groups of six or seven, each with a guide. The guides made the task look exceedingly easy. The Tohono O’odham woman deftly plucked all the ripe fruit from a tall saguaro while her son, Jordan, the designated bucket-toter, caught all the falling fruit in the pail. No problem. Now it was our turn. I decided that going right for the harvest pole might be a bit aggressive, so I grabbed the bucket and took over for the able Jordan. A fellow UBRP student seized the pole and began bludgeoning the cactus. I marveled at her lack of technique; surely I would do much better. She knocked a big clump of fruit off the cactus, and I attempted to catch it. It hit me squarely in the forehead. Jordan laughed, marveling at my lack of technique. It was much harder than it looked. Really. It was. I swear. Okay, I'm making excuses to avoid the public humiliation which ensues after displaying my startling ineptitude for all to see, but again, I digress.

We harvested for about an hour, and everyone was allowed to try - even the startlingly inept. We arrived back at the harvest camp and the brave of heart set to shucking the fruit, keeping the fleshy, sticky, red fruit and discarding the husks. The sun set over the mountain to the west, silhouetting the desert and accentuating the red highlights in the western sky. Lightning flashed in the distance, but somehow I knew it would not rain. The view was truly breathtaking, and I
could see why the harvesters left the cacti near the camp undisturbed. The saguaros stood against the twilight sky, like shadows, an almost imperceptible blush of red crowned the top of each arm. We all talked as dinner was set out on a nearby picnic table. The fry-bread alone was worth the measly five bucks we each paid for the voyage, and the warmth of the setting where we ate it was priceless.

The evening wound down with our Tohono O'odham hosts showing us the final stages of the preparation of the fruit into a thick syrup which is used on fry-bread and such, and also used to make wine and jelly. Most of us looked on as a few lucky individuals got to squeeze the juice out of the sticky, sweet fruits - an activity not unlike grape-stomping, excepting, of course, that one uses the hands and not the feet to "stomp." After that we said good-bye to our gracious hosts and climbed back into the clunky vans. Dr. Ward drove Gates Pass Road with his eyes closed. I guess you get to do that stuff when you're a department head and the van could not have cost more than ten bucks when it was new fifty years ago, so it really was not that tricky when you think about it. Anyway, with my skillful verbal cues and his lightning reflexes, we got back to the University in record time, and with only minor damage to the creepy old van of doom. The trip was great! If you did not go, you should have. If you did, well hey, let's do it again sometime.

_Eric Vens, UBRPer in Dr. Xiong's Lab_

**HOW MANY WAYS CAN YOU ENJOY A SAHUARO FRUIT?**

You start by making the sign of the cross over your heart or on your forehead with the pulp of the first fruit you harvest. This will ensure that the rains will come this year and the harvest will be plentiful. In addition to the little ceremony, Stella, a Tohono O'odham member, gave us a crash course in how to collect the fruit off the top of the giant cactus. Armed with buckets and sahuaro rib poles, we headed into the sahuaro forest. As soon as we got the technique down, the bottom of our bucket turned into different colors, shapes, and textures. Her is where all these wonderful, tasty options started.

During the sahuaro season the fruit goes through several stages of ripeness. The first one is when the tip turns pink. At this point the fruit hasn't opened, but the color tells us the inside is red, and we can eat it. This stage is not everybody's favorite because it is not quite sweet. The next stage will be when the fruit opens. The pulp has been exposed to the sun, so it has gotten a little sweeter. I would consider a third stage when the fruit is completely open like a flower. Now the pulp has been open for one day or more, and the natural fermentation process has made the fruit even sweeter. Fourth, somebody comes and adds a little formic acid flavor; yes, ants start visiting the ripening fruit. I, personally, think that if you don't eat a few ants in the process, you have not experienced the real Sahuaro fruit taste. Option number five is my favorite -- the ants have come and gone, and the blasting sun has completely dried out the exposed pulp. The hundreds of seeds have glued to the pulp, creating a natural, hard candy. Sometimes the fruit will stay attached to the plant and sometimes it will fall to the ground, where several creatures like coyotes and javelinas will take advantage of such a gift.

