

uncg research

spring 2003

Research, Scholarship, and Creative Activity

**EcoGenomix rides the next wave
of environmental surveillance**

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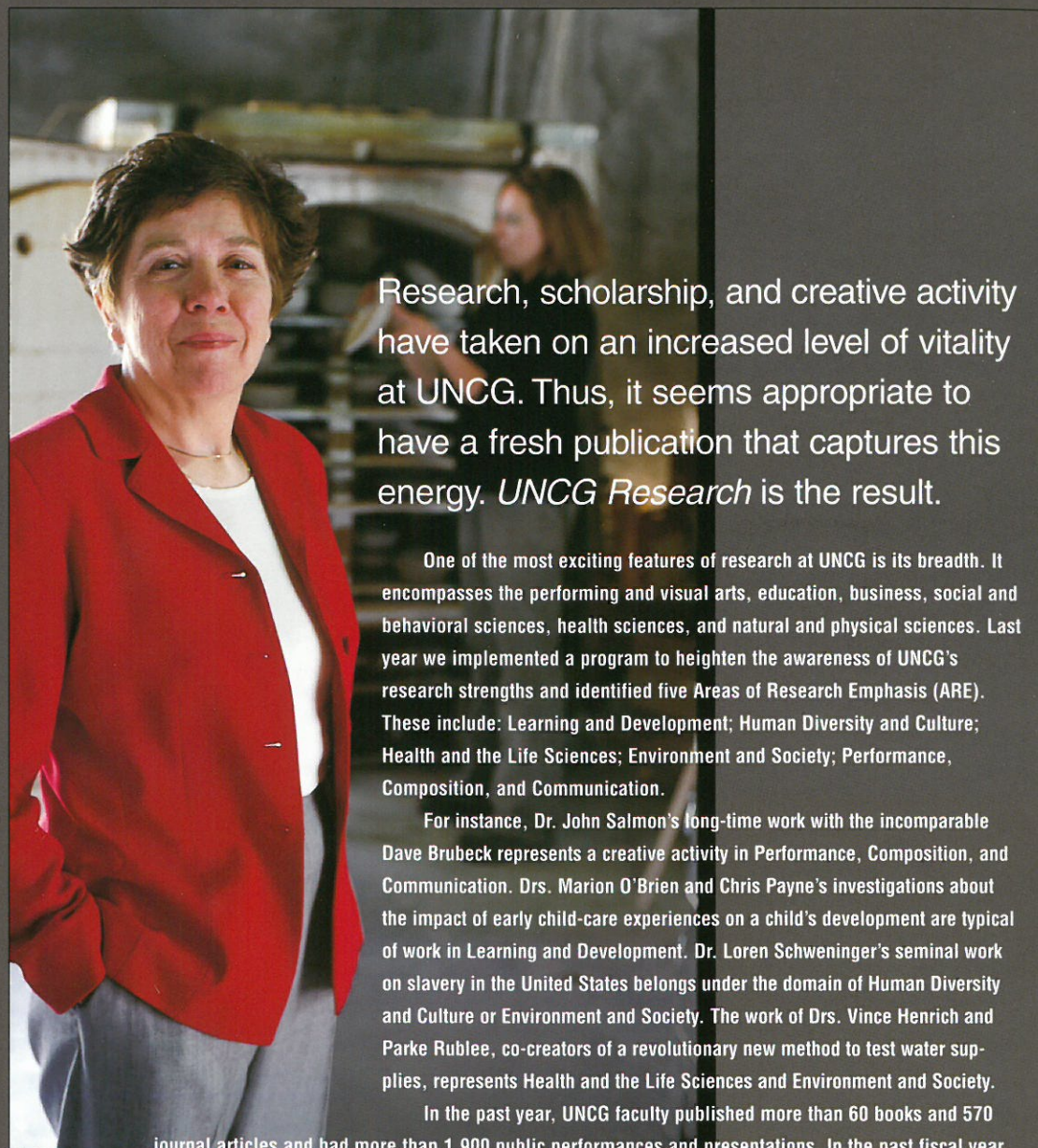
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The University of North Carolina at Greensboro is a student-centered research university stimulating growth in the Triad and North Carolina, while providing leadership in education for a diverse community.

15,000 copies of this public document were printed at a cost of \$10,639.00 or \$.71 per copy.



Research, scholarship, and creative activity have taken on an increased level of vitality at UNCG. Thus, it seems appropriate to have a fresh publication that captures this energy. *UNCG Research* is the result.

One of the most exciting features of research at UNCG is its breadth. It encompasses the performing and visual arts, education, business, social and behavioral sciences, health sciences, and natural and physical sciences. Last year we implemented a program to heighten the awareness of UNCG's research strengths and identified five Areas of Research Emphasis (ARE). These include: Learning and Development; Human Diversity and Culture; Health and the Life Sciences; Environment and Society; Performance, Composition, and Communication.

For instance, Dr. John Salmon's long-time work with the incomparable Dave Brubeck represents a creative activity in Performance, Composition, and Communication. Drs. Marion O'Brien and Chris Payne's investigations about the impact of early child-care experiences on a child's development are typical of work in Learning and Development. Dr. Loren Schweninger's seminal work on slavery in the United States belongs under the domain of Human Diversity and Culture or Environment and Society. The work of Drs. Vince Henrich and Parke Rublee, co-creators of a revolutionary new method to test water supplies, represents Health and the Life Sciences and Environment and Society.

In the past year, UNCG faculty published more than 60 books and 570 journal articles and had more than 1,900 public performances and presentations. In the past fiscal year, UNCG was awarded a record \$35.6 million in contracts and grants from proposals that faculty submitted.

Practical application of research, frequently referred to as technology transfer, has assumed a new role for the UNCG research enterprise. The 1980 Bayh-Dole Act gave researchers the freedom to retain the intellectual property of the work supported by federal dollars. In addition, the Act required that they put their best efforts into translating their research into useful products, an activity that often proves to be exceedingly difficult when the researcher is working alone to accomplish this. In April of 2002, UNCG opened the Office of Technology Transfer with Jerry McGuire as its director. Within nine months of his arrival, UNCG spun off its first company, EcoGenomix.

To further support the research activities of faculty, my office has provided an unprecedented opportunity for funding. This program, called EPDIP (External Program Development Incentive Program), was designed to promote interdisciplinary research. Faculty submitted proposals in which they described how they would leverage these starter funds to secure external support for their research. Approximately \$400,000 was awarded to nine research teams.

It's an exciting, happening time in the research world at UNCG. I am proud of the exceptional work of the UNCG faculty. We hope that you enjoy reading about it in our first edition of *UNCG Research*.

Rosemary C. Wander, PhD
Associate Provost for Research

Dr. Rosemary Wander emphasizes the broad spectrum of research at UNCG.
In the background, sculptor Nikki Blair checks student work in the Art Department kiln.

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THE RACE AND SLAVERY
PETITIONS PROJECT, page 13

To the Honorable Hugh R.
and William James, Judges of the Court of
South Carolina aforesaid—
I humbly complaining shew
that your petitioner, Edward Penman, Administrator of all
the lands and credits, which were...

Partnership F.I.V.E. Empowers the Disabled

“In the three-plus years since the project's inception, we have observed youth volunteers who were nonverbal become verbal; who often looked to the ground, begin to hold up their heads; who felt powerless, become empowered.” Dr. Stuart Schleien

The numbers behind volunteerism are impressive. In 1998 alone, volunteers did the work of 9 million full-time employees at a value of \$225 billion.

Yet, citizens with disabilities — who make up 17 percent of the US population — account for only a small fraction of America's volunteer corps.

“Partnership F.I.V.E. (Fostering Inclusive Volunteer Efforts) seeks to ensure that individuals with disabilities are recognized as valuable assets to their community and afforded their right to full community involvement,” said Dr. Stuart Schleien, department head of Recreation, Parks and Tourism and principle investigator for the project.

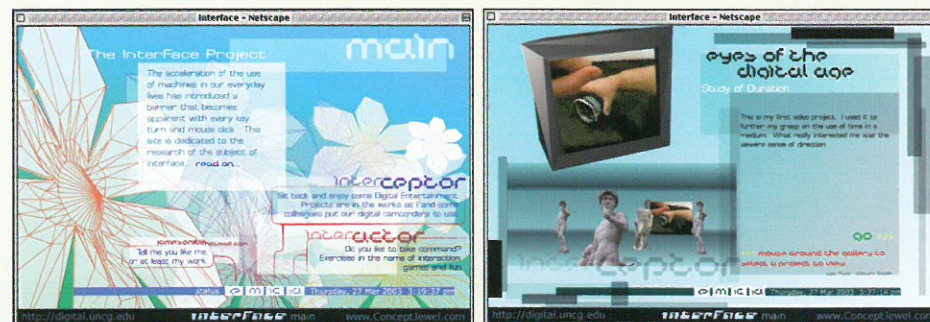
Partnership F.I.V.E., which is funded by a three-year, \$313,000 grant from the Rehabilitation Services

Administration in the US Department of Education, matches disabled individuals with volunteer opportunities at nonprofit agencies.

“We want to create a social shift, where the disabled are seen as contributors and builders of their communities,” said Partnership F.I.V.E. Project Coordinator Kim Miller. “It's exciting. The topic of inclusive volunteering is uncharted territory.” Social barriers, such as stereotyping and negative attitudes, have traditionally kept disabled individuals from volunteering, Miller said.

“The disabled are usually regarded as the recipient of volunteer services rather than the giver of such services,” she said. “Our project is turning that around. Volunteering focuses on a person's strengths rather than on his or her limitations.”

Undergraduate Explores the ‘Realm of the User’



Imagine walking by and examining a framed picture in an art gallery. As you look into what appears to be an inert computer screen, the “picture” suddenly reacts to your presence with chaotic frenzy.

Jameson Bennett, the creator of the interactive art, wants to “look at the relationship between the viewer and the viewed, wherein the human is also viewed, remembered and commented on — something that rarely happens in a gallery situation.”

Bennett is pursuing a dual major in art and computer science. “By applying dramatic theorem in artificial intelligence, stories can be constantly generated,” he said. His project integrates user mood, feedback, changing circumstances and other variables to weave a “morphable storyline,” he said. “These stories have potential to follow dramatic curves and weave infinite narratives, giving the user the role of participant and part author of the story.”

Jameson Bennett's web site, www.conceptjewel.com, allows surfers to explore his interactive art.

His “Artificial Intelligence and Interactive Drama Design” project is not his first venture into the combined world of art and computer science. Other projects, titled

“Fish Bowl,” “Confuseus” and “Havoc,” incorporate some artificial intelligence structures that are “stepping stones” in defining human-machine interaction.

Bennett's project receives visual art direction from Assistant Art Professor Amy Lixl-Purcell. Dr. Nancy Green, assistant professor of mathematical sciences, provides guidance in artificial intelligence and interactive narrative.

