Lessons from Snails

But snails can also teach us quite a bit about treating obesity and drug addiction.

Say again?

On the surface, ASU neurobiologist Richard Satterlie’s scientific studies might seem irrelevant to human life. He studies the organization of nerve systems—primarily, the systems found in a swimming aquatic snail called Clione limacina. The squishy little critter is technically known as a “pteropod.”

Satterlie studies these snails because their nerves are large and easy to observe. It also is easier, cheaper, and less problematic to do nerve studies on snails than it is to do them on higher animals or on people. The ASU scientist’s research is far from trivial. After years of work, Satterlie and his colleagues can now recognize that snail nerves are organized in groups that control certain functions, or “circuits.” These circuit modules combine to work with other circuits and sometimes take on very different functions.

Satterlie says that it is somewhat like different instruments playing in different ensembles. A clarinet, for example, would be more likely to play classical music when combined with violins in an orchestra. But jazz is the result when combined in a trio with a saxophone and a trumpet.

The end result is a better understanding of complex behavior at the nervous system level. Satterlie was one of two ASU faculty members in 2002 to earn prestigious John Simon Guggenheim Memorial Foundation Fellowships. The second was awarded to Anne Feldhaus, a professor of religious studies.

In his successful proposal for the award, Satterlie argues, “A neuropsychological understanding of nerve systems is key to a number of normal and abnormal behaviors of individual and societal importance. For example, a strong case can be made that eating disorders, obesity, alcoholism, drug and other addictions, and behavioral obsessions and compulsions can be directly or indirectly linked to abnormal (interactions between nerve systems).”

How do you get all this from studying snails?

In terms of nerves, snails and people may not be that different. The nervous systems of both developed from the same basic machinery that first evolved at a time when our animal ancestors were still invertebrates. Satterlie says that we can learn a lot about who we are by studying our cousins—even if they’re very distant cousins.

Satterlie uses some very human terms in describing the results of nerve circuit interactions in Clione limacina, terms like “mood,” “impulse,” “urge,” and “arousal.”

“Strange as it sounds, there seems to be a little snail in all of us,” says Satterlie.

Shrinking the Tire Pile

Imagine a pile of 5 million worn tires sitting above you. That’s a lot of old rubber. It’s also roughly the number of tires that Arizonans dispose of each year—one tire for every man, woman, and child. How to dispose of all those used tires without causing serious environmental hazards has state officials scratching their heads. Han Zhu believes he has the answer.

Or maybe not so distant. Satterlie uses some very human terms in describing the results of circuit interactions in Clione limacina, terms like “mood,” “impulse,” “urge,” and “arousal.”

Zhu is an ASU assistant professor of civil and environmental engineering. He says that adding a small amount of inexpensive crumb rubber to fresh concrete can improve the strength and durability of the final mixture. Crumb rubber is the end results of grinding used tires into one-millimeter chunks.

One tire produces about 10 pounds of crumb rubber and sells commercially for less than 20 cents per pound.

Zhu is not the first researcher to experiment with adding tire bits to Portland cement concrete (PCC). However, he does own rights for the first “real world” application of the material—a section of sidewalk on the ASU main campus.

“This is my baby,” says Zhu, as he bends over to look at the sidewalk between the Memorial Union and the ASU Bookstore. Black flecks of rubber sparkle in the morning sun, “I have been coming out here to examine this sidewalk for two years. Most people think I am just a pop looking for pennies,” he jokes.

Zhu began exploring uses for crumb rubber in 1998 with a grant from the Arizona Department of Environmental Quality. His research came to a screeching halt soon after because he could not find a natural environment as an experimental site, a critical step in testing new materials prior to certification. He says that few people were interested in using a new material because there was no guarantee of success.

In February 1999, Zhu personally added 200 pounds of crumb rubber to the concrete mixture being prepared for the ASU site. The ratio of crumb rubber added to the mixture was equal to about 8 percent of the cement weight.

Previous lab studies were not encouraging for the waste product. Earlier research showed that adding crumb rubber to concrete would lower the compressive strength, the major criterion used in designing PCC.

Zhu’s study showed that adding crumb rubber into PCC actually produced several benefits that would compensate for the loss in compressive strength, particularly for projects that are not considered load-bearing. These benefits include reductions in thermal expansion, also known in Arizona as “summer fatigue,” and reductions in drying shrinkage and brittleness. The recycled rubber also shows promise in ending the crumbling associated with freeze and thaw damage in colder climates.

