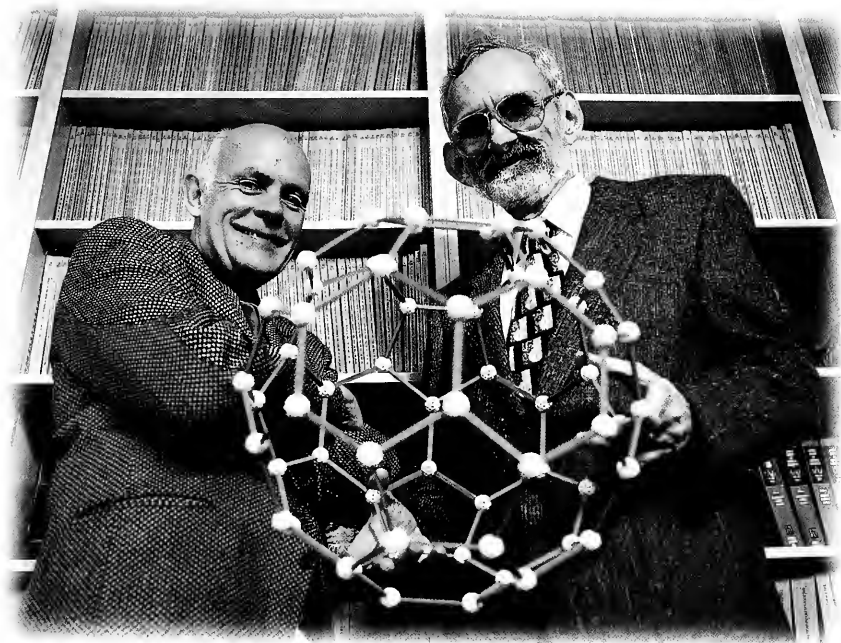


Rice University



1996 Report of the President



About the Cover:

On December 10, 1996, the Royal Swedish Academy of Sciences awarded Rice University professors of chemistry Richard E. Smalley (left), and Robert F. Curl, Jr., the 1996 Nobel Prize in Chemistry for their discovery of Carbon 60, or buckminsterfullerene. Rice University's fundamental principle that groundbreaking research and excellence in teaching are inextricably united endeavors is perfectly exemplified by these two scientists. Both distinguished scientists teach freshman chemistry and utilize undergraduates as well as graduate students in their research, even as they continue to open new scientific frontiers. Professor Curl and Professor Smalley have spent their entire teaching careers at Rice. In addition, Bob Curl is a member of the Rice class of 1954, and he and Jonel Curl have served as masters of Lovett College.



ALFRED
NOBEL

From the President

It has become my practice to utilize these annual reports as one means of familiarizing our alumni and friends with the workings of the university as they relate to teaching, scholarship, and student life. This year I call your attention to some quite notable characteristics of our outstanding faculty.

I have asked seventeen professors from a wide range of disciplines to portray for you their research. This seems most fitting in an academic year in which two of our faculty have been awarded the Nobel Prize in Chemistry for research done exclusively on the Rice campus.

Ordinarily there is nothing especially noteworthy about university presidents extolling faculty research. But there is something truly distinctive about this group of Rice faculty members, relative to most of their peers at comparable institutions of higher learning: while

all seventeen professors have compiled a distinguished record in research, *all seventeen have also been recognized as outstanding teachers. Every one of them has, within the past five years, received our most prized awards for excellence in teaching.*

The achievements of these dedicated and energetic educators are very much in keeping with the mission Edgar Odell Lovett envisioned at the opening of the university in 1912. Then and later, President Lovett stressed the essential unity of excellent teaching and excellent scholarship. He proposed an institution devoted “quite as much to investigation as to instruction,” where “the privileges of research” are inextricably linked to “the pleasures of teaching.” At the close of the twentieth century, many institutions have lost sight of this linkage; we, however, continue to hold to the simple truth so well enunciated by Lovett: “The best person to lead the learner from the unknown to the known is the person who is continually leading himself from the unknown to the known.”

Nowhere is our commitment to the unity between teaching and research better exemplified than in our two 1996 Nobel laureates. Both recipients, Professor Richard Smalley and Professor Robert Curl, are continuing to teach first-year chemistry this very spring.