Bennett's work can be viewed at www.conceptjewel.com.

Recessions Can Be Good for Your Health

In the '70s and '80s, it seemed a foregone conclusion that a depressed economy can lead to bad health, higher mortality rates and sickness.

In the '90s, Dr. Chris Ruhm took that notion to task.

“The research conducted then had some serious errors,” said Ruhm, Jefferson-Pilot Excellence Professor of Economics. By using more sophisticated methods, his research found the opposite result: Temporary economic downturns seem to produce better health.

Ruhm's study, “Economic Conditions, Health Investments and Health Outcomes,” explains the tie between macroeconomics and health.

“A key finding of my work is that time is an important component in producing health,” he said. “It's not impossible for people to maintain good health when the economy improves or when they get busier. But rather, people need to take special measures to make sure their health doesn't suffer.”

Ruhm's research also implicates lifestyle. The figurative “fat” of an expanding marketplace becomes literal when workers toil longer hours, exercise less and eat more fast food. During times of economic excess, Ruhm found an increase in deaths due to automobile accidents, heart disease, liver disease, flu and pneumonia.

The National Science Foundation provided a \$201,687 grant for the research. The National Institute on Alcohol Abuse and Alcoholism supplied two more grants totaling \$288,083.



Cracking the Code

Chemist studies how herbs work

An Amazonian shaman tells a visiting ethnobotanist that a particular plant is effective for the treatment of foot fungus. The ethnobotanist tries the plant, and it works. The scientist subsequently ships the plant to a laboratory where his colleagues separate it into parts, looking for the “active ingredient.” Unfortunately, the individual parts seem to have no effect on foot fungus, so the plant is discarded as useless.

For Dr. Nadja Cech, assistant chemistry professor, discovering what makes herbs work is a lesson in synergy.

“It is often impossible to identify a plant's ‘active ingredient’ because of the inherent complexity of herbs, which consist of hundreds or thousands of compounds that work together,” she said. Her study, “Synergy in Immunomodulation by Echinacea and Spilanthes,” seeks to crack the mysterious code harbored by plants reported to have immune-enhancing properties.

“We've had some exciting results in our initial experiments,” she said. “We've observed an immune-stimulating response in vitro for Spilanthes. We've also developed some highly-effective techniques to study the chemical composition of a variety of plant extracts.”

Cech's research team includes biochemists, immunologists and health care practitioners, as well as four graduate and 10 undergraduate students. The long-term goal of the research is to develop approaches for the use of plant medicines to treat or prevent medical conditions with immune-related causes.

The study has far-reaching ramifications. Most drugs are based on the chemical properties of plants. In many cultures, plants are still being used medicinally and are a major health care commodity. In the United States, millions of people self-medicate with herbs, which are loosely regulated by the FDA. “More knowledge about how herbal medicines work will help the public make informed decisions about the safety and efficacy of such products,” Cech said.

Cech's research is supported by a one-year grant from the North Carolina Institute of Nutrition.

Healthy Women, Healthy Babies



North Carolina leads the nation in the number of neural tube defects, and it was that statistic ... that served as the impetus for this project.” Dr. Heidi Krowchuk



Dr. Heidi Krowchuk has found a toothbrush to be an effective way to get a message across.

By printing a folic acid reminder on toothbrushes and distributing them to college-age women, Krowchuk, associate professor of nursing, hopes to get women to understand how important folic acid is to their health. Just 0.4 milligrams of the vitamin each day can prevent birth defects and decrease the rates of heart disease and colon cancer in women. Her project, Point 4 The Future (P4TF), targets 18- to 24-year-old women.

A woman's body needs folic acid to make DNA, which is required for the rapid growth of fetal tissues and organs in early pregnancy. "That's why it's important for a woman to have enough folic acid in her body both before and during pregnancy," Krowchuk said.

She has established a web site where students can register to receive a daily email reminder to take folic acid. Krowchuk has made presentations on college campuses across the state and forged partnerships with campus healthcare providers.

In addition, she has trained students to educate other students. With their help, more than 2,000 bottles of vitamins have been distributed. "Since the project's inception, we have established a presence on about 20 college campuses per year," Krowchuk said.

P4TF has experienced enormous success so far. In a nine-month period, Krowchuk has seen a rise in the number of women who now take a daily multivitamin that includes folic acid.

P4TF has received \$86,000 in grants from the Greater Triad Chapter of the March of Dimes. Because of the project's initial success, it also has received \$100,000 from the national March of Dimes that is renewable for three years.

Bridging the Gap

CENTe-R connects early intervention with deafness



Many new parents are familiar with the hearing test that is given to their babies shortly after birth. This test, now required by law in more than 40 states, helps identify infants who may be deaf and hard of hearing.

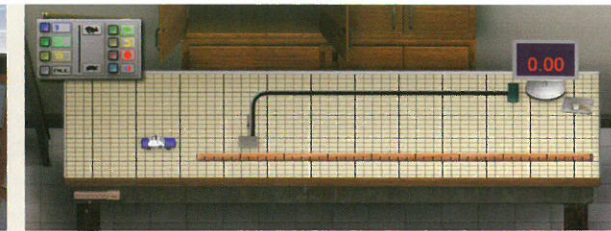
"In the past, we didn't identify a hearing problem in these children until they were two years of age," said Dr. Mary V. Compton, associate professor of specialized education services. "This was because the fields of deafness and early intervention were separate. Our project converges them so that these children receive help as early as possible."

Compton and her colleagues, Dr. Judith Niemeyer and Dr. Ed Shroyer, founded CENTe-R (Collaborative Early Intervention National Training e-Resource), which provides training modules for professionals working with infants and toddlers who are deaf and hard of hearing.

"In the past, it was very hard to find someone who worked with a very young infant," Niemeyer said. "It might take the parents a year to find a qualified professional, and that's a year lost for the child's social and educational development."

CENTe-R enables deafness experts to understand early intervention techniques and, conversely, allows those trained in early intervention to learn about deafness. "This is really breaking new ground, to the point that we had to first establish the accepted standards of practice that are now used across the country," Shroyer said. The project has so far pulled together more than 50 experts and partners who collaborate on module development.

Compton, Niemeyer and Shroyer are already receiving acclaim for CENTe-R, which is made possible by a five-year, \$2.5 million grant from the US Department of Education, Office of Special Education Programs. One parent stated that the training provided by CENTe-R "was a great experience for me personally and professionally. It's apparent that all the members are committed to helping young, deaf children. I know this project greatly benefits the professionals who will hopefully be required to educate themselves about deafness in infants and toddlers. Additionally, it provides great support to parents whose babies are diagnosed as deaf."



Virtual Physics

Professors Gerald Meisner and Harol Hoffman have created a physics lab that students can visit from anywhere.

Their virtual lab, built with a team of 16 computer programmers, education experts and physicists, promises to revolutionize online education. It is based on research that shows students learn best by participation.

"Millions of dollars of education research shows that students do not learn by someone lecturing to them," said Meisner, associate professor of physics. "People learn through discovery. By doing their own data collection, analysis and modeling, students learn and remember scientific principles. They generate their own knowledge."

Meisner and Hoffman, adjunct professor of

anthropology, have pioneered an interactive tool that features images of real equipment and a cyberspace tutor that guides the students through the learning process.

"We have to anticipate all the questions a student could ask," Meisner said. "Careful scripting generates productive dialogue with the student. They are prodded toward finding the answer them-

selves, not by being told what the answer is." The lab is also flexible, allowing instructors to customize a program to fit a course.

A five-year matching grant from the US Department of Education FIPSE/LAAP (Fund for the Improvement of Post-Secondary Education/Learn Anywhere Anytime Partners) program has made the project possible. Funding totals \$3.6 million.

Academic institutions across the country see the potential of the virtual lab. "We've gotten calls from universities as far away as California," Hoffman said. "Many schools are beta testing the program this summer. It's an excellent distance-learning tool. Students can even complete assignments from home," curbing the need for expensive equipment and classroom space.



the next wave

How the confluence of science and commerce is putting UNCG on the biotechnology map

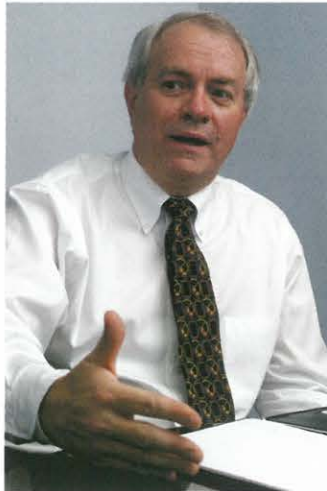
BY MARSHALL ELLIS
PHOTOS BY CHRIS ENGLISH
AND BERT VANDERVEEN '93, '97 MA

IN THE GOOD OLD DAYS OF ACADEMIC RESEARCH, IT IS LIKELY THAT ASIDE FROM A PASSING awareness of the other's specialty, UNCG biologists Dr. Vincent Henrich and Dr. Parke Rublee would have rubbed shoulders only at events such as departmental faculty meetings, graduation ceremonies, and the like. Any common ground in the realm of research between Henrich, a molecular geneticist, and Rublee, an aquatic ecologist, would likely have been accidental. As for the odds of collaborative research, well, that would have been about as likely as the Carolina Panthers winning the Super Bowl.

And if all of that seems a stretch, then the two of them taking chairs as vice presidents at the boardroom table of a biotech company whose genesis included the university as one of its parents would have sounded like a bit of award-winning science fiction. Yet, that is precisely what is happening in the laboratories of the Eberhart Building and in the hallways of the UNCG Office of Technology Transfer, where science and commerce have combined to make all of these things a reality.

The result has been a university-licensed company called EcoGenomix. Its calling card, a microscope slide-sized piece of cutting-edge science called the WaterChip, has the potential to fundamentally reorder how municipalities, governmental agencies and private industries monitor and manage a host of issues affecting water quality, among them the detection of pollutants and toxins, the remediation of contaminated sites, and the presence of natural and bioterrorism pathogens. Traditionally, these sorts of analyses have been conducted only intermittently and have relied on chemical or physical assays of narrow focus and slow response time. The WaterChip, on the other hand, will take a completely novel approach by using the tools of the molecular biologist to analyze a genetic portrait of the organisms living in the water. What's more, it will do it in real time. So if the tests of old were like ordering a five course meal a la carte at five different restaurants, then the WaterChip is more like one-stop shopping for a 500 course banquet, with your dinner already cooked before you check out.

How big could this be? "There are hundreds and hundreds of instances where this sort of real time monitor-



"Every startup that I know of is a fragile beast. The key is not just technology. You've also got to have management and finances. There will be some winners, but there will also be a lot of losers." Jerry McGuire

ing is needed," says Jerry McGuire, who, as the director of the university's Office of Technology Transfer, has shepherded EcoGenomix through its licensing phase and sits on its board. With a public now aware of the realities of pathogens as weapons, safe drinking water is the most obvious market. But toss in pharmaceuticals, food processing, microchip production, or virtually any other high-tech industry, and the everyday potential for the WaterChip becomes obvious.

