VICTOR NUNEZ: A LIFE THROUGH A FLORIDA LENS  [COVER STORY]

BY ELIZABETH BETTENDORF
No filmmaker has captured the quirky essence of Florida culture as well as Victor Nunez. The iconic face of indie films is still wowing 'em, but now in classrooms as much as in theaters.

COMPUTER COMBAT: FIGHTING CYBER FRAUD

BY FRANK STEPHENSON
Thanks to the Internet, stealing your money has never been easier. In the war against cyber crime, labs like this are the front lines.

CRIME AGAINST NATURE?
A LOOK INTO THE BIOLOGY OF BAD BEHAVIOR

BY ROBERT POOL
Can humans truly be born bad to the bone? Evidence is mounting that for too long, science has ignored the biological basis of crime. The implications are as complicated as they are profound.

FISH-EYE SCIENCE

BY PHILLIP MORGAN
For all we know about the sense of vision, the fundamentals still remain a mystery. Could the eyes of a popular aquarium fish shed any light?
Cover Story

Abstracts
Of grouper fraud, living frog fossils, living off the grid, and papers left by the strangest man.

From the Field
A pair of photographers records pathos in the collapse of Florida’s housing market.

Reviews
A trip through hell, courtesy of Pulitzer Prize-winner Robert Olen Butler; a turn-of-the-century look at public health care, Los Angeles-style

Portrait
Barbara Foorman, Florida’s top reading teacher

Insight
Carrie Ann Baade paints a path to national attention.
Discovery of a new species of plant or animal is usually interesting to biologists, but not always, since it happens so often. In 2006 alone, nearly 17,000 species of plants and animals got written up in science journals for the first time. And this didn’t include hundreds of new microbial species also discovered that year.

So, by and large, finding a new species of nematode or newt is pretty ho-hum business in the biological world. But if anything about scientists’ finds in the wild shakes the rafters of academia, it’s the discovery of a whole new kind of nematode or newt. Finding a new species is nothing compared to stumbling upon a whole new family of closely related, but nonetheless distinctive organisms. Such discoveries are typically rare—for example, scientists who puzzle over fish, one of the most studied animals on the planet, have turned up only five new fish families in the past 50 years.

But in its August issue, the journal Zootaxa announced the discovery of a brand new family of amphibians—in this case, frogs. Genetic analysis of three frogs found in the cloud forests of northern South America revealed not only that they are new species but also that they represent both a new genus and a new family of frogs.

The discovery so far caps a highly lucrative, 22-year odyssey by Florida naturalist and explorer Bruce Means who, together with colleagues, has collected 30 species of South American animals, including 22 frogs, three lizards, two snakes, two earthworms and a freshwater crab. Means, who is co-founder and director of the nonprofit Coastal Plains Institute based in Tallahassee, has served as an adjunct professor of biological science at FSU over the years and remains a research collaborator with FSU ecologists.

The new frog family, named Ceuthomantidae (soo-tho-MAN-tih-dee), is thought to represent a “living fossil” in the frog world, an ancient relative that links two very different groups of tropical, tree-dwelling frogs. Means said that DNA analysis proves that this rare family represents an evolutionary bridge between a group of frogs that lays its eggs on land, where development bypasses a typical tadpole stage, and another group that lays its eggs in water, where adults morph from tadpoles. No one yet knows how this new frog, dubbed Ceuthomantis (or “hidden treefrog” from the Greek smaragdinus for the color splotches its back), raises its young. Means said.

Means discovered the frog in 2007 in the highlands of Guyana (formally British Guiana) in an ancient geological feature known as the Guiana Shield, which dates to the Precambrian era roughly 1.7 billion years ago. Means says that the discovery of such “living fossils” as Ceuthomantis underscores the extreme importance of saving the world’s oldest ecosystems for understanding how evolution has shaped Earth’s explosion of life over time.

“These living animals can provide a wealth of valuable biological information far beyond what you’d ever get from fossils,” he said.—F.S.
Fighting Fish Fraud

As common as key lime pie on Florida menus, grouper is a staple of restaurants across the peninsula. But on the plate, whether breaded and fried, or marinated and grilled, is fresh Gulf grouper distinguishable from cheap, imported catfish from Southeast Asia?

For years, some restaurants have been betting customers can’t tell the difference. Studies have uncovered numerous cases of fish fraud. In 2007, Florida’s attorney general found 17 out of 24 Tampa Bay area restaurants were serving catfish from the Mekong Delta and calling it grouper. This summer, the Miami Herald reported that seafood researchers in Fort Lauderdale also discovered widespread fish substitution across the country, thanks in large part to steadily tightening federal regulations on grouper harvest by commercial fishermen.

“In the past two to three years, especially in Florida, this has been a big issue,” says Yun-Hwa Peggy Hsieh, professor of food science. “In a restaurant, if you order grouper or snapper, you’re likely to get (an Asian catfish called) basa.”

But so far most investigations have relied on DNA analysis, which is expensive and can take days to run. Hsieh has developed faster and more affordable tests that could bolster efforts to fight the growing menace of fish fraud.

Two tests based on Hsieh’s work were licensed in September by Gainesville-based ELISA Technologies and one could be on the market as early as next year. The first will be a strip test (shown above)—as portable, fast and easy-to-use as take-home pregnancy tests, Hsieh says. The second will require lab equipment.

Rather than testing a fish’s DNA, Hsieh’s methods detect proteins found specifically in the imported catfish basa and tra, two species in the Pangasius catfish family. Both are commonly served instead of grouper and snapper, Hsieh says. The new techniques, which can be used on raw or cooked fish, are highly reliable and can detect minute amounts of the targeted proteins.

Hsieh published her results in two papers in the Journal of Food Science earlier this year. Warning to purveyors of catch-of-the-day cons: Your customers may be about to catch you. —C.S.

Sax Success—The Mana Saxophone Quartet, made up of FSU graduate students, recently won the grand prize at the 2009 Coleman International Chamber Music competition.

Founded in 1904 in Pasadena, Calif., the Coleman competition is one of the world’s most rigorous and respected showcases for ensembles of young, non-professional performers, drawing competitors from top music schools across the U.S. The award is particularly significant for Mana because the group trumped other more traditional ensembles in the competition.

All four Mana musicians (pictured from left: Michael Mortarotti, Michael Hernandez, Josh Meyers, and Daniel Espinoza) were drawn to FSU to attend the university’s highly regarded saxophone graduate program, led by saxophone professor Patrick Meighan.

Under Meighan’s hand in 2007, they decided to revamp the quartet they created while undergraduates at Northern Arizona University.

“Before, we would have to be the ones calling the composers and asking them to specifically write pieces for us to perform,” alto saxophonist Michael Mortarotti says, “but now they are calling us with new pieces.”

For more about the quartet, see www.manaquartet.com and follow them on Facebook and Twitter. —E.A.
A Rare Collection; A Rarer Man

In September, the American version of British science writer Graham Farmelo’s biography of Paul Dirac won an enthusiastic thumbs-up in a review by the New York Times. Farmelo’s The Strangest Man: The Hidden Life of Paul Dirac, Mystic of the Atom (Basic Books) is the latest and, by all accounts, most complete portrait of a scientist who most physicists agree was, second to Einstein, the greatest physicist of the 20th Century.

What readers may miss is the fact that without a one-of-a-kind collection of Dirac’s papers at Florida State’s science library (named, aptly enough, after Dirac himself) the book never would have been possible. Farmelo spent months on campus poring through thousands of folders crammed with letters, manuscripts, lectures, scribbled notes and photographs.

Dirac, who won the 1933 Nobel Prize in physics, spent the last 14 years of his life as an emeritus professor in the FSU physics department after spending the previous 40 years at Cambridge. The science library not only has all of the materials that Dirac had with him at FSU and at his home, but also much that had been on loan to Cambridge. When he died in October 1984, his widow, Margit Dirac, bequeathed the papers to the library that bears the name of her husband of 47 years.

“We’re just at the beginning,” says Sharon Schwerzel, head of the Dirac Science Library, in speaking about the latest plans for the massive collection in their care. Schwerzel said the library now has the human and equipment resources it needs to begin to digitize key parts of the collection that likely would be of most interest to researchers.

If the project proceeds as planned, researchers will have access to high-resolution images drawn from nearly every phase of Dirac’s amazing career (he predicted the existence of anti-matter four years before it was discovered in 1932 by Carl D. Anderson, an American physicist). Here are priceless letters—including one from his close friend and fellow Nobel laureate Werner Heisenberg—early lectures, handwritten book manuscripts and many photographs of himself, his colleagues, friends and family.

The task is formidable, to say the least. Lucy Patrick, head of special collections at FSU, who is overseeing much of the digitization, estimates that the initial phase of the project will produce up to 5,000 pages of images, and that will be less than a 10th of the entire collection. At each step of the way, every digitized item must be inspected, identified, and put in its proper context both chronologically and conceptually, said Patrick.

Farmelo has agreed to provide suggestions for how best to organize and annotate the collection, says Schwerzel, who welcomes the help. “He can offer insights that we might miss.” —R.P.
To much fanfare, officials at Florida State in August unveiled a barn-red cracker-style house nestled in the heart of FSU's traditional, collegiate-Gothic style campus.

No ordinary cracker house, the small cottage is on the books as a rare, "off-grid, zero emissions building." The project is hailed as a gutsy experiment toward achieving what amounts to a Holy Grail for the world's housing industry—the invention of an ultra-efficient, non-polluting house that creates as much energy as it uses.

The attractive, 1,064-square-foot, four-bedroom house is a product of FSU's Energy & Sustainability Center, an outgrowth of research in alternative energy systems at the FAMU-FSU College of Engineering. Project engineers say the house may be the only one of its kind ever built—a hybrid of solar and hydrogen power technology designed to function just fine unplugged.

Every detail of the house—which took two years to design and a year to build—is crafted to deal with the sobering challenge of building a modern, comfortable house that is completely independent from a municipal power grid. The house is genuinely "off grid" when it comes to locally supplied electric power. The only utility grid the house depends on is a standard city water and sewerage hook-up.