There are many fascinating aspects of the research of the scholar-teachers presented in this report. One is especially worth noting: of the seventeen faculty members featured herein, six* have joint research programs in areas related to biomedicine. These six Rice faculty members collaborate with faculty at Baylor College of Medicine, the University of Texas Medical School, and other institutions of the sprawling Texas Medical Center just across Main Street from the Rice campus.

Please turn now to what our most outstanding teachers have to say about their past and present research initiatives.



Malcolm Gillis
President, Rice University



*The six professors with collaborative research programs at the Texas Medical Center are John Bennett, Marco Ciufolini, Steven Cox, Eugenia Georges, Don Johnson, and John Olson.

John B. Anderson

The Antarctic Ice Sheet contains enough frozen water to raise the global sea level approximately two hundred feet if completely melted. There is no concern that this will happen in the near geological future, but there are portions of the West Antarctic Ice Sheet that exhibit signs of instability, and some prominent glaciologists have proposed that deterioration of unstable portions of the ice sheet could occur within a period of centuries. One theory for this instability holds that, with time, the ice sheet exerts such great stress on the seafloor on which it rests (generally more than a thousand feet below sea level) that the bed begins to deform and flow, thus allowing the ice sheet to slide across the bed at high velocities. A likely result of this acceleration is a thinner ice sheet that could actually begin to float and ultimately collapse. Some models predict that the overall rise in global sea level that would result from such a collapse would be on the order of a few meters, enough to submerge many coastal cities.

The ultimate answer to whether the ice sheet is capable of rapid retreat rests in the geological record of past ice sheet behavior. There is independent geological record that sea level has risen fast enough in the past several thousand years to drown barrier islands and wetlands of the Gulf Coast. My research has taken my students and me to the Antarctic on numerous expeditions, where we acquire geophysical images of the seafloor and subseafloor in search of evidence for past instability in the ice sheet. Our research has also

been carried out on the Gulf of Mexico coast and continental shelf, where we search for evidence of rapid changes in sea level and attempt to assess the impact of these flooding events on past bays and coasts. We have our own seventy-foot research vessel, the R/V *Lone Star*, which also serves as a seagoing classroom for students to acquire marine geological and geophysical data. Our findings include evidence for rapid increases in the rate of sea level rise during the past twelve thousand years, changes that have dramatically altered coastal environments and may even have impacted early human occupants of the Gulf Coast. As for the cause of these sea level changes, we find features on the Antarctic continental shelf that are thought to be formed at the base of an unstable ice sheet.

Our research in the Gulf of Mexico has been funded by a variety of agencies and the oil industry; our research in Antarctica is funded by the National Science Foundation. One of my Ph.D. students, Stephanie Shipp, and I have a separate grant from NSF to develop a junior high school curriculum that uses the Antarctic as a focal point to inspire young people's interest in science and to demonstrate that an interdisciplinary approach is needed to solve global environmental problems.



*Professor of Geology
and Geophysics*

*Graduate Student
Association
Teaching Award,
1996*



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J o b n K. B e n n e t t

I maintain two unrelated research programs: a primary focus in high-performance parallel computing and a secondary interest in the safety and efficacy of latex surgical gloves.

High-performance parallel computing offers the potential to solve very large and complex problems. These include the traditional “grand challenge” applications, such as global weather prediction, analysis and mapping of the human genome, oil reservoir simulation, and hypersonic aircraft design, as well as mundane but important day-to-day computing tasks. In the absence of parallel computing, these problems are limited to the nature and size of problem that can fit a single machine’s memory and processing resources.

Unfortunately, the development of parallel programs that achieve substantial performance improvements over their sequential counterparts is often quite difficult. Many factors, most of which are unknown to the programmer, can have a substantial negative impact on the overall performance of parallel programs. The approach my students and I take is to have the runtime system monitor the performance and behavior of the application program while it is running and to use this information to improve subsequent execution of the program.

The “adaptive runtime support” dynamically changes the behavior of the program during execution based upon performance-related observations made during both the current and previous executions. Prefetching, changes in the way data is moved, migration of computational threads between processing nodes, and initial data placement are examples of the kind of performance-tuning mechanisms that can be added to a basic runtime system. My students and I have developed a prototype software system for x86 machines running Windows NT that incorporates adaptive runtime performance-tuning mechanisms. The work also has an industrial partner.