The devil, as always, will be in the details. In this case, that means refining and scaling molecular technology so that it is easily manipulated and accurately interpreted. With \$1 million in hand from the Environmental Protection Agency, and more state and federal grants in the works, the refining is happening apace under the direction of EcoGenomix research director Dr. Jennifer Freeman. Once that's done, "I think," says Rublee, "that we can only imagine the implications of this technology." Adds Henrich, "Somebody can make this work, and it might as well be us."

If, in fact, "us" turns out to be Rublee, Henrich and Freeman, then EcoGenomix will put UNCG squarely on the international biotech map. It's a scenario that was unimaginable only a few years ago, and it just goes to show what can happen when two very smart guys who have

spent divergent careers working on the genetics of fruit flies and the ecology of aquatic microorganisms spend a couple of hours talking.

TECHNOLOGY TRANSFER — OR HOW TO INCUBATE IDEAS INTO COMMERCIAL PRODUCTS

If all of this seems an unlikely marriage between the otherwise contradictory worlds of academe and commerce, then welcome to the new age of academic research and something called technology transfer. In a nutshell, it's what happens when disparate studies that might once have been maligned by cynics as the province of "so what" science converge to reveal scientific applications that transcend the campus and produce commercial products with the potential to create jobs, reinvigorate local economies and even attract global markets.

Angus Kingon, executive director of the Technology and Commercialization Program in the College of Management at NC State, calls this process "the front end of innovation," and with this sort of leverage in hand, handsome public relations and economic rewards are everywhere apparent. And in an era of tight budgets and flat economies, Raleigh News and Observer writer Jonathan Cox has noted it is no surprise university administrators are increasingly aware

that the creation of high profile university-sponsored spin-off companies "is a more concrete way to show their significance in local communities."

Today, bolstered by the federal Bayh-Dole Act of 1980, which encourages universities to license and market their discoveries, 43 states have biotech initiatives in place. The results are undeniable. As recently as 1999, the Association of University Technology Managers estimated biotech initiatives had generated \$40 billion and 270,000 jobs. Google, the hugely successful Internet search engine, is one example, having been created at Stanford University. Closer to home, technology-rich North Carolina has become one of the brightest stars in the biotech firmament, and between them, UNC Chapel Hill, NC State, and Duke have combined to spin off 65 biotech companies. Dozens more are in the offing, and the UNC system has undertaken a series of conferences to guide university researchers and administrators through the unfamiliar territory of patents, licensing agreements and corporate finance.

The guide at UNCG is Jerry McGuire, who brought with him more than 30 years of experience in the marriage of technology and commerce when he arrived in 2002 to head up the Office of Technology Transfer. Unabashedly enthu-



siastic and unstinting in his candor about the realities of technology transfer, he will tell you "this is about trying to leverage the fruits of research to generate economic income." That leverage can be years in the making, and EcoGenomix, which is already licensed, is unusual in that it has made it to the licensing stage much faster than anyone expected. The reason, McGuire says, is that the basic technology is already established.

But even with established technology, he will also tell you that you have to pick your battles carefully. "Every startup that I know of," he says, "is a fragile beast. The key is not just technology. You've also got to have management and finances." And you've also got to build the better mousetrap, because if you fail to find the right commercial niche, then in a world with 43 biotech initiatives, McGuire says, "there will be some winners, but there will also be a lot of losers."

biotech entrepreneur with a degree in biology and a knack for finding venture capital, Button is the president of BioEmerge Partners, a Clemmons-based biotech consulting company. He brings an international reputation to the table, and along with Jerry McGuire, it will be Button's responsibility to move EcoGenomix through its development phase. Operating from temporary offices in the Nussbaum Center, he will also serve as the CEO until the company is ready to build its own facilities and make the move to the big time.

In fact, EcoGenomix is UNCG's second foray into the world of big time university-sponsored biotech companies. The first occurred in 2001 in the form of a spin-off called Transgreenix, which sought to parlay gene function in plants into a place at the table in the lucrative pharmaceutical industry. In the end, Transgreenix failed, a victim of the steep learning curve and capital-rich require-

Dr. Parke Rublee, left, who has spent years studying fish-killing *Pfiesteria*, and Dr. Vincent Henrich, who has studied microarrays commonly used in cancer diagnostic tests, brought their knowledge together to create the WaterChip. After initial discussions, both took courses in the other's specialty to get a grasp on the science for the basis of the WaterChip.

ments of the genre. In the case of EcoGenomix, both Button and McGuire believe that it already possesses a better all-around science pedigree, its funding is secure and adequate at this stage of development, and it has a much more marketable commercial niche.

Filling that niche may yet require several years and a lot of very hard work, but the consensus is that EcoGenomix has more than a fighting chance.

And in a landscape that is crowded with biotech companies, McGuire believes there may be other chances waiting in the wings for UNCG faculty, including many in what he calls the little explored "crossover fields" of social sciences, life sciences, music and the arts.

"Look at any arts program," he notes, "and there is new technology at every turn." From computers in classrooms, to laboratory equipment, to teaching materials, much of this has come from what McGuire calls "leveraging the traditional uses of a university."

He believes UNCG is positioned, perhaps better than most, to move those uses from the classroom to the business world. But in an important nod toward what got the university to this position in the first place, he believes that UNCG will be "a contributor, not a competitor" as it works with other institutions in the system. So it may well be that in addition to being an incubator of ideas, the university may yet become an incubator of small businesses that will carry UNCG's reputation far beyond the Piedmont.

A MARRIAGE OF MINDS

Appropriately enough, the incubation of EcoGenomix sprang from a purely scientific conversation.

Rublee, who has spent years studying *Pfiesteria*, the notorious fish-killing microorganism that has plagued the fisheries of the Neuse River basin, thought that molecular biology might prove useful in unlocking questions about the relationships and changes that occur between toxins and their environments.

So in the fall of 1999, in a quest to get at what he calls "the bigger stuff," Rublee the ecologist, who knew about aquatic ecosystems, spoke to Henrich the geneticist, who knew how to conduct molecular level analyses.

As with most scientific discoveries, timing proved to be all. Henrich had been thinking since the mid '90s about something called microarrays — molecular level probes that are common in cancer diagnostic tests — and how they could be used to characterize complex mixtures. He needed those mixtures for his research, and Rublee, who wanted to get to what he calls "the front end of genetic technology," needed the microarrays. "Within a matter of hours," Rublee says, "the basic idea came out." They talked more, and then they took courses in each other's specialty. From there, "this thing keeps evolving," says Henrich. Along the way, that basic idea became the WaterChip, which acquired its name from the so-called "gene chips" that are used in producing molecular probes.

Aquatic environments are enormously complex, but the WaterChip's concept is simple: if you likened a lake to a cancer patient, and if you could produce a microarray that could sample the right things, then here was a way to characterize the "patient's" physical and chemical

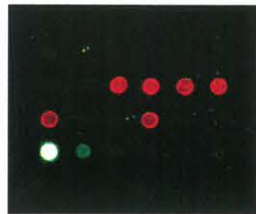
environment and detect large and small scale changes in those patterns. It is, says Henrich, "reverse ecology, in a sense." Changes in those patterns would infer a problem, and you could then look for factors that are known to cause those specific changes. "It's not foolproof," says Rublee, "at least not yet," but it's a step up from current tests, which may search for only a single pathogen. Such tests are used sporadically, at best, and at worst, only after it's become obvious there's a problem.

The WaterChip, on the other hand, will have the capability of characterizing and then continuously monitoring large-scale patterns in aquatic systems. It could be the ultimate ecological early warning system, and, most importantly, it will produce real time data. It may make the difference, says McGuire, in avoiding the situation that the city of Milwaukee, WI, once encountered, when public works employees learned of tainted water supplies only after there was a run on Kaopectate in every drug store in town.

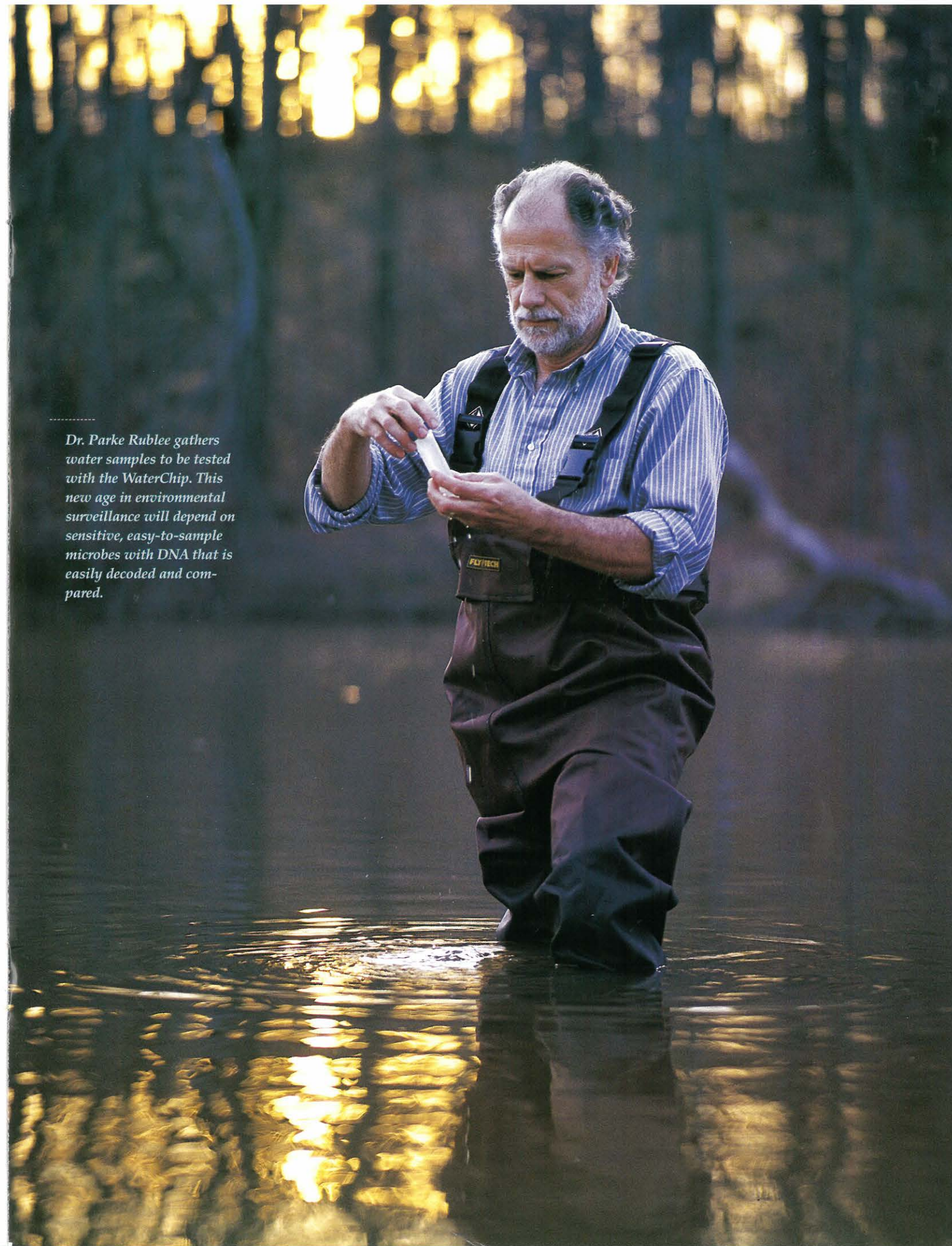
Much has been made, and will doubtless continue to be made, about the WaterChip's potential as a guard against the use of waterborne pathogens as weapons of bioterrorism. It is a popular notion, but "how often will city water supplies test positive for bioter-

rorism pathogens?" asks Rublee. Hardly ever, is his guess. And although tests for specific pathogens can be developed, Henrich notes that bioterrorism monitoring and testing is expensive. So in the end, it seems unlikely that bioterrorism will become the WaterChip's signal use. But in fact, it's probably better that way, because markers for potential bioterrorism pathogens can easily be piggy-backed onto the WaterChip, meaning that cities and industries can monitor for these pathogens while simultaneously using the system in a much more expansive and cost effective way to keeps tabs on a myriad of other characteristics.