Back in the camp, we gathered to hear instructions from Stella and learn the process of five more ways to enjoy this fruit. Some of us volunteered to take the husk off and mix the pulp in a bucket. There was not enough time to see the final product because Stella told us that the pulp, juice and water should sit over night. The next day, the juice should be strained a couple of times and boiled for a few hours. Then you will have sahuaro syrup. The syrup will taste very different from the previous stages of the fruit previously mentioned. At this point, the seeds and pulp can be separated and the pulp boiled down into a delicious jam for toast, pastries called "empanadas" or turnovers. The dried seeds without the pulp will still be an attractive candy for the kids. The last option, which requires a longer process and is exclusively for ceremonial use, is the making of wine—a fermentation process of the juice. Every year, Stella provides her share of juice for the
reservation's annual feast to bring the summer rains to the Sonoran Desert.

This is just a glimpse of what it takes to keep the Tohono O'odham culture and traditions alive. Next year when the hottest and driest part of the summer comes, Stella will also come and start the harvest all over again.

_Jesus Garcia, Outreach Participant in Dr. Papaj's lab._

**DESERV MUSEUM REVISITED**

UBRP took the Desert Museum by storm on Saturday, June 11. Nearly 30 persons met in the parking lot of Life Sciences South at 7:20 a.m. to take in one of the ten best museum/zoo's in the country. Jesus Garcia, currently in one of the summer research programs derived from UBRP and former Desert Museum staff person, gave us a quick overview of what we were to see. Then we were off to the Museum, via Gates Pass (much to my chagrin, since I was driving an aging UA van that had a lot of "play" in its steering). Safely deposited at the Museum, by 8:15 a.m., Jesus continued the narrative. He covered flora first, pointing out saguaro cactus, creosote bushes, and other native vegetation. We then moved on to the fauna, visiting the hummingbird aviary, the small cats exhibit, the bighorn sheep, the prairie dogs, the cotamundis, the javelina, the deer, the bears, the coyote, the kit fox, the mountain lion, and more. We finished up in the cave, where Jesus pointed out the unmarked door to the Desert Museum geology staffs' offices. A few intrepid individuals continued on to the snake exhibit while the rest of us made for the gift shop. On the return trip, everyone was in agreement that Jesus had given us the very best orientation to the Desert Museum that we have ever had.

I couldn't help reflecting, as I read off the list of names when UBRPers go: back on the vans, that a year ago Ali Baradaran and Huy Phan were on the trip. This year, we had Dawood Baradaran and Hoang Phan....does UBRP run in families I wondered? After all, Josette's younger brother Jeff is now in UBRP, and UBRPer Jeff Ludwig's older brother Chris Ludwig was a UBRPer.

Currently, both Katherine and Meredith Lee are in the program. In time we expect HSBRAPers, Marlene and Margie Uswandi, Shane's younger sisters to participate, and then there is Denice Warren and her younger sister former HSBRAPer Audrey Warren. It's something to ponder....

In the meantime, don't forget to sign up for the remaining summer 1994 field trips--there are some good ones!

**HSBRAP TRIP TO PHOENIX**

On Saturday, June 25, members of the HSBRAP group traveled to Phoenix to visit the Heard Museum and the Barrow Neurological Institute.

Our first stop was the Heard Museum. It was informative and enlightening. We viewed displays of geography, lifestyles, and customs of the many Native American tribes in the southwest. My favorite display was of poetry about the struggles of the modern Native American people. What was unusual about this particular display was that the poetry was written directly on the walls -- the stark white of the chalk contrasting dramatically with the black of the walls. Even though we had an hour and a half at the museum, we still did not get to view all the galleries. Nevertheless, I would recommend the Heard Museum highly as one of the most interesting museums I have ever been to and one of the most unique.

