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All of us at Emory have been working hard this past year to formulate a new strategic plan for the Arts & Sciences, a vision of where the College wants to go and a roadmap to get there. One of our guiding principles has been a belief in the value of a liberal arts education: its central importance within the University and its value to society as a whole. One of our main goals, we’ve also agreed, is to get still better at combining the resources of a first-class liberal arts college with those of a major research university.

These two ideas – the value of liberal arts and the importance of integrating undergraduate and graduate experience – got me thinking recently about the “problem” of pre-professionalism. (I’ll come back to those quotation marks.) By this I mean the suspicion of many faculty, here and elsewhere, that students treat their college years as merely a stepping stone to professional training. This dismay is understandable, of course. What teacher would want her students to treat a discipline in which she’s invested so much time and passion as just another hoop to jump through on the way to financial or social success?

But perhaps we should be thinking about this differently. Our students are, by and large, going to be doctors and lawyers and professors. They’re going to be ministers, architects, accountants, entrepreneurs. They’re smart and talented and ambitious; they want a lot out of life. What should focus our attention is the fact that a liberal arts education is the best possible preparation for all these pursuits, the most valuable thing our students can take forward into their professions. The liberal arts draw us out of our narrow individual experience into the wide world of ideas and historical precedent, offer us ethical standards, teach us to think critically and creatively. We emerge more human and more humane – more fully conscious. Are these not qualities we want in our teachers and clergy, our advocates and surgeons and business partners? So while liberal arts education is not vocational education, it is nonetheless eminently practical for anyone headed into professional life.

This is not just wishful thinking on the part of Arts & Sciences deans and faculty. Admissions officials have long counseled, for instance, that law and medical schools want students with broad backgrounds and the ability to speak, write and reason with subtlety and force. Recent testimonials add weight to this claim. A new poll asked hundreds of attorneys at the nation’s largest law firms, “What field of study, or major, would you recommend for an undergraduate student who is planning to attend law school?" The answer: liberal arts, by a wide margin. “A diverse educational background is a critical asset for today’s professionals, particularly attorneys," said the poll’s director.

The same holds true for medicine. A recent conference of medical school admissions deans concluded that “medicine itself is a liberal art” requiring “as broad an education as possible beyond the minimum science courses.” Liberal arts graduates are in fact accepted into medical school at a higher percentage than the overall applicant pool and are over-represented among students gaining honors. “Medical schools really do want liberally educated, well-rounded, empathetic people,” said one conference participant. “They’re looking for students with intellectual passion and curiosity.”

In this light the “problem” of pre-professionalism is no problem at all. If Emory continues to be the destination of choice for the best young minds, and if we continue to challenge those minds with innovative teaching and scholarship, we will have done our jobs. We’ll also have ensured that thousands of others will do theirs in a way that should make us all proud.

ROBERT A. PAUL, PHD
Dean of Emory College
Welcome to the inaugural issue of Quadrangle, the magazine for the Arts & Sciences at Emory.

If you’re holding this you’re already interested in Emory – you may be an alum, or the parent of a current student, or a faculty member – but we hope by the last page you’ll be even more interested. These are exciting times at Emory, and we’ve tried to communicate some of that here.

We all receive plenty of magazines, so it makes sense to ask “Why one more?” The answer is that we needed a place to focus on the work we do in Arts & Sciences. While Quadrangle isn’t entirely new – most of you have received a newsletter by that name – it expands on previous publications to give us room to cover the broad spectrum of our academic life. The College and Graduate School are centers of mind-expanding research and superlative teaching, and Quadrangle is designed to be a showcase for both. It goes beyond department newsletters to bring you the depth and breadth of work across campus. But it differs from Emory Magazine and the professional school magazines in focusing on the Arts & Sciences: the discoveries faculty and students are making here, the projects they’re talking about, what’s new.

One of the best parts of my job is talking with students and professors all over campus, finding out what research knots they’re trying to loosen and eavesdropping as they teach. It’s also one of the easiest parts. If you want to see intellectual energy at work, spend a few minutes with any of dozens of Emory faculty. Ask them what they’re working on right now, what fascinates them most, and watch their eyes light up and their hands begin to punctuate the air. These people love what they do, and they love to help others understand it.

Emory College, like the University, is currently examining itself, assessing strengths and resources, planning for the next decade and beyond. This issue of Quadrangle introduces you to some of the people and places that embody these initiatives. Emory’s emphases on internationalization and comparative religion, for example, come to life in our feature on the Emory-Tibet Partnership. The College’s goal of attracting the finest students and most distinguished faculty and staff finds expression in our feature on curricular innovation, in the profiles of Judith Kaine and Rosemary Magee, and in the books and awards sections. Our feature on cognitive neuroscience, one of the scholarly strengths the College has resolved to build upon, offers some surprising findings as researchers from multiple disciplines explore the mysterious terrain of the brain.

Having earned one degree here and another from a small liberal arts college, I’m in a position to appreciate how well Emory mixes the best of two worlds: world-class research and small-school teaching. At Emory, the researchers making discoveries that drive their disciplines forward are the same ones students encounter in the classroom. Often they’ve written the books that define the field. On top of this they’re passionate about their subject, approachable, everything you’d expect of faculty in a small college setting. This combination allows for powerful connections at Emory – between teacher and student, book and lab, field and classroom. Quadrangle will try to do justice to all this energy and accomplishment. We’ll help you join the conversation.

I hope you like what you see, and that you’ll let me know if so – or if not, that you’ll tell me where we might improve. We want Quadrangle to delight, to intrigue, and to deepen your appreciation of the Arts & Sciences at Emory. Let us know how we’re doing.

DAVID RANEY 99G
Editor
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In spring 2000, I had the privilege of interviewing the well-known literary scholar, Sally Fitzgerald, a few months before her death. When asked about the interesting path her life had taken, Fitzgerald replied without a moment’s hesitation, “I never expected to be in any of the places I found myself.”

These places included a farmhouse in Connecticut where she and her husband Robert Fitzgerald hosted a young southern writer for many months. At the time, Fitzgerald could not have imagined that her long conversations about literature and theology with Flannery O’Connor over the dinner table would one day lead to important contributions to American letters.

Over the course of more than two decades at Emory College, I have been regularly reminded of the important role that diversions, accidents, and serendipity play in all of life, even in the academy. New ideas, whether in the laboratory or library, don’t always occur in a straightforward linear fashion. In fact, the worlds of art and science reveal many stories of accomplished people who set out in one direction, only to find another path to discovery altogether.

The pioneering photographer Julia Margaret Cameron discovered her visual style by “embracing accidents.” In early experimentation, her portraits were consistently out of focus. Even when she later developed more precise techniques, she continued to play with the focal point to create portraits that became known for capturing the essence of her subjects.

Rosemary Magee has been a member of the College community for nearly thirty years. She came to Emory in 1977 as a graduate student in the Institute of Liberal Arts, and after earning her Ph.D in 1982 took the job of assistant dean. Made senior associate dean of the College in 1996, Magee left that position this spring to become Vice President and Secretary of the University.
I’ve learned that ideas may come to us at any place, in any moment, but also that they need time to evolve, meander, and develop.

David Lynn, an Emory chemist, describes how the researchers in his lab “stumbled” into a completely new way of copying DNA that has led to a different concept of synthetic biology and a better understanding of the origins of living systems. According to Lynn, such surprises happen frequently in the lab. Not all of them may change the world, he says, “but they always change the scientist.”

Students, too, may begin a semester with one major in mind, yet find new meaning and a sense of direction in a course taken primarily to satisfy a requirement. Suddenly a professor of anthropology or music provides a fresh perspective on life that points the student in an unanticipated direction.

As for me, I started out with the expectation that administrative work would be a temporary diversion from my academic fields of study, literature and religion. Twenty-three years later, I find myself still intrigued by the unexpected challenges of managing complicated processes that also provide opportunities for rumination and creativity.

Several years ago, before the grand opening of the Donna and Marvin Schwartz Center for the Performing Arts, a student reporter asked me what I was looking forward to the most. After a moment of reflection, I realized that I was eagerly awaiting the surprises, those events and epiphanies we couldn’t have known about in advance. Spaces we spent so many hours designing would soon shape our shared lives.

Through my experiences in academic administration, I’ve learned that ideas may come to us at any place, in any moment, but also that they need time to evolve, meander, and develop. Time, that rarest of all commodities, is essential to the art of creation. The poet and naturalist Diane Ackerman writes that we must strive to transcend daily urgencies in order to move into a more timeless and engaged awareness of ourselves in the world, a process she calls “deep play.”

Fortunately, the academic community is based upon a model that still respects time for reflection. Sabbaticals and summer breaks remain vital to our enterprise. Even in this era of Day-Timers and Palm Pilots, faculty and students do not have classes scheduled every hour of the day, every day of the week. The campus quadrangle itself, which continues to resonate as a powerful symbol of Emory, looks inward, allowing for reflection and unplanned daily encounters. Here students and faculty, like seemingly random particles, converge at specific moments to form units of activity and thought. Layers of meaning and intention overlap with hopes and dreams to create something totally expected on the one hand (the process of education) and completely unexpected on the other (new ideas and approaches). Plans and surprises unfold before us.