Zhu says these benefits alone improve the overall durability and serviceability of PCC. More recently, the ASU engineer made new advances. He boosted the compressive strength levels of crumb rubber PCC to specifications by simply adding a small amount of gypsum to the mix.

More than 12,000 cubic-yards of PCC are produced each day in the Phoenix metro area alone, according to the Arizona Cement Association. Using conservative estimates, 18,000 cubic-yards of PCC are produced each day in the Phoenix metro area alone. According to the Arizona Cement Association. Using conservative estimates, Zhu says that if just 20 pounds of crumb rubber per cubic yard of fresh PCC were added, all 5 million scrap tires produced annually in the state could be recycled into stronger and more pliable PCC for use in sidewalks, parking lots, and concrete floors.

In May 2000, the Arizona Department of Transportation used the new PCC technology to build a 10-yard by 15-yard section of parking lot at its Phoenix division site. Builders used 50 pounds of crumb rubber per fresh cubic foot of PCC. Quality monitoring is still in progress, but Zhu says, so far so good.

In May 2001, the Arizona Department of Transportation used the new PCC technology to build a 12-yard by 12-yard section of parking lot at its Phoenix division site. Builders used 50 pounds of crumb rubber per fresh cubic foot of PCC. Quality monitoring is still in progress, but Zhu says, so far so good.
Bad Kids or Bad Coaching?

When your son or daughter swings a bat, shoots a basket, kicks a ball, or slaps a hockey puck down the ice, are they becoming a better moral being? Maybe not.

In fact, Darren Treasure says that they could be learning entirely the wrong lesson—one that could have lifelong repercussions. Treasure is an ASU professor of exercise science who specializes in sport psychology.

Treasure claims that one of the keys to moral development in sports is coaching. More specifically, it is whether a coach establishes a motivational climate that defines success in mastery or performance-oriented ways. Your child’s coach might be one of many who are not up to par.

Coaching can make a big difference where your child’s morals are concerned. Bad coaching emphasizes winning as the sole source of success. Treasure calls this performance-oriented coaching. It can promote dishonesty and selfishness. “If winning is everything, an athlete will do anything to win,” Treasure says.

Good coaching emphasizes personal improvement and task mastery. Such mastery-oriented coaching can make sports and athletics one of the most effective moral tutors available to parents.

Treasure’s concern prompted a series of studies. The results of one are soon to be published in the *Psychology of Sport and Exercise*. The study involved 279 male soccer players, aged 12-14. The boys played in an international youth soccer tournament in Norway.

Treasure had each player complete a questionnaire. He wanted to know how each boy perceived the motivational climate of his team, ideas of sportspersonship, and social-moral reasoning and behavior. The scientist used statistical analysis to correlate the boys’ answers.

Treasure found a definite link between mastery-oriented coaching, good sportspersonship, and a well-developed set of morals. Players who perceived the climate as mastery-oriented preferred a mature moral motive to do what is fair or right, and were conscious of the needs of others. They were less likely to report an intention to intimidate an opponent, fake an injury, or risk injuring an opponent. They also regarded their opponents primarily as co-creators of an experience, and competition as a process of striving with, not against, others.

By contrast, Treasure’s analysis also revealed that players who perceived a predominantly performance-oriented climate were those most likely to report hostility. They engaged in illegitimate and unkind behavior toward other players. They employed ego-centric moral reasoning when faced with social-moral dilemmas. They also suppressed empathy to pursue victory by any means necessary.

Treasure says the findings demand that parents and communities pay attention to the way youth athletics are coached, played, and watched.

The ASU researcher is working with the Arizona Interscholastic Association to implement a program he calls “Pursuing Victory with Honor.” The program is funded by the Arizona Department of Health Services. It provides high school coaches and administrators with skills and strategies to develop sportspersonship in Arizona high schools.

For more information about the Pursuing Victory with Honor program, visit the site at [http://www.aiaonline.org/](http://www.aiaonline.org/).

Mystery Image

Shake the cobwebs from your brain. Take a close look. Do you have a clue as to what this image might be? Would you find it on Earth, or is it from outer space? Is it real? Vegetables? Mineral? Does it belong in outer space or inner space? Take your best guess, then check out your answer to this and other mystery images at the Ask A Biologist web site. The site also includes stories, puzzles, coloring pages, and lots more.