The principal objectives of my glove work are to develop techniques for improving the barrier effectiveness and reducing the allergenicity of natural rubber latex (NRL) gloves and to transfer these techniques to industrial products and practices. This work has relevance to both clinical practice and latex product manufacturing. Increasing health concerns in the last decade have resulted in a dramatic increase in the use of NRL surgical and examination gloves and have elevated the importance of these gloves as reliable biological barriers. I have found that NRL gloves exhibit unusual dynamic electrical properties that can be exploited to reliably monitor glove barrier effectiveness by electrical means, even while the gloves are being worn during surgery. I have developed an electronic device, worn by health-care providers, that informs them when their gloves are no longer an effective barrier. My device has received two patents, has been approved for use by the FDA, and is currently being taken to market by a Houston-based technology transfer company.



*Associate Professor
of Electrical and
Computer
Engineering,
Associate of Wiess
College, and Master
of Sid Richardson
College*

~
*George R. Brown
Award for Innovative
Teaching in
Engineering, 1995*



J o h n B. B o l e s

*Allyn and Gladys
Cline Professor of
History and
Associate of Will
Rice College*

~
*Graduate Student
Association Teaching
Award, 1994*

As an undergraduate at Rice in the early 1960s, I noticed a disjuncture between the southern history I read about and the South I had experienced growing up in East Texas. The South I knew was suffused with religion, but, in my U.S. history books, religion—with the sole exception of the Scopes Trial in Tennessee—seemed to have existed only in the North. Then I took an anthropology course and read about an outbreak of religious fervor that had occurred in Kentucky about 1800: At this event, there supposedly occurred religious exercises so bizarre and foreign from the experience of modern-day Americans that they were deemed worthy of a course on *primitive* religion. I was intrigued by this episode in the history of the South and wondered if there was a connection between it and the Bible Belt South that I had grown up in. Resolving that question became my doctoral dissertation at the University of Virginia and my first book, *The Great Revival, 1787–1805: The Origins of the Southern Evangelical Mind*, published in 1972. That work led to other books on southern religion, including African American religion, which led to a history of slavery in the American South. These two interests, race and religion, and their influence on southern history have remained central to my scholarship and teaching ever since, and I believe that there is no understanding of the



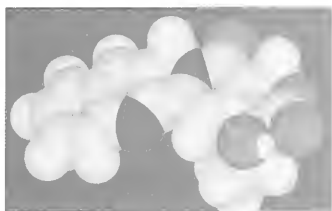
South without close consideration of both. Five of my doctoral students at Rice have written dissertations dealing with different aspects of these topics.

My editing of the *Journal of Southern History* for the past thirteen years has broadened my reading and interests. In particular, I have become interested in the role of education in the South. Certainly in the twentieth-century South, improvements in education have played a large role in the economic and social transformation of the region. More specifically, I am interested in the history of Rice itself and the career of Edgar Odell Lovett. The decades on either side of 1900 were extremely fruitful ones for educational reform and the creation of new universities. Johns Hopkins University had already pioneered the role of the graduate university, the Harvard curriculum had recently been thoroughly revised and its graduate schools strengthened, Stanford and the University of Chicago were established in 1891, the same year that the Rice Institute was chartered, and Princeton underwent significant reform during the leadership (1902–1910) of Woodrow Wilson. I intend to write a full-scale intellectual biography of President Lovett, putting his educational ideas and academic leadership at Rice in the context of this important era in American higher education. I will be on leave during the 1997–98 academic year researching President Lovett's life, and I hope that anyone who has letters, reminiscences, or information of any kind about him will share that knowledge with me.



Marco A. Ciufolini

My research in synthetic organic chemistry focuses on the development of new chemical reactions and strategies and on their application to efficient total syntheses of substances of biomedical interest. These compounds may display activity against tumors, bacteria resistant to known antibiotics, and viruses, as well as display immunomodulatory properties, but they are not proven drugs. Rather, they are top candidates for further pharmacological evaluation. At the same time, they are rare or otherwise unavailable, and total synthesis is



the only practical way to secure a supply for biological tests.