A college campus can teach us to embrace both intention and innovation. If we can occasionally create space and time for the unexpected, then we have indeed collaborated with the ongoing miracle of learning and living. The careful planning required to shape a quadrangle, laboratories, and dance studios also inevitably creates a place for serendipity. Our campus, like the education we hope to convey, relies on structure and rigor. But it also provides room for those special unplanned moments, leading us toward new ways of seeing ourselves and the world.

\[\text{\textcopyright 2005, Emory University} \]
When Judy Kaine, a senior in Emory College, designed an after-school arts program for refugee children last fall, she did more than open the eyes of the children to their own creativity. She also opened the eyes, hearts and minds of people throughout the Atlanta community. Emory faculty and program leaders have reason to praise Kaine’s dedication and selflessness: she devotes countless volunteer hours to the community while pursuing a multidisciplinary major in photography, sociology and anthropology within the Interdisciplinary Studies in Culture and Society program.

“She’s one of more caring people I’ve seen in the Community Building Fellowship Program,” says Sam Marie Engle, director of the program and senior program associate of the Office of University Community Partnerships.

“I was especially impressed with her ability to cut across academic lines and see how different approaches can help the community,” says Engle. “Her arts and photography background gives her an interesting eye. It lets her get inside people and see them for who they are, not as problems or data points.”

Kaine is no stranger to community service. Since the age of thirteen she has been involved in several community-based organizations, including volunteer work at arts camps in her hometown of Sarasota, Florida.

During her sophomore year at Emory she began lending a hand to the after-school arts program at Refugee Family Services, a bustling center located in the small downtown area of Clarkston, about a twenty-minute drive from campus. The nonprofit organization provides a wide range of services for refugee families, many of whom have settled in the community after losing everything they had in strife-torn countries such as Togo, Liberia, Sudan, Bosnia, and Somalia.
The following year, Kaine was selected as one of twelve students for the 2004 Kenneth Cole Fellowship. The program is very competitive, says Engle, drawing students from more than 15 different academic disciplines to participate in community-building activities that are both intensive and academic. Kaine soon found herself immersed in the challenges of a low-income southwest Atlanta neighborhood, where she helped families by creating a directory of resources for housing, employment and healthcare.

At the same time she continued to develop the idea of an art project as her senior honor's thesis, one that could be used as an academic model for encouraging creative expression among refugee children.

Anna Grimshaw, an associate professor in the ILA and Kaine's faculty advisor, was impressed by her student's initiative. “It’s a complicated piece of research--lots of ethical issues involved,” says Grimshaw. “And she was very aware of them.”

Kaine cleared one significant hurdle when Emory’s Institutional Review Board approved her proposal. She cleared another – funding – when she received an internship from the Neighborhood Development Intern Program (affiliated with several Atlanta universities). The small stipend, which most students use to cover their own living expenses, instead went toward buying art supplies and six digital cameras. With additional donations from friends and family, Kaine was ready to launch “Imaging Refugee Youth.”

Beginning in August 2004, she met with children once a week in hour-long workshops and asked them to make self-portraits and other images that touched on concepts of home, nation and utopia. Children shot their own photographs and, with Kaine’s help, transformed the images into exciting multimedia creations.

In December she organized an exhibit of the artwork at the Youth Art Connection (sponsored by Boys & Girls Clubs of Metro Atlanta) near downtown Atlanta, as well as an exhibit closer to the children’s homes at the Clarkston public library. (The project continues this semester as Kaine helps the children create artist books/photo albums they can keep.)

Bobby King, who was executive director at Refugee Family Services at the time, says that under Kaine’s guidance the children learned more than just arts and crafts. “As important as the art project itself were Judy’s wonderful interpersonal skills,” says King. “She was culturally sensitive and really made each child feel special.”

Bruce Covey, an adjunct professor in creative writing and a member of Kaine’s honors committee, believes her work is unique because “it stresses service above its more anthropological component.” For Kaine, Covey says, “the community part of the project always comes first, and to me that’s an inspiring approach to an academic project. I think many of our students perform great work within the community, but Judy seems to have found a new way to balance and integrate this work with her life as a student.”

In the immediate future, Kaine hopes to develop the project into a sustainable initiative for other community centers. After graduation she hopes to continue working with disenfranchised individuals, either abroad or domestically.

Kaine says her volunteer experiences while at Emory have taught her some valuable lessons. “Being exposed to the vitality and mental fortitude of these children has helped me progress personally. . . .”

“Being exposed to the vitality and mental fortitude of these children has helped me progress personally. . . .”
Some notable building features include: (1) the 5th-floor conference room, an open common space designed to facilitate faculty-student interaction; (2) an observatory with 24-inch Cassegrain reflecting telescope and Zeiss Skymaster planetarium; (3) reflecting discs to augment natural light in the lobby; (4) a bird-and-butterfly research garden containing the Gravity Stone, a campus fixture since 1963; and recycling centers on every floor. For more information and images, see http://www.college.emory.edu/about/facilities/; http://www.physics.emory.edu/astronomy/; and http://www.envs.emory.edu/Facilities/.
John Wegner stands in a grove of trees near the three-story glass atrium of Emory’s Mathematics and Science Center. The environmental studies lecturer, who performs double duty as campus environmental officer, is giving a tour of the facilities – one of many he’s given since the building opened in the summer of 2002. Suddenly a hawk lifts off a nearby branch and swoops straight toward the atrium windows. But instead of crashing into the glass, at the last moment the bird flares up and soars away.

Wegner’s face relaxes. Last year, his colleague Andrew Davis proposed the nets to prevent fatal avian head-ons. Emory’s Facilities Management designed and installed them. The nets are working beautifully.

So is the building.

In fact, few days go by in which the building doesn’t provide a new lesson plan for its occupants and visitors. Not only has it lived up to its promise as an environmentally friendly (“green”) building, it continues to spark the imagination of faculty, students and staff.

Already the spectacular planetarium on the third floor has seen works of classics, music and theater in a setting where, at the click of a switch, a projector rises into the middle of the room and displays a perfect night sky. In February, Theater Emory presented a semi-staged reading of Emory physicist Sidney Perkowitz’s new play “Glory Enough,” which tells the story of Rosalind Franklin, a brilliant chemist who received little credit for her contributions to the discovery of the structure of DNA in the 1950s.

Elsewhere in the center, people tell stories of the ways the building unleashes their potential to create new work.

Sonia Altizer, assistant professor of environmental studies, describes how proximity played a key role in a recent collaboration with Horace Dale, a research associate in the physics department. When Altizer and Catherine Bradley, a graduate student in biology, wanted to measure the speed and endurance of butterflies in flight, they only had to walk to the first floor to talk things over with Dale. As a result of their discussion (Bradley also credits a tempting piece of chocolate cake), Dale built a nearly frictionless tethered flight mill, and the biologists conducted a great experiment, leading to a forthcoming journal article.

Altizer’s studies also benefit from a nearby butterfly garden that was the inspiration of the Emory Garden Club. Thanks to the group’s effort, monarch butterflies now have a nectar bar to stop at during their long migration back to Mexico. The garden and nearby bird feeders (used in avian studies) make the location an appealing place for people to stop, too – for lunch or to discuss new ideas.

Woody Hickcox, a senior lecturer in environmental studies since the fall of 1984, has expressed his passion for the building in a bold, colorful way on the fifth floor. Where others saw blank walls, Hickcox saw
In the spring of 2004, the Mathematics and Science Center received the coveted LEEDS (Leadership in Energy and Environmental Design) certification recognizing its status as a high-performance, sustainable building. In all, Emory University has five certified LEED buildings and five more in the LEED pipeline – more than any other higher education institution in the U.S.

“The building has taught us how to minimize our footprint on the environment and to embrace the environment in the planning and design of buildings as we continue to develop the campus in the future,” says Robert Hascall, Senior Associate Vice President for Facilities Management.

gallery space for his oversized animal paintings. (No, he didn’t ask. Yes, everyone loves his work.) The fifth-floor stairwell is now home to a Japanese crane, while the men’s and women’s restrooms feature exotic shrimp and pink flamingos, respectively. Zebras and tropical fish inhabit other walls and recesses.

“The art just sort of happened,” says Hickcox. “This is a special building. I like to think that my murals make it more special.”

For the mathematics community, the new space has allowed the department to make exciting new intellectual connections with international scholars. Visitors will soon be arriving with year-long commitments from such far-flung destinations as Korea, Denmark and Russia. Closer to home, the School of Medicine connects with the College every time an advanced genetics seminar class drops by to share the Mathematics and Computer Science lab.

Of course, the most striking aspect of the building to first-time visitors is the three-story atrium. Already it has become one of the most desirable places on campus to hold large receptions and gatherings.

The space inspired Kate Bennett, program development coordinator in physics, to imagine it adorned with large-scale batiks by Mary Edna Fraser, an artist from Charleston, South Carolina. With the support of physics and environmental studies, science and art came together during the Charter Celebration in January 2004, with 45 silk batiks displaying images ranging from barrier islands to galaxies.

While most undergraduate students enjoy the spaciousness, natural light, and high-tech aspects of the center, at least one student has experienced a life change because of the building. Jacob Halcomb of environmental studies got involved as a student representative on the building committee. After leaving Emory he began Group Six Consulting in September 2002.

“Math and Science really got me started into the career field I’m in now,” says Halcomb. “My involvement as a student not only helped teach me across disciplines, but showed me a possible career that I’m lucky to be involved with.”

Rosemary Magee, who spearheaded the College’s facilities planning as senior associate dean and was recently named vice president and secretary of the University, believes the College succeeded with the Mathematics and Science Center because “it conveys both science and art, plus mystery.”

“The building is an organism that is part of our shared universe,” says Magee.