It is ironic, in a way, that in an era that's dependent on what Rublee calls "an information-based economy," the heavy lifting in this attempt to unscramble the workings of complex natural systems will fall to neither super computers nor banks of space age equipment. To be sure, the gadgets will have a role, but the new ecological centurions in the next wave of what Henrich calls "environmental surveillance" will be the microbial organisms that form the most basic tiers of life on our planet. More precisely, their DNA, which gives every living thing its own genetic fingerprint, will be mapped to create a sort of community level genetic fingerprint for aquatic ecosystems that run the gamut from



The WaterChip, above, analyzes a genetic portrait of organisms living in a water source. By highlighting changes in the DNA patterns of microbes through the use of fluorescent markers, it can alert municipalities and industries to changes in a water supply caused by pathogenic or chemical contaminants.



Dr. Parke Rublee gathers water samples to be tested with the WaterChip. This new age in environmental surveillance will depend on sensitive, easy-to-sample microbes with DNA that is easily decoded and compared.

It is ironic, in a way, that in an era that's dependent on what Rublee calls "an information-based economy," the heavy lifting will fall to neither super computers nor banks of space age equipment. The new ecological centurions will be the microbial organisms that form the most basic tiers of life on our planet.

alpine lakes to municipal reservoirs to trout streams to rivers. New microbes always leave genetic traces, so if unknown fingerprints show up, then it will be clear that new hands have been in the water. It will fall to the WaterChip, which will highlight changes in the DNA patterns through the use of fluorescent markers, to detect the changes and help identify to whom those hands belong.

Why microbes? As it happens, bacteria, algae, and the like are remarkably sensitive to environmental stressors; they are also ubiquitous, easy to sample, and their DNA is easily decoded and compared. And, as Rublee notes, the WaterChip is intended to detect pathogens, most of which are microbes. This fortuitous combination of factors makes them predictable indicators of both baseline, or normal, conditions, as well as changes, particularly in the complex soup of aquatic ecosystems. The biologists call such organisms "bioindicators," meaning that their presence — or absence — can give us vital clues about the biological and chemical characteristics of the environments in which they — and we — are living. In plain English, they are the microbial equivalent of a canary in a coal mine. As long as these invisible canaries can drink the water, so can we.

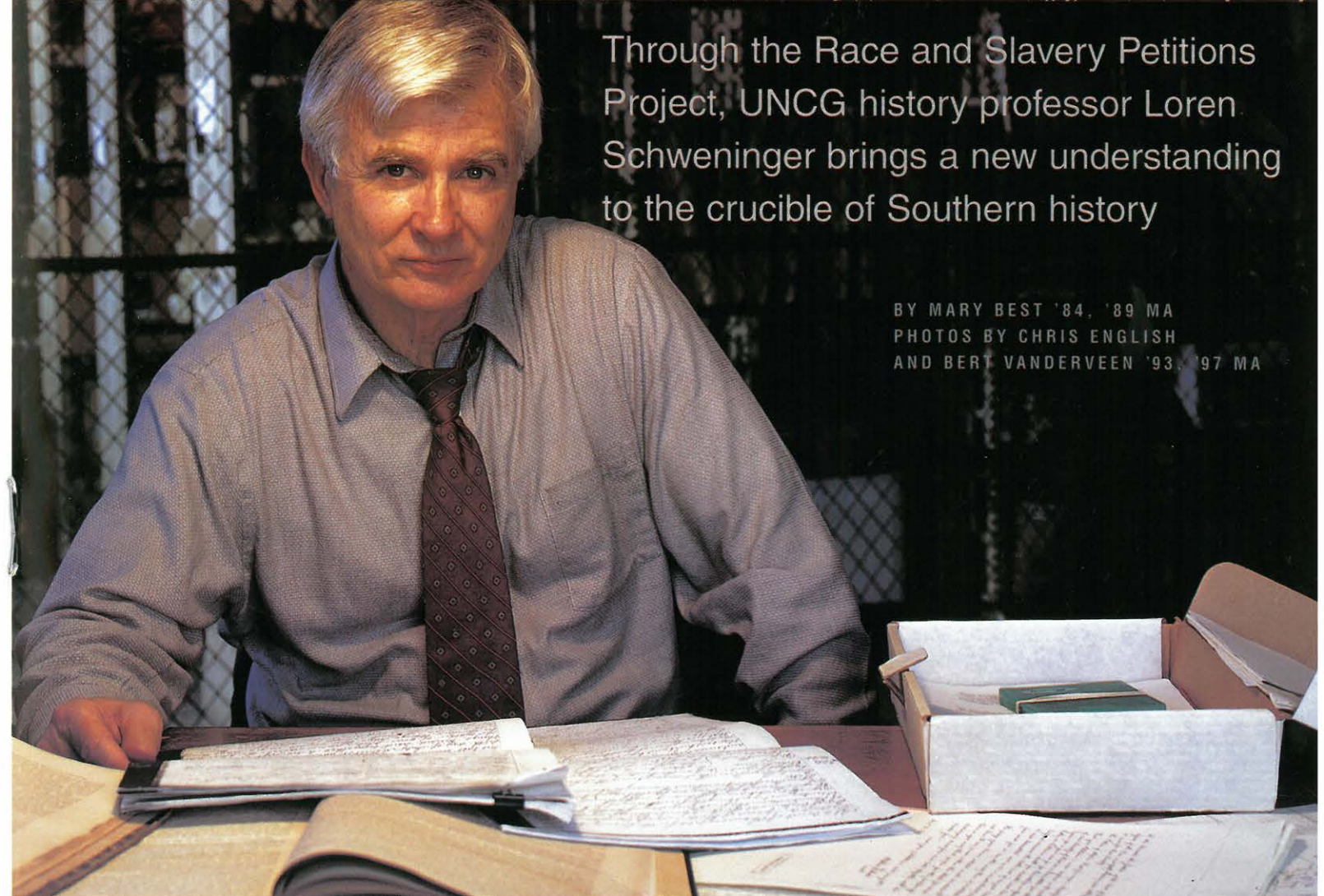
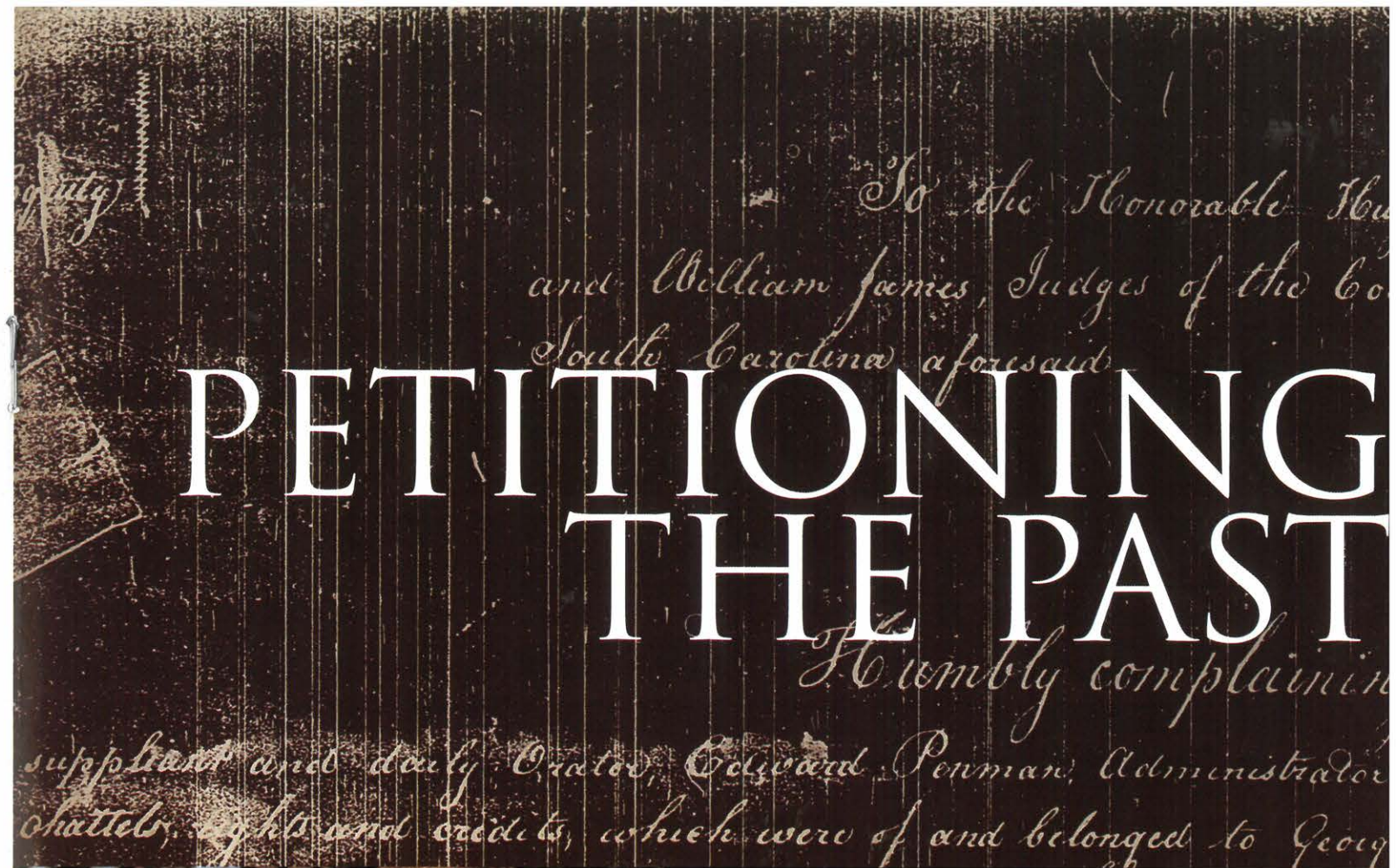
How hard will this be? There are

thousands of water-borne microbial species, many of which are not yet known to science. But fortunately, says Rublee, "We don't necessarily need to know all of them. We don't need exhaustive knowledge; we just need enough to rely on." Both professors know fundamental issues regarding methodology, reliability and economies of scale remain to be solved. "We're asking simple questions right now," says Henrich, but the basic molecular technology for getting at complex ideas is in hand. Once the chemical and biological characteristics in the DNA of a representative fraction of the microbial community can be reliably cataloged and encoded on the WaterChip, then for the first time, scientists will have an index against which they can reliably compare later indices, and the way for rapid detection and response will lie open.

