MESSAGE FROM THE VICE PROVOST FOR RESEARCH

The idea of a Christian university and the resulting accompanying tension between faith and intellect is nothing new to the academy. C.S. Lewis, who fought for the restoration of a vital Christian voice in the highest levels of academic life, went straight to the heart of the matter when he said in The Weight of Glory:

“If all the world were Christian, it might not matter if all the world were uneducated. But, as it is, a cultural life will exist outside the Church whether it exists inside or not. To be ignorant and simple now — not to be able to meet the enemies on their own ground — would be to throw down our defense but us against the intellectual attacks of the heathen. Good philosophy must exist, if for no other reason, because bad philosophy needs to be answered. The cool intellect must work not only against cool intellect on the other side, but against the muddy heathen mysticisms which deny intellect altogether. . . . [T]he scholar has lived in many times and is therefore in some degree immune from the great cataclysm of nonsense that pours from the press and the microphone of his own age.”

I welcome you to the inaugural issue of Baylor’s research magazine. In these pages, you will learn more about the exciting contributions Baylor students and faculty are making toward the fulfillment of the 2012 Vision. You’ll also find that the merging of faith and intellect is already well underway within laboratories and offices across the campus. Please feel free to contact me to learn more or visit Baylor’s Research Web site at www.baylor.edu/research.

I look forward to sharing with you the more I forget. The more I forget the less I know. So why study?

> So why study? Why conduct research?

Many of the answers at Baylor are the same as those at any other research university. Scholarship, research, collaboration and innovation have long informed the academic life within the halls of her schools and colleges. From interdisciplinary studies looking at new methods for treating cancer to scholarship into the history of the English language, research at Baylor pushes back the boundaries of knowledge and making a difference in today’s world. Collaboration with colleagues around the world is commonplace, and cutting edge research contributes daily to the academic vitality of the classroom. Thinking through a problem and asking the questions necessary to arrive at a reasonable conclusion is a skill students learn through their involvement in research, one they must have to address the intricate issues they face in an ever-changing world.

However, this is not the only (or even most important) reason research is vital to Baylor. The call for Baylor to become one of the great Christian universities (as recently issued in Baylor 2012, Baylor’s ten-year vision) is a call to academic excellence. A cornerstone of this charge to become a “city on a hill” is research.

The Weight of Glory:

“If all the world were Christian, it might not matter if all the world were uneducated. But, as it is, a cultural life will exist outside the Church whether it exists inside or not. To be ignorant and simple now — not to be able to meet the enemies on their own ground — would be to throw down our defense but us against the intellectual attacks of the heathen. Good philosophy must exist, if for no other reason, because bad philosophy needs to be answered. The cool intellect must work not only against cool intellect on the other side, but against the muddy heathen mysticisms which deny intellect altogether. . . . [T]he scholar has lived in many times and is therefore in some degree immune from the great cataclysm of nonsense that pours from the press and the microphone of his own age.”

I welcome you to the inaugural issue of Baylor’s research magazine. In these pages, you will learn more about the exciting contributions Baylor students and faculty are making toward the fulfillment of the 2012 Vision. You’ll also find that the merging of faith and intellect is already well underway within laboratories and offices across the campus. Please feel free to contact me to learn more or visit Baylor’s Research Web site at www.baylor.edu/research.

I look forward to sharing with you the more I forget. The more I forget the less I know. So why study?

> So why study? Why conduct research?

Many of the answers at Baylor are the same as those at any other research university. Scholarship, research, collaboration and innovation have long informed the academic life within the halls of her schools and colleges. From interdisciplinary studies looking at new methods for treating cancer to scholarship into the history of the English language, research at Baylor pushes back the boundaries of knowledge and making a difference in today’s world. Collaboration with colleagues around the world is commonplace, and cutting edge research contributes daily to the academic vitality of the classroom. Thinking through a problem and asking the questions necessary to arrive at a reasonable conclusion is a skill students learn through their involvement in research, one they must have to address the intricate issues they face in an ever-changing world.

However, this is not the only (or even most important) reason research is vital to Baylor. The call for Baylor to become one of the great Christian universities (as recently issued in Baylor 2012, Baylor’s ten-year vision) is a call to academic excellence. A cornerstone of this charge to become a “city on a hill” is research.

"Infrastructure is the most overlooked aspect of building an effective research-teaching program," provost and vice president for academic affairs David L. Jeffrey says. “But to be effective — indeed, even to obtain credibility from external granting agencies — we are obliged to show that we both have it and have planned for its future development wisely.”

INCREASING RESEARCH CAPABILITIES

Two significant granting organizations, the state-operated Telecommunications Infrastructure Fund (TIF) and the National Science Foundation (NSF), have provided funding to upgrade campus computer and networking capabilities. TIF awarded four grants to Baylor totaling more than $2 million, which dramatically impacted campus communications in the past year. A prestigious National Science Foundation grant received in January 2003 for $175,000 advanced leading-edge network capability on campus.

The TIF grants allowed campus upgrades of library computer services, expansion of instructional offerings, improvement of networking services and enhanced access to online information resources. The addition of a wireless computer networking system now provides wireless laptop access to the Internet in every academic and residential building on campus.

The NSF funds support Internet2 capability. Internet2 is a private consortium of more than 200 U.S. universities — including Baylor — that works with government and industry to develop innovative network capability on campuses. The group also provides the newest technological advances applicable to the Internet for the national research community and broader Internet use.

The NSF supports Internet2 goals to ensure the Internet of the future develops into a reliable and secure medium for information sharing and to foster partnerships among academia, industry and government.

THE NEW WORLD-CLASS BAYLOR SCIENCES BUILDING WILL HOST A FULL COMPLEMENT OF NATURAL SCIENCE TEACHING, RESEARCH AND EXPERIMENTATION ON CAMPUS. THE $103 MILLION, 500,000 SQUARE-FOOT FACILITY WILL BE COMPLETED BY FALL 2004.
“Infrastructure is the most overlooked aspect of building an effective research-teaching program,” provost and vice president for academic affairs David L. Jeffrey said, “But to be effective — indeed, even to obtain credibility from external granting agencies — we are obliged to show that we both have it and have planned for its future development wisely.”

**NEW RESEARCHERS > ON CAMPUS**

**THE FOCUS OF RESEARCH ENHANCEMENTS — SUCH AS COMPUTER UPGRADES, NETWORK EXPANSION OR ADDITIONAL FUNDS FOR FACULTY HIRING — IS TO PROVIDE A RICH ENVIRONMENT FOR RESEARCHING SCHOLARS. THE UNIVERSITY HAS COMMITTED UNDER BAYLOR 2012 TO HIRE WELL-KNOWN RESEARCHERS FROM ALL OVER THE WORLD TO JOIN BAYLOR’S CURRENT ASSEMBLAGE OF EXCELLENT RESEARCHERS.**

“Iron sharpens iron,” says the proverb, and observers should expect to see the sparks fly as new minds rub shoulders with Baylor’s veteran researchers. “Our recently hired faculty members are doing research on the sustainability of wetlands, the development of robots for disabling land mines, and the first Great Awakening, to name only a few topics,” said Vice Provost for Faculty Development Michael Beaty. “Combining passions for both teaching and research, the new faculty members are making their mark in the classroom and in their disciplines. We are pleased and fortunate to have such outstanding individuals join our University.”

A sampling of these exceptional new hires includes Ian Gravagne in engineering, Klaus Kirsten in mathematics, Melanie McIwen in nursing, DeAnna Toten Beard in theater arts, and Jo-Ann Tsang in psychology and neuroscience.

> Ian Gravagne, assistant professor of engineering, received his bachelor of science from Rice University, and his master’s and doctorate from Clemson University, finishing in 2002. His resume already reveals several conference publications and articles in peer-reviewed journals.

Gravagne’s research focuses on robotics and mechatronics. He is trained as an electrical engineer, but his research takes him into the fields of mechanical and electrical engineering, computer science and mathematics.