As the College embarks on planning new multidisciplinary science buildings, the center serves as a valuable reminder that a building is more than a collection of offices, classrooms and labs. If done well it can be a powerful organic force, a dynamic teacher and source of inspiration in the community.
Where Brain & Mind Meet

Where **Brain & Mind Meet**

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**Brains are big these days at Emory.** Not that they haven’t always been: the faculty, students and administration are as smart as ever. But throughout the College and the Graduate School of Arts & Sciences, researchers are plumbing the depths of the mind and brain and articulating the connections between the two. Cognitive neuroscience is drawing grants, criss-crossing disciplinary borders and producing fascinating results.

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**The Brain—is wider than the Sky—**
**For—put them side by side—**
**The one the other will contain**
**With ease—and You—beside—**

—EMILY DICKINSON

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**BY DAVID RANEY**
**ILLUSTRATION BY TOM GONZALES**
Most people no longer subscribe to the ancient theory... that our upper chests house the feelings that make us complexly alive.

One age-old view of the brain has it that human reason resides there, while emotions have their home in the heart. Another more recent conception holds that the route from thought to behavior is straight and unvarying: brains affect minds, which affect behavior. (We process, then think or feel, then act.) A third, just a few decades old, envisions the brain as a computer, a three-pound living laptop – one that substitutes synapses for silicon, but analogous in its operation to anything from the assembly line at Dell or IBM. Cutting-edge research in a variety of disciplines, though, is calling all these ideas into question.

Most people no longer subscribe to the ancient theory, posited by Aristotle and Hippocrates among other luminaries, that our upper chests house the feelings that make us complexly alive – pain, anger, empathy, joy – while our skulls contain our cooler selves, the logic and intellect that set us apart from the animals. That issue has been settled, hasn’t it? Well, maybe. We still speak of someone as lion-hearted or hard-hearted; we still ask whether a decision was made with head or heart; and not just the romantics among us might agree that, in Pascal’s well-known words, “The heart has its reasons of which the reason knows nothing.”

Old notions die hard, especially those lodged by centuries of poetry and metaphor in the popular mind. Professor Daryll Neill of the psychology department knows this from experience. It isn’t uncommon, he says, to be asked after a public lecture on cognitive science whether emotions really proceed from the brain. A colleague, Neill says, once gave a public school presentation on the topic and was reproached afterward by a teacher for suggesting such a thing to children. “Feelings are not in the brain,” the teacher corrected angrily; “they’re in the heart.” But among scientists, Neill says, and for “anyone attuned to contemporary neuroscience,” the biochemical basis of emotions and a view of the mind as the operation of the brain “are accepted to the point of banality.”

FROM SNAPSHOTS TO VIDEO

One reason is that neuroscience has gone high-tech with a vengeance. PET (positron emission tomography) scans have been around since the mid-1970s but have certain drawbacks in mapping human brain function. They require the injection and tracking of small amounts of radioactive material, which itself can be troubling, and those radioactive tracers break down rather quickly, leaving only a small window on what’s happening in the living brain. MRI (magnetic resonance imaging) exams have been performed on humans since 1977, but for all its versatility as a diagnostic tool an MRI cannot record a brain’s function, only its structure.

New technologies have changed that. A modified MRI called fMRI (“f” for functional) combines the precision of regular MRIs with the ability of older PET scans to record activity over time, rather than simply take a snapshot of structures. The procedure uses a powerful magnetic field, as in standard MRIs, to induce brief detectable changes in atomic nuclei in the brain. The fMRI’s innovation is to use this information to track the blood flow that accompanies neural activity, taking a series of images in quick succession and comparing them for differences. Thus if a subject is asked to look at a photograph or respond to a question while lying in the MRI’s familiar long white torpedo tube, an fMRI can track and record not only which brain areas “light up” but when, in what order and for how long. Since the first fMRI brain scan was accomplished in 1991, this non-invasive, high-resolution method of mapping brain function has revolutionized the field of brain science.

EVERYBODY IN THE POOL

That field is wide open, and growing. Religion, philosophy, computer science, anthropology, sociology, linguistics – virtually every discipline now seems to overlap with brain science at some point. And why not? We make sense of the world, and react to it, via the brain; our every cultural production is mediated by the mind. Still, neuroscience’s foot in the door of most academic departments is quite recent. When Daryll Neill graduated from college in 1967 with a degree in psychology there was no neuroscience for him to study.
“Physiological psychology, as it was called then, was a sideline,” he says. Behaviorism still ruled the roost, though the cognitive revolution of the 1960s was already challenging its assumptions.

Behaviorism, most closely associated with American psychologists John A. Watson and B.F. Skinner, claimed that psychology was not concerned with mind or consciousness as such – only with behavior, the observable responses to external stimuli. In its most radical form this reduced humans essentially to living machines, or reactive boxes: stimuli went in, behaviors came out, and what mattered was predicting one from the other, not what happened inside the box. Things have certainly changed. In Emory’s one-year introductory course in psychology, Neill notes, the entire first semester is devoted to neuroscience and cognitive psychology. Psychologists still pursue a vast array of research interests, “studying everything from family therapy to rats to molecules” (Neill himself studies brain neurotransmitters and their effect on behavior), but no one can ignore the flood of new insights from cognitive neuroscience. “What really thrills me,” Neill says, “is seeing how the biological approach has infused all of this.”

Anthropology assistant professor James Rilling would agree. His lab is using fMRI and an even newer technology called diffusion tensor imaging (DTI) to explore brain connectivity and the neural basis of such social phenomena as altruism and mutual cooperation. Drawing on game theory, he and his colleagues have studied varying versions of the Prisoner’s Dilemma and the Ultimatum Game, in both of which a player must decide whether to trust others or act selfishly. Surprisingly – at least to a cynic – Rilling finds that cooperation and reciprocity are “wired” in us to a substantial degree. Such behavior activates areas of the brain associated with reward and pleasure, suggesting it might have evolutionary survival value. One prominent theory, says Rilling, is that “the social emotions – guilt, say, or camaraderie – evolved to help us keep doing what’s in our long-term interest.” Playing these risk/decision games repeatedly “models real social interactions,” and while cheating might lead to short-term gain “it would not be good for society at large.” Thus our brains may have evolved to make doing right feel good. Such reciprocal behavior has been observed in lower primates but is much more prevalent in humans, says Rilling, and that’s “one of the reasons I’m attracted to this research. It’s one of the ways we differ… a kind of specialty of humans.”

John Snarey, an associated professor in the departments of psychology and educational studies, is part of a research team using similar techniques to study another human specialty, moral reasoning. A specialist in human development and ethics at the Candler School of Theology, Snarey first got interested in the new technology while reading about learning disorders. He was struck, he says, “with a renewed awareness that I’d always been studying the brain – just indirectly.” While the fMRI doesn’t change all the questions we want to ask, it does offer “a new tool, a new method for getting at answers.” Snarey and his colleagues scanned volunteers’ brains while presenting them with hypothetical decisions and dilemmas: whether to return a lost wallet, for example, or “bend” data to please one’s boss. The experimental design distinguished between moral and merely tactical decisions, between intuition and reasoning, and even between dilemmas involving care (disappointing a loved one, for instance) and justice (lying, cheating). The results showed that on a neural level all these complicated processes are separable: brain areas with names like the posterior cingulate cortex and the medial frontal gyrus activate differently depending on the kind of response called for. Snarey now wants to know whether these neural correlates of moral thinking vary by gender or developmental stage, and he foresees “practical implications, perhaps astounding ones, for moral education.”

TWO-WAY STREET

Just as brains influence behavior, behavior changes brains. Elaine Walker’s varied research covers stress hormones, adolescent schizophrenia, and development in infants with depressed mothers, and it all refutes the once-trusted theorem that “causation is unidirectional – brain to mind to behavior.” Instead, the Samuel Candler Dobbs Professor of Psychology and Neuroscience says, “We now recognize that these relationships are more complex. Behavior is no longer seen as a simple by-product of brain function; it can be causative too.” Experience and behavior, in other
words, don’t just reflect biology; they can change it. Stress, depression (closely linked to stress), or other traumatic experience can actually alter the brain’s structure and functioning.

So can physical trauma, of course, says Robyn Fivush, another Dobbs Professor of Psychology and director of the Emory Cognition Project. But Fivush, whose research focuses on trauma and memory, notes that the “amazing plasticity” of our brains allows them to recover from quite serious damage, especially in the young: “What would devastate an adult might result ultimately in quite manageable problems for a young person” as the brain adapts and reroutes connections. Positive experiences can alter brains, too, she points out. Studies have demonstrated, for example, that young rats in “enhanced environments” (bells, slides, pictures, things to look at and play with) “develop more complex brains, with much more connectivity” than their experimental counterparts raised in spartan circumstances. The human brain likewise “operates in larger socio-cultural contexts,” not just within its cranial case, “and it develops in those contexts.”

Her colleague, Associate Professor Stephan Hamann, draws a similar conclusion from his research on emotional memory. Positive or negative emotions associated with a memory, if strong enough, can have the effect of imprinting that memory very powerfully. The phenomenon involves the amygdala, an almond-shaped mass in the brain’s medial temporal lobe, which spurs the release of hormones that have this “hard-wiring” effect. Even in amnesiacs and dementia patients, Hamann says, strong emotion appears to boost memory. Evolutionarily this was likely crucial, as not every response can be genetically programmed: there would be survival value, for example, in generalizing to a visceral fear of all toothy predators from the memory of just one narrow escape. But the same process can imprint inappropriate or non-adaptive memories just as strongly, and this variation is part of what intrigues Hamann: “One reason emotional memory is so interesting to study is that it interfaces with so many things: pleasurable responses to certain smells, for instance, but also phobias, addiction, and post-traumatic stress disorder.”