My laboratory's efforts have produced reliable synthetic routes to Prosopis alkaloids, modulators of calcium transport with potential in the treatment of certain neuro-

logical conditions: various antitumor agents (pyridoacridine and phenanthroizidine alkaloids, lavendamycin, phyllanthocin); and antibacterial and antiviral compounds (carbacephems, azasaccharides). Our current efforts focus on the synthesis of highly potent antitumor substances, on complex peptides with anti-AIDS activity, and on the refinement of several novel reactions that we have developed to facilitate the assembly of complex molecules.

An especially significant accomplishment is our recent development of the best total synthesis yet available for an exceptionally promising antitumor agent: camptothecin. This substance, found in nature in a tree that grows only in China, is extremely rare and sells for as much as fourteen times the price of pure gold. Consequently, there is enormous interest in a practical synthesis of the compound, and, indeed, Rice University is patenting our process in collaboration with an industrial laboratory.

My work may be described as belonging to the realm of "heterocyclic chemistry," an area of science of special interest in medicinal and agricultural chemistry and in anticorrosion technology. Currently, I direct a group of ten collaborators (one undergraduate, eight graduate, and one postdoctoral) with support from grants from the National Institutes of Health, the National Science Foundation, and the Robert A. Welch Foundation.



*Associate Professor
of Chemistry*

*Amoco Teaching
Award, 1996, 1995*

S t e v e n J. C o x

*Associate Professor
of Computational
and Applied
Mathematics*



*Amoco Teaching
Award, 1996*

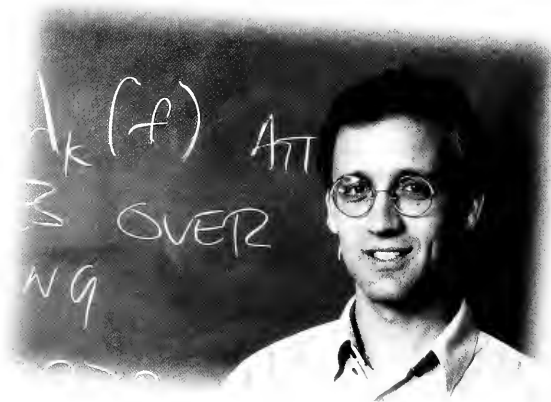
I work in an area of applied mathematics known roughly as the design and identification of heterogeneous media.

The design question asks how one may best distribute distinct materials throughout a body in such a way that it performs in an optimal fashion. For example, previous research has enabled me to mix a given quantity of conductive (expensive) material with a given quantity of resistive (cheap) material in such a way that the resulting composite is as conductive as possible. An important variant of the design problem asks how one may sculpt a given quantity of one material into an optimal shape. Though my personal physique is far from optimal, I have nonetheless confirmed the shape of the strongest column. I am presently conducting research into the shape of the tallest column, the optimal place to clamp a plate, and the best distribution of dissipative material in the quest to build efficient energy absorbers. To date, I have wrestled only with the analytical and numerical aspects of these problems and have not yet seen my ideas through to fabrication. I plan on remedying this deficiency through ongoing collaboration with engineers at Exxon and Owens-Corning.



The identification question asks how one may determine the composition of a body from nondestructive probing. In ongoing work with people at the Baylor College of Medicine, I am constructing a model that infers the distribution of stiffness within the intact canine

diaphragm from optical measurements of its motion under a prescribed pressure. In other ongoing work, I have identified the phenomena that dissipate energy in a vibrating string. In this work, I have conducted the mathematical analysis, derived from it a numerical algorithm, and tested this on experimental data gathered in my laboratory. From a mathematical standpoint, this string problem is very similar to the problem of determining the resistivity along the length of a nerve axon. In future work, I will be concentrating on identification issues in muscle mechanics and neurophysiology with an eye toward putting new tools in the hands of working physicians.



E u g e n i a G e o r g e s

Much of my previous research has involved transnational migration from the Dominican Republic to the United States and its consequences for local culture, economic development, social and political organization, gender roles and relations, and health. The Dominican end of this migration circuit was described in my book, *The Making of a Transnational Community* (Columbia University Press, 1990). Subsequent research focused on the political integration of Dominicans in New York, where they comprise the largest population of new immigrants.