A primary research interest of Gravagne’s is “soft robots,” a significant advance beyond the stiff, heavy machines most people imagine when they think of a robot. Soft robots are flexible, “or have so many joints they seem flexible,” Gravagne says; and they can be activated by small motors, fiber composites, shape memory alloys and gel polymer muscles. This idea is inspired by elephant trunks, octopus tentacles and caterpillars, he adds. A current project of Gravagne’s involves designing a soft robot with the capability to detect land mines.

Since arriving at Baylor, Gravagne and John Davis in mathematics have begun collaboration, along with doctoral student Jeff Dachuna, “to see what applicability time-scale calculus has to various engineering problems where discrete and continuous phenomena coexist,” Gravagne says. “It is a cutting-edge interdisciplinary exploration of exactly the type that I think Baylor is trying to foster.”

A primary research interest of Gravagne’s is “soft robots,” a significant advance beyond the stiff, heavy machines most people imagine when they think of a robot. Soft robots are flexible, “or have so many joints they seem flexible.”
“Generically, physicists need mathematics to formulate questions and also to answer questions.”

> Klaus Kirsten, associate professor of mathematics, received his bachelor’s, master’s and doctoral degrees from the University of Kaiserslautern, Germany. His doctoral work is in theoretical physics, specializing in quantum field theory, string theory and spectral theory.

“Generically, physicists need mathematics to formulate questions and also to answer questions. If the needed mathematics is not available, (some) physicists turn into mathematicians and develop whatever is necessary to progress in answering ‘their’ questions. This is what happened and continues to happen to me,” Kirsten says. “The methods I have developed raised the interest of mathematicians because their approach and my approach were complementary. I had a physicist’s education and so simply had a different viewpoint, which sometimes is very fruitful.”

Kirsten taught as a visiting professor at the University of Trento in Italy, then went on to serve as an Alexander von Humboldt Fellow at the University of Barcelona in Spain, after which he conducted research at the University of Leipzig in Germany and at the University of Manchester in England. He also received visiting appointments at the University of La Plata in Argentina and the University of Naples in Italy. Since 2001, Kirsten has been a postdoctoral associate at the Max Planck Institute for Mathematics in the Sciences in Leipzig, Germany. With two books to his credit, Spectral Functions in Mathematics and Physics and the forthcoming Spectral Geometry of Physics, Kirsten also has written 80 peer-reviewed articles and is involved in six current research projects.

“My next research topic will be the experimental plays of Theodore Dreiser.”

> DeAnna Toten Beard, assistant professor of theater arts, received her bachelor’s degree from Mary Washington College, a master’s from the State University of New York, and her doctorate from Indiana University, Bloomington in 2001. She came to Baylor from the University of North Carolina, Wilmington, where she served as a visiting professor of theater history.

Toten Beard wanted to be able to write in both artistic and research venues, so she decided to do doctoral work in theater history after receiving her master of fine arts degree. She specializes in dramaturgy — the study of how a play script works — which qualifies her to collaborate in production with directors and playwrights on genres of literature, history of certain kinds of plays, and dramatic structure.

She has published in On-Stage Studies, a theater journal, and has written a book chapter for the upcoming Blackwell’s Guide to Modern American Drama, among other publications. Toten Beard’s research focus is early 20th century drama and theatrical modernism, particularly American Expressionism. “My next research topic will be the experimental plays of Theodore Dreiser,” a writer known for his novels more than his plays, she says. Baylor theater professors should look for next fall’s adaptation of Marlowe’s Doctor Faustus, a project Toten Beard is working on with Steven Pounds in the theater department.

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality.”

> Jo-Ann Tsang, assistant professor of psychology and neuroscience, received her bachelor’s degree from University of California, Berkeley, and her master’s and doctorate from University of Kansas in 2000.


Tsang’s research interests include moral rationalization and moral motivation, forgiveness, gratitude, and the psychology of religion.

She was awarded the Howard Baumgartel Peace and Justice Award for Thesis/Dissertation Research at the University of Kansas. The dissertation studied changes in moral emotions by having subjects read an essay about people who suffer from hunger in other parts of the world, then looking to see if the essay influenced moral emotions and moral behavior.

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality,” Tsang says. “I’m working on a project that looks at gratitude, observing behavioral reactions of the subjects when someone does them a favor. She also is engaged in a collaborative project with a colleague at Southern Methodist University studying gratitude in school-age children.”

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality.”

> Jo-Ann Tsang, assistant professor of psychology and neuroscience, received her bachelor’s degree from University of California, Berkeley, and her master’s and doctorate from University of Kansas in 2000.


Tsang’s research interests include moral rationalization and moral motivation, forgiveness, gratitude, and the psychology of religion.

She was awarded the Howard Baumgartel Peace and Justice Award for Thesis/Dissertation Research at the University of Kansas. The dissertation studied changes in moral emotions by having subjects read an essay about people who suffer from hunger in other parts of the world, then looking to see if the essay influenced moral emotions and moral behavior.

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality,” Tsang says. “I’m working on a project that looks at gratitude, observing behavioral reactions of the subjects when someone does them a favor. She also is engaged in a collaborative project with a colleague at Southern Methodist University studying gratitude in school-age children.”

“Generically, physicists need mathematics to formulate questions and also to answer questions.”

> Klaus Kirsten, associate professor of mathematics, received his bachelor’s, master’s and doctoral degrees from the University of Kaiserslautern, Germany. His doctoral work is in theoretical physics, specializing in quantum field theory, string theory and spectral theory.

“Generically, physicists need mathematics to formulate questions and also to answer questions. If the needed mathematics is not available, (some) physicists turn into mathematicians and develop whatever is necessary to progress in answering ‘their’ questions. This is what happened and continues to happen to me,” Kirsten says. “The methods I have developed raised the interest of mathematicians because their approach and my approach were complementary. I had a physicist’s education and so simply had a different viewpoint, which sometimes is very fruitful.”

Kirsten taught as a visiting professor at the University of Trento in Italy, then went on to serve as an Alexander von Humboldt Fellow at the University of Barcelona in Spain, after which he conducted research at the University of Leipzig in Germany and at the University of Manchester in England. He also received visiting appointments at the University of La Plata in Argentina and the University of Naples in Italy. Since 2001, Kirsten has been a postdoctoral associate at the Max Planck Institute for Mathematics in the Sciences in Leipzig, Germany. With two books to his credit, Spectral Functions in Mathematics and Physics and the forthcoming Spectral Geometry of Physics, Kirsten also has written 80 peer-reviewed articles and is involved in six current research projects.

“My next research topic will be the experimental plays of Theodore Dreiser.”

> DeAnna Toten Beard, assistant professor of theater arts, received her bachelor’s degree from Mary Washington College, a master’s from the State University of New York, and her doctorate from Indiana University, Bloomington in 2001. She came to Baylor from the University of North Carolina, Wilmington, where she served as a visiting professor of theater history.

Toten Beard wanted to be able to write in both artistic and research venues, so she decided to do doctoral work in theater history after receiving her master of fine arts degree. She specializes in dramaturgy — the study of how a play script works — which qualifies her to collaborate in production with directors and playwrights on genres of literature, history of certain kinds of plays, and dramatic structure.

She has published in On-Stage Studies, a theater journal, and has written a book chapter for the upcoming Blackwell’s Guide to Modern American Drama, among other publications. Toten Beard’s research focus is early 20th century drama and theatrical modernism, particularly American Expressionism. “My next research topic will be the experimental plays of Theodore Dreiser,” a writer known for his novels more than his plays, she says. Baylor theater professors should look for next fall’s adaptation of Marlowe’s Doctor Faustus, a project Toten Beard is working on with Steven Pounds in the theater department.

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality.”

> Jo-Ann Tsang, assistant professor of psychology and neuroscience, received her bachelor’s degree from University of California, Berkeley, and her master’s and doctorate from University of Kansas in 2000.


Tsang’s research interests include moral rationalization and moral motivation, forgiveness, gratitude, and the psychology of religion.