INTERDISCIPLINARY BY NATURE

Cognitive neuroscience, nearly all agree, doesn’t just benefit from a multi-disciplinary approach – it requires it. The Neuroscience and Behavioral Biology (NBB) program is one way the College has taken advantage of its rich diversity of disciplinary resources and interests. Begun in 1998 with a mere 12 majors, NBB has blossomed into one of the largest neuroscience undergraduate programs in the nation, boasting over 300 majors and nearly 70 associated faculty. Fifty-four College faculty from nine departments participate. That explosion of interest mirrors the field itself, says director Paul Lennard. “In 1971, the Society for Neuroscience had 500 members. Today it has over 36,000.” And NBB’s interdisciplinary approach is vigorous and intentional. “Any intellectual problem can be approached that way,” Lennard maintains, “whether it’s philosophical or neurochemical. Surely every scientific problem can – and show me the subject in the humanities or social sciences that isn’t inherently multidisciplinary, too.” If he had his way, he says, “every faculty member of the College would be affiliated with NBB.”

Most semesters NBB offers 25-30 courses, with the exact selection “dynamic,” says Lennard; “it depends on what’s being taught at Emory and where.” There might be cross-listed courses with English, the medical school or Interdisciplinary Studies, and this variety reflects in NBB student research. Honors student research alone right now, says Lennard with a touch of pride, includes projects in psychology, cell biology, primate reproductive behavior, and Parkinson’s disease.

Philosophy professor Robert McCauley, one of three members of his department who serve as associated faculty in NBB, points out that many of the disciplinary walls between the physical and social sciences and humanities are of quite recent origin. They would not have made sense to most researchers of the nineteenth century and earlier, when “natural philosophy” was the term for what we now think of as the “hard” sciences. (The full title of Newton’s seminal *Principia Mathematica* was *Mathematical Principles of Natural Philosophy.*) “And now cognitive science,” McCauley says, “is coming back to lay claim to some areas of philosophy.” His own research bears this out. As a philosopher of science he is interested in “how the social
sciences conceive of the mind, how the natural sciences conceive of the brain, and how disciplines conceive of themselves.” As a naturalist philosopher he works the other side of the same street, “bringing all relevant science to bear” on his writing about religion and the mind. (He is currently at work on a book comparing the cognitive foundations of science and religion.) It’s a research agenda that amply confirms the contention that in mind-brain studies, disciplinary overlap is not a matter of lip service or academic fashion. John Snarey, whose project brought together faculty in biostatistics, psychiatry, and business, puts it this way: “Cognitive science is the ideal discipline for collaborative work. Biologists, chemists, psychologists, ethicists – we need each other to do it right.”

“It’s the epitome of an interdisciplinary field,” says Winship Distinguished Research Professor Lawrence Barsalou. Barsalou, along with colleagues in psychology, philosophy, and anthropology, has proposed an Emory Center in Mind, Brain and Culture. Similar centers at peer schools like Harvard, Penn, and Duke promote innovative research and “foster intellectual community,” Barsalou says, and such an initiative here “would draw on Emory’s strengths” in many fields. The resultant synergy would represent, as Lennard says of NBB, “an emergent property of what we already do well.”

Barsalou, author of The Human Conceptual System, studies modalities of perception, or the hypothesis that cognition is grounded in sensory-motor mechanisms. In this view, when we think about colors or sounds, for example, we partially “run programs” in the parts of the brain that would be active if we were actually experiencing those things. But the “programs” are only figurative for Barsalou, who resists the common characterization of the brain as a computer. That metaphor rose along with computer science and the cognitive revolution in the 1960s, he says, and it is inescapable today, but according to Barsalou it fundamentally misrepresents brain activity. “Computers convert data into symbolic code and manipulate that. Brains deal more with images, in a modular, mediated, fluid way.” He notes that as an empiricist, he is willing to be proved wrong: “I’m not dogmatic about theory; but show me that the brain functions like a computer. The evidence just isn’t there. I would bet a lot of money (if I had it) that the modular interpretation will win out.”

Associate Professor Dieter Jaeger and his biology department colleagues Ron Calabrese, Astrid Prinz and Robert Liu might just take that bet. As the “core of four” computational neurophysiologists at Emory, they study the human brain as precisely what Barsalou rejects – “a biological computer.” Jaeger’s research examines, among other things, “synaptic integration,” which he describes as “trying to understand neurons in networks.” Brain cells “talk to” each other across the tiny spaces (synapses) between them, and the entire network “talks to” individual neurons in turn, managing and making sense of those trillions of individual transactions. It is this latter process that Jaeger and others are trying to fathom. They do so by passing electrical currents through carefully sectioned mouse, lobster, or other animal brains and recording the voltage across synapses, then building quantitative computer models of individual neurons – one computer modeling another, in a sense.

The next step would be to map an entire network, but “no computer is yet powerful enough to do this,” Jaeger says, even for a smaller system than the human brain. What makes the work so challenging is the mindbending complexity of the interactions. Actually our brain’s speed at the synaptic level, Jaeger says, is nothing special by modern computing standards. “A Pentium can now run at three gigahertz, or three billion operations per second; the brain, only about 1000 operations per second – that’s six orders of magnitude slower. But we still can’t build a computer that does what we do.” Why? Because the brain’s connectivity (parallel processing, we would call it in our desktop CPU) is incomparable. Our hundreds of billions of neurons, each communicating with as many as 15,000 others, yield what’s known as a “complex non-linear dynamic system,” which is devilishly hard to analyze or predict. The Emory team’s research may have implications for treating Parkinson’s and other diseases of brain processing, but the effort to understand our own brain has rewards that go beyond the practical, Jaeger says: “It’s one of the biggest intellectual thrills available to us as a knowledge-seeking species.”
Even a brief study of Tibet,
sometimes called the Roof of the World,
reveals a history unusually suited to the phrase “high points.” The region of half
a million square miles and some two million people has witnessed over a thousand years
of high scholarship and high drama. Emory’s connection with this elevated place is of
considerably shorter span, but that story too is rich in history, scholarship and political
excitement during a period in which Tibet has captured growing international attention.
Few Americans other than avid high-country climbers and Colorado ski buffs ever stand on ground more than 12,000 feet above sea level. That figure is Tibet’s average elevation. The Indus, Mekong, and Yangtze rivers rise here and flow to the Arabian and China Seas, providing sustenance to civilizations both ancient and modern.

This position between giants, at a kind of headwater of history, nicely encapsulates the political strife that is a hallmark of Tibet’s history. Early nomadic tribes, the Mongols, the colonial British and the modern Chinese have repeatedly invaded, meddled, conquered and clashed here. Most recently and famously, a rumored Chinese plot to kidnap the 14th Dalai Lama (“superior priest” of Tibetan Buddhism) triggered a 1959 uprising, and the subsequent Chinese occupation brought labor camps, starvation and the destruction of thousands of monasteries. The Dalai Lama fled from Lhasa, the capital, to exile in India, where he remains the political and spiritual leader of six million Tibetans worldwide. Now 70, he is in his fifth decade of working toward a non-violent resolution to the Tibetan-Chinese conflict and the liberation of his homeland. In 1989 he was awarded the Nobel Peace Prize, focusing worldwide attention on these efforts.

the emory connection
As the Dalai Lama was fleeing Tibet, Robert A. Paul, now Dean of Emory College, was entering Harvard. He would graduate with a degree in history and literature and a growing interest in cultural anthropology. Moving on to the University of Chicago, Paul earned a masters and doctorate degree in that field, specializing in comparative religion and the ethnography of South and Central Asia. (His first book, in 1982, was *The Tibetan Symbolic World*.)

In Chicago Paul crossed paths with anthropologists Clifford Geertz and Melford Spiro, who were doing pioneering research in Indonesia and Burma, respectively. While these two eminent anthropologists helped and inspired Paul, he wanted to look north rather than south. “At the time,” says Paul, “there was almost no work being done on northern Buddhism. One very good reason was the 1962 Indochina War: westerners were not allowed within twenty-five miles of Tibet.” So Paul went instead to Nepal for his doctoral research in 1966, studying Sherpas, meeting Sir Edmund Hillary, and not returning until 1968.

While he was gone, Paul says with a laugh, “the 60s happened,” and the tectonic cultural shifts of those years had brought a sudden interest in all things Eastern. From sitars to sarsis, meditation to medication, the Beatles, Timothy Leary, and hippies young and old played on (or at) Eastern themes. “When I came back,” says Paul, “people who hadn’t known where Tibet and Nepal were in 1966 were asking me, ‘Do you have a guru? What’s your mantra?’ It was remarkable.”

Then “life intruded,” and Paul took teaching appointments – first in New York, then in 1977 at Emory’s Graduate Institute of Liberal Arts (ILA) – and didn’t return to the region for years. In 1991, Emory religion professor John Fulton got a call from an area woman that ran something like “I have a Buddhist monk here – would you like to meet him?” Fulton, knowing of his interest in such matters, called Paul, and the two of them had a cheeseburger at Jagger’s with Geshe Lobsang Negi.