To learn the answer, go to: [http://askabiologist.asu.edu/gallery/gallery36_answers.html](http://askabiologist.asu.edu/gallery/gallery36_answers.html)
Philo's Passion

Don Godfrey has always found inspiration in everyday people. In 1988, he began a project that would consume more than a decade. The work: tracing the footsteps of a farmer’s son who would eventually change the world.

Philo T. Farnsworth, the inventor of the television, is the subject of a new scholarly publication that took Godfrey 12 years to research and write.

Godfrey is a professor at Arizona State University’s Walter Cronkite School of Journalism and Telecommunication. He first became fascinated with the inventor after perusing a collection of historical papers that once belonged to George Everson, the first and longtime financial associate of Farnsworth. Jay Faulkner, a close friend of Everson, donated the collection to ASU’s Hayden Library.

Reading through the pages, Godfrey began to fully appreciate the young Farnsworth’s fortitude and creativity. He decided to write about him. The more Godfrey learned, the more he wanted to know. It was not long before his paper began to look like a book manuscript.

“Writing a historical piece is a lot like being a detective,” Godfrey says. “My job is to get all the available facts and get to all the primary sources.”

There were significant challenges to overcome in documenting the inventor’s biography. His first was with Farnsworth himself. Godfrey says a workaholic who did not care much for history—especially his own—Farnsworth left few personal insights into his life. When approached about writing his autobiography, Farnsworth once commented, “I'll leave that to others.”

Farnsworth lived and worked in many locations across the United States— from San Francisco to Pennsylvania. Maine, Indiana, and Utah. That provided a logistical challenge for Godfrey. The inventor’s many moves left huge gaps in corporate records, which Godfrey partly relied on to piece together a complete picture. To complicate matters further, many of the corporations Farnsworth worked for had been sold multiple times since the early 1930s.

“Fortunately, the available resources allowed me to sustain historical integrity,” Godfrey says. The ASU scholar relied on personal interviews with the inventor’s widow and business associates. Pam, family papers, and many of Farnsworth’s original records now deposited at the J. Willard Marriott Library at the University of Utah. That collection contains Farnsworth’s daily log books and related records, as well as the logbooks of engineers who assisted him. He continues, “My book is a biography of a man whose life was inseparable from his work.”

My purpose was to document, not editorialize on his developments, so that the reader might conceptualize his involvement in television history and the events underlying his career.”

In 1906, Philo Farnsworth was born in a humble log cabin near the town of Beaver in southwest Utah. Unable to sustain a decent living from agriculture, the family moved to his uncle Albert’s farm in Rigby, Idaho in 1916. It was there that the 14-year-old Philo conceived the basic operating principles of electronic television, purportedly while tilling a field.

Farnsworth’s interest in electricity probably began around the age of six when many new inventions, including the hand-cranked telephone and Edison’s gramophone, were the rage. It was old enough to become inquisitive about motors, magnets, coils, armatures, and other components of the newly popular electric gadgets. Godfrey says.

The young Farnsworth proclaimed that he would be an inventor. He read everything about electricity that he could get his hands on, including Popular Science and the instructions to the farm’s Delcopower system.

To effectively demonstrate how electricity is conducted, he would line up his four younger siblings, finger tips touching. Then he would send a mild electric current from one end to the other,” Godfrey says.

Farnsworth’s youthful genius and technical innovativeness fascinate Godfrey. But he says that few people documenting the inventor’s life have gone much further than the tales of his childhood.

“A partnership known as Everson, Farnsworth & Gorell provided the financial backing,” Godfrey says. On September 7, 1927, George Everson and several friends watched as Farnsworth slowly turned on the control of the first-ever television set—a camera tube system with an electronic optical receiver.

An unmistakable single black line appeared. Later that year, Farnsworth was transmitting symbols on the screen, including a dollar sign that was meant to set his banker friends’ minds at ease.

Eighteen months later, Farnsworth would demonstrate his invention to the press and begin working on a new 300-line narrow-band system. In August 1934, the public got their first glimpse of a completely electrical television system. Godfrey said this new and improved version could scan 220 lines and 30 frames per second.

There is no doubt that Farnsworth’s invention changed the world for future generations. For most Baby-boomers and their parents, the first recollection of watching television is held vividly, if not romantically, in memory.

The remarkable picture box made the rest of the world a little less distant. It also is responsible for providing images that are intricately woven into the fabric of our lives.
At home, they face misunderstanding by parents who may be naïve about the environment at school — where there can be frightening levels of violence, gang activity and drug use. “I think it’s just not in the parents’ own experience,” says Koss-Chioino, “especially if they came from Mexico, where there was much more control over the youth. Here, the young people expect to be freer.”