She was awarded the Howard Baumgartel Peace and Justice Award for Thesis/Dissertation Research at the University of Kansas. The dissertation studied changes in moral emotions by having subjects read an essay about people who suffer from hunger in other parts of the world, then looking to see if the essay influenced moral emotions and moral behavior.

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality,” Tsang says. “I’m working on a project that looks at gratitude, observing behavioral reactions of the subjects when someone does them a favor. She also is engaged in a collaborative project with a colleague at Southern Methodist University studying gratitude in school-age children.”

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality.”

> Jo-Ann Tsang, assistant professor of psychology and neuroscience, received her bachelor’s degree from University of California, Berkeley, and her master’s and doctorate from University of Kansas in 2000.


Tsang’s research interests include moral rationalization and moral motivation, forgiveness, gratitude, and the psychology of religion.

She was awarded the Howard Baumgartel Peace and Justice Award for Thesis/Dissertation Research at the University of Kansas. The dissertation studied changes in moral emotions by having subjects read an essay about people who suffer from hunger in other parts of the world, then looking to see if the essay influenced moral emotions and moral behavior.

“Since I’m a social psychologist, I was interested in studying religion, and religion naturally leads to the study of morality,” Tsang says. “I’m working on a project that looks at gratitude, observing behavioral reactions of the subjects when someone does them a favor. She also is engaged in a collaborative project with a colleague at Southern Methodist University studying gratitude in school-age children.”
AND THAT SUITS DR. TRUELL HYDE JUST FINE.
The vice provost for research, Hyde is the catalyst behind CASPER — the Center for Astrophysics, Space Physics and Engineering Research — which in four short years has grown from nothing into a research, education, and outreach paradigm unlike any other in the country. A partnership between Baylor University and Texas State Technical College/Waco, CASPER includes two theoretical research groups at Baylor, an experimental lab at TSTC and an intensive educational outreach program that brings students and educators onto both campuses as well as develops curricula for public school science courses.

A Baylor physics professor since 1988, Hyde had been doing theoretical physics research for years but lacked an experimental facility. He knew that neighboring Texas State Technical College/Waco offered cutting-edge technical programs, whose teachers had experience in Los Alamos, Livermore, and other leading scientific labs.

“I thought there had to be a way to meld what Baylor had with what TSTC had,” Hyde said. The opportunity presented itself when TSTC opened a new automotive lab, vacating a 5,000-square-foot facility. Hyde saw it as an ideal location for an experimental lab that could be supported by the TSTC’s technical programs and began working toward a partnership between the two institutions.

“Once we forged a deal between Baylor and TSTC, everything just fell together,” Hyde said. “We really hit a cosmic wave of interest and research and were able to get funding that allowed us to hire some outstanding people.”

About $250,000 went into renovations at the TSTC lab, where air conditioning, fiber optics, a DC power supply from the Super Colider and other features were added. The facility now houses CASPER’s Hypervelocity Impacts and Dusty Plasmas Lab and the Space Science Lab, where researchers create laboratory simulations of dusty plasmas, develop prototype designs of dust particle accelerators, and provide real-world support for the theoretical research groups. One of TSTC’s faculty members works full time at the experimental lab, with technical support provided by TSTC technical students and graduates.

“Baylor is the only university in the world I know of that has this type of environment,” Hyde said. “It gives great mentorship and internship opportunities for both TSTC and Baylor students.”

“Our research covers from the beginning of time to the latest space and theoretical plasma information,” Hyde said. CASPER’s two theoretical groups, located on the Baylor campus, are involved in dozens of research projects covering a range of issues. Among them are dusty plasmas and super strings — two breaking topics on the horizon.
"Acceptance of super string theory within the elementary particle physics community began about 20 years ago. Over the last two decades it has become one of the most active areas in theoretical physics," said Dr. Gerald Cleaver, who came to Baylor in 2001. He was attracted to Baylor by the opportunity to simultaneously do front-line research, teach students at all levels, and design a science and theology course for Baylor's Honors College. At Baylor, Cleaver has continued to explore some of the most fundamental questions about the physical universe as part of the worldwide attempt to find Albert Einstein’s long-sought “Theory of Everything” through string theory.

“It's amazing how quickly string research at Baylor has grown,” Cleaver said. “In a short time we have become one of the leaders in string model building. Baylor is the only university listed in the National Science Foundation registry as offering a summer program in string research for undergraduates.”

Two graduate students have joined EUCOS and have begun their research in strings, while another graduate student will be initiating his research this summer. A fourth student is entering the program this fall with the intent to join EUCOS for his research, after having attended last summer’s undergraduate program in strings. A high school student who attended Baylor’s recent Spring Preview has expressed similar hopes of participating in Baylor’s string program.

Faculty membership in EUCOS is also growing. Dr. Itina Ali, a recent Ph.D. graduate from Cambridge, has started a three year postdoctoral position in EUCOS, while a professor from the State University of Rio De Janeiro is likely joining EUCOS this fall.

“Super-string theory suggests that there is but one fundamental particle, a string of energy, and one fundamental force, gravity,” Cleaver said. Physicists are discovering that what once appeared to be different particles, such as leptons, quarks and photons, are really only different vibration modes of a single type of string of energy, similar to the way a range of notes can be produced by a single violin string.

While string theory simplifies some aspects of the universe, scientists also are finding that the universe is far more complicated than the long-accepted four-dimensional model, Cleaver said. “We are learning that there is much more to our universe than we can see or imagine. We thought the universe had only four dimensions—height, width, depth, and time,” he said. “But string theory indicates there are actually seven more dimensions we didn’t know about.”

At the time of the Big Bang, the three known spatial dimensions grew very large, very quickly, but the rest stayed very small and compactified. Cleaver and his fellow EUCOS-CASPER researchers and students are constructing string models that will predict the arrangements of the seven compactified dimensions.

“Our research focus has been the analysis of our three most successful string models,” Cleaver said. “One of the three models reveals an arrangement of the compactified directions that produces exactly the known particles in nature and nothing more. This is the first string model that doesn’t contain particles we know don’t exist. This model demonstrates that string theory can, indeed, offer viable solutions.

“If one or more of the compact seven dimensions were changed, even slightly, in length or direction, life as we know it could not exist,” Cleaver said. “String theory, I believe, illustrates God’s blueprints for the universe — the beauty and order and the resulting complexity that allows for life.”

Educational programs are perhaps the most exciting components of CASPER, said Hyde, who discovered his passion for science in the third grade. A full range of educational outreach activities bring elementary, middle and high school students, as well as their teachers into the exciting world of science. High school and college students participate in research teams, joined by public school teachers who take the excitement back to their home classrooms. The Physics Circus, held each April on the TSTC campus, introduces students from the Waco area to physics in a theatre-like atmosphere that’s “purely wild science,” Hyde said.

But it is the interdisciplinary approach that brings together math, technology, physics, and other disciplines into a team setting that Hyde finds most enjoyable.

“One of most unique things about CASPER is that we always have students of all levels involved in every part of every activity, at every level,” Hyde said. Undergraduate, graduate, and sometimes post-doctoral students work alongside senior research scientists, teachers, technicians, and sometimes high school students in classrooms, seminars, and even research labs. Allowing that kind of access to labs is something unique among research universities. “Very few universities are bringing students into the labs,” he said, “and Baylor is doing it most successfully. We think it’s an important part of giving our students the opportunity for a well-rounded education and opportunities they wouldn’t otherwise get.”

“At CASPER, we have a full pipeline path that can take students as young as kindergarten and as far along as post-doctoral fellows,” Hyde said, “and keep them involved in real research, real learning in a team environment. Our emphasis is on the students and what’s good for them.”

If you would like to see a 30-second commercial about this research, please visit: http://www.baylor.edu/research/
In early summer 2002, the most technologically advanced material in Room 122 of Rena Maris McLean Gymnasium was likely the climbing wall or the camping gear stored upstairs. By the next spring, Baylor University Health, Human Performance and Recreation researchers were utilizing this space for sophisticated tests of women’s aerobic capacity and resting metabolism for a weight loss study.