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common thread

Jaggers is long gone, as is its Emory Village successor Park Bench, but Geshe Lobsang Negi is still at Emory. A lecturer in the department of religion and chair of the Emory-Tibet Partnership, Negi was born in Kinnaur, a small Himalayan kingdom adjoining Tibet. He began his training in the monastic system at age 14 and eventually received the degree of Geshe Lharampa, the highest level of learning in Tibetan Buddhism, requiring sixteen years of formal coursework. In 1991 he was in Atlanta at the request of the Dalai Lama, who after visiting Emory in 1987 wanted him to investigate east-west science links and the possibility of developing a North American seat of Drepung Loseling Monastery, a center of scholarship established in 1416. (Dr. Negi now directs the Drepung Loseling Institute, on Briarcliff Road near Emory – see www.drepung.org for a calendar of programs.) Negi entered the ILA in 1991, studying traditional Buddhist and contemporary approaches to emotions and health, and by 1999 he had his Ph.D, completing the rarest of academic double plays: the terminal scholarly degree in both eastern and western systems.

In his teaching, Negi makes clear that his intention is not to proselytize. His courses in the Psychology of Enlightenment or the Culture of Buddhist Tibet are excursions in scholarship, not indoctrination. “That is not a strong impulse in Tibetan Buddhism,” he said in his sunlit office recently. “His Holiness the Dalai Lama stresses that religious practices evolve around people’s needs and predispositions and are rooted in places and conditions.” Still, he says, “I am continually struck by the commonalities as I study comparative religion – the emphasis on love, compassion, forgiveness, finding meaning in suffering.” And we should in any case learn from as many traditions as possible: “His Holiness says diversity is beautiful, and a world with only one religion would be like dinner with only one dish at the table.”

from small seeds

On the Dalai Lama’s next visit to Atlanta, his first stop on a four-city tour in 1995, Paul led a small Emory delegation to his downtown hotel room to propose an affiliation between Emory and Drepung Loseling. This would offer an unprecedented possibility, Paul said, of bringing together Western learning and “the wisdom and culture, and concludes with month-long independent student projects.

Philip Wainwright, director of the Center for International Programs Abroad and senior associate director of ICIS, saw the inaugural Tibetan program first-hand in April 2001 and came away enthused: “It was the most impressive experience I’ve ever had visiting a study abroad program.” Beyond their formal coursework, he notes, students were exposed to a wide spectrum of Tibetan culture, including the Shoton Opera Festival, tangka painting, and volunteer work with orphans and refugees at the Tibetan Children’s Village. “What I thought was most remarkable about the Tibetan Studies program was the opportunity to engage with a government in exile and a culture in exile. I can’t think of another study abroad setting or program where this can happen. Dharamsala provides a concentration of resources and opportunities for students that they could not find anywhere else — and the program allows them not just to learn about Tibetan culture in the classroom, but to engage with the Tibetan community directly.”

On a trip to Dharamsala this past February, Dean Paul met again with the Dalai Lama and signed an agreement for continuing scholarly exchange between Emory and the Institute for Buddhist Dialectics. The signing, said Paul on returning to campus, “will solidify Emory’s position as one of

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the premier institutions in North America for the study of Tibet.” When the Dalai Lama was shown a copy of the Emory-Tibet Partnership brochure, Paul says, “The look of wonder and pleasure on his face was very moving. He saw that his dream was being realized.”

**long road, strange bedfellows**

Two Emory students, starting at very different points of the compass, have helped energize the Emory-Tibet Partnership. Tsondue Samphel’s route to Emory began at Dharamsala, where he moved at age 8 from his birthplace in southern India. After the equivalent of high school, he joined the Institute of Buddhist Dialectics (IBD) and studied as a monk for seven years. During this time of spiritual growth, his interest in Western science also deepened, and in his advanced coursework he chose to focus on physics. To some this might seem an unlikely marriage – Buddhism merely mystical abstraction, physics all gritty fact – but Samphel sees no disconnect between them. “Both strive to understand the nature of reality,” he says in his soft, earnest voice. “And both question the reality of nature.”

In fact, Buddhist thought is remarkably congenial to modern science. The Dalai Lama co-founded the Mind & Life Institute in 1990 specifically, as its charter states, to “establish a powerful working collaboration and research partnership between modern science and Buddhism.” The Institute’s annual conferences, at sites alternating between east (Dharamsala) and west (recently Wisconsin-Madison and MIT), address such decidedly non-mystical topics as neuroscience and quantum physics.

Part of Samphel’s work at Dharamsala involved translating scientific chapters and articles from Tibetan to English (and occasionally the reverse), as well as serving as translator for Tibetan teachers on trips to the U.S. In 1998, during his first visit to the U.S., Samphel stopped at Emory to visit his sister-in-law, who was studying public health. That same year, His Holiness the Dalai Lama and then-President William Chace signed an agreement formalizing the links between Emory and the Tibetan government in exile, especially the educational affiliation with the Institute of Buddhist Dialectics.

Three years later, Samphel was translating for IBD director Geshe Dhamchoe Gyaltshan when Emory’s first study-abroad students arrived. Connections made on that visit led to his enrolling at Emory in the fall of 2003, with a scholarship provided by alumnus Albert Anderson [see Impact, p. 30]. Now a junior, Emory’s first Tibetan student wants eventually to complete his PhD in physics, then to return home to educate Buddhist scholars and young students in western science. Samphel hopes, he says, “one day to fulfill my dream of bridging the apparent gap between science and the inner traditions of the East.”

**staying connected**

“Wow” was sophomore Leigh Miller’s simple, visceral reaction on hearing the Dalai Lama speak to a packed Woodruff Recreation Center on his second visit to Emory, in 1995. “This was something I had to know more about.” Those who know the lively, engaging Miller might have predicted that she wouldn’t wait long to follow through, and within a year she was off to Nepal on a junior study-abroad program, based in Katmandu and living with a Tibetan family for several weeks. “It was amazing,” she says. “I made fantastic contacts, and learned so much.” In her senior year she “wanted to keep the connection going,” so she took a job as a work-study student at the Loseling Institute.

“Emory has been incredibly supportive,” says Miller, now a doctoral candidate in the ILA who is writing a dissertation on the tensions between innovation and tradition in Tibetan visual arts. She has received financial aid through the ILA, the Vernacular Modernities program and the University Fund for Internationalism. And Miller has returned the favor, playing an instrumental role in outlining goals and possibilities for the Emory-Tibet Partnership and raising its visibility, whether by serving on the Emory-Loseling Liaison Committee or founding Students for a Free Tibet. In 1998 the Dalai Lama made his third visit to Emory as the commencement speaker for Miller’s graduating class, and that summer she assisted with what she calls “a trial balloon” of Tibetan Studies courses at Emory, measuring campus interest before going through with the formal course approval process.

The balloon sailed. Today the Asian studies program has two dozen core and affiliated faculty, an annual Tibet Week is well attended, and the Loseling Institute and Tibetan study-abroad program are thriving. According to Bobbi Patterson, senior lecturer in religion, Emory “has been incredibly fortunate in the convergence” of people who have made the partnership possible and “put it from the very beginning on such a strong footing – honoring the ancient scholarly traditions of Buddhism.” The Dalai Lama’s enthusiasm, Geshe Lobsang’s continuing presence, Dean Paul’s commitment and learning, and the energy of Miller, Samphel and other committed students have given this high-concept partnership, Patterson says, “a constant anchoring.”
Why We’re Here

Fresh approaches to teaching and learning

A wave of curricular innovations is rolling across the College of Arts and Sciences, drawing professors and students across many of the boundaries that traditionally have defined learning. The name of one of the courses that greets first-year students at Emory, Creativity and Collaboration, captures the spirit of many new teaching initiatives. Divisions among disciplines, between graduate and undergraduate education, and between the classroom and community are all being challenged as professors adapt teaching practices to help students grapple with the complexity of the pursuit and application of knowledge today. And the trend toward multidisciplinary approaches to problem solving at the highest levels of academic inquiry now shapes many students’ experiences from the moment they walk into their first classes.

Multidisciplinarity from Day One

“Creativity and Collaboration” is one of the latest in a line of seminars begun in 1999 to give freshmen a small seminar experience and close contact with a faculty member early in their undergraduate education. Professors in music, art, dance, and theater team up to introduce students to the common principles of the creative process. Students in the fall of 2004 began the term by studying either music with Associate Professor Steve Everett, dance with Associate Professor Lori Teage, theater with Associate Professor Leslie Taylor, or visual arts with Lecturer Katherine Mitchell. After midterm came a kind of curricular musical chairs as students switched focus, sampling another creative discipline, before ending the term with a multidisciplinary collaborative project. While people associate creativity most closely with the performing arts, Everett hopes that the course’s emphasis on engaging students in the process of forming and nurturing creativity across disciplines might be replicated in other
parts of campus. “Any group of linked disciplines, like English and the social sciences,” he says, “can examine how ideas come about and the process of nurturing them.”

While students have had a buffet of choices among freshman seminars in recent years, few focused on the sciences until Professor of Chemistry David Lynn brought ORDER to the curriculum. Like “Creativity and Collaboration,” ORDER (On Recent Discoveries by Emory Researchers) guides freshmen across the terrain of several related disciplines while stressing, in the words of student Stephanie Whisnant, “the underlying themes that define science.” Unlike most freshman seminars, ORDER shifts the focus from the work of senior faculty to that of graduate students. In a competitive process, five graduate researchers are selected to teach a two-week module on their own research in Lynn’s seminar. In addition to giving the graduate students valuable experience in communicating their own work, the course brings undergraduates face to face with real research and with the graduate students’ infectious excitement about their unfolding discoveries.