Integrated into the house's rooftop solar power plant is a hydrogen-producing system intended to compensate for days when the sun doesn't shine, said Brent Greska, associate director of the energy center. Unfortunately, by October the hydrogen system wasn't yet working as planned, mainly because the commercial electrolysis device installed proved to be inadequate, he said.

Making hydrogen from water is an old and a relatively reliable process but typically not an inexpensive one thanks to current technology that uses platinum as a catalyst for electrolysis, whereby electricity (in this case supplied by solar panels) is used to split water molecules. Greska said he's hopeful that the electrolysis bottleneck eventually will be resolved, and said that FSU chemists have developed a patent-pending technology designed to make the production of hydrogen from water less expensive and more efficient.

Even though it's still a work-in-progress, the experimental house is a remarkable design-and-build achievement that has caught the attention of green-building advocates around the globe. The handsome interior is set off by earthy, reclaimed cedar beams and 22-foot vaulted ceilings. Walls are made from a material that's essentially a sandwich of Styrofoam and wood, and the front porch is made from cast-off plastic containers.

On the roof, an array of 30 photovoltaic cells is capable of producing 6.9 kilowatts of power under sunny skies. Integrated into the solar array is a standard water-heating system that can produce 133-degrees F water for showers and washing dishes. The kitchen features most standard appliances, including a gas-fired Viking range that FSU engineers modified to burn hydrogen instead of natural gas. (Burning hydrogen releases only water vapor and heat.)

Greska said that a bank of eight, six-volt, deep-cycle batteries stores excess power generated from the solar panels, and is sufficient to provide all the house's power needs over a 24-hour period.

With an advertised cost of $575,000—raised through in-kind gifts, grants and donations—the state-of-the-art cracker house is pricier than most houses its size. Boosters say the start-up costs are reasonable considering that the house is basically a test-bed for technology that isn't yet commonplace, but could be.

At its dedication ceremony in August, the house was named the Kirby W. Kemper Off-Grid Zero Emissions Building in honor of the university's current vice president for research. A physicist, Kemper has long advocated research in alternative energy and "green" industrial systems. —E.B.
A couple of years ago, John Raulerson and Daniel Kariko, both photographers and instructors in the FSU College of Visual Arts, Theater & Dance, set out to document a fast-disappearing commodity in Florida—land.

Fascinated with Florida’s then red-hot real estate market, they picked up their cameras and began roaming the state in search of stories to tell. Their collaborative effort, “Beyond Disney, Florida Family Farms” was a visual research project that captured the rapidly vanishing tracts of ranch, farmland and citrus grove at the hands of development. The project was designed, they write, “to explore the cultural significance of the family farm to the state of Florida through documentation using film, interviews and photography,” with a goal of exhibiting their work in museums, schools, corporations and galleries.

At first, the pair spent time on Central Florida cattle ranches, hanging with centennial farmers, exploring a farm belonging to former slaves, visiting orange groves and organic growers.

Then, in 2007, the Florida real-estate market tanked. The project might have lurched to a halt as well, but the pair decided to explore the land issue from a different, more poignant angle. Their focus aptly shifted to the detritus of Florida’s flying-high years: foreclosures. They started photographing dying developments from Pasco County to Fort Myers to Carrabelle.

The most haunting images came from Lehigh Acres, a 61,000-acre development in Lee County, the most densely populated county in southwest Florida. The community got its start as Lucky Lee Ranch, the brainchild of Chicago businessman Lee Ratner, who had sold his pest control business and plunked his money into a cattle-ranching tax shelter. Initially, Ratner and his partners began selling off about 100,000 lots, but the development never took off until 2001. In 2006, at the peak of the real-estate boom, more than 6,000 new homes were built. Housing prices doubled, then tripled with speculators flipping the same houses sometimes four times in a year.

In 2007, the cacophony of hammers and drills went silent. Between 2005 and late 2008, average housing prices in the Fort Myers area plunged from $322,000 to $106,000, according to the New York Times. In 2008, the Federal Bureau of Labor Statistics put the percentage of Lee County job losses higher than any other county in the U.S. “Foreclosure” became Florida’s newest curse word.

Raulerson and Kariko captured the despair throughout the decimated Lehigh Acres development. They walked into “brand new abandoned houses with graffiti spray-painted on the front and the electricity still running,” Raulerson recalls. “Everywhere were abandoned homes and vacant notices. What was booming five years ago had become a ghost town.”

They captured the sadness in images of weedy front yards, sliding glass doors smashed by vandals, possessions left behind by families who clearly fled with only what they could cram into a car. One particularly haunting photo reveals what was once a little girl’s room, cluttered with trash and debris, abandoned dolls, a pink tent and stuffed toys.

An exhibit of their photos, “Restricted Geography” went on display earlier this fall in the 621 Gallery in Tallahassee’s Railroad Square, an artist’s enclave near the main FSU campus. A larger show, “Florida Family Farms” will be on display from April 17 through July 5 at the Museum of Florida History in Tallahassee.

The project is a collaboration of an unlikely duo. Raulerson, a sculptor and fifth-generation Floridian who...
once flirted with the idea of majoring in agriculture—grew up in Bartow, the county seat of Florida’s grove-rich Polk County. He even worked as a cowboy in his teen years: “To this day, it’s the hardest work I’ve ever done physically,” he said.

Kariko was born in Yugoslavia and lived in the town of Novi Sad in northern Serbia. When he turned 17 he moved Louisiana “for political reasons.” He has a “strong awareness” of western pop culture, he said, because he grew up watching John Wayne and Johnny Weissmuller on television in communist Eastern Europe.

“For us this was very emotional project,” said Kariko. “I felt like it was my assignment to bear witness.”

—E.B.
BY FRANK STEPHENSON

COMPUTER COMBAT

THANKS TO THE INTERNET, STEALING YOUR MONEY HAS NEVER BEEN EASIER. IN THE WAR AGAINST CYBER CRIME, LABS LIKE THIS ARE THE FRONT LINES.
Never in the history of crime has it been easier, or more lucrative, to be a criminal—and to get away with it scot-free. Consequently, never has it been as easy to be the victim of crime: Nearly half of the households in the U.S. report they’ve been invaded by cyber criminals who have stolen their credit card numbers and other personal information, burned them with a clever con-game, stalked them, or threatened them with bodily harm.

Confronted with the onslaught, law enforcement on every continent finds itself vastly out-manned and out-gunned. Criminals’ arsenals of sophisticated machines and software masterminds are staggering, and growing stronger and shrewder by the day. Chillingly enough, the evil extends well beyond greedy assaults on bank accounts and related areas of white-collar crime to cyber-terrorism, which poses a genuine threat to civilization as we know it.

If there’s any good news to temper this depressing scenario—and luckily there is—most of it is coming from a rapidly growing army of cybercrime fighting professionals hunkered down in research and development labs in government and on university campuses. Here live and work the “good guys” in a global war with no borders, no Geneva Conventions and few rules of engagement. This bunch tends to be acutely dedicated, smart as hell—and not afraid to play catch-up with the thugs of the ether.

Forget the Wild West.

Today’s wide-open world of crime by computer keystroke makes that lawless era look like an early episode of Mr. Rogers.

DIGITAL DETECTIVES

In a suite of offices at Innovation Park, Florida State’s research park just south of main campus, computer scientist Sudhir Aggarwal (Ag-er-wall) oversees a small squad of what could fairly be described as cyber-crime assault troops. These are his grad students, members of a special unit formed in 2007 called the E-Crime investigative technologies laboratory. The lab’s founding dates to 2002, when Aggarwal’s promising work in the young field of computer forensics drew its first substantial support, resulting in a collaboration between the Florida Department of Law Enforcement, FSU, and the National White Collar Crime Center based in West Virginia.

Computer forensics—becoming better known as digital forensics—is a field analogous in many ways to old-fashioned criminal forensics, where investigators try to solve crime by using various scientific techniques to turn up incriminating evidence. Instead of looking for real DNA at a crime scene—a mainstay of every episode of TV’s wildly popular CSI series—computer forensics experts look for electronic traces of either criminal or unethical acts, whether committed in a crack-house or a corporation. Thanks to the explosion in computer devices, digital sleuths now
face a jungle out there—the hunt ranges from cell phones to pages on Facebook.

Aggarwal’s focus of late has been on tackling two of the toughest challenges that investigators face when dealing with cybercrime—tracking down the perpetrators of malevolent e-mails designed to steal your personal information, a soaringly popular tactic known as “phishing”—and gaining access to encrypted computers and data used by suspects or known crooks involved in all sorts of crimes, from drug-trafficking to contract murder. This latter, Herculean effort is all about building a powerful password-cracking program—the Holy Grail of cybercrime fighters everywhere (see page 12).

“What we’re doing is more than just pure research,” Aggarwal says. “We want to build systems that will be deployed, actually put into use.”

PHISHING: SCOURGE OF THE INTERNET

“Phishing”—the term first popped up in 1996—is computer slang for using e-mails, instant messaging, texting and just about any other link to the cyber-world to steal someone’s personal identification. Who among us has not opened an example of the most famous e-mail con ever invented—the so-called Nigerian bank scam? Untold legions of gullible Internet users have fallen for this fraud and its promise of staggering wealth by agreeing to help a distressed banker, chieftain, or rich damsel in distress protect his or her wealth from unscrupulous types in their country.

But as users have grown increasingly savvy, such obvious cons today are rapidly being replaced by phishing operations that are so sophisticated that even experts get fooled. Unsolicited e-mails from banks, retailers—even nonprofit charities—have the look, sound and feel of the real thing, prompting the unwitting to hand over their usernames, passwords, even Social Security and PIN numbers.

Today, most experts will readily tell you that phishing is an enormous, costly problem that bedevils just about every facet of society. But because it’s such a complex aspect of white-collar crime—a constant shape-shifter with many heads—no one can put a number on just how big the problem really is.

A recent report by RSA Anti-Fraud Command Center—an arm of the EMC Corporation, an international information security provider—said that in 2008, phishing attacks in the U.S. grew from just over 90,000 reported attacks to over 135,000 attacks—a whopping 66 percent jump. For the first time this year, payment service companies overtook financial services as the ultimate target of choice, but individuals are still the first targets to be fooled in such schemes. Still, no one has yet to be able to put a dollar amount on the damage, even though some guesses have put annual losses above $2 billion in the U.S. alone.