Today, Henrich, who is from the Midwest and grew up believing that "the only tools had windshields, metal, and rubber tires," chuckles at the memory of those first discussions, and says "I was just the guy who supplied the petri dishes." But scratch a little harder, and both of these scientists will tell you that this happened because of what Henrich calls UNCG's "openness of communication." Rublee says that "the size and nature of UNCG fosters this sort of collaboration," and if you want more of this sort of

thing, then Henrich's advice to administrators is simple: "juxtapose labs that don't do the same things." And if the scientific advances and commercial possibilities are nice, Henrich will tell you "the most exciting thing to watch is when you get a visiting scientist into one of our students' seminars." No one, apparently, expects what's coming, but everyone sits up straight and pays attention to the students' lab work before it's over.

They pay attention, of course, because this is gee-whiz science of a rarified kind that could give every body of water on the planet an ecological address of a sort never before seen. And that's important, because one of the biological truths of life on Earth is that the amount of water present today is precisely the same amount that was around 2 billion years ago. We can make a lot of things, but we can't make water. This means water is the strongest proof that the fate of the microbes below us on the food chain is also our fate. Trouble in the basement augurs poorly for the penthouse, and it's why the noted wildlife writer Larry Earley has said of water, "There is no more important community than this one, commanding equal fealty from largemouth bass, great blue herons, white-tailed deer, monarch butterflies and 5-year-old children skipping to school."



Through the Race and Slavery Petitions Project, UNCG history professor Loren Schweningen brings a new understanding to the crucible of Southern history

BY MARY BEST '84, '89 MA
PHOTOS BY CHRIS ENGLISH
AND BERT VANDERVEEN '93, '97 MA

"If it can be said that there are many Souths, the fact remains that there is also one South."

— W.J. Cash, *The Mind of the South*

My enduring image of Dr. Loren Schweninger is one of him sitting in front of a computer in the cavernous attic office of his College Hill home and recounting the extraordinary yet overlooked lives of 19th-century black property owners. With his tall frame shadowing mountains of neatly arranged, oversized computer printouts, and surrounded by almost every book ever written on the African American experience, his fingers deftly deliver commands while he shares poignant tales of the black struggle for respect, economic independence and family sovereignty.

While in the graduate history program at UNCG, I worked in that attic office as Dr. Schweninger's research assistant, analyzing listings in the 1850, 1860, and 1870 US Census to further his study of 19th-century property ownership in the South. A wet-behind-the-ears, want-to-be-historian, I marveled at Schweninger's gift for taking intimidatingly huge amounts of information and turning them into something that helps us understand our past and ourselves. For months, I watched him comb through volumes of material and piece history together through millions of bytes of computerized data, methodically building what would become an award-winning monograph. While I contributed a mere fraction of the work that needed to be done, I thought about his commitment and debated silently whether he was crazy or fearless with an insatiable sense of curiosity. As the voices of schoolchildren and the smell of homemade pizza wafted up the stairs, I wondered what compelled this man — teacher, father, husband — to tackle a project that seemed to have no end.

Some 18 years after working for Dr. Schweninger, once again I am sitting across from him and listening to him share insights into African American life from his current project, the Race and Slavery Petitions Project 1776-1867. His boundless energy for the process and the meaning of his work is electrifying — albeit grounded in his keen, pragmatic demeanor. It's a familiar feeling; surrounded by countless legal-sized boxes filled with photocopied petitions, he leans into his computer while expounding on profoundly disturbing yet significant revelations into the institution of American slavery.

"Legislative petitions reveal the brutal nature of slavery, the fears of whites living in areas of large concentrations of blacks, and the workings of a legal system designed to control African Americans," Schweninger says. "They also tell of slaves' yearnings for freedom, the attitudes of free blacks toward the South, and the efforts of free persons of color to overcome restrictive laws."

REMEMBERING WHAT HISTORY FORGOT

In examining these legislative petitions, Schweninger brings the forgotten names and faces, perils and indignities of slavery into the minds and hearts of 21st-century Americans. Immense in scope and depth, the massive project is under way to compile a documentary history of race and slavery from thousands of petitions submitted to state legislatures by Southern slave owners, slaves and free blacks. When completed in 2005, the Race and Slavery Petitions Project 1776-1867 will make available a repository of more than 18,000 petitions on 150 reels of microfilm, four letterpress volumes of selective petitions, a searchable database and a comprehensive slave index.

While 20th-century historians have undeniably enhanced the study of slavery, the petitions project has bequeathed pivotal yet little-known intricacies of the institution. "Scholars have produced extensive literature on race and slavery in the South," Schweninger says, "but to a remarkable degree, this scholarship has relied either on slave reminiscences, slave narratives, slave autobiographies, or on plantation records,

planters' journals, and the testimony of prominent whites. ... The petitions with which this project deals not only supplement available resources but create a much more detailed picture of African Americans seeking their legal rights at local and state levels. By their nature, these records reveal new dimensions of the African American experience."

The Petitions Project also helps dispel the myth of paternalism of the Old South and demonstrates the material and psychological consequences of white supremacy. The myth that slaves received benevolent treatment and were considered part of the slaveowner's family collapses in light of the harsh duality of racism and owned labor. Through the words of slaveholders, we see the cold-hearted economics of the institution, slaves as property and modes of production, the relentless pursuit to dominate an enslaved people, and the ideals of submission and obedience.

Ours is not a past of moonlight and magnolias; it is a complex one, filled with ambitions, inconsistencies and consequences. One of the lessons of Dr. Schweninger's Petitions Project is that oversimplifying the history of the South trivializes the lives of those who constructed it. As well, history is not easy and convenient because life doesn't play out that way. To learn from the wrongs of our past we need to understand them — in all their imperfections.

A NEW LOOK AT THE OLD SOUTH

Moreover, the petitions illustrate the raw drama of slave life — both in the lives of slaves and their relationship with owners. In each petition, an intriguing human story unfolds filled with the layered textures of life and exciting plots about the struggles of slavery, fractured families, betrayal, violence, runaways, inheritance and more. "Indeed," Schweninger says, "they provide fascinating insights into every aspect of Southern life —

John Hinkle states he "contracted with one Van Swearingen ... for a Negro man for the sum of six hundred dollars" in July 1817. Based on the "declarations & recommendations of said Swearingen," the petition admits he "did not for a moment supposed that [the slave] was not perfectly sound in all respects." However, Hinkle contends that Swearingen "committed a gross fraud." He alleges that the slave Tom arrived at his house "full of pain & disease," adding that "sometime in the month of October last ... he was compelled to lay up in bed being unable to walk & so continued until the 9th of February 1818 when he died." Charging that his "family was put to great inconvenience in nursing and attending upon the slave for several months & were obliged to lift him from place to place he being unable to walk," Hinkle prays that the judgment obtained by Swearingen for nonpayment be enjoined.

— From the Petition of John Hinkle to the Superior Court of Chancery for the Winchester, VA, district,

1818

Christopher Clark purchased a slave named Randal for eight hundred dollars from Isaac Skillman on the recommendation that he was "a very good Country black Smith" and that he was "honest and faithful." Clark hired Randal out to "Mayberry and Weaver, Iron masters" but later learned the slave "commenced there a system of plundering and stealing seldom equalled and perhaps never surpassed." As punishment, Randal was "burnt in the head," but "this punishment however produced no reformation for before the wound got well he committed new felonies was again apprehended, tried and condemned to be hanged and the Court from the badness of his character valued him at only five hundred dollars."

— From the Petition of Christopher Clark to the Court of Bedford County, VA,

1816

To the Honorable Lacey Bar Judge of the Superior Court of Chancery for the Winchester District, humbly complaining your orator John Hinkle of Jefferson County that sometime in the month of July 1817 your orator being desirous of purchasing a negro man contracted with one Van Swearingen of Jefferson County for a negro man (then his property) for the sum of six hundred dollars and a promissory note for that amount to

political, legal, economic, social and cultural."

Their drama appears even more dynamic given the brutal honesty of the petitions. Because of the nature of the cases, it was to the advantage of Southerners to tell the truth in civil proceedings. Further, in most cases, the parties involved knew one another, so petitioners couldn't falsify information, even if they wanted to. With denials, verifications, rebuttals, judgments and witnesses, the documents put forth a penetrating portrait of Southern life. According to Schweninger, "There is a bias reflected in all testimony, but when it was in the interest of individuals or groups to state their case as clearly and truthfully as possible, and to secure corroborating testi-


mony, the evidence achieves a high degree of credibility."

The petitions especially elucidate the lives of 19th-century Southern women, including divorce, alimony, sexual harassment, trust accounts, movement West, children, family and freedom. "They bring to light slave women who lived with their owners, mulatto children who were rejected by their white fathers, and black men who had liaisons with white women," Schweninger says.

Finally, woven throughout the petitions are horrific tales of violence and cruelty — torture, abuse, mistreatment, incest, battery. You name it, it's here. The petitions illustrate that violence and bondage were inseparable in the slave-holding South and an accepted means of social control, how the institution of slavery calibrated cultural values and social standards, and that slavery's savage praxis permeated all Southern institutions, especially the family.

"All together," Schweninger says, "we begin to see an intricate, desperate image filled with conflict, brutality, rape, gender fights, and family separations."

The petitions are a testament to the unspeakable acts of inhumanity that occurred during the unforgiving era of American slavery and the resilient spirit of those who endured it.

Perhaps that's why Dr. Loren Schweninger doesn't shy away from projects of this enormity. Unlike many of us, he knows how to ask the largest questions of our time and find the answers in the smallest places. And, more important, he has the courage and fortitude to let the answers be told by long-ago and silent voices, even if they are sorrowful and shameful to hear. 