After a brief stop for lunch, our group went to the Barrow Neurological Institute (BNI). Dr. Adrienne Scheck spoke on oncology and the proliferation and growth of cancer cells. Not only was Dr. Scheck extremely knowledgeable about her field of study, she was able to explain the most complex of concepts in a few, easy-to-understand words. She allowed us to ask questions and took us on a tour of her lab. We were greeted by many smiling faces as we were told enthusiastically about various projects. The visit to BNI was a great way for me to explore a different environment and field that I didn't know much about. I was also made aware of the opportunities to participate in several programs at BNI. All in all, our field trip to the Heard Museum
and the BNI was a pleasant diversion as well as a great learning opportunity.

Lucia Nurman, HSBRAPer in Dr. Laird's Lab.

BIOSPHERE TOUR SCHEDULED FOR JULY 9

Ever wonder just what is going on at the Biosphere II Project in Oracle? Want a first hand look? Well here's your chance! Participants in UBRP and related outreach programs will visit the Biosphere II on Saturday, July 9. The tour is restricted to the first 35 individuals who sign up (in LSS, 527).

We will gather in the parking lot south of Life Sciences South at 7:45 am and leave at 8 am, returning to campus by 2 pm. The cost for admission for our group is $3.50/person to be paid to Genevieve or Carol in the UBRP Office no later than July 7. This promises to be an interesting day!

UPCOMING EVENTS

JULY 6 3:30 PM HSBRAP CLOSING CEREMONY FCR 202

JULY 9 FIELD TRIP: BIOSPHERE II PROJECT ($3.50; sign up in the UBRP office)

JULY 13 UBRP SEMINAR
4:00 PM "ENVIRONMENTAL ETHICS"
CBS 216

JULY 16 FIELD TRIP: BUENOS AIRES EXPERIMENTAL STATION (sign up in UBRP Office)

JULY 19 10:00 AM TOUR OF UMC ARTIFICIAL HEART LAB
AHSC, 5505 (sign up in UBRP Office)

JULY 20 10:00 AM TOUR OF UMC ARTIFICIAL HEART LAB
AHSC, 5505 (sign up in UBRP Office)

AUGUST 10 BIOLOGY BRIDGE
2:00 PM CLOSING CEREMONY FCR 202

ETHICS SEMINAR A BIG HIT!

It was a full house for the Wednesday, June 22, seminar. Faculty, students, and friends crowded into CBS 216 to discuss the "Ethics of Gene Therapy." Some even sat in the aisles to listen attentively as knowledgeable panelists presented their viewpoints. Patricia Baumann, UBRPer in Dr. Tolbert's lab, served as moderator for the event and began the seminar with an eloquent introduction of each speaker.

Dr. Thomas Lindell, Associate Professor in Molecular and Cellular Biology, began with an overview of ethics. He mapped out four ethical "yardsticks": Autonomy - self governing, self directing, without outside control; Non maleficence - do no harm; Beneficence - do good for others; Justice - fair, equitable, and appropriate treatment.

Leslie Pettijohn, graduate student in genetic counseling, defined genetic counseling as a process by which patients are informed about the possibility of a child being born with a genetic defect, the availability of testing for genetic diseases, and the related risks. Ms. Pettijohn emphasized that genetic counselors do not advise parents, but provide them with as much information as possible so they can understand their situation and make their own decisions on what course of action to take. She explained that every couple has a minimum of a 3-5% risk of bearing a child with a genetic defect, but for some couples it can be as much as 100%. No couple has a 0% risk of having a child without any genetic defect. Ms. Pettijohn went on to discuss causes and incidences of major congenital malformations and the techniques used to determine if a child has a genetic disorder. She finished by posing several questions to the audience such as: Should all tests be available to everyone? Does society have a right to intervene with a mother's pregnancy?
Steven Rosinski, UBRPer in Dr. Gerner's lab, shared his personal experiences in living with a genetic disease called osteochondroma. Steve has undergone 25 operations to correct the growth and development of his bones. He provided insight into the problems with various health insurance plans in regards to the high costs and limits of coverage and the resulting financial and emotional strain on the patients and their families.