“It’s a huge problem, because the perpetrators have such an enormous network readily available to them, and their chances of getting caught are so low,” Aggarwal said. The world’s growing phishing enterprise draws most of its strength from spam—barrages of unsolicited e-mails—which get fired by the millions from tens of thousands of computers daily that have been cleverly hijacked by phish-masters and—unbeknownst to the computers’ owners—turned into vast, evil-doing networks.

Any computer without some very good software protection, if connected to the Internet for even a few minutes, can be turned into a “zombie” by software robots (“bots,” in the lingo) and made to do the bidding of a “bot master” who can command a vast “bot-net” of zombie machines.

“If your machine isn’t protected, it’s estimated that within 10 or 15 minutes it will be taken over. That’s how prevalent this is,” said Aggarwal.

Given all this, one would think that cops would have a wicked battery of weapons at their disposal to track down these cyber thieves. But they don’t. Martin Novak, a project manager with the National Institutes of Justice in D.C., said he’s unaware of any “off-the-shelf” anti-phishing software available to law enforcement, which is a main reason his agency helps fund Aggarwal’s research. “This is the only research like this that we’re funding,” he told Research in Review. “Sudhir’s doing some forward edge stuff down there.”

A GLOBAL “SHELL GAME”

Early this fall, news broke of more than 10,000 Hotmail accounts—complete with real usernames and passwords—being posted on the Internet by cyber-thugs apparently interested in little more than strutting their stuff. The attention-getting stunt showed that the miscreants may have compromised up to 143,000 accounts—a fraction of the 400 million Hotmail accounts that exist, but a sobering development nonetheless.

How did the perps pull this off? Investigators soon eliminated all ways but one—phishing. A clever spam attack fooled thousands into handing over serious chunks of their personal information to con artists.

[ CONTINUED ON PAGE 14 ]
UNLEASHING UNMASK

Cyber-crime fighters may soon have a powerful new tool for tracking down phishing operations. UnMask, developed by FSU’s E-Crime Investigative Technologies Laboratory and now in final testing, would be law enforcement's first dedicated weapon aimed at busting phishing scams.

UnMask Terms of Service

Thank you for your interest in UnMask. UnMask is a preliminary system designed to support Law Enforcement in investigating email based crimes.

1. Your relationship with UnMask

1.1 Your use of UnMask should solely be in support of allowing ECIT/Law Enforcement test the system. UnMask is still in its preliminary stages.

2. UnMask - Terms of Use

2.1 In order to use the UnMask, you must have been granted an account by a group authorized by ECIT. Any other use of the system is prohibited.

UnMask was supported in part by a grant from the National Institute of Justice.
Ace cyber sleuths working in FSU’s E-Crime Investigative Technologies Laboratory believe they may have come up with the most powerful password-breaking program ever developed.

Backed by grants from the National Institutes of Justice, the team has spent the past two years building the software that they hope will soon make it into the toolbox of every cyber-crime investigator in the country.

“Law enforcement needs a way to break passwords to find out what’s on an encrypted disk,” said Sudhir Aggarwal, the lab’s director. “We think we have the best technique anywhere out there.”

Aggarwal and his team of grad students, led by doctoral student Matt Weir, have run their password cracker in head-to-head lab tests with the leading, off-the-shelf password-cracking programs available. They say their program beats the socks off most of these, including John the Ripper, an open-source, free program that may be the most popular password cracker in use today.

In a competition whereby Ripper and the FSU program faced thousands of coded passwords to “crack” or de-code, Ripper ran out of steam after deciphering 6,000 passwords. In the same time, the FSU program crunched through 11,000 passwords and actually grew stronger the longer it ran.

Basically, what sets Aggarwal’s program apart from all other password crackers is that its algorithms are based on what people actually do when they create a password, rather than what they could do—namely, create a password that is genuinely unique and thereby almost impossible to break.

Aggarwal’s team was able to determine the grammatical patterns and a variety of other user habits (e.g. adding a “1,” a “2” or a “3” at the end of a four-letter name) that they gleaned from analyzing over 100,000 old passwords amassed from a number of sources. One of the biggest batches they got their hands on was a list of 67,000 passwords that hackers stole from MySpace.com, for example.

Weir said this massive data set of known passwords became the focus of the research. “This was our central set of training data, which we used for building the model that is based entirely on probabilities. What are the odds, in other words, that a password will be either this or that? We assign probabilities to everything.”

Unlike John the Ripper and its ilk, which rely almost solely on searching for root words based on common words or phrases—a so-called “dictionary” approach—to an approach called “brute force,” which tries everything—word and number combinations, mainly—the FSU program is based on “rules” governing grammar usage that their analysis of the training set revealed.

Weir said they discovered that they could assign a probability, for example, to the odds that someone would use a four-letter versus a five-letter root word, how often these words would appear in a given set of data, the odds that each would be followed by a number, the odds that number would be a “1” or a “2”, or an “11” or a “12” and so on.

“Ours is a totally novel technique for generating guesses on passwords,” Aggarwal said. “The point is, we built this model from actual data not on what we think people do, but what they actually do.”

In tackling a stack of coded passwords—better known as “hash” in the jargon—Aggarwal said his cracking program could generate a stupefying 34 trillion “intelligent” guesses given enough time. Even running on a laptop, the program can make over a million guesses a second.

So just how good is this new password parser?

“Given enough time, we can break about 90 percent of the average passwords most people use,” Aggarwal said. “This might take weeks, of course. But we can do this because most people don’t go to the trouble of creating a really, really good password, mainly because they can’t remember it.”—F.S.
FIVE STEPS TO A REALLY, REALLY GOOD PASSWORD

In its research to build a better password-cracking program for cyber-crime fighters, FSU’s E-Crime Investigative Technologies Laboratory discovered ways to create passwords that are all but unbreakable. The lab recommends following these five steps to build a truly ironclad password (you’re on your own in remembering it):

1) Start with a minimum of seven characters (e.g. seminoles)
2) Capitalize a letter in the middle: (e.g. seMinoles)
3) Replace a letter in the middle with a symbol: (e.g. seM%noles)
4) Use more than one word: (e.g. goseM%noles)
5) Add digits up front instead of at the end: (e.g. 2goesM%noles)

The lab also says that changing one’s password often isn’t nearly as important as making sure to use different passwords for different functions. For example, never use the same password for your bank account that you use for Facebook or Twitter, they caution.—F.S.

CRACKING CONTEST

In heads-up competition, password-cracking software developed by FSU’s E-Crime Investigative Technologies Laboratory (ECIT) bested John the Ripper, one of the more popular password breaking programs available, by a wide margin.
The odds of ever bringing these crooks to justice are long, mainly because they know how to cover their cyber tracks so well. First of all, cyber criminals take full advantage of the Internet’s openness, and they flout international agreements on how the Internet is supposed to be managed and run.

“It’s a huge shell game,” Aggarwal said. “You can attack someone from any place that has an Internet hook-up, anywhere on the planet, and you don’t have to give your right name, address or anything. It’s really the Wild West out there—very few rules.”

If spammers even bother to register with the Internet’s Domain Name System, set up as a way to help manage the World Wide Web, (not surprisingly, nothing happens to them if they don’t) they tend to do their damage, drop their registration and move on, he said. By the time their victims realize they’ve been hit by a phishing attack, the spammers have vanished down a trackless rabbit hole.

For two years, Aggarwal’s team has been tackling what amounts to one of the thorniest challenges in fighting cyber crime—developing anti-phishing technology that gives law enforcement its first, powerful leg up on the phishing industry. They’ve dubbed their new program UnMask, and it is now in the second stage of testing by the National White Collar Crime Center in West Virginia. If all goes well, UnMask will emerge from the testing stage in the next few months as the newest and best weapon for helping lawmen everywhere fight the phishing wars. This has some top cops who fight so-called “white-collar crime” excited.

“What Sudhir and his team have done simply hasn’t been done before,” said Bob Hopper, manager of the National Center for White Collar Crime’s computer security unit. “He’s got a bunch of very smart, very dedicated grad students down there.”

POINT & CLICK TO PHISH-LAND

Hopper’s agency, which provides the NJ and other federal units with specialized training in digital forensics, contracts with universities and other institutions for research and development on tools that law enforcement needs to track down criminals who leave trails dotted with digital crumbs. He’s visited Aggarwal’s lab in Tallahassee numerous times, and is high on the work he’s seen there.

“A year ago, there were any number of problems that could have killed this (UnMask) project, but those guys just wouldn’t let it go,” he said. “They just beat the problem up until they figured it out.
A program that will securely and permanently erase information from popular computer devices such as thumb drives, digital cameras and cell phones is the brain-child of a grad student in FSU’s Computer Science Department.

Sarah Diesburg, of Washburn, Iowa, is the developer of TrueErase, a prototype program that in preliminary tests completely erases all information from so-called flash-based computer drives that are found in an ever-increasing array of popular electronic gadgets.

TrueErase was created to overcome the difficulties in erasing data from “solid media”—or computer drives that don’t involve spinning disks, as in most hard drives. People get fooled into thinking that when they “write over” their flash drives, the old information is destroyed when it’s replaced by new data. But in reality, the data is still there, Diesburg said.

“This is the big problem with flash (drives),” she explained. “It’s hard for you and me to just delete a sensitive file, for a hospital to delete personal health records or for a bank to delete sensitive information there. So this is what TrueErase is made for.”

With the combination of heightened computer security issues and the increasing popularity of flash, the program could be enormous value to businesses and governments as well as individuals who are now reluctant to use flash drives for anything that sensitive information could be stored on.

Diesburg hopes that if the program gets enough attention, flash manufacturers such as Samsung and Western Digital will see and take notice. Some day, using a flash device could be as safe as using a ballpoint pen.

—Elizabeth Copps

They just do wonderful work down there.”

To fully understand the skunk-works of UnMask (or just about anything else Aggarwal’s team puts its mind to) requires a degree in computing science coupled with a first-hand knowledge of the bewildering variety of techniques used by both cyber frauds and the good guys who fight them every day. To fully appreciate the program’s power and versatility, it also helps to try to think like a cyber crook.