Polly Gray seeks "some adequate support" from James Gray, her husband of 30 years. Charging that he is guilty of many offenses, the petitioner laments that he "has for about six or seven years been continually in the habit of deserting the caresses of a fond & affectionate wife to whom he was bound by way ... of religion morality & law;" that he has "committed the worst open conjugal infidelities with prostitutes of the most abandoned order;" and that he "has taken to the very house in which they resided ... — a wretch whose very colour is as sable as her crimes" and who "assails her with reproaches & insults which would be insufferable even from one more respectable." Forced to abandon their home, Polly notes that at the time of their marriage James was very poor and that she brought to the marriage a number of slaves, who "now with their increase" number sixteen or seventeen. Polly Gray prays the court will secure her a provision, "which security becomes ... necessary as the said James Gray is daily wasting and squandering on harlots those possessions which should be preserved for the comfort & support of your unfortunate oratrix."

— From the *Petition of Polly Gray to the County Court of Southampton, VA,*

1817

BY THE NUMBERS

A glance at the breadth of Loren Schweninger's Race and Slavery Petitions Project:

Overview

14-year project, 1991-2005

150 reels of microfilm

More than 150,000 pages of documentary evidence

Projected four letterpress

volumes of selective petitions

Searchable database

LAW AND ORDER

IN 1991, UNCG HISTORY PROFESSOR DR. LOREN SCHWENINGER BEGAN TRAVELING around the South to gather legislative and county court petitions to further a study of runaway slaves. Expecting to find boring, legal transcripts, he instead discovered a wealth of information about the lives and experiences of slaves between the American Revolution and the Civil War. It was an awakening that would change his life and the study of America's "peculiar institution" forever.

Deciding to build a repository of slavery petitions, Schweninger gathered approximately 3,000



Marguerite Ross Howell, left, confers with Michael Richardson while examining petitions to be transcribed. Pictured in the background are Nicole Mazgaj (center) and Jennifer Burns.

legislative petitions and 20,000 pages of documentary evidence, from seven states (Delaware, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia) from 1991 to 1994. Also included were some 15,500 county court petitions and 124,000 pages of documentary evidence from 15 Southern states and the District of Columbia. With the petitions scattered and isolated, the undertaking proved to be time-consuming and laborious.

But the collection process was only the beginning. To provide access to this wealth of information, Schweninger decided to create a searchable database, realizing the mammoth task of logging the petitions would require funding and staffing. A tireless campaign of applying for research grants has produced more than \$1.22 million since 1991.

Currently, the project is working with \$470,000 and underwritten primarily by three sources. A \$2,500 grant from the National Historical Publications and Records Commission has been awarded every year since 1991. Schweninger has won four grants — more than \$100,000 each — from the National Endowment for the Humanities. And the prestigious Charles Mott Foundation, which awards \$90 million a year, has given the project two three-year grants totalling \$250,000.

Research

540 research travel days from 1991-1994

175 courthouses

268 counties

14 state archives

15 Southern states and DC

African Americans

23,000 defendants

37,000 petitioners

Database of more than 94,000 known slaves

Documents

18,500 photocopied petitions

3,000 legislative petitions

15,500 county court petitions

51,000 related documents

Staffing

\$1.22 million in research grants

Total of 60 assistants since 1991

Currently, three full-time employees and five graduate assistants who work 180-200 hours per week

Theatrical Documentary

"Let My People Go"

Premiered in 1997

14 stories taken from petitions

74 performances in 33 NC counties, four states, and DC

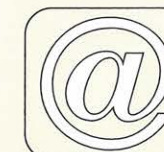
Average of 220 people per performance

Funding has enabled Schweninger to hire a staff to help organize, enter and edit the petitions. In 1997 he hired a full-time assistant editor; since 2001, that position has been held by Marguerite Ross Howell. An outstanding student whose strengths complement Schweninger's, Howell began working on the project in 2000 as an undergraduate assistant.

Also working full-time on the project are Kate Knight and Nicole Mazgaj, who, as a native of France, has been instrumental in translating Louisiana petitions written in French. In addition, five graduate students currently work on the project.

Using a template to streamline information, assistants create a Petition Analysis Record (PAR) for each petition, including names, status, color, subject, county, date and disposition, as well as an abstract and related documents. Once the information is entered, it is edited and proofread numerous times, requiring hours of work. Petitions are transcribed exactly as written with original spelling and idiosyncratic phraseology. Notations are added only when necessary for clarity.

Impressively, the project is on schedule to be completed in 2005. "I feel great that we are going to finish on time and that we have done what we set out to do," Schweninger says.



To find out more about the Race and Slavery Petitions Project, visit <http://history.uncg.edu/slaverypetitions/>

the Salmon Strikes

John Salmon fine-tunes Brubeck's classical piano manuscripts



PIANO PROFESSOR DR. JOHN SALMON STILL HAS the reply to the fan letter he sent as a teen to jazz great Dave Brubeck. The personal response is now pressed between two layers of protective plastic.

"Your interest in music of all kinds reminds me of my own sons...If you decide to become a professional musician, the road is rough and the rewards are slim, financially, as my boys are soon learning, but to be doing for a livelihood, what you most want to do with your time, means more than anything else," Brubeck wrote.

Little did Salmon know, the correspondence would be the first step in a friendship and professional collaboration with the famed composer and jazz pianist.

In 1991, the two pianists met when Salmon interviewed Brubeck for *American Music Teacher*. After that meeting, Salmon began mailing Brubeck recordings he had made of Brubeck's piano works. Impressed by Salmon's interpretations, Brubeck began sending him photocopies of manuscripts to edit.

Today, more than a decade later, Salmon has hundreds of

BY TIFFANY AUMANN

PHOTO BY BERT VANDERVEEN '93, '97 MA

loose sheets of music written by Brubeck. There are cantatas, oratorios, pieces for strings and other compositions. In fact, the volume of music is so massive that he took leave fall semester 2002 in order to catalogue the literature. So far, the professor has labored 120 hours and the job is about 70 percent complete.

Also during his absence, the professor was busy editing "Seriously Brubeck," a collection of six piano works, as well as writing its 3,000-word preface. The 204-page publication was co-edited by Salmon and Gail Lew, director of keyboard publications for Warner Brothers, and was published in March.

"I send pieces immediately to John and ask him if he likes them. I trust him (as an editor) to see it through," said Brubeck, lamenting that a dozen errors were found in a score Salmon didn't review. "John has a critical, sharp mind. He's a stickler. It's humorous to watch the way he reacts to music. If it isn't the way he thinks it should be, he can get really red in the face."

Salmon knows Brubeck's music nearly as well as the composer himself. He has written several articles about the jazz artist, including 1992's "What Brubeck Got From Milhaud" for *American Music Teacher*, 1997's "Dave Brubeck's Pioneering Explorations of Rhythm" for *The Chronicle of Higher Education*, and "The Classical Side of Dave Brubeck," printed in 2001 in *American Music Teacher*. In October 2002, he participated in a Brubeck Symposium at Emory University, where he led a master class and a public concert.

Salmon is one of those rare musicians who can slip comfortably between classical and jazz playing styles. As a high school student, he played in a jazz trio. Yet, when he graduated, he decided to follow the classical route, earning a doctorate at The University of Texas at Austin.

"The die is cast and I can't give up either one now," he said.

Last fall, the professor recorded a 55-minute compact disc of Brubeck's music, some of which he was simultaneously editing for "Seriously Brubeck." Through that process, his roles as performer and editor intertwined, resulting in helpful notations in the publication that will offer Salmon's suggestions for performance. Salmon is currently seeking a label for the CD's release.

That versatility has been beneficial in his work with Brubeck, a composer who is constantly blurring the lines between classical and jazz. Although Brubeck composes classi-

cal and choral works, his own playing style leans toward jazz. "I stumble through classical," he confessed.

Without Salmon's initiative, many of Brubeck's pieces would have faded into obscurity, said the famed composer. The professor has crafted piano solo arrangements for works originally written for string quartet and small chamber ensemble.

"There were things that had been hanging around for years," Brubeck said, citing the dark piano solo "Tritonis" as an example. "John really believed in that piece. Otherwise, it might never have seen the light of day."

Brubeck, 82, is still touring and writing prolifically.

While known to mainstream audiences as the creative genius behind "Time Out" and "Blue Rondo a la Turk," Brubeck is also a talented composer of classical work. With nearly 100 minutes of playing time written for solo piano, Brubeck has surpassed Samuel Barber's output by 40 minutes and approaches Aaron Copland's 115 minutes of literature.

"Seriously Brubeck" makes a statement about the composer's range. It includes six large-scale compositions for piano: "The Salmon Strikes," "Tritonis," "They All Sang Yankee Doodle," "Chromatic Fantasy Sonata," "Points on Jazz" and the Milhaud-inspired "Glances." Of the selections, "Chromatic Fantasy Sonata" has been the most difficult to edit, Salmon said. Littered with accidentals, the piece requires meticulous analysis.

Brubeck paid tribute to his editor's piano performance by dedicating a composition to him called "The Salmon Strikes." He has played a jazz version in concert with the Dave Brubeck Quartet, but the classical version has never been performed.

It was published for the first time in "Seriously Brubeck." Through music, Brubeck draws the analogy between Salmon's hard-hitting technique and a feisty salmon he wrangled during a 1960s fishing trip in Alaska.

"It starts out very brash," explained Salmon. "There's a place when the salmon is circling the boat, and then it progresses to when the salmon takes off in a rage."

Salmon has previously edited two other publications of Brubeck's work, "Nocturnes" and "Two Part Adventures." Going beyond catching typographical errors, he attempts to capture Brubeck's stylistic intentions during the editing process and to ensure the music is playable.

"I take this very seriously," Salmon said. "When you commit something to print, that's a sacred act. I am doing this for the precocious 12-year-old in Kansas who is going to play this. He would catch an error. I was like that."

A Question of Quality

Two UNCG professors find that the caliber of childcare matters most

PARENTS WHO WANT TO GET THEIR NEWBORN into a high-quality childcare center like Creative World in Greensboro might want to reserve a spot in those precious first three months.

The first three months of their pregnancy, that is.

That's because parents can spend four to six months on the center's waiting list — just to secure their little one a space in an infant class. Enrolling toddlers at the center can be even tougher because few parents give up those prime spots once they've got them.

"They get in and stay in," says Carolyn Pryor, the executive director of Creative World.

Parents scramble to get into this center, mainly because it boasts lots of credentialed teachers, computers, extracurricular activities, summer camp and even such amenities as video classroom monitoring.

Mothers and fathers who seek this kind of high-quality childcare — and take the time to investigate their options — have the right idea, say two UNCG professors.

And Dr. Chris Payne and Dr. Marion O'Brien should know. The professors in the Department of Human Development and Family Studies are two of the investigators in one of the largest long-term studies of childcare in the United States.