Since coming to Rice in 1988, I have also been involved in a number of multidisciplinary projects with scholars at the University of Texas Health Science Center (UTHSC). As part of a joint Mexican and U.S. team comprising epidemiologists, physicians, and biomedical researchers from UT, the University of Campeche, and the National Autonomous University of Mexico, I studied an array of health issues among the Maya of Yucatan, including changing patterns of obesity, body fat distribution, and diabetes in villages undergoing rapid economic change. This research has resulted in several multiauthored papers and publications in both English and Spanish. Another interdisciplinary project with UTHSC has analyzed roles of ethnicity and social factors in the patterning of body fat among U.S. Hispanics using the large database of the National Hispanic Health and Nutrition Examination Survey. This research has produced several articles that challenge conventional genetic explanations of body fat patterning by demonstrating a relationship with social class and specific behaviors.

My most recent research has addressed the cross-culturally variable meaning and interpretations associated with the new reproductive technologies. This project was inspired by my own experiences with the new technologies, by the development of a course ("The Life Cycle in Biocultural Perspective") I teach at Rice that addresses a range of issues related to reproduction, and by the stimulating discussions that took place in the Rice Department of Anthropology around the emergent field of cultural studies of science and technology. I selected Greece as the site of my new research because almost no research had examined these technologies outside of the U.S. and England and because preliminary fieldwork revealed exceptionally intensive use there. Since beginning this work in 1990, the project has grown into a broader study of the politics of reproduction in which issues of medicine and technology are necessarily enmeshed. Among other topics, this research explores cultural understandings of fertility, ethnicity, nationalism, personhood, gender roles and relations, and the construction of professional expertise and authority. During my sabbatical leave this year, I have begun writing a book based on this fieldwork. Over the next three to four years, I plan to conduct further research on the relationship between the various discourses concerning reproduction and the intensifying nationalism characterizing contemporary Greece.



*Associate Professor
of Anthropology*

~
*George R. Brown
Award for Superior
Teaching, 1994*



David L. Ikenberry

At each spring's commencement, new graduates and faculty ceremoniously pass through the Sallyport of Lovett Hall. Above the heads of those performing this rite are two inscriptions carved into either side of the Sallyport. The inscription on the left reads: *If we properly observe celestial phenomena we may demonstrate the laws which regulate them.* This phrase has always fascinated me, for the operative word is observe. As a financial economist, the goal of my research is to extend our knowledge of the world by watching it work using careful empirical analysis.

I examine data that comments on issues in corporate finance—questions that a corporation's officers or directors might face. My work is perhaps best known for its approach to these problems, for it often challenges a fundamental tenet of traditional economic theory, one perhaps best paraphrased as "the price is right." Financial economists have held steadfast to the notion that prices observed in the world's markets, particularly its competitive stock markets, reflect all information and are fair to both buyers and sellers. In many settings, particularly cases where small segments of time are examined, the price does seem right.

Yet my research has focused on longer periods of time. Here, the observations are at odds with classic economic presumptions. My work has examined several issues ranging from corporate proxy fights to the decision of a company to repurchase stock. Most recently, I have studied stock splits, a rather innocuous event that has been pondered for decades. Each of these events reveals information as they are announced. The general observation emerging from these studies is that the market does not appear to immediately react to information. In short, perhaps the price is not quite right as we have supposed for decades.

To my profession, these conclusions are challenging at an academic level—we will strive for years to better understand why they arise. One clue may lie in recognizing that market prices reflect the expectations of people—expectations that may be fallible in rather consistent ways. Regardless of how this debate eventually resolves, my work has pragmatic impact on a host of issues ranging from how corporations should approach financing decisions to how institutions should invest pension or endowment assets.

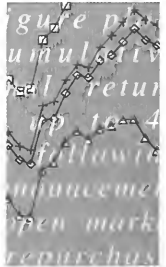
Finance as an academic profession is strikingly young, and, as such, we expect great strides in our understanding of financial markets. As a researcher, my work contributes to this growth. As a teacher, my philosophy has been not only to introduce my students to the building blocks of our knowledge but to assure they appreciate that this knowledge is not static. Perhaps this notion is best captured by the phrase carved to the right of the Sallyport: *Love, beauty, joy and worship are forever building, unbuilding and rebuilding in each man's soul.*

Construction continues.