Dr. Lindell pointed out that correcting genes so as not to express a genetic defect cannot be done at this point in time. He explained that so far DNA can only be randomly inserted into cells and this random insertion could effect expression of other genes. However, just the possibility of scientist being able to manipulate genes sometime in the future raises many concerns ranging from whether it should be done at all to the fear of creating a "master race."

The seminar stimulated a lengthy discussion which was carried over to Z's pizzeria. Thanks to everyone who participated in this fun and informative event.

*Cynthia Gentry, UBRPer in Dr. Van Antwerpen's Laboratory

ENVIRONMENTAL ETHICS SEMINAR IN JULY!

The next UBRP-sponsored ethics seminar is scheduled for July 13, 1994, at 4 p.m. in the CBS Building Room 216. T.J. Harrison and Laura Key will lead a discussion entitled "Environmental Ethics: 'Is It OK to Eat Bambi?' and Other Ethical Decisions." The topic covers how we make decisions and why we make decisions regarding wild plants, animals, and ecosystems. The discussion will focus upon many real-life conflicts involving local, national, and international events.

T.J. Harrison is the environmental attorney for the City of Tucson. He chairs the Commission on the Arizona Environment, a state agency created by the legislature. Laura Key is the park manager of the Oracle Center for Environmental Education. She is also president of the Arizona Association for Learning In and About the Environment (AALE). She earned her M.S. in Ecology and Evolutionary Biology from the U of A in 1983.

This promises to be an engaging and though-provoking session, so bring your friends and lab cohorts. See you there!

TIME FLIES FOR OUTREACH PARTICIPANTS

Summer "vacation" seems to pass quickly for most people. Outreach participants test how quickly when they experience our five- and ten-week summer programs. Not only do HSBRAP, Bridge and NUANA-UBRP students work full-time in research labs, but they must also complete projects reflecting the results of their endeavors. They communicate these results on a weekly basis during discussion group meetings and at the end of the program via a written paper and an oral presentation (a.k.a. what I found this summer in 5 minutes). Students will present their work at the closing ceremonies on July 6, 1994, at 3:30 p.m. and August 10, 1994, at 2:00 p.m. Both will be in room 202 of the Family and Consumer Resources Building with a courtyard reception following. In addition, they attend the ethics seminars (see related articles) and optional field trips such as a visit to the Barrow Neurological Institute and Heard Museum (see, also, related article). Phew, so many things in one summer!!! They even get featured in the local paper (Arizona Daily Star, June 26, 1994).

UBRPers! PLANNING TO CONTINUE WORKING IN THE LAB THIS FALL ????. WE PAUSE FOR AN IMPORTANT ANNOUNCEMENT!!!!

Believe it or not, it is already time to begin planning for the next academic year. If you will not be graduated in August 1994, and would like to continue to work in your assigned lab through the academic year, this is what you need to know:

To be eligible to apply for academic year UBRF positions, you must:
* be a current UBRP student, enrolled as an undergraduate at UA in 7 credit hours or more;
* be able and willing to devote 15 hours per week during the semester to the lab; and,
* have the support of your faculty sponsor.

To be considered for one of the academic year positions, please complete and submit to the UBRP office the following materials, no later than AUGUST 1, 1994:

* an application to continue (appended to the evaluation you will receive at your local Tucson address early in July);
* a completed program evaluation on the summer's experience; and,
* a letter of support from your faculty sponsor indicating that s/he is willing and able to continue you in his/her lab through the academic year.

If you have questions about this process, or if you do not receive a program evaluation to complete by July 20, please call the UBRP office.