By Marla Pierson Lester

Cycling equipment was set for a final series of sprinting tests that would provide information about whether ribose increased the performance of a select group of male cyclists and triathletes. Lab workers were busy scheduling slots for a slate of supplement studies about to be underway.

And this is just the beginning. A few feet down the hall in department chairman Richard B. Kreider’s office is other research that will begin as soon as the details are hammered out. In his head — and likely on the desks of companies who know Kreider’s work — are countless other studies.

Kreider arrived at Baylor in June 2002 as the new chair of the Department of Health, Human Performance and Recreation — bringing his renowned Exercise, Sport and Nutrition Laboratory with him from the University of Memphis, along with a lab coordinator and graduate assistants, a wide reputation for research in this area and a number of studies. “With Kreider, you know he’s headed in a direction. You have somebody that has vision and is going to openly pursue that vision,” said Truell Hyde, vice provost for research.

The department has obtained $1.2 million in grant funding since June 2002. When new faculty members are added and the Ph.D. program is fully underway, Kreider expects that number to increase to $3 to $5 million per year. “It’s apparent he’s moving the department forward, and that he’s moving it forward rapidly,” Hyde said.

By September 2002 — three or four months ahead of schedule — the lab was fully supporting itself with outside funding paying salaries for about 30 students and staff. The lab is in the midst of a large Curves International weight loss study, research that examines the Curves exercise regimen for women and measures its effect. In addition to physiological factors involved in developing an exercise and health routine, questions measure the program’s impact on body image and self-esteem. Other studies test the claims of a weight loss supplement of green tea and caffeine.
trace the effect of ribose on cyclists, and explore the effects of different substrates meant to build muscle and optimize performance. These and other studies in the works demonstrate the advantages of the international network of clients and fellow scholars that Kreider had developed over the years and brought with him to Baylor.

“It’s just a win-win for everybody,” Kreider said. “We’re integrating faculty here into that research program. We have a lot of faculty now getting into position to be very productive.”

He is stretching outside the department for collaborators as well, examining how engineering, nursing and statistics students can benefit from having access to the lab’s clinical trials. “You get an active research team, and everybody builds off that,” Kreider said.

Reputation is, in a way, the fuel for this engine. Kreider, who is currently president of the American Society of Exercise Physiologists, is well-known enough that people regularly ask him to collaborate on their studies. Companies give financial support for the lab to study health outcomes, trimming pounds or making athletes more buff.

“Doing it in healthy populations will give us the baseline clues as to what will help rebuild muscle mass in patients recovering from surgery,” Kreider said. His team oversees weight-loss studies and supplement studies that look at potential products and ingredients that would build the body. Yet the repercussions go far beyond trimming pounds or making athletes more buff.

“We look at both exercise and health, but there’s also usually a medical application we’re interested in,” Kreider said. For example, a supplement or program that aids a weight lifter in gaining muscle mass may give researchers clues as to what will help rebuild muscle mass in patients who have lost it due to illness or other health problems. “It’s important to have the media to interpret the science,” Kreider said. And that is another way of spreading Baylor’s name and the reputation of the program. Kreider said. Often, he has found people read about it in a major publication, and they want to come be part of it.

“We had 10 people just yesterday interested in our Ph.D. program,” Kreider said. People are calling from across the United States and from abroad. “They know this is where the core research is being done.” Kreider’s vision for the department is expansive. He dreams of a sports medicine facility so the department can do more orthopedic research and work in balance, gait and biomechanics. He would like to have an exercise rehab area to do training onsite instead of at the Student Life Center, a fitness evaluation center that gives students the chance to work with assessment tools and also to gain more information about their own health. Then there are the graduate programs and the constant stream of studies. Kreider speaks excitedly of a push for the FDA to establish regional sites to do supplement research, his hopes for more health and disease intervention studies within the department.

“He likes to keep things moving,” said Chris Rasmussen, the lab’s research coordinator who came with Kreider to Baylor. “He has his finger on the fast-forward button.”

Companies give financial support for the lab to study their products, but Kreider sees his role really as a consumer watchdog for products that are often already on or soon to be on the market. “We need to really look at whether they work. Most of the things we’ve studied haven’t worked,” Kreider said. Kreider is often found weighing in on the latest trends in health, exercise and nutrition with news outlets from major magazines to CNN. The lab’s position papers, particularly on Ephedra, have gone all over the world.

“We want to do the original research to advance the science, but we think it’s extremely important to be available to the media to interpret the science,” Kreider said.

“It’s exciting to see the interest and activity and publications just within a short period of time,” Kreider said. “There’s been a lot of interest in the lab, and it runs much, much faster. Now, Kreider said, the roles in research are most often split between researchers and sometimes between institutions, such as, for instance, Baylor gathering data and taking blood samples but another institution analyzing them.

“It enhances research capabilities. It provides greater expertise. It really increases productivity,” Kreider said.

“We publish a lot because we have a lot of people working on studies.” This push falls right in line with Baylor 2012, the school’s 10-Year Vision, and indeed that was what brought Kreider to Baylor from the University of Memphis. “I’d been recruited by a number of schools,” Kreider said. “Baylor University moved its entire lab to Waco. They listened when he proposed the Ph.D. program and the two additional master’s programs.”

“I’m excited. I’m at a Christian university. I can train people to be good scholars but also to be good people,” Kreider said. The possibilities for research are an integral part of his message.

Kreider, who played football at Virginia’s Liberty University, was studying to be a strength training coach when he went to graduate school at the University of Southern Mississippi. “I made the decision I could probably make a bigger impact if I’m doing research and educating,” Kreider said. The Exercise, Sport and Nutrition Lab he brought to Baylor focuses on the role of exercise and nutrition on health, performance, disease and rehabilitation. His team oversees weight-loss studies and supplement studies that look at potential products and ingredients that would build the body. Yet the repercussions go far beyond trimming pounds or making athletes more buff.

“When we publish a lot because we have a lot of people working on studies,” Kreider said. People are calling from across the United States and from abroad. “They know this is where the core research is being done.” Kreider’s vision for the department is expansive. He dreams of a sports medicine facility so the department can do more orthopedic research and work in balance, gait and biomechanics. He would like to have an exercise rehab area to do training onsite instead of at the Student Life Center, a fitness evaluation center that gives students the chance to work with assessment tools and also to gain more information about their own health. Then there are the graduate programs and the constant stream of studies. Kreider speaks excitedly of a push for the FDA to establish regional sites to do supplement research, his hopes for more health and disease intervention studies within the department.

“He likes to keep things moving,” said Chris Rasmussen, the lab’s research coordinator who came with Kreider to Baylor from the University of Memphis. “He always has his finger on the fast-forward button.”

If you would like to see a 10-second commercial about this research, please visit: http://www.baylor.edu/research/
The happy result for Baylor was extensive research funding from OXiGENE already had some familiarity with Baylor. An OXiGENE with Oxigene at that time on a separate research project, and so licensed his compounds, Pettit told the company about the work of time,” Pinney said. “I had followed his work for a long time.”

Professor George R. Pettit at Arizona State, seeking to collaborate. developed at the Arizona State University and also licensed by the compound began extensive in vivo testing (in a mouse model.)

“OXiGENE has also funded our research program for four years — the whole program, not just the compound,” Pinney said. “It’s one of the best success stories between industry and academics that is.”

“In 1999, OXiGENE licensed all of my patents in this area and paid Baylor back for all the patent costs,” he said. “The company paid a licensing fee to Baylor and took over all the future patent costs — a significant expense. Most importantly, the company provided research support for Pinney’s group. Last year, it supported as faculty members, all under the central theme of vascular targeting.

Vascular targeting staves tumors by removing their blood supply. Conventional chemotherapy treatments commonly used to fight cancer tend to be highly toxic to healthy cells as well as cancerous ones, so researchers continue to seek drugs that might be more effective at targeting the tumor only. Although none of the VTAs is to the point of receiving FDA approval, researchers are optimistic because OXiGENE is moving rapidly ahead.