*Associate Professor
of Administrative
Science and
Associate of Jones
College*

*Jesse H. Jones
Graduate School of
Administration
Award for Excellence
in Teaching, 1996*



D o n H. J o b n s o n

My research efforts concentrate on statistical signal processing: how information can be extracted from the physical world, particularly when that information is contaminated by random disturbances—noise—or is itself fundamentally random. I try to develop new methods of extracting information for digital communication systems, and I also study how the brain performs similar functions, particularly how the mammalian auditory system sifts through the acoustic environment and determines the directions sounds come from.

In both of these efforts, I work on the most difficult random signals, known as non-Gaussian signals. Gaussian signals have been studied for most of this century, and that work underlies the design of virtually all modern communications systems. However, physical signals that a cellular telephone or a satellite receive do not fit that mold, and I want to develop new systems that can deal with virtually any disturbance, be it Gaussian or not. My most recent work focuses on universal signal processing methods, so-named because they make no assumptions about the physical world, and, by learning from the signals themselves how they should best be processed, these methods apply broadly—universally. With both graduate and undergraduate students doing most of the work, we have developed a universal receiver for digital communications that not only provides nearly the best possible level of performance but also works in both wireless (cellular telephone, for example) and optical fiber communications systems. In addition to being universal, our methods are effective: The mathematics underlying our methods indicates that no other technique of the same ilk, having no built-in knowledge of what the disturbances are, can perform better.

The universality of our techniques becomes strikingly evident when we apply them to the auditory system. Here, acoustic information is represented by neurons using a random code: Repeating the same sound yields a different neural output that is random but does convey aspects of the sound. Our work has shown that single neurons are incapable of representing acoustic information. Thus, we need to understand the characteristics of the whole to fully appreciate how the brain processes acoustic information. While this fact seems obvious, neuroscientists did not know until recently how to measure how groups of neurons operate in concert. Our universal signal processing methods apply here as well, and we are currently honing our methods in preparation for analyzing neural activity. While my research colleague at the Texas Medical Center is preparing her multineuron experiments, my students have developed rather accurate computer simulations of how individual neurons operate. Until we analyze the data to learn the real story, we are trying various ways of interconnecting our simulated neurons, performing *in computo* experiments, and analyzing the results with our methods. We hope to determine not only the neural code but also how well the code works in our sound localization task.

*Professor of
Electrical and
Computer
Engineering and
Statistics and
Associate of Will
Rice College*

~
*George R. Brown
Award for Superior
Teaching, 1995*



Stephen L. Klineberg

*Professor of
Sociology and
Associate of Lovett
College*

*George R. Brown
Award for Excellence
in Teaching, 1996;
Amoco Teaching
Award, 1995, 1992*



In recent years, I have sought to develop a clearer understanding of contemporary social change by conducting systematic survey research in an unusually rich sociological laboratory called Houston, Texas. Supported by generous contributions from corporations, organizations, and individuals in the Houston area, our research has focused on three broad areas of inquiry:

Public Responses to Contemporary Social Change. For sixteen years, my undergraduate students and I have been conducting systematic annual interviews with representative samples of Houston-area adults. We have measured the ways area residents are responding to remarkable changes (in the ethnic composition of the population, in the nature of the American family, in the foundations of the U.S. economy) that are transforming Houston and American society and challenging traditional assumptions. The surveys record the continuities and changes that have occurred among area residents in economic outlooks and inter-



ethnic relations; in perspectives on education, poverty programs, crime, taxation, and other urban issues; in attitudes toward aspects of the "social agenda," such as abortion and homosexuality; and in religious beliefs and political orientations.

Ethnic Differences in Perspectives and Life Circumstances. During 1995, we carried out the most comprehensive study yet undertaken to explore the similarities and differences in experiences, attitudes, and beliefs among Houston's four largest ethnic populations. Using a carefully pretested questionnaire that had been translated into Spanish, Vietnamese, Cantonese, Mandarin, and Korean, systematic telephone interviews were conducted with scientifically selected representative samples of Harris County residents from the region's Anglo, African American, Hispanic, and Asian communities. A report on this research, titled *Houston's Ethnic Communities, Third Edition: Updated and Expanded to Include the First-Ever Survey of the Asian Communities*, was published in October 1996.

Environmental Concerns. In November 1996, we completed our fourth biennial Texas Environmental Survey in statewide research that has been monitoring since 1990 the public's changing understanding of environmental issues and exploring the determinants of individual differences with regard to six distinct dimensions of environmental concern.