Unable to connect their two worlds, many teens feel ambivalent about their ethnicity. This is often a root issue for Hispanic youths with behavior and drug use problems. To counter this problem, Koss-Chioino developed a group therapy model with a strong focus on ethnic pride.

“We taught the kids that their heritage is important and that they should be proud of it. The findings were very promising. Substance use decreased in almost all measures, particularly the use of inhalants and some hard drugs,” she says.

The family therapy program was just as effective, though it took a slightly different approach. “We wanted to help the parents understand what the kids’ lives were like and help them communicate better. We definitely strengthened communication between youths and their parents,” she says.

The most positive result was that depression levels decreased among many youths and some parents. Parents, armed with a clearer understanding of what was happening to their children away from home, also saw where they needed to exercise more control.

Although few other researchers have tested the effectiveness of culture specific therapy, Koss-Chioino is convinced that it works well. By expanding the concept to fit her ecological model, she hopes to make it even more effective.

“We now have a whole new take on it. We know that we need to work with other aspects of their life and community — schools, churches, anywhere that a person can be connected,” she says. “We haven’t tested it yet, but that’s the next thing we’re going to do.”

Joan Koss-Chioino started by revamping the typical models of psychotherapy, in which the therapist usually takes an impersonal, passive stance, and uses structured teaching and problem solving to teach effective interpersonal skills. Koss-Chioino found that Hispanic youths respond more positively when the therapist takes an active, supportive position and focuses on expressing emotions.

The ASU researcher also put an especially high priority on providing Spanish-language services. “Ninety-five percent of our staff members were comfortably bilingual, so people could choose what language they wanted to use. Sometimes the family sessions were half in English and half in Spanish,” she says.

The clinic itself, a welcoming, unpretentious place where clients felt at home, was also designed with culture in mind. “The clinic was very humble,” she explains. “They had coffee and cookies, and toys for the kids. There was a TV always blaring in Spanish-language programs. It was an informal setting.”

More than 300 teens and their families participated in the study by attending weekly therapy sessions for 16 to 20 weeks. Some youths were assigned to group therapy with other Hispanic-American adolescents; others were assigned to family therapy. Each participant completed several questionnaires before and after treatment, which Koss-Chioino used to assess the success of the program.

The teens who came to the clinic suffered from problems widespread among youths from many ethnic backgrounds, including depression, anxiety, aggressive behavior, and drug use. However, as newcomers to the United States or as children of immigrants, these adolescents also faced the additional challenge of straddling two cultures. They have Hispanic families at home, and American peers and teachers at school. Often, friends and family members in these two environments understand each other poorly. The kids end up feeling out of place in both worlds. In the community, they face discrimination.

“There’s a lot of prejudice, especially in portions of the Phoenix metropolitan area, particularly against the immigrant kids,” says Koss-Chioino. “At school, the youths were often looked at as potentially troublesome. Some appeared to live up to those images.”

When a gardener transplants a seedling, she provides it with light, water, and nutrients to help the young plant spread its roots and grow. With attentive care in the right environment, the plant will eventually mature and bloom.

Joan Koss-Chioino views people the same way. A cultural psychologist and professor of anthropology at Arizona State University, she works with youths and families transplanted from Mexico to the United States. Koss-Chioino says that helping adolescents to thrive and not wilt in their new homes is all about getting the environment right.

This situation prompted Koss-Chioino to establish the Hispanic Family Center, a family and group therapy clinic devoted to helping troubled Mexican-immigrant and Mexican-American youths. Her work at the clinic was part of a six-year study investigating the effectiveness of culturally responsive mental health care.

Many standard approaches to psychological treatment were developed by European psychologists who contemplated the “human” condition rather than culture. Such approaches often work well for Caucasian patients. But they are less effective for Hispanic youths, who may have different communication styles and interpersonal boundaries, according to Koss-Chioino. Consequently Hispanic families and other ethnic minorities can be more difficult to recruit and retain in mental health treatment programs.