Aggarwal explained that the beauty of UnMask is in its ability to run a variety of Unix-based, open-source tools designed to route and track e-mails simultaneously at the click of a mouse button. This includes the popular “WHOIS” tool that dates to the earliest days of the Internet. By combining WHOIS with a variety of other tools out there, the FSU program offers the prospect of greatly speeding up a phishing investigation, Aggarwal said. An enormous amount of data can be generated quickly from a single e-mail.

In a demonstration by SriHarsha Angara, one of Aggarwal’s key doctoral students behind the UnMask project, a fresh version of the notorious Nigerian bank scam was run through the program. Within seconds, the program traced the phishing e-mail to a town in Guatemala.

In a real investigation, such information may be either useless or extremely helpful to law enforcement, Aggarwal said, depending on the case. One of the things cyber cops look for in phishing scams are patterns of activity, and if they are able to discover that a town in Guatemala has suddenly become a new phishing hot-spot, that could be a crucially important tip.

“Our system lets you point and click to get more information about any suspicious e-mail,” he said. “This is useful not just for phishing but for tracking down anything from spam to e-mailed threats to cyber-stalking. UnMask just takes the tedious work out of it.”

©
No filmmaker has captured the quirky essence of Florida culture as well, or for so long.

Looking at Florida Like a Native

VICTOR NUNÉZ relaxes along the coast at Shell Point, not far from where he filmed scenes for several movies set in North Florida.
No filmmaker has captured the quirky essence of Florida culture as well, or for so long.
BOOKSHELVES (above) in the filmmaker’s editing studio brim with literary titles that have shaped Nunez’s thinking and writing.

(right) A SUNDANCE FILM FESTIVAL Grand Jury Prize medal for Ruby in Paradise (1993) is displayed without fanfare in a corner of a bookshelf.
“For all I know it could be full of lies.”

Filmmaker Victor Nunez, 64, leans his chair against the cluttered backdrop of his editing studio and stretches a ragged grin.

An interviewer—he has made something of a career in avoiding them—has asked what he thinks of his profile on the Internet Movie Database, the web’s most popular cache of movie lore. In a voice honeyed by a faint North Florida drawl, Nunez shrugs off the mention of it and talks instead about the stories he loves to tell best—the ones about real people.

Did someone say real?

Wearing a yellow, short-sleeved shirt, untucked Guayabera-style, over Bermuda shorts and Birkenstocks, Nunez surveyed his visitor one drizzly Saturday morning in September. At 6-foot-1, unshaven and bespectacled, he’s a hard target for his neighbors at Railroad Square, an artist enclave just south of Florida State University’s main campus, to miss.

He’s arrived this morning, as he always does, in his 1993 Honda Accord whose odometer already pegs 200,000 miles. It’s his vehicle of choice, he jokes, for tooling around on the curvy, canopied roads of Tallahassee where he grew up and where he recently returned to teach at the FSU College of Motion Picture, Television and Recording Arts.

Well before this morning’s introduction, the interviewer had learned that Googling “Victor Nunez” is largely a waste of time. A decade-old interview with a Tampa newspaper, a 1993 Q & A with Art Forum magazine, an occasional insider story with a movie-trade publication—that’s about all the world can learn about the man or his movies, despite their millions of fans around the world.

This is not how they do things in Hollywood’s mammoth PR machine. Fact is, Nunez is so archly un-Hollywood that if his life followed the narrative arc of his films and he had to sum up his own plot in one pithy line, it would be this, “Can you be an American filmmaker without being a Hollywood filmmaker?”

Nunez is a textbook on how it’s done. He’s best known for writing, directing and shooting some of the finest independent movies ever made about Florida. The most famous among them is Ulee’s Gold, (1997) a project that rejuvenated the career of Peter Fonda and earned him an Academy Award nomination for Best Actor. An earlier film, Ruby in Paradise (1993), won a Sundance Grand Jury Prize and launched the career of a then very-young Ashley Judd.

Lauded for his subtle lyricism as both writer and cinematographer,
“I realized that Victor had written the film and was directing, shooting and editing it. Victor has such incredible ability—he has such an old soul. You just want to work with him,” Fonda recalls.

Nunez is the workingman’s auteur. In 2007, he returned to Florida State, where he taught film for a stint in the early ’70s. For most of his career, he’s used the same, loyal film crew that he culled mostly from the halls and classrooms of FSU and around Tallahassee: Gus Holzer, his assistant director from the start; Sean Coyne, a set builder and dolly grip; Pat and Greg Garner, aces in art and camera; line producer Stewart Lippe; costume designer and make-up artist Marilynn Wall from Gainesville; sound man Pete Winter; and Charles Engstrom, who has scored and overseen the music for every Nunez film.

In conversation, Nunez always mentions Sam Gowan, his production partner for many years. It was Sam who introduced him to the mystery writer John D. MacDonald (whose work he would later portray in the film Flash of Green). Until his sudden death this summer, Gowan kept all the bureaucratic records and Screen Actor’s Guild requests in order.

“Plain and simple, it takes a team of crazies to make a film,” jokes Nunez, whose low-key, yet highly honed directing skills have impressed even the Hollywood elite.

Actor Peter Fonda who played the taciturn, gentle Ulee, a loner Vietnam vet and Florida beekeeper with a passion for tupelo honey, is perhaps his most effusive fan.

“I remember asking him who was the cameraman, and Victor said, ‘I am. I had to take a step back,’” Fonda recalls. “I realized that Victor had written the film and was directing, shooting and editing it. Victor has such incredible ability—he has such an old soul. You just want to work with him.”

LOOKING IN FROM THE OUTSIDE

If there’s a theme running through Victor Nunez’ life, it’s of the outsider looking in. Not surprisingly, the theme shows up often in his films.

His father was a Peruvian-born painter who made his way to New York’s Columbia University in the 1940s on a Fulbright Fellowship.

“My mother’s favorite story is that when she graduated from Sophie Newcomb with an art degree, they said: ‘The only thing you can do is get married.’ So she also ended up at Columbia University, in her case, to study occupational therapy.”

Nunez recounts his parent’s wartime romance that eventually led the couple back to Peru. The marriage didn’t work out. “They separated very amenable,” explains Nunez, “and they kept in contact until my father’s death.”

After the separation, Nunez’ mother landed back in Florida with 3-year-old, Victor in tow. The move made sense: Nunez’ maternal grandmother was born in Jacksonville and raised in Central Florida. Victor’s mother had grown up in Haines City, a scrappy farm town teeming with orange growers and packing companies and named for the bureaucrat who persuaded the railroad to build a station there.

She eventually found work teaching art in the schools around Plant City, a rural outpost of Tampa renowned for its strawberry fields and seasonal swell of migrant workers. When Nunez was in the third grade, his mother moved them to Tallahassee for good.

“I used to tell the story that on one hand I’m a third- or fourth-generation Floridian,” he explains. “I also told the story that I’m a first-generation immigrant, always a good combination for looking at the world.”

Florida tends to be an oasis for outsiders bent on re-invention, and Nunez knows the state’s quirky nuances better than most. Not only did he grow up in Florida, but he vacationed regularly with his family in Panama City Beach (he can still smell the suntan lotion, he says, and remembers buying ice in the local convenience stores).

But it was more than just swimming in the Gulf of Mexico that later piqued his interest in the panhandle town as an adult. He was intrigued, he remembers, by the life experiences of the people who labored year round in the coffee shops and behind the motel check-in counters.

It was this childhood experience that shaped the concept for his heroine in Ruby in Paradise. Another outsider trying to find her way back into the fold, Ruby—played by Ashley Judd—flees an abusive marriage in rural Tennessee and finds work in a Panama City surf shop.

The outsider theme surfaced again in the storyline of Ulee’s Gold. To restore his broken familial relationships, Fonda’s character—shy, widowed, and down on his luck—stands up to bullying druggies in the swamps of Wewahitchka.

“I’ve never been one drawn to stories about taking the castle; finding the treasure,” Nunez explains. “If I have a fascination,
THE FORCE behind *Ulee’s Gold* (1997), Nunez also wrote the film’s script, filmed it and edited the final cut. His skills impressed Peter Fonda (left) who starred in the film and subsequently received an Oscar nomination for Best Actor. (below) on a movie set somewhere in Florida, ca. 1979. Nunez is known for writing, directing and shooting some of the finest independent films ever made in the Sunshine State.

**VICTOR AS DIRECTOR**

**MOVIE CREDITS INCLUDE:**

*Spoken Word* (2009)

*Coastlines* (2002)

*Ulee’s Gold* (1997)

*Ruby in Paradise* (1993)


*Gal Young ’Un* (1979)

*A Circle in the Fire* (1974)

*Charly Benson’s Return to the Sea* (1972)

*Taking Care of Mother Baldwin* (1970)
it’s usually with people who have somehow strayed from the world, and they’re trying to decide whether or not they’ll be able to get back in again.

“It’s a condition; it’s all about the myth of the Garden of Eden: What do you do when you are no longer a child and you’ve been expelled from the Garden? All of us go through it—each of us in our lifetime has been seduced by the serpent and we have to figure out what the hell we’re gonna do next.”

The journey of the average person toward an examined life has always tugged at Nunez. His latest movie, Spoken Word, released in August 2009, is set in the old, Espanola Valley community of New Mexico.

“I had spent a year and a half researching a very different project for Zoetrope, currently run by Roman Coppola. That project ran into rights issues—it was to be an adaptation of a classic film by Carl Dryer—just when I got the call for Spoken Word. I was primed for working in New Mexico, and the producers needed a director, so off I went.”

The film centers on a poet who returns from San Francisco to the New Mexican town of his boyhood to care for his ailing father. It was the first time, Nunez says, that he directed a script he did not write, though he did get to spend several weeks tweaking copy with the writer.

“It was really a wonderful process directing and editing up to the point I did and I’m grateful for the opportunity,” Nunez says, adding that he approached the film with the sensibilities of a “regional” filmmaker, addressing the idea of how “place” informs both character and story. At a certain point, however, he notes, “those jobs were done, and the film was left in the very able hands of the producers. It is now complete and they are currently looking for distribution.”

A HEART FOR “SOUTHERN” FLORIDA

Despite his penchant for making movies about the Sunshine State, Nunez shuns the Florida filmmaker label.