**LIFE AFTER GRADUATION**

Want to get a jump on the job market? Consider attending a Bioscience Job Fair sponsored by Life Science Associates. According to their ad in the May 16 issue of *The Scientist*, this organization sponsors events that bring people in the biosciences together with representatives from leading pharmaceutical and biotech firms. Baxter Healthcare, Biogen, Cytrx, FDA, Genetech, Pfizer, Syntex, and many others were among the firms who recruited from Life Sciences Associates during 1994. San Diego was the site of the June 9 fair; but if you want to travel a bit further, you might consider attending the fair on August 18 in Philadelphia; or the October 27 fair in San Francisco. There will be fairs on November 14-15 in Boston and in January 1995 in Washington, DC. For a personal invitation to register FREE, send your resume to: LSA/Department T, 2100 Embarcadero, #101, Oakland, California 94606. According to Life Science Associates, there are opportunities available throughout the US for BS/MS/PhD through Director level professionals in all bioscience disciplines. (Note from the Editor: If one of you follows through on this, please let the UBRP office know if you were satisfied with this service!)

**NEWS FROM AROUND THE WORLD**

Paul Klekotka, UBRPer from Dr. James Halpert's lab in Pharmacology & Toxicology who is working at the Karolinska Institute in Stockholm, Sweden this summer writes "Halsinger från Stockholm." Which we take to mean, "greetings!" He is, apparently, cool, since he writes that "...the weather is great, the people are nice, and the Institute is incredible!" He continues..."I am slowly learning Swedish and I am the resident English expert...which is funny because English was never my best subject." In case anyone wants to commune with someone who is not experiencing 100 degree temperatures, Paul's e-mail address in Sweden is: paul.klekotka@mbb.ki.se. Give it a try!

Gabriel Maxwell, UBRPer who works for Dr. Javier Enriquez in Veterinary Sciences, writes from the Institute of Parasitology in the Czech Republic that "the cells survived the trip and are now growing rapidly." He is acclimating to the culture and learning his way around and plans to take some Czech language classes at the University. Gabe reports that he is "looking forward to sharing all his experiences with everyone at DATABLITZ."

"Rio is spectacular," according to Teresa Isaías, UBRPer from Dr. Jose Ribeiro's lab in Entomology. Teresa is working at the Oswaldo Foundation in Rio de Janeiro, Brazil. Teresa's work is going well, and so is her Portuguese. She writes, "already my vocabulary has increased tremendously."

"I am having the time of my life doing research (National Institutes of Health, in Bethesda, Maryland) and sightseeing (Smithsonian Institute, etc.)," says Shane Uswandi, UBRPer in Dr. Naomi Rance's lab in Pathology at AHSC. Shane is excited to be among the 600 students doing research this
summer at the NIH campus, in addition to learning a new research technique.

ALUMNI NEWS

Remember Eric Jackson? Well, he writes that he is now working as a firetower lookout (that is a person who watches for fires) on Mount Union, in the woods south of Prescott. On lightening storms, Eric expounds, "There's nothing quite like sitting on a thirty foot metal tower at eight thousand feet during a storm. My chair has little glass feet to insulate me from bolts of lightening." Perhaps as a way of enticing some of us to visit, Eric mentions that the high temperature this week was 78 degrees!

Kimberly Horn reports that she is "alive and well," after seeing her name on the lost alumni list in the last issue of the Gazette. Since graduation in December 1992, Kim has been traveling and working for Pima County Home Health providing in-home care. She is excited about beginning medical school this fall at Dartmouth.

MOVING??

If you to move, please send us your new address and phone number. We want to keep in touch with you to inform you of new program developments and to keep you in touch with fellow UBRPers. So, if you have any updates or changes, let us know!

THANK YOU, THANK YOU

Thanks to all of you for your contributions to the UBRP Gazette. Your creativity was greatly appreciated. We will gladly accept your contributions at any time, however, they must be submitted on or before the 15th of the month in order to get them published in the next month's newsletter. Please keep up the good work and continue to send us your letters, articles, opinions, poetry, etc.