By designing a research and treatment clinic specifically for Mexican-descendent and Mexican-American youths, Koss-Chioino tended to the particular needs of this ethnic group. “In order to be culturally responsive is to have people better engaged and more willing to come for that service,” she says. “That was the whole key.”
The College Experience - Latino Style

For Guadalupe Nuñez and Abraham Peña, making the transition from high school to college as Latino students has been a challenging experience. "I'm sure there were many Latinos at my high school who decided not to go to college," says Nuñez, who attended high school in Mesa, Ariz. "But because they didn't want to go, or because they didn't feel like they had to do it or get in," says Nuñez, a freshman pre-law major, took it upon herself to find out what Arizona State University had to offer, "My high school's career center just pointed students toward the paperwork that needed to be completed for college," says Nuñez, a first-generation college student. "There were no guidelines or instructions given to me, but I knew I wanted to go to college." Peña is a freshman majoring in social work. He says the high school he attended in Payapil, Wash., was more attentive to his needs. "Granted, there were very few Latinos at my school," says Peña, also a first-generation college student. "But my school really encouraged all the students to attend college. Once I decided to attend ASU, I still wasn't sure what to expect." Nuñez and Peña are members of the largest growing population of minority students at ASU: Latinos. In 1989, Latinos made up 5.8 percent (2,536 students) of the entire student population. In 2001, Latino students made up 10.4 percent (5,480 students), according to a report by the Office of Institutional Analysis.

For some Latinos, self-motivation is not enough. "White students are brought up to be very verbal," says Espejo. "In an academic setting, if both students disagreed with the grade a professor handed them, the white student might be more motivated to speak up and argue his or her case. A Latino student would accept the grade, even though they might have a strong argument and credible evidence to support a grade change."

In February 2002, researchers at the Hispanic Border Leadership Institute completed a major study. Their work examined how Latino students progress through the education systems in Arizona, California, Colorado, New Mexico and Texas. The numbers are not encouraging. In the number of Latino students who are enrolled from kindergarten to grade 12 to the graduate level. The researchers found that of the 31.3 percent of Latinos who graduate from high school, only 6.8 percent will enroll in college at the graduate level.

In their report, the researchers concluded that a lack of preparation and the establishment of a proper support system are hurdles Latino students fail to clear. As a result, they are unsuccessful in higher education.

Academic programs like Head Start and Title I enhance the educational development of low-income children and their families. However, Valverde says that Latino students need to make an effort to "educate themselves aggressively" about the programs and academic support available at the university level. Since 1965, Head Start has been providing many children with the opportunity to become familiar with an academic setting before they officially enter their scholastic careers, he says.

The same type of preparation needs to be made before Latino students enter college. The smartest thing that any student can do is to become familiar with the university they plan to attend," says Valverde, a second generation Mexican American and the first in his family to attend college. "I don't mean simply knowing where classes will be. I mean recognizing and building a support system that will help through their college career."

The researchers concluded that a lack of preparation and the establishment of a proper support system are hurdles Latino students fail to clear. As a result, they are unsuccessful in higher education.

Baltazar Arte¡yte y Acevedo Jr. is the founding president of the Community College Without Walls in Houston. He never considered attending college until he and his family established a support system with his high school assistant principal, Delia Barron.

“For a lot of us (Latinos), our only mentors were really our parents," Acevedo says. "My parents never went to school in their life. They really couldn't provide me with an idea of where to go or what to do." Barron paid out of her own pocket for Acevedo to take the SAT exams. "She really helped me see that attending college was a attainable thing and not just something other people talked about," he says. Acevedo admits his case might seem ideal, but his struggles went beyond academic. "I performed well in school because I was very well read," says Acevedo, who suffered from polio when he was younger. "I spent a lot of time in the Shriners Hospital in San Francisco. I read all of Shakespeare's books, read volumes of the encyclopedia up to volume E. "Even so, I failed English and Algebra right off the bat," he admits. "But I got my Biology, American History, and American Government, so I knew I could succeed. That success helped me stay motivated." Acevedo eventually went on to earn his doctorate degree in education from the University of Southern California.

For some Latinos, self-motivation is not enough to succeed. "I earned scholarships to attend ASU," says Espejo. "It's an honor to be attending college," says Peña, who plans to join the Peace Corps after graduation. "I have confidence that I will finish and be successful.

Roberto Haro is a professor of ethnic studies at San Francisco State University. He says that a Latino's upbringing, in these types of cases, can hamper the student's success rate in college. "As a child, a Latina is taught that talking back when addressing adult figures is not a proper thing to do," Haro says. "Most Latinos are brutalized when they do this, because to other Latinos, they are not showing respect for themselves or adults.