“We are the company that really started focusing on this area,” said Dai Chapkin, OXiGENE’s chief scientific officer. “That’s our entire focus. This area is very exciting in terms of this development, and other companies are now interested. While we’re always looking out for other areas, we are focused on making vascular targeting a successful area for drug development.”

With only 10 employees, OXiGENE outsources all of its work to universities, and all of its drug development is focused on collaboration. That’s what makes Baylor’s discovery so valuable, Chapkin said. “OXi-6197 is a second generation VTA, CA4P being the first. This drug is now in a Phase II clinical trial in advanced thyroid cancer,” said Scott Young. OXiGENE’s VP of Clinical and Regulatory Affairs. “Two other clinical trials are ongoing, one using CA4P with radiation and the other with carboplatin, a commonly used chemotherapy drug. The Phase I/II clinical trial is in Vanderbilt, the Phase II/III is treating patients with advanced or recurrent anaplastic thyroid cancer. It’s alive and well.”

“More than three years after receiving CA4P treatment, about 25% of patients are still alive. There is no standard treatment for this disease periods of stable disease,” noted Young. “We are very encouraged by the Phase I data and the preclinical results using CA4P in combination with other treatment modalities.”

The second generation of VTAs, ia OXi-6197, impacts the vascular structure at the center of the tumor and has the goal of occluding vessels on the periphery of it. Researchers believe the compound works in such a targeted way, Pinley said. But they believe that once the drug is close to the tumor, a biological mechanism will stop the patent drug. The parent drug binds to a protein called tubulin, the protein with which Pinney and his team have been working.

Tubulin forms the structure of cells and keeps them from collapsing. It plays a key role in mitosis, or cellular division, Pinney noted; and for many years, traditional anti-cancer drugs have targeted tubulin by disrupting it. That, however, targets healthy cells along with cancerous ones. Cancer cells are very clever and when they get to a certain size of academic or corporate laboratories, they need more nutrients,” Pinney said. “They’re very good at sending out signals that say, ‘Hey, blood vessels, grow here.”

VTAs work by changing the shape of endothelial cells that lining the vessel from flat to round. The endothelial cells in essence swell up, blocking the blood supply to a malignant tumor. Deprived of oxygen and other nutrients, the tumor cannot grow. “If blood flow is blocked long enough, you get necrotic events,” Pinney said. “The tumor becomes essentially die and the body will remove this dead tissue through a variety of mechanisms.”

In late March, OXiGENE announced that it had won the U.S. patent for its method of treating vascular diseases. OXiGENE has filed 13 U.S. patent applications and many foreign patent applications. While the use of VTAs to treat cancer is clearly one of its most exciting applications, the treatments also have shown promising results in treating retinal disorders such as macular degeneration, a disease in which blood vessels grow where they’re not supposed to.

CA4P is showing that it can shut down these vessels that shouldn’t be there. The Foundation Fighting Blindness, Inc., a charitable eye research organization, has agreed to fund a clinical trial to evaluate CA4P in patients with wet age-related macular degeneration, a condition characterized by abnormal growth of blood vessels. The National Institutes of Health will take the compound into human clinical trials. “This clinical study represents a new direction in treating ocular disease and a new potential therapeutic area for the use of VTAs,” commented Young.

Pinney has a BA degree in chemistry from Ohio Wesleyan University and a PhD in chemistry from the University of Illinois at Urbana-Champaign. He was getting that second bachelor’s degree, he decided to study organic chemistry, too. “So I was a first-year graduate student in chemistry and a senior in chemical engineering at the same time.” He received his PhD in organic chemistry, then received a post-doctoral fellowship from the National Institutes of Health.

Although he thought about becoming a medical doctor, he felt research held tremendous promise in terms of providing our future treatment agents for human diseases. “I thought the better way to do this, personally, was to remain in the chemistry. You have the ability of designing new molecules and creating them,” he said.

He wanted a place where he could design his own academic career, a place he could teach and do research. Baylor’s resources, environment and mission drew him, as did the chance to make a difference in treating cancer patients.

Cancer is an international scourge,” he said. “Many fantastic researchers are working on it and have worked on it for many years, but it seemed like an area where one could make some contribution.”

In addition to Baylor and Arizona State, OXiGENE maintains academic partnerships with the University of Texas at Austin, the Texas A&M University, and the University of Lund in Sweden. Without OXiGENE’s support, it would have been financially challenging for Baylor to have been able to pursue the patents the very partners, Pinney said.

“Baylor was very wise and very generous to initially fund the patients, but it couldn’t have been done internationally. They wouldn’t have taken on that cost without a partner. And if one of those compounds actually gets FDA approval, it will probably be built on the very few real research collaborations between academics and industry that’s resulted in an approved product. Very often, companies will license from universities, but then they don’t continue financial support. They just take the compound away and work with it in their own labs. So OXiGENE is very unique in that sense.”

If you would like to see a 30-second commercial about this research, please visit: http://www.baylor.edu/research/
MAX SHAUCK AND HIS PLANES

The Houston-Galveston area, one of four urban regions in Texas that does not meet federal standards for ozone, is home to many pollutants: heavy traffic, refineries, ships and power plants. All contribute to what Shauck calls the “witches’ brew” that people are breathing. Although regulations are in place to limit the pollutants that industry can spew into the air, “the more data in place, the better, to make the case that industry and stakeholders comply with the regulations,” Alvarez said.

The other three non-compliant areas are Dallas-Fort Worth, Beaumont-Port Arthur, and El Paso. But Shauck said the Houston area probably has the dirtiest air in the United States.

“It’s very, very dirty air. Because you have the water there, you have the land-sea breeze effect. In the morning, the proximity of the water causes the air to go out. Then in the afternoon, the land heating changes and the air comes in. So you get a double-vortex,” he said. “You get all the pollution from Houston moving out over the water. It heats up and gets in this vortical brew of oxides of nitrogen and hydrocarbons.”

Next the air moves over and picks up more chemicals from Texas City and Galveston and the refineries.

It then moves back into Houston, where pollution has reached more than 200 parts per billion, Shauck said. “Back when I started doing air pollution sampling, the ‘never exceed level’ was 80 parts per billion. It’s not healthy,” he said flatly.

While Shauck flies the plane, perhaps doing a spiral or a traverse over the water, Alvarez is monitoring a computer that shows the gases they are measuring. He is also keeping track of another instrument that measures particles in the air.

While measuring pollution over a highway, the crew would take samples up and downwind of the highway to see whether there is a difference on the two sides of the highway. “We are looking at nitrogen and oxide compounds, and also carbon monoxide,” Alvarez said. “In addition, we take these canisters where we trap the air and send it to a lab so they can run the gas through a mass spectrometer and test for 200 different compounds.”

The Twin Otter carry 20 to 30 canisters. “You open them up and take them five to 10 seconds to collect the air,” said Alvarez. But the pilot may make several passes over the same area at different altitudes to get the necessary samples. “We do it until we can no longer measure,” that is determined by the limitations of our instruments,” Alvarez said.

BAYLOR’S INTEREST IN AIR SCIENCE HAS GROWN FROM FOUR STUDENTS (IN 1995) TO ALMOST 100 (IN 2002).

LAST YEAR IT EARNED 5.6 MILLION IN RESEARCH GRANTS.

While pollution studies are a major focus, it also studies renewable fuels in aviation, both for jets and piston engines. “We develop those fuels, test the aircraft, develop the modifications, and do demonstrations,” Shauck said. “We do demonstrations because Shauck, tapping a thick stack of papers on his desk. “It’s kind of a joke in aviation these days that when the paperwork equals the weight of the airplane, you’re allowed to fly.”

Pilot Grazia Zanin, Shauck’s wife, locates the public and private contacts that keep the researchers in the air. The institute recently monitored an oil refinery in Canada for URS Corporation, a company that develops and improves transportation systems and infrastructure while keeping an eye on the environment.