“When I have a story in Florida, I sort of know a lot about that world before I even start because I lived here for so long,” he says. “But I’d like to believe my camera won’t break if I cross the state line.”

If he’s anything, Nunez is a Southern filmmaker with a distinct Florida twang. As the old maxim goes, the tropics end and the South begins at the Tampa-Lakeland line.

“In my college English and literature classes I discovered the power of Southern literature,” he recalls. “It was the notion of the commitment of writers to stay in place. Alfred Kazen makes a very big distinction between writers in the South who were locked in their place to writers in the North who basically lived in a kind of floating collective world full of fellow writers and slap in the center of the literary marketplace.”
Long a devotee of Southern literature,

Nunez praises Flannery O’Conner for her “distilled” style of writing; and Florida’s Marjorie Kinnan Rawlings for her sense of “humanism.”

“I don’t consider myself a word person; I write in order to make the film,” he explains. “Writing is very frustrating, the hardest part for me. For most American filmmakers, place is just background, a setting, sort of ‘what can I do with this to make my movie cuter or weirder or prettier?’”

In fact, his filmmaking style is so rooted in “place,” it’s clear he deeply “gets” the settings of his movies, particularly Florida culture, a crazy amalgam of drugs, tourists, snowbirds, service workers and hardscrabble natives holed up in obscure rural outposts.

“His descriptions are the best I’ve ever read. I knew all about North Florida before I had ever been there,” recalled Fonda one day by phone. “I suddenly knew what it smelled like in the swamps; I even understood the way my character walked. The script was so incredible, so good, so perfectly written—as were the narrative directives, the descriptions of what’s going on and where.”

Fonda says he was so taken with the Ulee’s Gold script that it triggered an emotional reaction that he still recalls vividly.

“The lines were so bloody perfect. I got his number from Jonathan Demme (who’s company executive produced Ulee) and called him up. I was quite emotional, I had tears in my eyes. I looked up at the ceiling of the cabin where I was staying and said ‘I’d like to thank the members of the Academy.’ I knew it would take me to the gold. I wouldn’t win, but I knew it would take me there.”

[CONTINUED ON PAGE 24]
GAL YOUNG ’UN AND FAME

Nunez, got his first movie camera—an old 8-millimeter—from his granddad. “He told me that he didn’t know how to run it and that if I could make it work I could have it.” The newfound interest in film remained dormant until he went to Antioch College in Yellow Springs, Ohio and where he discovered Southern literature and foreign film and ultimately took a bachelor’s degree in art with an emphasis on film and sculpture.

“In my naivete it seemed obvious that if writers could write in the South, why couldn’t a filmmaker make movies there just like they did in Europe?”

There he discovered his cinematic talents at a time when European film was thriving and attracting large, loyal audiences in the U.S. “There was a wonderful little art theater there and a great film program run by the students. I probably watched four or five movies a week during those years,” he recalls.

“In those days you could buy a roll of 8-millimeter film for $3—and that included processing—at the drugstore counter. The options for being a filmmaker were much more fluid then.”

He made his first shorts during college, including Taking Care of Mother Baldwin (1970) about a young African-American boy caring for an elderly lady in his neighborhood and Fairground (1968) about a hog raising family in Concord, a small town in North Florida.

After Antioch, Nunez earned an MFA degree at the UCLA Film School, where he made his “thesis” film Charley Benson’s Return to the Sea (1972) about a young Vietnam war vet’s return to his Gulf Coast family, then returned to Tallahassee to teach film briefly at FSU and where he began working on A Circle in the Fire, (1975) based on a Flannery O’Connor short story. In order to finish the movie, which ultimately received critical accolades, he had to quit teaching, which, he jokes, put him well “on the way to the rest of my patchwork career.”

In ’79, Nunez debuted his first feature-length film. Funded by grants from the National Endowment for the Arts and the Florida Fine Arts Council, Gal Young ’Un was a low-budget drama set during the 1920s. It tells the story of an unhappily widowed Florida woman, her young husband and his very-young girlfriend, for whom the story is titled.

It was Gal Young ’Un that brought Nunez to the national stage, thanks in large part to a review by Vincent Canby of the New York Times. Canby called the film “an astonishingly good first feature, written, directed, photographed, edited and produced by Victor Nunez.”

He went on to muse: “I know very little about Mr. Nunez except that he lives and works in Florida, but if he’s representative of our new regional film makers, things are looking up.”

Notably, Nunez cast Dana Preu, an English professor at Florida A&M University, for the film’s starring role. As it turned out, it was an inspired choice. He had spotted Preu sitting at a friend’s dining room table smoking a pipe.

“Literally I saw her for 20-seconds through a door. I didn’t even go inside,” he recalls. “Dana (later) told us she had recently lost her husband. So I was looking at a pipe-smoking widow from the South. She combined this real experience with her literature professor analysis and created a wonderful character.”

“In a different world, I might have cast Geraldine Page (who bears an uncanny resemblance to Preu) and she might have won an academy award. But at the end of the day, I happen to think that Dana did a much better job.” Preu, now retired, still lives in Tallahassee (see next page).

STAR STRUCK

For his first films, Nunez had been known to travel hundreds of miles in his car looking for amateur actors to cast on a nominal budget. He always found casting to be one of his biggest challenges.

“I went all over the state, to every big city that had theater groups. I even went to the Asolo Theatre (in Sarasota) and some of the people I met there ended up being cast a few years later in a Flash of Green.”

That 1984 film was financed through a combination of grants (Rockefeller and NEA among others), foreign presales, Public Broadcasting’s American Playhouse, and private investors including the writer John D. MacDonald himself. He was able to cast Ed Harris (Apollo 13, The Right Stuff, et al), Blair Brown (Smallville, Law & Order, et al), and Richard Jordan (The Friends of Eddie Coyle, Rooster Cogburn, et al). Based on a James D. MacDonald novel, the movie—named for that storied, split-second sunset phenomenon along Florida’s Gulf Coast—told the tale
of a newspaper reporter investigating a shady landfill development deal in a backwater Florida coastal town.

Since then, Nunez has courted some big names, making his quirky, “on-the-money” casting decisions based on an instinct that he can’t quite define. Ashley Judd, for example, in 1993 was a little-known television actress who had been modeling in Japan when Nunez cast her in *Ruby in Paradise*. “She had minimal acting experience but exuded a “hungry” quality that was right on,” he recalls.

“The casting director was pushing a very accomplished young actress, but she didn’t feel right. Ashley came in—and she came in late. She was sort of awkward, but in a very charming sort of way. She did her interview and came back a half hour later and gave us a CD of her sister and mother (the country music stars, Winona and Naomi Judd) so we would know what sister she was.”

### A PLACE TO PONDER

Inside Nunez’ long-time editing studio at Railroad Square a map of North Florida’s rivers and swamps hang alongside large, abstract paintings by his wife, Cynthia Nunez, to whom he’s been married for over 40 years.

They have one grown son (who lives in Anaheim and teaches English as a second language) and two grandchildren. He keeps his home and family life intensely private and relegates interviews and photography to his studio, which sits next to a shop that sells herbs and “co-exist” bumper stickers.

“There’s almost 30 years of trends in this place,” says Nunez who describes the studio as wallowing in “four or five layers” of antiquated equipment.

“We’ve gone through machines like my old, flatbed Moviola. It was quite radical at the time and that’s what we used to edit my first three features. I get sentimentally attached to equipment, but sometimes, you know, you just have to let it go.”

The studio’s small front room, where Nunez spent much time writing, stands as a cluttered homage to his film career. His Sundance Medal for *Ruby* is wedged unassumingly on a library shelf crammed with titles that have shaped his thinking and creativity. It’s a messy, literary cocktail party with a guest list that includes Raymond Carver, Shirley Jackson, Frederick Barthelme, Janet Burroway, Diane Ackerman, Ron Hansen and Susan Sontag.

At FSU, a place he’s come back to possibly for good, he jokes that he remains the “loyal opposition,” still a true believer when it comes to the idea of making a film honestly and cheaply, “by getting a few friends together with a camera and telling a story,” he said.

“I think I’m the exception who proves the rule. You do it (make independent films instead of industry work) not necessarily because you have a mission from God, but because that’s what you enjoy and what you’ve done.”

He’s looking for a new film project, something small, low-budget, where he can kick around some of his ideas, maybe even work with a few good actors again like Fonda or Judd. If he makes money, then he’s appeased “the film gods.” If he doesn’t, well, par for the course, he shrugs. He’s been there before, to the cusp of Hollywood fame and fortune and back again to the canopied college-town of his boyhood, and a happy place.
CRIME AGAINST NATURE
A LOOK INTO THE BIOLOGY OF BAD BEHAVIOR

FOR TOO LONG, SAYS THIS RESEARCHER, SCIENCE HAS IGNORED THE BIOLOGICAL BASIS OF CRIME. THE IMPLICATIONS ARE AS COMPLICATED AS THEY ARE PROFOUND.

KEVIN BEAVER belongs to a new breed of criminologists distinguished by their curiosity about the links between genes and criminal behavior.
Why is it that some people just seem to be bad to the bone?

In 1982, American blues-rocker George Thorogood even wrote a hit song about it:

“On the day I was born, the nurses all gathered ‘round
And they gazed in wide wonder, at the joy they had found
The head nurse spoke up, and she said leave this one alone
She could tell right away, that I was bad to the bone…”

Funny how it falls to poets and pundits to put the human predicament into finest relief, and often in few words, while the most learned men and women of science spin out whole careers searching for some of the same truths about what it means to be human.

Is it natural for us to be aggressive, to be murderously violent, to be criminals? Judging by humankind’s bloody, criminally inclined history, the answer should be obvious. But it’s anything but.

Serious scientific debate on the origins of criminal behavior, for example, began well before Darwin, and more than a century before the discovery of genes. For most of their modern histories, the intertwined fields of sociology and psychology have been in lockstep in condemning the idea that criminal dispositions are something we’re born with instead of something we learn.

The academic tradition has been to look to the environment—societal factors, or what sort of upbringing a person has had—to explain pretty much everything about crime. And although for some years there has been a small contingent of “biocriminologists” (see box, page 33) speculating about how genetic factors might influence crime, there has been little direct evidence showing that genes actually do play a role.