The federally funded Study of Early Child Care and Youth Development began in 1991, when a diverse group of parents across the country enrolled more than 1,300 newborns into the project. The parents chose what kind of childcare arrangement they wanted for their children. Some infants were cared for at home with mothers or grandmothers. Others had babysitters or went to childcare centers.

Then, researchers in 10 key areas throughout the country — including Morganton in western North Carolina —

observed the children as they grew from infants to pre-teens. The children are now in sixth grade, and investigators hope to follow them into adolescence.

So far, most findings show that children do not suffer developmentally when they are cared for in high-quality settings by people other than their mothers. According to researchers:

Family dynamics have more impact than childcare on a child's development.

Out-of-home childcare doesn't significantly harm children's relationships with their parents.

High-quality childcare can improve preschool children's language skills and help them do better on school-readiness tests. This is particularly true when the care is provided in childcare centers that offer children extensive interaction with adults.

But researchers also caution that:

Children who spend significant amounts of time in childcare in their preschool years can sometimes get into trouble with their teachers, who perceive them as more aggressive than their classmates.

And children in low-quality childcare centers do not do as well as their peers on school-readiness tests.

THE EARLY YEARS

Both Payne and O'Brien say they are doing this research to help answer questions for both parents and policymakers.

"I don't think the debate should be whether we should have childcare or not have childcare," O'Brien says. "Many women need to work or want to work. I don't think it's really an option for our society to say, 'It's time for all mothers to stay home.' That's just not going to happen. We should be asking, 'What is it that we need to look for in quality care?"



And when we try to improve quality, what are the kinds of things we should try to change to make all care better?"

The researchers define high quality care by the kinds of interactions childcare providers have with children.

"I always encourage parents to think about the care in terms of how the care provider is interacting with children," O'Brien says. "Are they talking a lot, smiling a lot? Do they seem to be enjoying being with children, spending time with children?"

The researchers have found that high-quality care can exist in any kind of setting. "Quality does not necessarily mean center care or a home-based environment," O'Brien says. "We found high and low quality in all types of care."

O'Brien, who formerly lived in Kansas, became interested in child development as a freelance writer. "I spent a lot of time watching children and observing and reading about child development, and I became more and more interested in the children," she says. "I thought I really ought to go back to school and get a degree."

She earned her doctorate in developmental and child psychology at the University of Kansas. She tracked children at the national study site in Kansas before joining the faculty at UNCG in 2001.

She also has some personal experience with childcare. As a mother of three, she was able to bring her children to work with her in their early years and later enrolled them in childcare centers for preschool.

Her colleague, Chris Payne, has been in North Carolina for most of her career. While teaching learning-disabled children in elementary and high schools, she increasingly noticed that the early years were key predictors of a child's success in school. She, too, decided to pursue graduate work in child development and family relations. She

Lona Shockley at Creative World listens intently to a 2-year-old in her class during a lesson on putting away toys.

Dr. Marion O'Brien and Dr. Chris Payne say parents should watch for how childcare providers interact with children to determine the level of quality offered by a childcare center.

became the principal and director of a High Point childcare center that was being developed as a model for the North Carolina Department of Public Instruction.

Her own children spent some time in the care of their grandmother and a nanny before starting at an organized preschool.

"We all have personal concerns as working parents," Payne acknowledges.

A LONG-TERM LOOK

This study's large sample of children, its lengthy duration and its observational methodology sets it apart from other childcare studies, both researchers say.

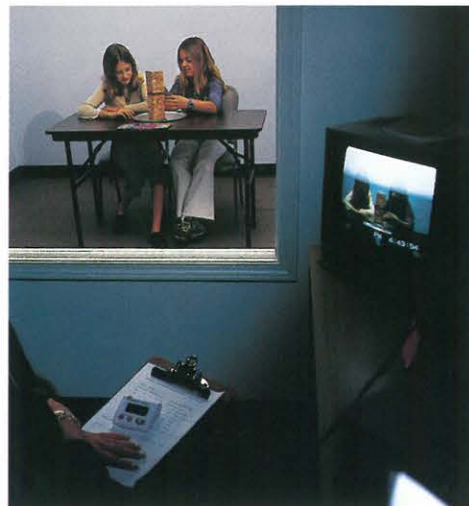
"A lot of studies involve surveys and questionnaires," Payne says. "But this is one of the largest studies to include such extensive observational data."

And it is extensive.

Researchers visit families' homes. They interview parents and children. They videotape children and parents together. They watch children playing and learning. They note how children get along with their playmates and siblings. And they visit them at school.

Children then come to the lab in Morganton once a year to undergo developmental and psychological assessments and to take part in various social activities.

Unlike other studies, this one evaluates family factors as well as childcare arrangements.



Above, a study participant and her friend play a game of Jenga behind a two-way mirror. Researchers watched and videotaped the girls' interaction and problem solving strategies as part of an on-going study of the effects of childcare. Right, the study participant completes an assessment.

That means that researchers consider such indicators as the parents' employment, income, home environment and even their mental states. That's because "children are not randomly placed in different kinds of child care," O'Brien notes. "The factors we looked at in families have something to do with what kind of childcare parents select. So we enter all of these family factors into our analysis and then we look at: On top of those factors, did childcare have an effect?"

DEVELOPMENTAL STAGES

The study, funded by the National Institute of Child Health and Human Development, is divided into four phases. Payne and O'Brien received \$1.7 million from the NICHD via a subcontract from UNC Chapel Hill in their 2001-03 funding.

In the first phase, researchers followed families and children from birth to age three. A key finding here showed that children who were cared for outside the home still developed strong attachments to their mothers. "That had been a concern in the field for a number of years, and it was one of the early kind of debates that this study was designed to answer," Payne notes. (The study did not measure children's attachment to their fathers.)

The second phase tracked these chil-



dren through first grade, allowing researchers to examine their transition into school. One finding in this phase received a great deal of publicity — that children who spent extensive time in non-maternal childcare were perceived as more aggressive by their kindergarten and first-grade teachers.

There was no clear evidence as to how much time spent in this kind of childcare spelled trouble. "It was not that part-time care was fine, and full-time care was not," O'Brien says. "There really were no cutoff points."

She notes, however, that none of the perceived behavioral problems — which included disobedience, defiance and assertiveness — were in ranges that signaled serious problems.

Payne says she was somewhat surprised by the finding, but also points out there could be another explanation for children's troublesome behaviors. Perhaps their families were more stressed because the parents had to work longer hours, and

that in turn affected the children.

Research from the third phase, following children into fifth grade, has not yet been released. It will likely be available in about two years. This phase considers children's school achievement and delves into health behaviors and physical activity.

The fourth phase, if funded, would follow the children into adolescence. "That's just such an important time to look at," Payne says. "We could examine peer networks, risk-taking behaviors and the transition into adolescence, a major developmental milestone."

That possibility is exciting for them.

"From a scientific point of view, it's a unique opportunity to be able to see how children change and study that over time," O'Brien says.

CAREFULLY CONSIDERED

Of course, the study has implications beyond the researchers' own scientific interests. Many times, their findings make news. Sometimes, they cause controversy. And almost always, they are examined by parents everywhere.


That's a responsibility they don't take lightly.

"We see our role as being cautious when we offer findings," Payne says. "We try to make sure that all the caveats are known and that people don't leap to one-sentence, sound-byte conclusions. There are no simple answers in social-science research."

Both researchers say they try to remain objective and not interject themselves too much into the national debate over childcare. But they do hope policy makers will rely on their research to consider more family-friendly policies, such as: flexible work schedules for parents; more liberal family-leave policies; and anything to make high-quality childcare more affordable.

And they hope that their findings will assuage some parents' childcare fears.

"Overall, our findings are very positive for parents," O'Brien points out. "Parents don't really need to agonize over the 'childcare or no childcare' decision. Childcare in itself is not a bad thing. Children are thriving in childcare, particularly if it is high-quality and their family is involved with them."

"There is no one right way to raise children. Both patterns can work fine." 

“Her example proves it's possible to address social issues while pursuing individual interests.” Linda Brown

“Wildfire: Black Hands, White Marble”

A play about African-American sculptor Edmonia Lewis
Written by Linda Brown; Directed by Marsha Paludan

No one knows the exact date or birthplace of Edmonia Lewis. Consensus places it around 1800 in New Jersey, Ohio or New York — a telling commentary on the value of a nineteenth century racially-mixed woman.

Despite cultural obstacles, Edmonia, the daughter of a black father and an Ojibwa mother, became the first professional sculptor of African-American and Native-American descent.

“Wildfire: Black Hands, White Marble,” celebrates Edmonia's life, vision, strength and determination.

Dr. Frank Woods, director of the African-American Studies Program, envisioned the play after completing his dissertation on Edmonia Lewis. He approached Dr. Marsha Paludan in the Theatre Department with the idea and the final piece fell into place when they discovered author Linda Brown was writing a novel based on Lewis' life. They asked her to write the play — “a proposition that was absolutely irresistible for a writer,” Brown says. “It's almost unbelievable the life she lived.”



The play follows the events of Edmonia's life from the age of 8 until the time of her death, another unknown date. The expressionistic play captures dream-like language and images, and in one of its most eloquent moments, Spider Woman, a Native American Creatrix, mixes Indian and African myths into a mystical language that literally simmers. Cast with students from the Theatre Department, Edmonia is played by two actresses in two roles. The Storyteller is Edmonia as a mature artist reminiscing about her life. But it is through Wildfire/Edmonia that

events unfold in chronological time.

Early on, Edmonia is forced into a world of rejection and ridicule. Her brother sends her to boarding school and then on to Oberlin, the first college to admit women and blacks. There she is falsely accused of poisoning two white classmates.

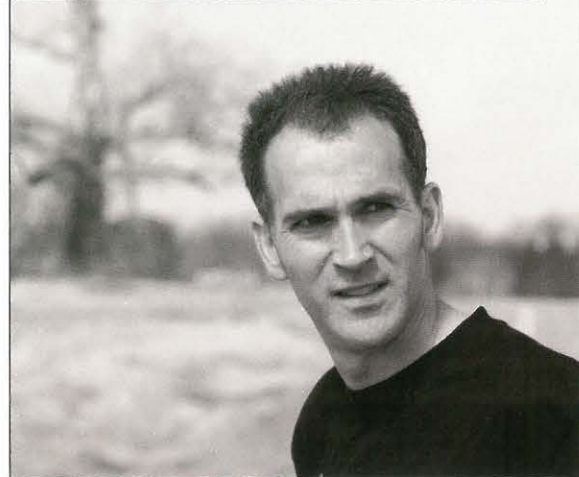
Awaiting her arraignment, she is abducted and brutally beaten. After the trial, Lewis moves to Boston, the center of the Abolitionist Movement and begins sculpting. From Boston she travels to Rome, where after many trials, she achieves international recognition.

Dr. Frank Woods and Dr. Marsha Paludan on the set of “Wildfire: Black Hands, White Marble.”