"White students are brought up to be very verbal," he says. "In an academic setting, if both students disagreed with the grade a professor handed them, the white student might be more motivated to speak up and argue his or her case. A Latino student..."
There are several possible reasons why activity helps children learn. Researchers know that there is a relationship between arousal and attention. Physical activity increases arousal and helps focus attention. Very young children also may learn partly through movement. Physical activity helps them learn about various spatial or temporal relationships.

Physical activity may help middle-schoolers. This fall, Sibley will work with ASU Exercise Science professors Robert Pangrazi and Jennifer Etnier in Mesa public schools. They will try to determine the link between activity and cognition. “The effect on cognition isn’t huge, but PE also improves physical health,” says Sibley.

Childhood obesity has become a major problem. Obesity-related illness is skyrocketing, and a lack of physical activity is a primary cause. The percentage of overweight children in the United States has doubled since 1968. As a result, the incidence of type-II diabetes in children is soaring. This form of diabetes is strongly linked to weight and is commonly known as adult-onset diabetes. Overweight kids are also at risk for high blood pressure, high cholesterol, orthopedic problems, and sleep difficulties.

“One of the big points we try to make with this research is that you can have that PE time, and get those physical health benefits, without hurting academics,” says Sibley. “It might actually help.”

Don’t Ditch Gym Class!

Faced with budget constraints and increased testing requirements, many public schools are scaling programs they deem “unnecessary.” Often the first program to get the boot is physical education—good old gym class.

“One of the reasons PE gets cut back is because schools want kids to spend more time in the classroom,” explains Benjamin Sibley, an ASU doctoral student in Sport and Exercise Psychology. However, his research findings show that taking time out for PE might actually help kids learn.

Several studies have examined the link between physical activity and cognition, but their results have varied. Advocates and opponents of physical education have selectively used these studies to support their own agendas. To help settle the debate, Sibley conducted a meta-analysis of research on physical activity and cognition in children. He analyzed 45 studies on children ranging from five to 18 years old.

Some studies examined the effect of starting a physical activity intervention (such as increasing PE or starting an exercise program). Others compared students with varying fitness levels. The studies used quantifiable cognitive measures such as IQ or grade-point average. These measures reflect the cognitive abilities of students with varying fitness levels. The studies used quantifiable cognitive measures such as IQ or grade-point average.

Taken together, the studies show that physical activity does improve children’s mental functioning. Even when you factor in lost classroom time, PE offers kids an “mental boost.” The best results were in middle school and also very young elementary school students (pre-K to second grade), says Sibley. He is working to find out why.

Asu's Most Recent Public Sculpture

ASU’s most recent public sculpture was dedicated in April 2002. But the New Deal-era art project was actually seven decades in the making.

Titled “Hopi Flute Player,” the 6-foot bronze statue originally was commissioned as part of President Franklin D. Roosevelt’s Public Works of Art Project. The project lasted only a few months, but it successfully placed thousands of American-themed works throughout the country. Arizona received 56 murals and paintings—and a design to improve the fountain in front of ASU’s Old Main.

Enter Emry Kopta. Born in Austria in 1884, Kopta studied in Paris and set up a sculpture studio in Los Angeles during the early 1900s. In 1912, Kopta went on an artist’s excursion to the American Southwest. His goal was to see what he could find that would inspire him as an artist. “This is where I shall work. The people here, especially their elders, possess a great wisdom, which is reflected in their faces.” Kopta stayed for 11 years, and tribal elders today remember him wandering the villages with a sketchpad. He created such accurate sculptural depictions that their descendants can still recognize them.

Kopta moved to the Phoenix area to complete a war memorial at Phoenix Indian School. He was tapped for the ASU fountain project. Kopta drew inspiration from his many years on the reservation. He designed a cell-phone base that featured four totems, then had it cast in bronze and presented it to the university. Kopta accepted, and for three decades the statue has been on display in Hayden Library.

When ASU decided to cast the 6-foot version, new technologies, such as digital scanning, made the precise enlargement possible. In accordance with the wishes of the Hopi Tribes, the statue was cast in bronze and presented it as a gift to the university. Kopta accepted, and for three decades the statue has been on display in Hayden Library.

New Deal Legacy

Since the 1980s, the ASU sculpture program has produced over 50 public sculptures. Each year, the university also commissions a new sculpture. This year, the project will be a new public sculpture to be installed on campus.

The project is supported by the ASU Public Art Fund. For more information, contact the Office of Public Art, 480.965.8885.