My role is to write proposals, present proposals, assess feasibility, organize everything, prepare before and over-run during, and make sure of fulfilling deliverables,” said Zanin, the director of research.

Born in Italy, Zanin has been flying since 1980. She was studying geology in her native country when she met Shauck. She had obtained her pilot’s license in Fort Worth and was commuting to Italy for her last year of geology courses when he asked her to make a now-historic Trans-Atlantic flight in 1989 in an ethanol-powered aircraft. The couple successfully flew 6,000 miles. “It was always my idea to be involved in the environment,” Zanin said. She got her degree in earth sciences at Baylor and is enrolled in the master’s program in environmental sciences.

Alvarez, 29, graduated in May with a degree in aviation sciences. The son of migrant workers, he is first in his family to finish college. Although he took him longer to get his degree than it does some students, he is a pilot with more than 500 hours. “Flying is expensive and I had this opportunity to work for Baylor,” he said. “This involves flying and doing research.”

He wanted to be a flight surgeon before discovering, while flying for a pilot’s slot in ROTC, that he had a high-frequency hearing loss. He learned about the aviation sciences program and has been working there ever since.

“I really enjoy what I am doing. The value is when we go out and collect the data, we know we are making an impact to air quality in general. We have direct influence on people’s lives to improve the air that they are breathing,” he said.

Baylor also fits into Alvarez’s plans after graduation. He wants to go abroad for a semester, then attend graduate school at Baylor. His unusual experience as both pilot and researcher puts him in the position to work in many places, said Shauck.

“Serio’s work is recognized in the United States and in all the agencies that do sampling with aircraft,” he said. “He taught himself about instruments. He spends all his time validating data or working on instruments.”

Such recognition is not unusual in a department where top students tend to get involved in research.

The program offers a heavy concentration in science aimed at using the aircraft as a scientific tool. This means students like Alvarez can go into many fields. “They have a good background in atmospheric physics, atmospheric chemistry, instrumentation,” Shauck said. They also can fly non-standard patterns in high-density areas. They must do this safely, while keeping in mind meteorology, chemistry and diplomacy with air traffic controllers.

Shauck, who grew up in Ohio, has been flying since he was 11 and was a fighter pilot in the Navy. While teaching theoretical math at Yale, he got a call from NASA asking if he would be interested in becoming an astronaut.

“I told them ‘no’ like a fool, then I started thinking about it and called them back. They said, ‘Since you turned us down, we’ve had 11,000 applicants. Now you’re just one in a queue.’”

He adds: “The fighter pilot is told the airplane is a weapon, and that’s all it is. I like to think of this as a little bit higher calling — using the airplane as a scientific tool.”
The wetland classroom will be part of a 5,000-square-foot visitors center, which might be ready for classes as early as this fall. The wetland, which was an option city officials chose to replace wildlife habitat acreage that will be flooded when the lake is raised seven feet, should be completely planted by next spring.

This partnership between Baylor University and the City of Waco can trace its origins to a relationship partially forged in the unlikely setting of bar ditches and ponds. This is the second wetland project that Doyle and Tom Conry of Waco’s Water Utilities Department have worked on together. A Houston wetland they helped build has provided some of the plants for the local wetland. The two met through mutual friends and have known each other for a number of years. Although they are of like mind on the importance of the local wetland, they have different interests in the results. Doyle sees it as a research tool and as a resource for countries that don’t have the water purifying infrastructure the United States enjoys. Conry, program manager for production quality control programs in Waco’s water department, is interested in lake management strategies.

Doyle’s interest in biology and in providing aid to poor countries has roots in his childhood, when he lived 1,000 miles up the Amazon River, near the city of Manaus, Brazil, as the son of Baptist missionaries.

“My father was a church planter, involved in starting and developing churches and programs. I was educated in the Brazilian school system, and other than getting homeschooled in English grammar and U.S. history in the evenings, my life was not all that different from the others I went to school with,” Doyle said.
In that lush setting, his interest in nature developed early. He nurtured macaws and monkeys as pets. But science made its most important mark on him during a visit by Dr. Chillean Prance of the New York Botanical Gardens. Prance traveled to the Amazon to identify plants from the rain forest. Young Robert Doyle, about 11, was hooked.

“He and his family lived there for several years,” he said of the taxonomist. “My parents helped them set up house and learn how to boil the water and all the things you have to do to run a home in the tropics. As a thank-you to them, he took me out on an expedition.”

When young Doyle returned from the trip, he said, “When I grow up, I’m going to be one of those. My parents always talked about their call to missions. I’ve always thought that was my call to science.”

Additionally, he said, Prance “was a very strong believer and so my first image was of a terrific, world-renowned scientist who was a very vocal believer. So on this whole issue of science and religion, I always wondered how the fuss was about. I didn’t know there was a fuss.”

From those roots, Doyle received his B.S. and M.S. from Baylor, where he trained under Dr. Owen Lind, and later trained as a wetland scientist, doing research for his doctorate on the Amazon floodplain. He also worked with the Army Corps of Engineers as a wetland scientist,

and took a faculty position at University of North Texas in the same capacity. When he discovered Baylor was doing “exciting things” with water research, he arrived on campus in the fall of 2001.

Much of his excitement revolves around the 190-acre Lake Waco wetland, which volunteers started planting in October 2003. Because diversity of plant life is important to attract diverse animal life, Doyle created a species list that includes Bulrush, softrush, cattail, spikerush, nutgrass, duck potato, pickerelweed, burhead, water lilies, and several submerged species.

“We spent a lot of effort planting the first eight acres so that those plants could get established,” Dr. Doyle noted. “We got plants by spring 2003, Conry said. “Everything else is harvested locally, from bar ditches, Waco Creek, and some below Lake Whitney.”

Only about $2,000 of the $300,000 wetland budget had gone to buy plants by spring 2003, Conry said. “Everything else is harvested locally, from bar ditches, Waco Creek, and some below Lake Whitney.”

More than 90 percent of the first plants survived, he said, because of gentle treatment that included putting plants back into their natural environment only 48 hours after harvesting them. “In essence, they didn’t even realize they’ve been moved.”

The kinds of creatures they are luring into the Waco marsh has everything from scaly skin to feathers and webbed feet, noted Doyle. “We are encouraging amphibians, frogs, salamanders. There is a global decline in them, probably pollution-related. Duck habitat is also a big issue. And there are the less well-known organisms and migrating birds.”

Conry said the city could have planted new trees to replace the bottomland hardwoods, or forest, that will be lost once the lake is raised. But officials chose a wetland because of its ability to improve water quality and its unique features for this area — large size, public access and educational opportunities.

Based on 40 years of data on river flow, the wetland’s diverse plant and other life will purify 20 percent of the average annual inflow from the Bosque River, which dumps pollution into the lake from dairies upstream. Because this area of Texas has both wet and dry years, that percentage will vary from year to year, said Conry. In wet years, the percentage drops. In dry years, it could increase to 40 to 50 percent.

Of three major items that come through the wetlands — suspended solids, nutrients and phosphorus — Doyle said the wetland will do a good job removing solids for a “very long time” and an “OK” job of removing nutrients, to the extent they are associated with solids.

Phosphorus, however, is of “the most concern and is the least well-removed in the long term,” he said.

Although this wetland won’t handle enough of Lake Waco to make a large difference in water purity, said Doyle, the concept has great potential. “If we begin to manage our water so that we deliberately divert it through wetlands, that has the potential for long-term benefits. This one wetland, while it’s a great start, is not a solution to the Bosque River problem. By itself, it’s not going to make a big difference on the overall quality of the lake.”

But perhaps another water research partnership between Baylor and the city will. Called the Center for Reservoir and Aquatic Systems Research (CRASR), it involves a collaboration between the two entities to collect huge amounts of information about the lake. The city is funding about $2 million worth of projects involving samples that Baylor will analyze.