But that’s changing, and the findings pose profound implications for research in a host of fields including psychology, medicine, criminology, molecular biology, sociology, social work, education, philosophy and even religion.

IGNORING GENES

Kevin Beaver is an assistant professor in Florida State’s College of Criminology and Criminal Justice whose prolific research over the past decade counts as some of the most compelling evidence yet compiled on the influence of genes on crime. He’s convinced that the jury is in on the subject. When it comes to having either a criminal bent or, most interestingly, even being a victim of a crime, genes play a powerful, if still poorly defined role, he said.

“Criminology has generally ignored the role of genes,” he says. “We’re seeing all that changing now. Whether we like it or not, genes matter.”

Beaver’s studies of adolescents, for example, have shown a strong genetic component not just in crime victimization, but in such behaviors as gang membership, use of weapons and the lack of self-control that criminologists believe lies at the root of most criminal behavior.

Some of Beaver’s harshest critics have been his fellow criminologists. A recent article in the Chronicle of Higher Education, for example, quotes Simon A. Cole, an associate professor of criminology, law, and society at the University of California as saying that “he and other mainstream criminologists are likelier simply to ignore the articles that are published by biocriminologists.”

A second criminologist quoted in the article, Jeff Ferrell from Texas Christian University, said that trying to understand the genetic component of crime “strikes me as misguided at a minimum, if not morally and politically questionable.”
Still, by producing work that is meticulously researched and supported by reams of evidence, Beaver is slowly winning converts to his point of view. Although there are still just a handful of researchers in criminology who are looking to genes for explanations, Beaver’s work may well be opening up a new front in our understanding of crime.

The power of Beaver’s approach is on display, for example, in his victimization study, which is the first to find a genetic component to the likelihood of being a crime victim. Just this summer, in the journal *Youth Violence and Juvenile Justice*, Beaver published the results of his study of more than 500 pairs of identical and fraternal twins. He analyzed the various factors, genetic and environmental, related to an adolescent’s chances of being a victim of some crime or violent act. He found that genes could explain about 45 percent of the variation in adolescent victimization.

That paper is just one of more than 40 papers Beaver has authored or co-authored over the past five years, including three that appeared in *Criminology*, the field’s premier journal. He has another 20 or so forthcoming in various journals and lists yet another 20 in his vita as being under review.

Although many of the papers are co-written with his graduate students, the sheer numbers tell you two things about Beaver: First, he has seemingly endless energy and curiosity, and, second, he has found an area with a huge number of questions waiting to be answered and studies waiting to be performed.

**MOLECULES THAT MATTER**

Beaver says he has always been interested in human behavior as it relates to crime, and, in the beginning, he followed a relatively traditional path in the areas of criminology and criminal justice. As an undergraduate at Ohio University he majored in sociology with an emphasis on criminology.

After graduation he enrolled in the masters program in criminal justice at the University of Cincinnati, where his thesis looked at the effects of marriage, employment and education on a person’s ability to stop smoking marijuana. For his doctoral work, which he began in 2001, he stayed at Cincinnati but moved back to sociology. And it was there in the UC sociology department where he first found himself, quite inadvertently, stepping on other peoples’ toes.

As Beaver took classes and began doing the reading and research necessary for deciding the direction he would take in his own research, he found himself increasingly drawn to the question of what causes violence and criminal behavior—why one person commits crimes and another doesn’t—but the traditional sociological approach seemed insufficient to answer that question.

“People exposed to the same environment can turn out very differently,” he says, “and when you look at this from a purely sociological perspective that doesn’t make sense. I began to realize that there was a lot about crime that sociological theories couldn’t address.” So he began looking for another tool to apply to questions about crime.

Well before the 2003 publication of a complete draft of the human genome and the identification of a growing number of individual genes and their functions, molecular biology had become a powerful tool for investigating human behavior. Suddenly, researchers had new insight into studying why some people are more vulnerable to cancer than others, for example, and the roots of mental illness. Why not apply this tool to the study of those behaviors of interest to criminologists, Beaver asked?

He quickly discovered, however, that the enthusiasm for this new tool was not shared by others in his program. “I was interested in crime, genes, and the environment, and the
Not only do genes influence criminal behavior, but it is possible to link specific genes to specific crimes.

people in sociology didn’t really like what I was doing,” he said.

BREAKING THE PC BARRIER

In its quest to understand how humans behave as members of groups, sociology traditionally has focused on factors shaping human behavior that arise from groups, e.g., family upbringing, socialization in schools and peer groups, the more diffuse effects of the broader society, and so on.

Many sociologists have resisted—sometimes quite adamantly—the idea that genes have a significant influence on human behavior. Indeed, sociobiology, a field of inquiry legitimized by Harvard biologist E.O. Wilson in the mid-1970s, uses evolutionary—and thus genetic—insights to explain human behavior. The term “sociobiology” is still a dirty word in many academic departments, an affront to a mindset that critics charge is steeped in political correctness.

At Cincinnati, Beaver grew increasingly aware that the entire topic of gene-related crime was taboo within the sociology department. After two years, he decided to pursue his dissertation elsewhere. Fortunately, he had met a young criminal justice professor at Cincinnati, John Paul Wright, who was becoming interested in many of the same questions that were tugging at Beaver.

“John was just starting to get into it,” Beaver says. “He was moving that way.”

So Beaver moved to the criminal justice program to become one of Wright’s graduate students, and the two of them began applying the lens of genetics to some of the most interesting questions in criminology.

One of the first projects that Beaver took on with Wright was a re-examination of one of the classic theories in the field of criminology. In 1990, Michael Gottfredson and Travis Hirschi, both then at the University of Arizona, published *A General Theory of Crime* (Stanford), whose core claim was that the essential element of criminality—the one characteristic that is common to most criminals and others who act in antisocial ways—is a lack of self-control. They went on to claim that this lack of self-control among criminals has its roots not in any genetic factors but rather in how these people were raised as children. In short, criminals are made, not born, and they are made mainly by parents who fail to instill self-control in their offspring.

Since that book appeared, a number of researchers have tested Gottfredson and Hirschi’s claims about the link between lack of self-control and criminal behavior, and the claim has stood up well. Today criminologists take it for granted that lack of self-control is a major part of why some people break the law. But, Beaver notes, no studies had examined whether the lack of self-control had anything to do with genes—or in other words, whether the criminal behavior could be blamed on the parents.

Beaver had his doubts, though. In part they had been stirred by the work of Judith Rich Harris, an independent psychologist, who had challenged the importance of parenting in a well-known 1995 article in *Psychological Review*, for which she won the George A. Miller Award for an Outstanding Recent Article in *General Psychology* from the American Psychological Association, and in a book called *The Nurture Assumption* (1998, Free Press). Parents actually have very little to do with what sorts of adults their children become, Harris contended. Instead, most of how a child turns out is due either to influence from the child’s peers or from the genes.

So Beaver and Wright set out to test just how large a role parents play in the development of self-control. Did they play the major role that Gottfredson and Hirschi claimed, or were they mainly just bystanders, as Harris said?

Beaver and Wright looked for answers by reanalyzing the results of a survey of children called the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999. The study, conducted by the U.S. Department of Education, examined a nationally representative sample of more than 21,000 children from across the United States. The project assessed the behavior of the children in kindergarten and then again in first grade while also getting answers about the behavior of those children from their teachers and parents along with details about the children’s home life and how they were being raised. The survey included information about the children’s self-control as well as about such parenting characteristics as parenting involvement, parental affection, and family rules.

What allowed Beaver and Wright to compare parenting influences with genetics was the presence of 155 pairs of twins in this study. By examining these twin pairs along with another 1,000 children without twin pairs, the two researchers had enough data to calculate how large a role genetics was playing versus how large a role parenting was playing.

Beaver and Wright concluded that although the twins in the study were definitely more similar on measures of self-control than were unrelated children, those similarities were caused mainly by their genetic closeness rather than to the fact they grew up in the same household with the same parenting. “As such,” they concluded, “these finding provide tangible evidence in favor of Harris’s..."
Resea Rch in Review

Youth & Crime: Kevin Beaver’s studies of adolescents have shown a strong genetic component in such behaviors as gang membership, use of weapons, and the lack of self-control that criminologists believe lies at the root of most criminal behavior.
proposition that parental socialization techniques minimally influence the individual traits of their children.” Genes, not parenting, made the difference.

A Biological Basis for Self-Control?

The study was published in 2005 in Criminology, the field’s flagship journal and, thanks to that paper plus a flurry of similar work that followed, Beaver quickly became very well known among criminologists—and not necessarily in a good way. When he gave a talk at a professional meeting or conference, he says, “usually there would be at least one person in the audience who had come because they disagreed.”

Some of the attacks were “very scathing,” he recalls. He regularly received emails from other criminologists telling him that he should not be performing that sort of research. He remembers one woman in particular who showed up at one of his lectures and stood up to make a comment during the question-and-answer session afterwards. “I believe that your results are true,” she told him. “I accept that you have done the work carefully. But shame on you for doing it.”

As Beaver discovered, the problem was not so much his research results themselves but how other researchers feared they might be interpreted. If criminal behavior came to be seen as genetically imprinted, what might the implications be? Would there be calls to prevent criminals from reproducing and passing on their genes? Would genetic tests be developed to predict the likelihood of criminal behavior so that mothers could abort fetuses that had the potential of turning into a Charles Manson or a Bernie Madoff?

But Beaver is making it increasingly hard for his detractors to ignore the evidence. In a study done in 2007, he used data from the federally funded National Longitudinal Study of Adolescent Health, to revisit the question of what causes a lack of self-control. Funded by the National Institutes of Child Health and Development, the study is the largest and most comprehensive of its kind ever done. It tracked adolescents across the country from 1994 to 2002.

Beaver re-analyzed data drawn from a study of nearly 300 pairs of identical twins who had been surveyed when they were in middle school or high school and again about six years later.

That study, which Beaver published in 2008 with Wright and two other colleagues, found that the variation in self-control could be explained completely by genetics and “non-shared environmental influences,” that is, environmental factors that are not shared by siblings growing up in the same home.