I am at work this year on several additional journal articles, culminating soon (I hope) in a major book, tentatively titled *Making Sense of Our Times: Social Change and Public Opinion in a Revolutionary Age*, that will build on this multifaceted research to explore the ways Americans are responding to the challenges of our time.

William C. Martin

Shortly after arriving at Rice in 1968, I wrote an article for *The Atlantic Monthly* titled “The God Hucksters of Radio,” a study of the fundamentalist preachers I had listened to on super-power Mexican radio stations since I was a boy in South Texas. That was the first of more than two dozen articles I eventually wrote about various aspects of religious broadcasting. One of those articles was about Billy Graham, who thought the article to be accurate and fair and later invited me to write a history and assessment of his ministry, with his cooperation but free of editorial control. After six years of near-total immersion, I finished the full-scale biography of over seven hundred pages, *A Prophet with Honor: The Billy Graham Story* (William Morrow and Co., 1991).

My next research project also chose me. Diagnosed with prostate cancer in 1993, I found no book that laid out the options available to a man with this disease or that dealt with the quite personal aspects of facing the triple threat of incontinence, impotence, and death. Partly as therapy for myself and partly as a service to others in a similar situation, I wrote *My Prostate and Me: Dealing with Prostate Cancer* (Cadell and Davies, 1994). The book broke no new medical ground, but the three or four letters or phone calls I continue to receive each week from all over the world help me believe it was nonetheless a worthwhile effort.

As an aspect of my work on religious broadcasters, I inevitably wrote and spoke about the religio-political movement known as the Religious Right. While on leave from Rice during the 1995–96 academic year, I served as chief consultant for a public television documentary history of this movement and wrote the companion volume to the series. Both the book, published by Broadway Books, and the series were titled *With God on Our Side: The Rise of the Religious Right in America*, and both appeared in the fall of 1996. My current research focuses on the Religious Right’s involvement in and impact on various facets of education, such as home schooling, private schools, vouchers, influence in textbook selection and curriculum content, school prayer, and participation on local and state school boards. I expect this will occupy me for at least the next two years.

In addition to my work in the sociology of religion, I continue to teach criminology, and, if I can ever carve out two or three years of free time, I’d like to solve the problem of crime in America. Until I get that opportunity, we’ll just have to deal with it the best we can.



Harry and Hazel Chavanne Professor of Religion and Public Policy and Associate of Sid Richardson College

~
Nicholas M. Salgo Distinguished Teacher Award, 1995



Ellsworth Milburn

Professor of
Composition and
Theory and
Associate of Baker
College

Graduate Student
Association
Teaching Award,
1995

Although I do considerable research in the area of contemporary music, I do not publish in the field. Rather, my research area is music composition, and all my work is published. My catalog includes orchestral pieces, chamber music, solo pieces, vocal music, and a short one-act opera.

Over the past several years, I have worked on a symphony for the Chamber Orchestra of Pardubice in the Czech Republic, and an orchestration of a chamber piece, *Menil Antiphons*, which was originally commissioned by the Da Camera Society, premiered at the Menil Collection, and has been performed numerous times around the country and once in Australia.

Currently, I am working on two projects. The first is a recording for a CD to be released by Composers Recordings, Inc. (CRI) in June 1997. The disc will include two string quartets, *Menil Antiphons*, and two pieces for piano. This project also involved fund-raising, because in the field of contemporary music, very few recordings are done without outside funding. CRI is somewhat archival, in that what they record does not go out of print, and they subsidize subsequent pressings with any money earned from sales.

The second project is the composition of a third string quartet. This came about as a result of a consortium commission from the Blair String Quartet of Vanderbilt University, the Lark String Quartet of New York City and Ohio University, and the Cuarteto Latinoamericano of Mexico City and Carnegie-Mellon University in Pittsburgh. Application for funding was sent to Commissioning Music/USA, Meet the Composer in June of 1996. The purpose of this program is to guarantee multiple performances of a new work in geographically diverse areas of the country. Each quartet must play it twice, but I anticipate more performances, since the Blair Quartet has performed my Second String Quartet twice and the Lark Quartet has done it eight times.