“Without contact with graduate students,” Lynn argues, “the college student does not see the whole of the academic enterprise.” On a recent tour of universities with his daughter, Lynn was struck by the apologetic attitude of top institutions toward their use of graduate students as teachers. “Each school failed,” Lynn says, “to capture the positive and essential element that graduate students bring to academe. Particularly in the sciences, the funding structure has allowed graduate and undergraduate education to evolve along separate tracks, to the detriment of both. We hope that ORDER will find ways to mend that divide.”

ORDER also aims to bridge divisions across the disciplines. The multidisciplinary approach of ORDER seminars, like one in the fall of 2004 that brought together researchers from neuroscience, sociology, chemistry, psychology and anthropology, allows students to see the necessity of collaboration across fields in solving scientific problems. The teachers also progress in their search for a common language. “To sit in a room of teacher-scholars,” says Dawn Comeau, one the course’s researchers and a graduate student in women’s studies, “and hash out what language and methodologies to use to talk to undergraduates to show them the underlying processes of science – that’s really doing interdisciplinary teaching and it’s exciting.” The course has been effective in capturing students’ interest in science early, as many ORDER students go to work part-time in research labs after the course. The interactive learning that characterizes both “ORDER” and “Creativity and Collaboration” also serves as a foundation for the students’ experiences in many upper-level courses.

**Taking it to the Streets (and Creeks and Corporations)**

Sponsored by the Center for Teaching and Curriculum, Emory’s Theory Practice Learning (TPL) Program aims to strengthen the connection between academics and contemporary social issues by training teachers in “experiential education” – learning by doing. TPL courses, says former program director Preetha Ram, integrates activities like internships, community service, and field trips into the curriculum to boost students’ active engagement in learning. The pedagogical theory underlying TPL, Ram explains, holds that concrete experiences lead students to reflect on their own observations and formulate principles that serve as guides to further action and analysis of problems. Faculty from a wide variety of disciplines in the College, such as anthropology, religion, biology, Jewish studies, and environmental studies, use TPL techniques in their courses.

Students in Anthropology 240, for example, encounter the culture of the Gullah people who inhabit Sea Islands from the Carolinas to Florida. After reading ethnographies of the Gullah, they travel to St. Helena Island and visit the Penn Center, the main center for Gullah research. “This course,” Assistant Professor Tracy Rone says, “affords students the opportunity to study the culture deeply through course readings, lectures, sound recordings, and film. And the trip provides hands-on engagement.” Eating Gullah food, touching the famous “tabby” walls of Gullah buildings, and
“Students learn that they can learn on their own, on the job, and in many other ways besides sitting in a class.”

attending concerts of Gullah music brings their reading to life. And students understand the dilemmas involved in preserving Gullah culture amidst the area’s booming tourism industry much more concretely when they are stuck in traffic caused by the development and thus witness the impact first-hand.

But unplanned interactions with local people sometimes provide the most realistic taste of ethnographic work. “We stopped in at a fish fry,” Rone remembers, “and you could see students really begin to see what it means to be an anthropologist, figuring out who you can talk to, who’s going to let you in.” Similarly, an impromptu stop at a bowling alley allowed students to hear Creole spoken freely, as a community elder regaled them with stories of Martin Luther King’s visits to the Gullah community.

“While most Emory students have heard of Hilton Head and some have visited the island and frolicked in the sun and played tennis or golf, most have very little knowledge about the cultural heritage of the region,” observes Rone. Through a blend of theoretical study and practical observation, “this site that was previously seen as a place for leisure and entertainment is transformed into a locus for meaningful conversations about the impact of tourism on the environment, the tensions between capitalism and maintaining cultural heritage, and questions about who decides whose heritage gets preserved and why,” she says.

As with all TPL courses, learning through personal engagement equips students not only with deeper knowledge of their subject but with skills they can transfer to other situations. Just last fall, Melissa Burroughs (Emory ’04) called Rone to say the interviewing she did for her ethnographic project gave her the confidence to interview patients, a task that many of her classmates at Harvard Medical School found outright intimidating.

Taking learning to the streets – or elsewhere beyond the classroom’s four walls – is part of many other courses too. Environmental studies, for instance, requires both a service learning course for majors that emphasizes learning through working and an internship program for academic credit. When Emory’s chief environmental officer, John Wegner, teaches the service learning course, he creates an artificial environmental consulting company with which the class negotiates. Students have investigated watershed management for the Peavine Watershed Alliance and done contracts for Facilities Management at Emory. Instead of regular class sessions, the group holds “company meetings.” There are no lectures, and most of the work is done outside of class. Unproductive students are “fired”: dropped from the class, as they might be in the working world. While many students enjoy the flexibility and creativity of the course, the experience can be demanding. During the Watershed Management Project, for instance, any time it rained more than an half an inch – even in the middle of the night – someone had to go out and measure it.

“This kind of course demands a lot of self-motivation and resourcefulness in problem-solving,” Wegner notes. “Students learn that they can learn on their own, on the job, and in many other ways besides sitting in a class. And after all, most of the things we do in our working lives aren’t what we’ve been trained for but things we have to learn how to do on our own.”

This term Wegner’s class will tackle issues he is working on himself, for an environmental report on the state of Emory. This requires measuring what is happening to the forests, to energy use, to recycling – in short, anything Emory does that has an impact on the environment.

The environmental studies internship, rather than setting up virtual companies, sends students off campus to test their theories in actual environmental organizations. “The internship lets students who want to do environmental advocacy see what it is really like,” says Wegner. Ten to fifteen students each year do internships, which can dovetail with a summer job. Students regularly work with groups like the Southface Energy Institute, CNN, Fernbank Science Center, the Sierra Club, and the Georgia Conservancy. Some internships even take students overseas.

Environmental studies major Lijing Xu helped to reduce sulfur pollution for a company in Beijing, China, and found that what she learned through her internship was very different from her classes, much more specialized and specific. “While it made me realize how much I don’t know about environmental science, it was great to learn on a much deeper level and to see it in person,” reflects Xu. Internship experiences like Xu’s often are rewarding personally as well as intellectually. “The kindness of the Chinese people at this company,” says Xu, “toward an odd not-quite-Chinese, not-quite-All-American girl was overwhelming.”

Environmental studies intern Lijing Xu enjoys dinner with her Beijing hosts (far left) and visits a nearby park (near left). Fernbank Science Center (right) provides local internship possibilities.
**Intellectual Ecosystems**

One of the most interesting aspects of curricular innovation in the Arts and Sciences at Emory is the trend toward faculty initiatives which sprout offshoots in the undergraduate curriculum. The pursuit of knowledge among faculty, graduate students, and undergraduates seems at times a kind of intellectual ecosystem, with change in one arena fostering change in others. For instance, a recent interest in water as a focus of interdisciplinary learning began with the Piedmont Project, a faculty initiative to investigate how to support environmental sustainability on the Emory campus. This spring’s two-day Science and Society Symposium, “Water in Our Lives,” and an accompanying interdisciplinary upper-level course grew out of a faculty retreat last year at which professors learned about water issues in Atlanta and global public health perspectives on water and disease. The aim is to integrate classes with less formal activities and to collaborate with other universities; Georgia Tech and Atlanta University Center faculty also participated, according to Science and Society Director Arri Eisen. Science and Society undergraduates helped plan and coordinate the symposium.

Students in “Water in Science, Philosophy, and Literature,” cotought this spring by associate professor of philosophy Jack Zupko and associate professor of environmental studies Anne Hall, attended the symposium as part of their course. “We’re looking at water supply and water quality issues,” says Hall, “at the local, regional and global scales. Aquatic ecosystems have been threatened by engineering projects to prevent floods, dams built for hydroelectric power, overuse of water resources, and industrial and domestic wastewater releases.” This generation of students, asserts Hall, can be key players in reestablishing a balance between human needs and water supply.

As an environmental scientist, Hall’s passion for this topic is a natural fit. But students will also discover what a scholar of ancient philosophy brings to the study of water issues. “The understanding of water in the Middle Ages, explains Zupko, “predates the division of learning into so many branches. Then, philosophy and natural sciences were one.” Perhaps with the curriculum, as with water itself, everything old is new again. “The Greek treatment of water – at once philosophical, scientific, and literary – models for us a way to think about the elements where the strands of inquiry are wound all together,” says Zupko. As Zupko and Hall crossed their fields of expertise to explore this topic, they warned their class of juniors and seniors to say goodbye to comfort zones. “If you’re a scientist we’re going to make you think about the natural world poetically; and if you’re a humanist, you’re going to engage the science,” said Zupko.

A less structured kind of initiative bubbling up in another corner of the academic ecosystem pushes students across a different boundary. Advanced graduate students often enjoy a relationship with faculty based on a shared fascination with the questions of their discipline and a sense of camaraderie in the pursuit of answers. Two years ago comparative literature professor Dalia Judovitz decided to try to replicate what is best in that relationship by fostering connections between graduate students and undergraduate majors in her department. While less formal than the ORDER seminar, the “Intellectual Buddies” program similarly encourages interaction that benefits both levels of student. Graduate and undergraduate pairs meet for coffee a few times each semester to talk about ideas and issues in their field.

Such casual interactions can subtly strengthen the sense of intellectual community in a department. According to Brian McGrath, a dissertation-stage student, the program works. Undergraduates have a chance to voice questions and anxieties they may not feel comfortable sharing with faculty members, and graduate students get to talk with them about the questions of their discipline without the pressure of grades getting in the way. “People often comment about how Emory undergraduates are so concerned with grades,” McGrath remarks, “but from this process, I get to see their genuine interest in the issues.” The active engagement that this informal mentoring program encourages is a common denominator of many of the curricular innovations in the College. “What I really like about this program,” McGrath reflects, “is that it reminds me that these intellectual questions are really why we’re here.”
Students and faculty gather for commencement on the quadrangle, seen from Pitts Theology Library.
Fascinating scientific puzzle though it is, the creation of artificial beings and bionic people are responding to the magnetism of the technological imperative, the pull of a scientific problem as challenging as any imaginable.