To be sure, these non-shared influences were hard to pin down, Beaver found. “There are a lot of thoughts out there about what they might be,” he said. “Research shows that parents can actually treat their children very differently, even in the case of identical twins. And siblings can have very different peer groups. One twin might hang around one group of friends, while the other has a completely different set.”

What was clear from Beaver’s data, however, was that shared environmental influences—including the shared home environment and the lessons that parents impart to each of their children in pretty much the same way—had basically zero effect on the level of self-control that those children eventually developed.

In the same study, Beaver also examined delinquent behavior, including such things as fighting, drug use, and vandalism, and the tendency to associate with delinquent peers. Genes and non-shared environmental influences together explained both things, he found, and parenting had no discernible influence on whether children associated with delinquent peers or became delinquents themselves. A follow-up study was the first to show a link between the genes and the types
The Rise of Biocriminology

Ever since Darwin explained how traits are passed from one generation to the next and how natural selection favors the passing on of certain traits over others, people have speculated about the genetic basis for criminal behavior.

One of the earlier and best-known practitioners of this approach was Cesare Lombroso, who published his theory of the “criminal man” in 1876, 17 years after Darwin’s *The Origin of Species* appeared. Lombroso, an Italian criminologist often called the “father of modern criminology,” argued that criminals were born, not made, and that they were evolutionary throwbacks to a time when people—and particularly men—were more aggressive and violent and less able to be civilized.

Because criminals were more “primitive,” Lombroso said, they could be identified by certain physical characteristics, e.g. low, sloping foreheads; large jaws; long arms; fleshy lips; shifty eyes. Lombroso’s assumption that certain people were more advanced evolutionarily than others tied in with his racist belief that certain groups of people—in particular, those of European ancestry—were more advanced evolutionarily than other groups, such as those from Africa.

The idea that some people are born criminals had obvious—and unpleasant—policy implications. For one thing, it implied that rehabilitation was unlikely. Someone genetically destined to a life of crime was not likely to change, and so the best approach was just to lock him away.

The idea also led directly to the rise of eugenics as a worldwide social movement by the early 1900s. The central idea was that the human race could—and should—be improved by encouraging people with “desirable” traits to reproduce and discouraging or preventing reproduction among those with “undesirable” traits. For people with criminal genes, the best thing for all concerned was to make sure they didn’t have children. After Hitler used eugenics to justify his genocidal bloodbath in WWII, the movement was abandoned.

Not surprisingly, Lombroso’s most enduring legacy has been the tendency of progressive-thinking people ever since to reject the idea that criminal behavior has a genetic component, since that belief seemed to lead directly to prison, sterilization, or death for those unfortunate born with the wrong genes.

In the 1970s a very different approach to understanding the genetic component of criminal behavior arose. It was inspired in large part by the development of sociobiology, a synthesis of biology and sociology that sought to use insights from genetics and evolutionary theory to understand the behavior of individuals in groups.

Termed biosocial criminology, or biocriminology, it was far more nuanced than the genetic determinism of Lombroso, and it recognized that all human behaviors, criminal or not, are shaped by a complex interplay of genetic and environmental factors. Lombroso’s claims that heredity determined all behavior were ridiculous, these biocriminologists believed, but equally ridiculous was the idea that heredity had no influence on behavior at all.

In its early years, much of biocriminology was theoretical in nature, as there were few data that spoke directly to the link between genes and criminal behavior. And as such, it was easy for most mainstream criminologists to ignore or deride the young field. This changed, however, with the 13-year, international Human Genome Project (completed in 2003) and the growing number of techniques that allow researchers to explore the relationship between genes and behavior in a very explicit, data-driven way.

In part because of the legacy of Lombroso, criminologists have been slower than researchers in other fields to follow this path. That’s changing with the work of FSU criminologist Kevin Beaver and other path-breaking biocriminologists.

In a recent book, *The Criminal Brain: Understanding Biological Theories of Crime* (2008, NYU Press), Northeastern University scholar Nicole Rafter predicted that the tools of genomics and the new capabilities they bring will fundamentally change criminology. The biosocial approach, she wrote, “promises to dominate criminology and other behavioral sciences for decades to come.”—R.P.
of peers—in this case, delinquent peers—that adolescents choose to hang around with.

**“Criminal Genes”**

Beaver also has investigated the influence of individual genes on specific behaviors. In research that has just been published in *Comprehensive Psychiatry* for example, he focused on a gene that produces an enzyme called monoamine oxidase A, which breaks down various neurotransmitters, such as dopamine, serotonin, and norepinephrine and thus limits their effect in the brain.

Some researchers have dubbed the gene that makes this enzyme the “warrior gene” because it has been linked to aggressive behavior. Researchers have found evidence suggesting that this gene may be more prevalent in cultures with higher than average levels of violence. In particular, certain molecular variations in this gene cause some people to produce a monoamine enzyme that is underactive, which in turn can lead to abnormal levels of various neurotransmitters and thus affect brain functioning and emotions.

For that study, Beaver again used data from the National Longitudinal Study of Adolescent Health, a project that also had accumulated genetic samples from a number of the participants. Working with this subgroup for which genetic data were available, Beaver divided the participants into those genetically wired to produce high activity monoamine oxidase A and those whose bodies produced low-activity monoamine oxidase A. Then he compared the prevalence of gang membership and weapon use in the study sample against the prevalence of the gene.

Among men, Beaver found that individuals with the low activity variants of the monoamine oxidase A gene were twice as likely to have joined a gang as those with high counts. Among those who were gang members, those with low activity variants were more than four times as likely to have used a weapon in a fight. Interestingly, no correlation of any kind was found in female participants. Still, the study served as an exclamation point to Beaver’s previous work: Not only is it possible to show that genes do indeed influence criminal behavior, but it is possible to link specific genes to specific types of criminal behavior.

Despite the fears of many criminologists that such clear-cut evidence of a gene-behavior link could lead to oppressive policies toward criminals and anyone with “criminal genes,” Beaver sees the situation quite differently.

First, he argues that there is no “criminal gene” here—that is, no gene that causes most or all of the people who possess it become criminals. For example, although his most recent study proved one gene’s role in criminal behavior, it also showed that most men who have the gene don’t join gangs or use weapons. The gene is one small piece of a much bigger picture, most of whose details are still being worked out, he said.

Furthermore, the gene does not exert its influence alone, Beaver believes. It interacts with various environmental factors and other genes to push a person in this direction or that, and there is no way to predict from that single gene how any given individual will turn out.

This hardly means that there’s no practical value to this sort of research into the genetic influences on criminal behavior. Beaver envisions a way that research like his can indeed be quite useful to criminologists—and in a very “progressive” way.

“We can use genetic information not as a way to decide which people to lock up in order to protect the rest of society but instead to develop different prevention and intervention programs that are tailored to the individual. We can use genetic information as a way of saying, “This person is most likely to benefit from this program, and that person is most likely to benefit from that one.””

**Biology’s Day in Court**

One of the major focuses of criminology, Beaver explains, is figuring out how to keep people who have committed crimes and gotten caught from committing more crimes. Criminologists know from
A variant gene known as 5HTT has been shown to make adolescents twice as likely to engage in such behaviors as drinking, smoking marijuana and having sex. The new research showed that participation in prevention program canceled out this increased risk. Adolescents who had the gene but also took part in the program were no more likely than other adolescents to engage in risky behavior. By contrast, the program didn’t help the kids who didn’t have that particular gene.

**BAD TO THE BONE?**

The moral, Beaver says, is that genetic information can be useful in targeting interventions to those individuals who can most benefit from them. And this is how he hopes his genetic research will eventually be used—not to stigmatize individuals who have “crime genes” but to learn better how to help them.

Beaver’s message, as uncomfortable as it is to so many, is beginning to be heard. In the past year or two, he says he’s seeing a more positive, accepting attitude toward his work among his peers in criminology. Ultimately, he says, his goal is to have the genetic approach accepted as one more—very useful—tool in the criminologist’s toolkit.

“I would hope that eventually every university will offer classes in which this approach is taught and that every student interested in this approach will be able to pursue it.

“And although it is not something that will likely dominate criminology, I do think it is critically important that everyone in the field should realize the value of genes in understanding why people do what they do.”
There's an answer to how things they do. In these tiny fish, Zebra Fish (Danio rerio), there's an answer to how things they do.
Having yearned for a life of scientific discovery since her childhood in Cuba, Karen Alvarez-Delfin had adjusted to the less-than-dazzling routine of a genetics lab.

The Florida State University doctoral candidate took her turns coming in on weekends to feed the lab specimens, hundreds of darting zebrafish. The species is highly popular among aquarists—as well as scientists who need good models for studying a world of little-understood biological phenomena.

When the timing of an experiment demanded it, Karen was there at 3 a.m. She spent long days peering through a fluorescence microscope at the orderly mosaic of zebrafish retinas, studying the cells that allow the minnow to see. She saw nothing surprising.

Then, on an otherwise mundane day, she spotted something never before seen by scientists. This new batch of zebrafish had a super-abundant supply of rod cells—the cells that enable an animal to see in dim light. She could tell because the rods were colored gold with fluorescent dye. Later, she and her colleagues found that they had fewer of the rod cell’s counterpart—the cone cells, which enable animals to see color.

Karen had stumbled upon an unknown function of a well-known, but elusive gene that scientists call “thx2b.” The gene is found in animals ranging from worms to humans, and plays fundamental roles in development. In zebrafish, for example, scientists had documented...
the gene’s role in developing the fish’s fins and heart. Until Karen’s find, no one had ever thought the gene played any role in vision—yet here was proof.

Suddenly, scientists who study vision had one more, tantalizing clue about a phenomenon they’ve puzzled over for decades: What causes cells in a developing retina to specialize the way they do to make vision work? The answer could pose a giant leap for medicine, which has long dreamed of using gene therapy to treat some common forms of human blindness, including retinitis pigmentosa and macular degeneration.

That’s the goal, says James M. Fadool, associate professor of biology and neuroscience and Karen’s faculty advisor.