“It will be comprehensive,” said Conry, ticking off experiments on the lake’s depth and scope, wind and heat dynamics, in addition to its chemistry. The city will also collect biological data so that aquatic and bottomland hardwoods, or forest, that will be lost once the lake is raised.

The kinds of creatures they are luring into the Waco marsh has everything from scaly skin to feathers and webbed feet, noted Doyle. “We are encouraging amphibians, frogs, salamanders. There is a global decline in them, probably pollution-related. Duck habitat is also a big issue. And there are the less well-known organisms and migrating birds.”

Conry said the city could have planted new trees to replace the bottomland hardwoods, or forest, that will be lost once the lake is raised. But officials chose a wetland because of its ability to improve water quality and its unique features for this area — large size, public access and educational opportunities.

Based on 40 years of data on river flow, the wetland’s diverse plant and other life will purify 20 percent of the average annual inflow from the Bosque River, which dumps pollution into the lake from dairies upstream. Because this area of Texas has both wet and dry years, that percentage will vary from year to year, said Conry. In wet years, the percentage drops. In dry years, it could increase to 40 to 50 percent.

Of three major items that come through the wetlands — suspended solids, nutrients and phosphorus — Doyle said the wetland will do a good job removing solids for a “very long time” and an “OK” job of removing nutrients, to the extent they are associated with solids.

Phosphorus, however, is of “the most concern and is the least well-removed in the long term,” he said.

Although this wetland won’t handle enough of Lake Waco to make...
1 VALUE BASED MANAGEMENT: The Corporate Response to the Shareholder Revolution
Harvard Business School Press

John D. Martin and William Petty

Why do some firms create extraordinary value for shareholders, while others destroy it? A powerful suite of value-based management tools can make the difference. This book contains a comprehensive, significant and effective response to the shareholder revolt, value-based management (VBM) allows financial managers to plan, monitor, and control a firm’s operations in ways that enhance shareholder value. This timely book — based on the authors’ research and on an extensive study of firms that have successfully implemented VBM systems — provides the first objective, field-tested synthesis of the most popular models in use today: the free cash flow method, the economic value added (market value added) method, and the cash flow return on investment approach (CFOI). Pioneering to the lessons learned by VBM adopters in a wide variety of industries, the authors outline the advantages and disadvantages of each model, and guide managers in selecting, implementing, and operating one that best fits their organization.

2 THE POWER OF GOOD DEEDS: Privileged Women and the Social Reproduction of the Upper Class
Rowman & Littlefield

Diana Kendall

The Power of Good Deeds presents the personal narratives of elite women as they describe their views on philanthropy, the need for exclusivity in their volunteer organizations, their childhood and college years experiences in prestigious schools and sororities, and the upper-class rituals in which they are involved. Also included are sociological conclusions about class and social power derived from those narratives.

Kendall’s research was conducted in order to find out how elite women use social power — not only to benefit less-fortunate people but also to benefit themselves and their families. The study included the integrated use of participant observation, interviews, and content analysis that draws upon materials from biographies and journalists’ reports. The participant observation portion of the study took place in gala benefits, monthly meetings of leaguers and guilds and their boards of trustees, and parties and social gatherings in private residences and clubs. Interviews were conducted with women in upper-class organizations, and over 225 members of one organization responded to a questionnaire that examined the women’s views on organizational power, socialization of children, and their reasons for participation in elite volunteer organizations. This research allowed the author unprecedented access to elite women across social and ethnic categories in many Texas cities.

Kendall (Ph.D., University of Texas at Austin) is associate professor of sociology at Baylor University. Her research and teaching interests include social theory and race, class, and gender.

3 TEXAS ADMINISTRATIVE PRACTICE AND PROCEDURE

Ron Beal

This treatise is a thorough analysis of all procedural and legal issues in Texas Administrative law. Since the adoption of the Texas Administrative Procedure Act in 1976 (APA), administrative law in Texas has been characterized by an explosion of “new law” and inconsistent judicial decisions. This treatise is a comprehensive reference on all procedural and legal issues in Texas administrative law. The treatise covers and examines the delegation doctrine, rulemaking procedures, and the legal challenges that may be made, procedural, legal and constitutional, to the adoption of a rule. All issues related to the contested case hearing process at the pre-hearing, hearing, post-hearing and judicial review stages are thoroughly analyzed. The scope of agency adjudicative power, the impact of constitutional due process on agency decision making, and the judicial scope of review of agency action are set forth in detail. In addition, all hoc adjudication, declaratory judgment actions, and the Texas Open Meetings Act are reviewed in light of judicial decisions interpreting the same.

The treatise covers administrative action by local governmental bodies not subject to the Texas APA.

Beal has taught at Baylor Law School for 20 years. He teaches three administrative law courses and is a consultant to top law firms in the state regarding administrative law litigation.

4 ETHICS FOR EDUCATIONAL LEADERS

William Beckner

This book was written to help meet the need to develop educational leaders who are more efficient, leaders who effectively serve the educational and developmental needs of children and youth. These leaders face daily a multitude of demands and challenges requiring many kinds of decisions that at times have no good solution available. Every option has one or more negative aspects. Making the best decisions in these kinds of situations must involve more than following policies, rules or accepted practices. Other considerations, typically involving ethical concepts, must be included in the decision-making process if the best interests of the students, the school and the society are to be well served.

The basic purpose of this text is to take what we can glean from the study of philosophy and ethics and find a way to apply the best thinking from these and other related fields of study to the everyday world of teaching, learning, and educational leadership. Beckner has been a professor of educational administration at Baylor since 1995. His major professional interests include educational leadership, organizational development, ethics in educational leadership, and rural education. He served as vice president of academic and student services at Wabash Baptist from 1983-1995 and as chairman of the Department of Education at Wabash College from 1976-1983.

5 COMPONENT-LEVEL PROGRAMMING

Peter Maier

There are many books that show how to use components, but this text covers the "other side" of component-based development — the development of the components themselves. The development of new components is based on a new theory of how to subdivide components into categories. This division into categories simplifies the task of creating new, component-based programs from specifications. In component-based design it is necessary to subdivide a program into several component clusters, plus a substantial amount of glue logic. Until now, no formal methodologies have been developed for doing this. This book shows how to use categorization as a tool for partitioning subtasks between components and glue logic. It shows how to assign tasks to components, some of which will be custom built, and some of which will be off-the-shelf parts. A substantial portion of the book is devoted to design methodologies for each component category. Each category and how it relates to others is explained in detail, as well as design methodology and sample applications for the category.

The reader is lead through the principles of component-level design one step at a time. Maier has been an assistant professor of computer science at Baylor since 2002. He came to Baylor from the University of South Florida. His research interests include component-level programming, web-based applications, object oriented programming, and rapid prototyping.

6 CRIMEN Y PODER EN LA NARRATIVA CHILENA CONTEMPORÁNEA (Crime and Power in the Contemporary Chilean Narrative)
Marquis Editorios, Santiago, Chile (2002)

Guillermo García-Cordal and Mirta Pino

Pino, of Argentina, is a professor of Latin American literature at the University of Córdoba in Argentina. García-Cordal, of Chile, is an associate professor of Spanish at Baylor, where he has taught for 11 years. He received his BA in education and Spanish from the University of Notre Dame. His MA in Latin American literature from Notre Dame and his PhD in Latin American literature from the University of Colorado at Boulder, Pino, of Argentina, is a professor of Latin American literature at the University of Córdoba in Argentina.
Each year, world-renowned scholars from a variety of disciplines gather at Baylor University to present their latest research to students and professors at the Vice Provost for Research Office Colloquium Series.

In April 2003, the Colloquium Series featured Doug Axe, a research scientist at the Babraham Institute in Cambridge in the United Kingdom. Axe expanded ideas on “Probing the Relationship between Sequence and Function in Enzymes: A New Picture in Sequence Space.” Genomic sequencing projects and high-throughput structure determination are leading to rapid expansion of the known repertoire of these units, each with its own characteristic three-dimensional fold. As explained, despite their numerous and central importance to life, the processes by which new domains originate remain obscure. Key insights into this have been obtained by experimentally probing the functional constraints on the sequence of a suitable test domain. The results provide a new picture of sequence space with some surprising properties which Axe discussed.