The scientists and engineers spearheading the creation of artificial beings and bionic people are addressing the need for society and individuals. Industrial robots are already widely used in factories and on assembly lines. Robots for hazardous duty, from dealing with terrorist threats to exploring hostile environments, including distant planets, are in place or on the drawing boards. Such duty could include military postings because there is a longstanding interest in self-guided battle mechanisms that reduce the exposure of human soldiers, and in artificially enhanced soldiers with increased combat effectiveness. (For this reason, the Department of Defense, largely through its research arm – the Defense Advanced Research Projects Agency – is the main U.S. funding source for research in artificial creatures.) Artificial creatures can also be used in less hostile environments: homes, classrooms, and hospitals and rest homes, serving as all-purpose household servants, helping to teach, and caring for the ill or elderly.

Among these possibilities, the connection between artificial creatures and human implants might be the most important because it promises enormous medical benefits. This connection might be the single greatest motivation to develop artificial beings. Yet regardless of their potential good uses, and apart from any issues of blasphemy, we have concerns about robots and androids. One fear is that the limitations we think to design out of our creations, from cosmetic deficiencies to the existential realities of illness and death, are essential human attributes, and that to abandon them is somehow to abandon our humanity. Something in us, it seems, fears perfection, and artificial beings threaten us with an unwelcome perfection, expressed as rigid unfeeling precision.

There is another menace first conveyed nearly 200 years ago in “Frankenstein,” and now more compelling than ever: the fear that technology will grow out of control and diminish humanity for all of us. That concern is hardly limited to artificial creatures. It appears in many arenas – the loss of privacy associated with new forms of surveillance and data manipulation; the depersonalization of human relationships; the incidence of human-made ecological disaster; the growing gap between the world’s technological “haves” and “have-nots.” It is especially and deeply unsettling, however, to contemplate the literal displacement of humanity by beings made in the human image, only better…

The abilities of robots and androids are still limited. If they behave intelligently, they do so only in specialized areas, or at a childlike rather than an adult level; though they might be mobile, they cannot yet independently navigate any arbitrary room or street; they are not conscious and self-aware, and hence are not moral beings as we understand morality; they are not emotional, and although they might elicit affection or an appreciation of cuteness as a living pet does, they evoke no deeper feelings. [Yet] now, for the first time in history, the means might be at hand to make beings that pass [these tests] and others. Advances in a host of areas – digital electronics and computational technology, artificial intelligence (AI), nanotechnology, molecular biology, and materials science, among others – enable the creation of beings that act and look human. At corporations and academic institutions around the world, in government installations and on industrial assembly lines, artificial versions of every quality that would make a synthetic being seem alive or be alive – intelligent self-direction, mobility, sensory capability, natural appearance and behavior, emotional capacity, perhaps even consciousness – are operational or under serious consideration….

There is, however, considerable debate about the possibility of achieving the centerpiece of a complete artificial being, artificial intelligence arising from a humanly constructed brain that functions like a natural human one. Could such a creation operate...
intelligently in the real world? Could it be truly self-directed? And could it be consciously aware of its own internal state, as we are?

These deep questions might never be entirely settled. We hardly know ourselves if we are creatures of free will, and consciousness remains a complex phenomenon, remarkably resistant to scientific definition and analysis. One attraction of the study of artificial creatures is the light it focuses on us: To create artificial minds and bodies, we must first better understand ourselves.

Emory College Faculty Books Published in 2004


——. I’m the Teacher, You’re the Student: A Semester in the University Classroom.

Peggy Barrett and Geoffrey W. Chase, eds. Sustainability on Campus: Stories and Strategies for Change.

Robert C. Barrett. Plato’s Protagoras and Meno.

Mark Bauerlein, X. J. Kennedy, and Dana Gioia, eds. A Glossary of Literary Terms.


——. Al-Kitaab: A Textbook for Beginning Arabic. Part one, second edition with DVDs.

Rong Cai. The Subject in Crisis in Contemporary Chinese Literature.

David Carr, Rudolf Makkreel, and Thomas R. Flynn, eds. The Ethics of History.

Giuliana Carugati. Il Ragionare Della Carne.

Yuk Fai Cheong, S.W. Raudenbush, A. Byrk, and R. Congdon. HLM6: Hierarchical Linear and Nonlinear Modeling.


Stephen A. Crist and Roberta Montemorra Marvin, eds. Historical Musicology: Sources, Methods, Interpretations.


Yayoi Uno Everett and Frederick Lau, eds. Locating East Asia in Western Art Music.

F. Family et al. Dynamics and Friction in Submicrometer Confining Systems.


Jim Grimsley. The Ordinary.

Mark Hallerberg. Domestic Budgets in a United Europe: Fiscal Governance from the End of Bretton Woods to EMU.


Carol Herron, Matthew Morris, and Collette Estin. Identite, Modernite, Texte.


———. World Culture: Origins and Consequences.

Earl Lewis. Defending Diversity: Affirmative Action at the University of Michigan.

Scott Lilienfeld, Steven Jay Lynn, and Jeffrey M. Lohr, eds. Science and Pseudoscience in Clinical Psychology.


Randall M. Packard, Peter J. Brown, Ruth L. Berkelman, and Howard Frumkin, eds. Emerging Illnesses and Society: Negotiating the Public Health Agenda.


Julie Shayne. The Revolution Question: Feminisms in El Salvador, Chile, and Cuba.

Vanessa Siddle Walker and John R. Snarey, eds. Raceing Moral Formation: African American Perspectives on Care and Justice.

Steven Strange and Jack Zupko, eds. Stoicism: Traditions and Transformations.


Paul Waltman. A Second Course in Elementary Differential Equations.

Frans deWaal has received many accolades for his work. But a call last spring brought news of an honor that truly sets him apart. DeWaal, Charles Howard Candler professor of psychology and director of the Living Links Center at Yerkes Regional Primate Center, has been elected to the National Academy of Sciences. He was formally inducted this April in a ceremony at the neoclassical NAS Building on the mall in Washington.

Membership in the Academy, chartered by President Lincoln in 1863 to “investigate, examine, experiment, and report upon any subject of science or art,” is considered one of the highest distinctions that can be accorded a scientist or engineer. Just seventy-two new members were elected this year, plus eighteen foreign associates from thirteen countries (including deWaal, a native of the Netherlands). Of the Academy’s roughly 2000 members, nearly one in ten have won Nobel Prizes.

At a dinner and reception in deWaal’s honor Nov. 11 at the Miller-Ward Alumni House, President Jim Wagner called the NAS “part of the nation’s conscience” and praised Professor deWaal for providing “an example of contributory excellence.” He has “enriched our intellectual lives,” added psychology chair Elaine Walker. “In addition to being an outstanding scholar and an excellent teacher and mentor, he’s also an incredibly congenial colleague.”

Professor deWaal spoke of his good fortune in finding at Emory a combination of supportive colleagues, excellent graduate students, and superlative research facilities. He noted that Atlanta has the highest number of primatologists of any city in the world and said of his students, “You don’t need to think any more – the students do all the thinking, and you just organize.”

His scholarly achievements, though, belie this generous compliment. His fourteenth book, *Our Inner Ape*, will be published in June, and his output of scholarly articles runs into the hundreds. Since deWaal joined the faculty in 1991, his studies of monkeys and apes – especially chimpanzees and bonobos – have steadily made a name for himself, Emory, and the Yerkes center. His success at writing for both the scientific community and the general public has prompted comparisons to such famed animal researchers as Jane Goodall and Nobel laureate Konrad Lorenz. One reviewer called *Peacemaking Among Primates*, which won the 1989 Los Angeles Times Book Award, “Probably the most clearly written, consistently and infectiously readable reporting of scientific research since T.H. Huxley popularized Darwin.”

When his first book, *Chimpanzee Politics*, came out in 1982 it was “not the fashion,” says deWaal, to ascribe to lower animals cognitive abilities such as intentionality, morality, or empathy – all supposedly exclusive human traits. “Ninety percent of researchers at the time viewed animals as robots,” he maintains. But his work has helped change that. “Frans has done a wonderful job,” says Stuart Zola, director of Yerkes, “of bringing ideas about primates’ lives, minds, and sense of self to the general public.” In the process, Zola adds, “he has generated a lot of discussion about what it means to be human.”

Frans deWaal has received many accolades for his work. But a call last spring brought news of an honor that truly sets him apart. DeWaal, Charles Howard Candler professor of psychology and director of the Living Links Center at Yerkes Regional Primate Center, has been elected to the National Academy of Sciences. He was formally inducted this April in a ceremony at the neoclassical NAS Building on the mall in Washington.
Kristen Brustad, associate professor of Middle Eastern and South Asian studies, received a Frederick Burkhardt Residential Fellowship for Recently Tenured Scholars from the American Council of Learned Societies for 2004–2005. This fellowship supports long-term, unusually ambitious projects in the humanities and related social sciences.

Vialla Hartfield-Mendez, senior lecturer in Spanish, received an Emory College Winship Award for Senior Lecturers for 2004–2005. The award, recognizing excellence and innovation in teaching, provides a one-semester leave to pursue activities that will foster professional development and a cash prize to use toward professional expenses during the award year.