“Time will tell how important this really is,” says Fadool, though he is obviously wowed by the discovery, calling it an incredible effort on the part of his doctoral student. And the editors of the highly regarded Proceedings of the National Academy of Sciences deemed it important enough to publish the paper by Alvarez-Delfín, first author, with second-author Ann Morris (now an assistant professor of biology at University of Kentucky) and Fadool.

It’s also another affirmation of the zebrafish, an aquarium favorite with the rakish name of Danio rerio, as a laboratory staple. Fadool started the first and only zebrafish lab at FSU a decade ago with the goal of understanding the genetic workings that create the central nervous system in vertebrates. Funded largely by a five-year, $1.7 million grant from the National Institutes of Health, his lab focuses on retinal research. The FSU team works closely with others studying zebrafish at Vanderbilt University, The University of Louisville and the University of Pennsylvania School of Medicine.
about two months. The transparent eggs develop outside the mother’s body, so scientists are able to observe changes as they grow from a few cells to fully formed fish.

Zebrafish have another advantage for Fadool. Unlike in mice, whose retinas are specialized for night-time vision, zebrafish that have excellent daylight and night-time vision, with their rods and cones laid out in an easily recognizable pattern. That makes it easier for zebrafish researchers to spot anomalies, which is how Alvarez-Delfin was able to observe the work of the errant, “lots-of-rods” gene, as the team named it.

But interestingly, Fadool’s team never would have discovered the gene’s unusual role in zebrafish vision by studying normal fish. What Alvarez-Delfin was looking at under her microscope were the eyes of zebrafish mutants, created deliberately in the lab by exposing the parent fish to gene-altering chemicals. The technique is commonly used in genetics research, Fadool said.

“We study mutants to try to figure out how genes work in normal organisms,” he said. “It’s kind of a reverse approach to studying gene function.”

In the eyes of normal fish, the researchers learned that the “tbx2b” gene typically develops cone cells, but in mutants, the same gene makes rods—and lots of them. Since rod cells are typically associated with the capacity to see in dim light, did the finding mean that these rod-rich, baby zebrafish had great night vision?

“No, surprisingly that’s not what we found,” Fadool said. “This could be because the overall neural network for night vision isn’t yet developed in larval fish. So exactly how these (rod-rich) fish see is something we don’t know, but would like to find out.”

The discovery poses intriguing questions, says Alvarez-Delfin. She notes that the mutation of cones into rods is the opposite reaction of a disorder called Enhanced S-Cone Syndrome in humans, which turns cells destined to be rods into the short-wave cones that see only the bands of blue. The human cone corresponds closely with the mutating cone in Alvarez-Delfin’s study. Humans born with the malady eventually go blind, but the mutation doesn’t seem to affect zebrafish.

“These guys see very, very well,” she says. “We know that because they eat well. If they don’t see well, they don’t eat.”

RESEARCHERS IN THE LAB of Jim Fadool like to use images such as this to get a sense of the three-dimensional perspective of cell distribution in the retinas of larval zebrafish. By staring at these twin images and crossing their eyes, they see a stereo image of the entire organ. (This is an image of a retina taken from a normal zebrafish labeled for UV cones in purple and rods in green.) To see the effect, Fadool recommends holding this page about 20 inches away while slowly crossing your eyes. (And no, your eyes won’t stay that way.)
THE HELL OF IT

Hell: A Novel
by Robert Olen Butler: Grove Press, 2009; 232 pages, $24

Guess what’s the number one question on everyone’s mind in Hell? It’s “Why do you think you’re here?” Hatcher McCord, the protagonist of Robert Olen Butler’s latest and the anchor-man for the Evening News in Hell, finds himself posing that very question to a lot of his fellow sufferers every day.

Not that he has any idea himself. He’s got enough on his plate careening around Hell trying to appease his boss, Satan, and deal with unconsummated lust for his new girlfriend Anne Boleyn, whose head keeps coming off to a chorus of screeching cockroaches.

McCord shares his miserable, underworld stage with just about every imaginable dignitary that ever stumbled through history. J. Edgar Hoover, Michael Jackson, Dante, Nixon, Shakespeare and more float by with nary a passing glance from McCord, until Robin and Maurice Gibb, dressed in identical powder-blue jumpsuits, spirit him away to a private audience with Satan himself, and he gets to use Adolf Hitler and Joseph Stalin as target practice.

Hell as imagined by Butler is a lively, disgusting, scary, high-tech place, its characters doomed to repeat the same scenarios ad infinitum, torn apart and dying gruesomely only to be put back together and then killed again. New Wal-Marts open all the time; people are routinely made to exclaim “poopy butt” against their will; you can use a cell phone but you’ll never get good reception; and the PC Blue Screen of Death is the universal screen saver. The citizens of Hell feel Satan reading their every thought and thwarting their every move, and are so busy being tortured, killed and reconstituted that they don’t have a whole lot of time to figure out why, in fact, they might be there.

So when the Gibb brothers bring McCord to Satan and he realizes Old Scratch cannot actually read his mind, it’s then he realizes there might just be a way out of the place, starting with the quest to answer that eternal question about what he’s doing there. Not that that quest ever really gets McCord anywhere. This is, after all, Hell.

—Kim MacQueen

A PEACEFUL REVOLUTION

Cultivating Health: Los Angeles Women and Public Health Reform by Jennifer Lisa Koslow: Rutgers University Press, 2009, 204 pages, $45.95

During the 1880’s, Los Angeles, Calif. experienced a huge surge in population and urban growth, knocking the city’s public health-care system for a loop. But by the early 20th century, this “Progressive City” had become a national leader in both political and social reforms, with middle class women at the forefront. Their top mission? To make the L.A. health-care system accessible to all classes while simultaneously educating the public on various ways to prevent illness.

In Cultivating Health, author and Florida State assistant professor of history Jennifer Koslow details how a group of civic-minded women of late 19th-century Los Angeles pulled off a revolution in municipal health care in a place that today faces, ironically enough, many of the same challenges it did 120 years ago. Engaging, informative and timely, Koslow recounts how this grassroots movement succeeded in installing a workable health-care system despite intense opposition from all quarters.

The L.A. of yesteryear—while not the deadliest city in the United States—was hardly a safe place to live, much less raise a family. In 1889, the L.A. was troubled by high infant-mortality rates as well as contagious diseases, the latter causing at least 44 percent of all deaths in the city. Something had to change, not only in the medical sphere, but also in housing and food safety.

Koslow explains how a group of progressive middle-class women created programs for public health nursing, housing renovation, birthing services, protecting the quality of milk, and the treatment of various venereal diseases to help heal an unhealthy society. They did this in part by appealing to their city health departments using the argument of maternalism, reasoning that as women, their natural nurturing instincts equipped them with both the knowledge and empathy necessary for the proper treatment of the city’s sick and poor.

Koslow wraps up on a contemporary note, contrasting the United State’s current health-care drama to that of the 18th and 19th centuries. She argues that it should always be the government’s job to promote public health, and that the women of Los Angeles did not just react to growing health problems, they collaborated to prevent them, a point too often overlooked in today’s frenzied health-care debate.

—Elizabeth Copps
THE SAD STATS SAY IT ALL, or enough anyway—fully a quarter of the nation’s 8th and 12th graders score “below basic” on the National Assessment of Educational Progress, also known as “The Nation’s Report Card.” A main reason? The kids simply can’t read.

It’s not a question of money. In 2004, federal spending for Title I reading-improvement projects in the earliest grades outpaced spending for the same programs in the higher grades nearly 10 to one. Despite all, when it comes to literacy, a fourth of our nation’s youth still scores a solid D.

Struggling young readers have been at the forefront of Barbara Foorman’s mind for most of her adult life, ever since she realized that her seventh-graders (in a Boston schoolroom) couldn’t read. A Missouri native, Foorman spent 28 years in the education research business in Texas, designing reading curricula and tests for the earliest grades. She came to FSU in 2006, fresh from a one-year stint as commissioner of education research at the Institute of Education Sciences, U.S. Department of Education. Today, she directs the Florida Center for Reading Research, which is charged by statute with conducting basic and applied reading research and providing technical support to school districts statewide.

Foorman’s current focus is on reading assessment for third- through 12th-graders who can’t score well on Florida’s Comprehensive Assessment Test (FCAT) because they don’t understand the questions. Her hallmark has been identifying struggling readers early and upping the instructional ante to get them help, “instead of waiting for them to fail, like we used to do,” she says.

Foorman and her staff have developed the state’s first computer-based statewide reading assessment. Launched this fall for K-12 students, the Florida Assessments for Instruction in Reading (or FAIR) project is designed to help teachers pinpoint the exact problem a student may be facing in reading.

By mid-October FAIR had tested 1.6 million students, Foorman said. In spite of initial technological problems, FAIR is proving to be popular with teachers all over the state who are clamoring for it for all their students—not just the ones in trouble, she said.

Something, apparently, is working. State tests showed that in 2009, 61 percent of Florida’s school kids were reading at grade level, compared to 50 percent in 2004. —Kim MacQueen

Barbara Foorman is the Francis Eppes Professor of Education and director of the Florida Center for Reading Research, based at Innovation Park near the FSU main campus. For more about the center, see www.fcrr.org.
Carrie Ann Baade (she likes to joke that it’s pronounced “BAA-da” as in “badda bing”) paints exquisitely beautiful, albeit edgy trompe l’oeil portraits and allegorical narratives that are gaining recognition worldwide. With more than a passing nod to religion and mythology, her lush works often portray the ongoing struggle over the complexity of the human condition.

Bejeweled women, serpents, frogs, beetles and winged creatures play out dramas over everything from blasphemy to betrayal: “This duality in our nature, no light without dark and no dark without light, reflects the consequences in choosing a path,” she writes.

An assistant professor of painting and drawing, Baade holds a bachelor’s degree from the School of the Art Institute of Chicago and a master’s degree in painting from the University of Delaware. A recipient of a National Endowment for the Arts fellowship, Baade’s star is on the rise: Her work has been reviewed in national publications, featured on book covers and in solo exhibitions in U.S. museums, galleries and abroad, and will be included in the annual faculty show, which opens in February at the FSU Museum of Fine Arts.

“The subjects of my work are heroines and demons...” Baade explains in her artist statement. “My favorites are both valorous and perverse.” See more of Baade’s work at www.carrieannbaade.com — E.B.