Also in April, Apostolos Karafillis spoke on “Development of Sheet Metal Forming Processes: Modeling Methods, Defect Prediction and Manufacturing Process Design Procedures.” Karafillis explained that the sheet metal forming processes enable the manufacture of complicated three-dimensional parts at a low cost; however, a long lead time is usually associated with the introduction of these products. Karafillis explained that one of the main reasons for the long lead time is the use of multiple tryouts that are performed to ensure that the produced part is free of manufacturing defects (e.g., tearing or wrinkling) and meets the shape fidelity that is required by design. Karafillis gave examples of these procedures, demonstrating the effectiveness of the presented approach.
Graduate Degrees at Baylor

Accounting — MAcc, MAcc/BBA, MAcc/ID
Advanced Neonatal Nursing — MSN
Advanced Nursing Leadership — MSN
American Studies — MA
Biology — MA, MS, PhD
Biomedical Studies — MS, PhD
Business Administration — MBA, MBA/ID
Business Administration in International Management — MBA
Business Administration/Information Systems — MBA/MIS
Chemistry — MS, PhD
Church Music — MM, MM/MDiv
Church-State Studies — MA, PhD
Clinical Psychology — PsyD
Communication Sciences and Disorders — MA, MSCS
Communication Studies — MA
Composition — MM
Computer Science — MS
Conducting — MM
Curriculum and Instruction — EdD, MA, MSE
Directing — MFA
Earth Sciences — MA
Economics — MSE
Educational Administration — EdD, MSE
Educational Psychology — MA, MSE, PhD
English — MA, PhD
Environmental Biology — MS
Environmental Studies — MES, MS
Family Nurse Practitioner — MSN
Geology — MS, PhD
Health Care Administration, Fort Sam Houston — MHA
Health, Human Performance, and Recreation — MSE
History — MA
Information Systems — MSIS
Information Systems Management — MBA
International Economics — MA, MS
International Journalism — MJ
International Management — MIM
International Relations — MA
Journalism — MA
Limnology — MLS
Mathematics — MS, PhD
Museum Studies — MA
Music Education — MM
Music History and Literature — MM
Music Theory — MM
Neuroscience — PhD
Performance — MM
Philosophy — MA, PhD
Physical Therapy, Brooke Army Medical Center — DScPT
Physical Therapy, Fort Sam Houston — MPT, DPT
Physical Therapy, West Point — DScPT
Physics — MA, MS, PhD
Piano Accompanying — MM
Piano Pedagogy and Performance — MM
Political Science — MA
Public Policy and Administration — MPPA, MPPA/ID
Religion — MA, PhD
Social Work — MSW, MSW/MDiv
Sociology — MA, PhD
Spanish — MA
Statistics — MA, PhD
Taxation — MTax, BBA/MTax, MTax/ID

University Research Centers and Institutes

Center for American & Jewish Studies
Center for Analytical Spectroscopy
Center for Applied Geographic and Spatial Research
Center for Astrophysics, Space Physics & Engineering Research (CASPER)
Center for Business and Economic Research
Center for Christian Ethics
Center for Community Research & Development
Center for Drug Discovery
Center for Family & Community Ministries
Center for International Education
Center for Ministry Effectiveness
Allbritton Art Institute
Institute for Air Science
Institute of Archaeology
Institute of Biblical & Related Languages
Institute of Biomedical Studies
Institute for Faith & Learning
Institute for Oral History
Institute for Statistics
Institute for Technology Innovation Management
J. M. Dawson Institute of Church-State Studies
History — MA
Information Systems — MSIS
Information Systems Management — MBA
International Economics — MA, MS
International Journalism — MJ
International Management — MIM
International Relations — MA
Journalism — MA
Limnology — MLS
Mathematics — MS, PhD
Museum Studies — MA
Music Education — MM
Music History and Literature — MM
Music Theory — MM
Neuroscience — PhD
Performance — MM
Philosophy — MA, PhD
Physical Therapy, Brooke Army Medical Center — DScPT
Physical Therapy, Fort Sam Houston — MPT, DPT
Physical Therapy, West Point — DScPT
Physics — MA, MS, PhD
Piano Accompanying — MM
Piano Pedagogy and Performance — MM
Political Science — MA
Public Policy and Administration — MPPA, MPPA/ID
Religion — MA, PhD
Social Work — MSW, MSW/MDiv
Sociology — MA, PhD
Spanish — MA
Statistics — MA, PhD
Taxation — MTax, BBA/MTax, MTax/ID

Selected recent project grants and contracts of Baylor faculty members:

Truett W. Hyde, Vice Provost for Research > $45,000; Research Experiences for Undergraduates and Teachers-REU Site; National Science Foundation, additional funding to existing grant

F. Gordon A. Stone, Chemistry and Biochemistry > $52,000; Synthesis, Structure and Reactivity of Transition Metal Complexes; The Robert A. Welch Foundation

Kevin G. Pinney, Chemistry and Biochemistry > $150,000; Molecular Recognition of Tubulin by New Classes of Affinity Probes and Polymerization Inhibitors; The Robert A. Welch Foundation

G. Peter van Walsum, Environmental Studies > $50,000; Vision Grant: Uniting Students from Baylor and Area High Schools to Improve Water Quality in Central Texas; 3M Foundation

Lisa Taylor, Nursing > $247,955; Basic Nurse Education and Practice Program, Year 1; U.S. Department of Health and Human Services, Health Resources and Services Administration

Robert Doyle, Rene Massengale, and Joseph White, Biology, and Bruce Byars and Lisa Zygo, Center for Applied Geographic and Spatial Research > $101,874 for Phase I of a project involving water quality of Lake Waco, from ENGR Corp. through the City of Waco

John A. Dunbar and Peter M. Allen, Geology > $204,862; Variable Frequency Acoustic Profiling for Sediment Surveys of Flood Control Reservoirs; U.S. Department of Agriculture

Susan Johnson, Education > $284,355; TExES-Phase II; U.S. Department of Education through Educational Service Center Region 12

Dennis Myers and Helen Harris, Social Work > $60,000; Geriatric Enrichment in Social Work Education; Council on Social Work Education

Marianna A. Busch, Charles M. Garner, Stephen L. Gibson, Robert R. Kane, Kevin K. Klausmeyer, Carlos E. Manzanares, Kevin G. Pinney, and F. Gordon A. Stone, Chemistry and Biochemistry > $552,000 for individual grants from the Robert A. Welch Foundation in support of basic chemical research

John Dunbar, Geology > $140,000; 3-Dimensional Modeling of Geologic Structures; Shell International E&P, Inc.

Steven R. Eisenbarth, Ben Kelley, Leigh Ann Marshall, Engineering > $20,527; Launching the Texas Engineering Education Pipeline: Deploying the Infinity Project Statewide; Texas Higher Education Coordinating Board

Diana Garland, Rob Rogers and Gaynor Yancy, Social Work > $2,030,000; Best Practices for the Faith and Service Technical Education Network; Pew Charitable Trusts through the National Crime Prevention Council

Rebecca Sharpless, Oral History > $119,222; Learning from Experience: Accounts and Documents from Population Pioneers; William & Flora Hewlett Foundation through the University of New Mexico

Trena Wilkerson, Curriculum and Instruction > $79,000; Problem Solving for the 21st Century 2002-03; Texas Higher Education Coordinating Board-Eisenhower Professional Development Program

Mary Margaret Shafai, Mathematics > $79,000; Rethinking Middle School Math: Proportional and Algebraic Reasoning; Texas Higher Education Coordinating Board-Eisenhower Professional Development Program

> For additional information about the above partial listing of Baylor faculty project grants and contracts, contact the Office of Sponsored Programs and Contracts, Gary E. Carter, director, the Office of Foundation Development, Cynthia J. Dougherty, director, or Truett Hyde, vice provost for research.