Joseph Henrich, assistant professor of anthropology, received a 2003 Presidential Early Career Award for Scientists and Engineers. This is the highest honor given to professionals in the early stage of an independent research career.

Dieter Jaeger, associate professor of biology, accepted an invitation from the National Institutes of Health (NIH) to serve as a member of the Sensorimotor Integration Study Section of the Center for Scientific Review until 2008. Study sections review grant applications submitted to the NIH, make recommendations on the applications, and survey the status of research in their scientific fields.

James Kindt, assistant professor of chemistry, received a Sloan Foundation Award, intended to enhance the careers of the best young faculty members nationwide in seven scientific fields. Thirty-two former Sloan fellows have received Nobel Prizes.

David Lynn, Asa Griggs Candler professor of chemistry and Stefan Lutz, assistant professor in the department of chemistry, along with Ichiro Matsumura, assistant professor of biochemistry, and Nicholas Hud, associate professor of chemistry and biochemistry at Georgia Institute of Technology, received a major Collaborative Research in Chemistry Program (CRC) award from the National Science Foundation for their project, “Toward Synthetic Biology: The Replication of Synthetic Polymers.” Lynn also was awarded a grant from the Seaver Institute in Los Angeles to support research in fundamental and applied molecular evolution.

Tony Martin, senior lecturer in environmental studies, received an Emory College Winship Award for Senior Lecturers for 2004–2005. The award, recognizing excellence and innovation in teaching, provides a one-semester leave to pursue activities that will foster professional development in teaching and a cash prize to use toward professional expenses during the award year.

Laurie L. Patton, Winship distinguished research professor in the humanities, and chair, department of religion, accepted an invitation from the American Council of Learned Societies to serve on a national task force examining the state of the humanities in American universities.

John Wegner, senior lecturer in environmental studies and campus environmental officer, received the President’s Award from the Georgia Urban Forest Council, given in recognition of Wegner’s contribution to the organization and his work on environmental initiatives at Emory.

Shozo Yokayama, Asa Griggs Candler professor of biology, was elected a Fellow of the American Association for the Advancement of Science. He is also president of the American Genetic Association.

Students

Nathan Woodling, Ansley Dillehay, Cindy Soo, and Koshlan Mayer-Blackwell, all College seniors, were awarded Robert T. Jones Jr. Memorial Scholarships. Jones scholars, selected on the basis of academic excellence and leadership, pursue graduate studies for one year at the University of St. Andrews in Scotland with tuition and expenses paid and also tour Europe.
“My study of quantum mechanics led to a reawakening of the wonder of creation that we’re living in the middle of,” says Anderson, recalling an intellectual journey that includes a memorable lunch with writer and lecturer Joseph Campbell. This explains why, when Anderson first learned about the Emory-Tibet Partnership program from Emory College Dean Robert A. Paul, he was immediately intrigued.

Shortly afterwards, Anderson began contributing to a scholarship that provides for the living expenses of Tsondue Samphel, a Tibetan student and former monk who studies physics at Emory. [See “Friends in High Places,” p. 16.] Although Anderson and Samphel come from vastly different backgrounds, they both have an abiding interest in exploring the similarities between modern physics and Buddhism – and sharing their knowledge with others.

“The Emory-Tibet Partnership is one of Emory’s programs that are juxtaposing science and religion. This affords Emory students – the future leaders of this and other nations – the opportunity to formulate a new world view that minimizes cultural and religious biases and emphasizes the unity of creation.”

Anderson’s connection with Emory is a long and distinguished one. His great uncle was the celebrated architect Hal Hentz ’04C, who joined with Neel Reid to design some of Georgia’s finest houses. Anderson’s father graduated first in his Emory law school class of 1924. Anderson himself earned an Emory degree in mathematics in 1962, then a PhD in physics from Stanford. While there he discovered the truth behind “publish or perish” and left academics – after earning yet another degree, from Emory Law School – to practice patent law, an area where his physics background serves him well.

Since graduating from Emory, he says he has always tried to give at a level that was comfortable. But now his views about giving have changed with his support of an international student. “Instead of just responding to a responsibility that I thought was necessary,” he says, “I feel like I have an opportunity to make a difference.”

Thomas Hines 73PhD

Personal relationships. That’s what Thomas Hines 73PhD remembers most vividly when he looks back at his Emory experience. In particular he recalls two professors in the Department of Romance Languages who left a lasting impression. Grant Kaiser and Arthur Evans were brilliant colleagues who made him feel at home from the beginning – and who never stopped giving.
“Even after leaving Emory, both Grant and Arthur stayed in touch,” Hines says. “Arthur being a great scholar, every time he found something of special interest he would pass it on.”

Their inspiration has guided him throughout his career. After leaving Emory he joined the faculty as a French professor at the University of Alabama in Birmingham, then took a position at nearby Samford University. Since 1983 he has chaired Samford’s French studies program. For fourteen of those years, his wife, Sandra, taught down the hall as a part-time Spanish instructor. She has retired now, and Hines says he is set to follow her soon.

Outside the classroom, the Hineses have made valuable contributions to the world of letters. Their privately owned academic publishing firm, Summa Publications, produces six to nine titles a year of some of the finest scholarly works in comparative literature and French studies. In 1999, after giving regularly to Emory’s annual fund for many years (“very small sums at first”), they established the Thomas Hines French Studies Scholarship for dissertation-level students. They have also made a substantial bequest that will one day benefit the scholarship.

Hines says he and his wife considered other options for their inheritance at first. But they eventually decided to bestow it on Emory, source of so many fond memories, and in honor of the program that permitted him to have a career.

“It’s part nostalgia and partly a practical side, thinking about to whom you are going to leave your money,” he says. “And for perpetuity I just thought it would be better to leave it to an entity like Emory where I could feel that someone who truly needed assistance would receive it.”

It certainly explains why she “never lost a minute’s sleep” as an Emory freshman in 1965, just one year after the University first opened its doors to African-American students. Four years later she received a degree in physics, then stayed on another year to earn a master’s degree in science education. Eventually she found a satisfying career in Southern Bell’s first consumer affairs/community relations office in Atlanta. And for the next nineteen years she did what came naturally – helping others in the community, which she enjoys as much as her passion for collecting dolls.

Throughout the years, Pam has stayed closely involved with Emory. In 1999 she received the J. Pollard Turman Service Award.
These days, Adam is an assistant professor in ophthalmology specializing in vitreoretinal surgery at Tufts University’s New England Eye Center. After studying psychology at Emory, Stephanie earned a master’s degree in early childhood education from Leslie College. Their support for Emory began soon after graduation, while Adam was still in medical school. “We started off giving gifts of $50,” he says. “Basically, we wanted to support the school. We love Emory and thought it was just a way to give something back.”

Earlier this year, they learned about Emory’s new Adopt-A-Scholar program (see below). “It stood out for us because we loved the idea of making a difference in one person’s life,” Adam says. “The Adopt-A-Scholar program allows us not only to support Emory, but also to financially assist students who might not otherwise have the opportunity to attend.”

And even with the pressures of a growing young family, they’ve found a way to continue supporting their alma mater. “You always have a lot of demands on your life,” says Adam. “But you’ve got to look at the bigger picture of giving. And that’s what we’ve done.”

Emory’s Adopt-A-Scholar Program

For a donation of $2,500 per year over four consecutive years, sponsors can provide a scholarship award to support a student during the course of his or her four academic years at Emory. Throughout the school year Emory will provide special events for sponsors and students to get to know one another better. In addition to organized events, the program encourages mentoring relationships and other regular contact between students and sponsors. In this way Emory alumni can not only help students with expenses but also provide encouragement and support to help young scholars achieve their educational and career goals.

The scholarship will be named for the donor unless otherwise specified – such as naming in honor of a family member or favorite faculty member. Student selection criteria may include the donor’s geographic region or home state, and at the donor’s request the scholarship can be designated for a particular school or department.

Donors also have an opportunity to support additional students, or those with higher financial needs, by giving $10,000 per year for a total of $40,000. People wishing to support the Adopt-A-Scholar Program with gifts under $2,500 are welcome to do so as well. These funds will be assigned to a general pool of students, and donors will be invited to attend Adopt-A-Scholar events.

For more information, please contact Lacey Harrison at 404.727.1521 or lisanfor@emory.edu.

— Hal Jacobs
Dr. Timothy Albrecht, professor of music and Emory University organist, performs the inaugural recital of the new Jaeckel Opus 45 Organ on Sunday, September 18, 2005 at 4:00 p.m. in Cherry Logan Emerson Concert Hall of the Donna and Marvin Schwartz Center for Performing Arts. The Year of the Jaeckel is also highlighted by the November 4-6, 2005 Fall Weekend Organ Celebration featuring guest recitalists from Paris and New York, Emory graduate alumni and current organ masters students, and several music department choral and instrumental ensembles.

A mechanical key action instrument weighing 14 tons and costing $1.5 million, the Jaeckel Op. 45 has taken nearly eighteen months to assemble and voice. Its 3,605 pipes, blending French, German and Austrian design elements, are enclosed in a stunning 36-foot-high hand-carved cherry case above the stage in the Dewey-Lemons Choral Balcony.

To inquire about making a donation or naming gift in support of this historic addition to the Emory campus, please contact Arts & Sciences Development at 404-727-8780. For event information go to www.arts.emory.edu. For more organ information, visit www.schwartzcenter.emory.edu/about/organ.html.