Director Marsha Paludan enhances the symbolism in the play with minimal set pieces and props. In the final image, Spider Woman, The Storyteller and Edmonia become a living totem pole with a projection of a photograph of Edmonia Lewis shining over them.

The troupe plans to tour the country introducing new audiences to this trail-blazing woman.

"The Daily Advance" (Working Title)
By Michael Parker
Delphinium Press
Projected Publishing Date: Summer 2003



Interesting characters, intricate plots and evocative, lyrical writing won UCG English Professor Michael Parker critical praise for his first two novels, "Keep Me Guessing" and "Towns Without Rivers." A critic with The Charlotte Observer said Parker's writing "invites comparison to Faulkner and Reynolds Price." With such accolades, Parker's third novel, due to hit the press this summer, is eagerly anticipated by many readers.

"The Daily Advance," the working title of his third novel, is set in the 1970s. "Two brothers are the prime suspects in the murder of a gay high school student," Parker says. "Afraid they will be found guilty, the two brothers flee their small town in Eastern North Carolina. On the road, Pete and Daniel are drawn closer, and Daniel eventually confesses to his brother that he is gay."

"Meanwhile, back at home, their father, Thomas, the editor of the local newspaper, keeps track of the investigation and the town's reactions. The novel focuses on the impact this event has on the lives of these three men and the outcome of the investigation."

PHOTO BY BERT VANDERVEEN '93, '97 MA

Protestant unrest

"Reforming Empire: Protestant Colonialism and Conscience in British Literature"

By Christopher Hodgkins
University of Missouri Press

Ben Jonson wrote, "The strength of Empire is in religion."

Christopher Hodgkins, associate professor of English, takes Jonson's dictum as his point of departure in "Reforming Empire: Protestant Colonialism and Conscience in British Literature."

Organized around religious theories, Hodgkins' book shows how the Arthurian chronicles were used by England to claim Rome's inherent right to build an empire. Closer to home, the book traces how the celebration of the marriage of Pocahontas to John Cook eventually faded and gave birth instead to racist metaphysics.

Presenting both sides of the coin, Hodgkins focuses on writers who were anti-expansionist and fanned the flames

of Protestant imperial guilt. Written in a lively and accessible style, "Reforming Empire" will enthrall anyone with a passion for English literature and history.

Not business as usual

"Becoming an Invitational Leader: A New Approach to Professional and Personal Success"

By William Purkey and Beth Siegel
Humanics Publishing Group

In "Becoming an Invitational Leader: A New Approach to Professional and Personal Success," Dr. William Purkey, professor of Counseling and Educational Development, and co-author Dr. Beth Siegel of Kennesaw State University, present their fresh and innovative leadership model to a broad audience.

"Most leadership models," Purkey says, "are based on either 1. Bribery — 'I'll pay you to do this,' 2. Intimidation — 'You will do this or pay the price,' or 3. The Power Play — 'It's my way or the highway.' All of these approaches assume people are not moti-

vated and lack direction. Not only is this insulting, but statistics show that it's an incorrect assumption. People want to do good work."

Purkey has a national reputation for his concept of Invitational Leadership. It employs respect, trust and optimism to create a philosophy based on persuasion instead of coercion. "The idea is working with, instead of doing to. It encompasses volunteerism and enthusiasm to involve others."

Based on sound philosophical and psychological assumptions, this model has been tested and successfully applied by leaders in numerous fields, including administration, business, nursing, dentistry and counseling. As further proof of the theory's power, Purkey received a \$350,000 research grant to work with schools in the Washington area to implement the Invitational Leader Theory. A "must read" for leaders in all fields, the authors provide practical applications to support and help implement their theory.

The cat's meow

"Companion Volume: Poems"

By Fred Chappell
Yonno Press
Projected Publishing Date:
Summer 2003

Fred Chappell's "Family Gathering: Poems" used "snapshots in rhyme" to introduce readers to a family reunion jam-packed with zany, eccentric, not-to-be-forgotten characters.

Chappell's latest offering puts the reader back on familiar ground, but with a whole new litter of characters marking their territory.

This time around, in "Companion Volume: Poems," the rub for readers is an introduction to the feline members of the family.

Published by Yonno Press, an independent publisher in Greensboro, the book will be hand-set and printed on hand-made paper — constructed from cat hair, no less. The book, sure to be a collector's item, features illustrations by Fritz Janschka and poems from the former North Carolina Poet Laureate.

Businesses will benefit from the collaboration of Dr. Rahul Singh, Dr. Al Salam and Dr. Lakshmi Iyer.

The three up and coming researchers — all of whom have been at the Bryan School of Business and Economics for less than four years — are making their mark with their Intelligent Knowledge Exchange Architecture for the Digital Economy (IKEADE). When complete, their research will allow businesses to communicate more freely in an intelligent electronic marketplace.

"We are developing a framework that will take information across systems and business processes cutting across value chains," Iyer said. The overall objective is to improve the effectiveness of business processes in the digital economy.

"People tend to think that as long as they are on the Internet, their computers can talk to each other," Singh said. "Not necessarily."

Using intelligent software agents to set up a framework to model economic processes in marketplaces, they hope systems will more easily interact and share information and knowledge so businesses can plan for dynamic changes — such as a furniture manufacturer who might be impacted by the activities of cloth, wood and fabric manufacturers and wholesalers.

"All the companies are on the Net but it's not enough," Singh said.

The researchers also hope to create software agents that can organize

and present information for problem-solving and decision-making. They also envision agents that will actively contribute to the decision-making process by simultaneously interacting with users and monitoring dynamic market conditions.

Singh said he has always been interested in artificial intelligence. "Now I look at how artificial intelligence can help make business decisions," he said. Salam's passion is electronic commerce. He has focused on helping decision makers in e-business by using artificial intelligence.

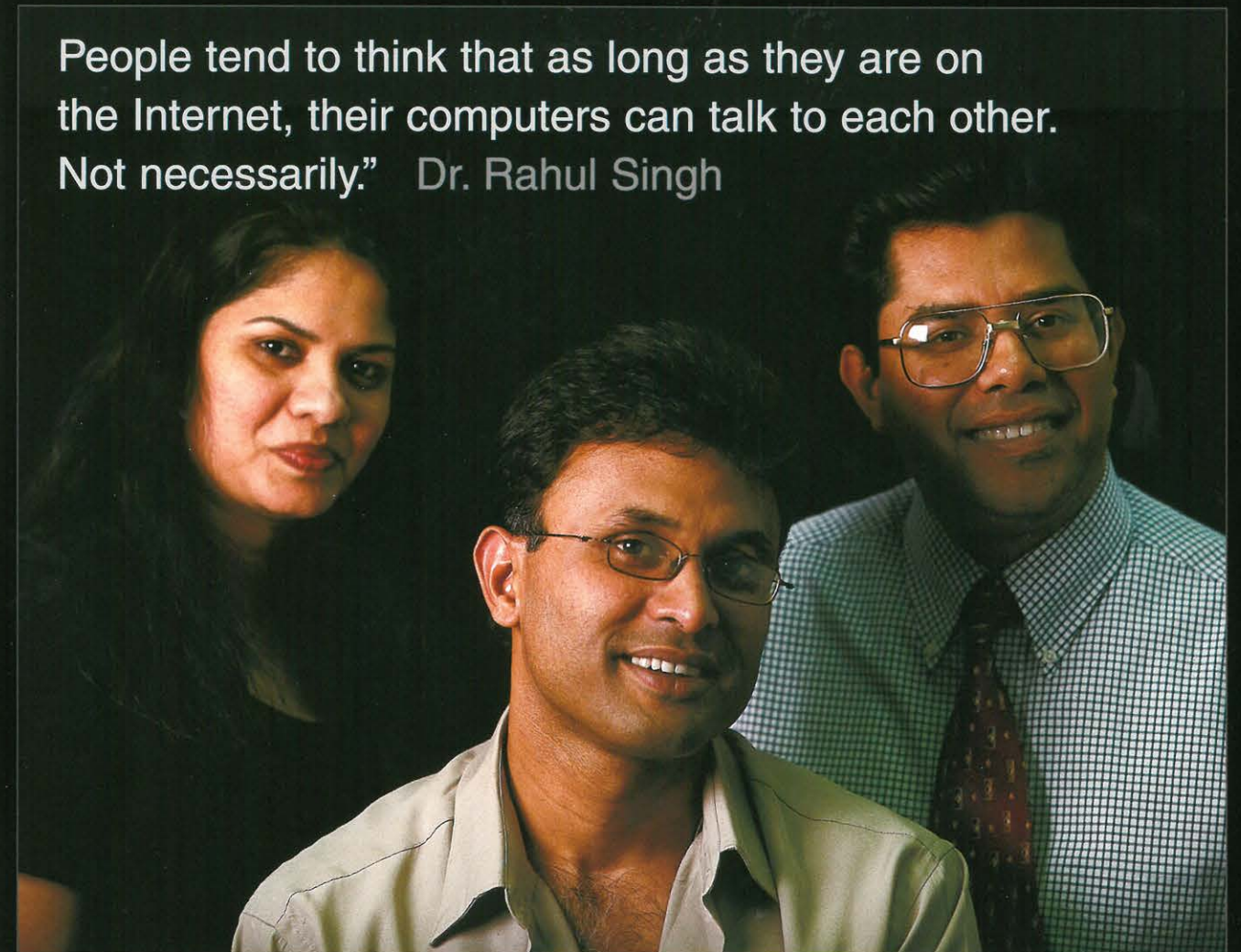
Iyer found her way into e-commerce research before coming to UCG. When she arrived she taught the first e-commerce classes in the Bryan School. She also brought with her managerial expertise. Dr. Iyer's research encompasses the fields of knowledge management (KM) and electronic commerce (EC).

"The three of us got together and asked, how can we put our backgrounds together?" Salam said.

The group discussed the issue for two to three months before they started writing and designing. "It's a general problem people have been looking at for the last 25 years," Singh said. "It's an evolving problem."

The researchers are, from left to right, Dr. Lakshmi Iyer, Dr. Rahul Singh and Dr. Al Salam.

“People tend to think that as long as they are on the Internet, their computers can talk to each other. Not necessarily.” Dr. Rahul Singh





Counting down the days

From the first brick to the last light bulb, the UNCG community has been watching the construction of the new science building and awaiting the day it would open for learning.

And now the countdown is on.

With move-in scheduled between May 15 and July 15, students will take their first classes in the \$40 million state-of-the-art facility during the second summer session.

Some other things students in the departments of chemistry & biochemistry and biology can count on:

- 5 classrooms (300 seat auditorium, 120 seat lecture hall, 100 seat lecture hall, two 50 seat classrooms; total 625 seats)
- 7 seminar rooms
- 25 teaching labs
- 15 research labs
- 34 faculty offices
- 1 specialized NMR facility
- 172,000 square feet
- Full use Fall 2003

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