There have been many "-isms" in the world of twentieth-century music. Among them are impressionism, modernism, neo-classicism, expressionism, serialism, neoromanticism, eclecticism, Aleatorism, indeterminacy, postmodernism, and the somewhat oxymoronic minimalism (oxymoronic because most minimalist pieces tend to be *very* long). The early twentieth-century composers who have most inspired me are Bartok, Stravinsky, Schoenberg, and Schoenberg's students, Berg and Webern. In that regard, I consider myself a modernist with expressionistic tendencies. On the other hand, I grew up with a love of eighteenth- and nineteenth-century music, so there is a streak of romanticism in my music as well. Add to that a fascination with jazz, which I think is embedded at least subliminally in my music, and eclecticism becomes a part of the fabric as well.



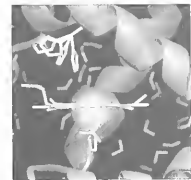
J o h n S. O l s o n

I believe strongly that undergraduate education and graduate research are closely linked, particularly in the biological sciences. Faculty need to be using the newest technology and participating in the latest discoveries. A genuine enthusiasm for science can only come from successful research experiences. Our job is to provide undergraduate majors and graduate students with the rigorous training, practical skills, and drive that are required for solving important agricultural, medical, and industrial problems.

For the past ten years, my laboratory has been using biophysical and genetic engineering techniques to examine how hemoglobin and myoglobin deliver and store oxygen in our bodies. These iron-containing proteins give blood cells and muscle tissue their red color. One of the most exciting aspects of this work is its application to the design and construction of hemoglobin-based blood substitutes. The long-range goal is to find a transfusable, biosynthetic alternative to donated blood.

In projects funded by the National Institute of Heart, Lung, and Blood Diseases, my laboratory is developing strategies for constructing oxygen delivery proteins. The background work for these strategies comes from basic biophysical studies being carried out in collaboration with George N. Phillips, Jr., professor of biochemistry and cell biology at Rice, and with Quentin H. Gibson, professor emeritus Cornell University and a distinguished faculty fellow at Rice. We have also established a long-range collaboration with Somatogen, Inc., of Boulder, Colorado, to produce "second generation" blood substitutes with greater stability, less interference with blood pressure regulation, and more specific pharmaceutical targets.

Occasionally, patients experience a mild increase in blood pressure when given hemoglobin-based blood substitutes. Together with scientists at Somatogen, we have constructed blood substitute prototypes that eliminate that side effect. The new protein designs are part of a joint patent application that describes how to reduce the reactivity of hemoglobins and myoglobins toward nitric oxide and other oxidizing agents. Nitric oxide is the molecule that regulates blood pressure in most animals, including man, and interference with its levels in blood vessels often leads to hypertension. Our success is a tribute to the power of using chemical mechanisms derived from basic research.



Our work is a direct product of the synergy provided by various interdisciplinary research institutes and graduate training programs at Rice, particularly the Institute of Biosciences and Bioengineering, the W. M. Keck Center for Computational Biology, and the Houston Area Molecular Biophysics Program. As a result, my students obtain practical cross-training in biophysics, biochemistry,

chemistry, chemical engineering, and computer science. In turn, I try to express my enthusiasm for this larger view of the biological sciences in my undergraduate lectures in biochemistry and physical chemistry for the biosciences. This is truly an exciting time for our undergraduate and graduate students. All the powers of the natural sciences and engineering are at their fingertips to solve important clinical, pharmaceutical, and physiological problems.



*Professor of
Biochemistry and
Cell Biology and
Associate of Hanszen
College*

~
*Amoco Teaching
Award, 1995*

Carol E. Quillen

Associate Professor
of History

George R. Brown
Award for Superior
Teaching, 1995,
1994, 1995; Amoco
Teaching Award,
1992

Although I now work on early modern (1350–1700) Europe, my way of thinking about historical research grew out of a project I undertook in college. As an American history major, I read with awe the analysis of the “puritan mind” written by Perry Miller. I was especially interested in puritan attitudes toward the past, in how puritans used history to give meaning to their own sense of mission as a “godly” people. Miller’s model of the puritan understanding of historical causation—the complex interplay that puritans saw in mundane events between the divine and the human, the past and the present, the origin of the world and its inevitable end—fascinated me, and I decided to read the histories of Massachusetts Bay written by puritan colonists.

Although I approached puritan histories looking for neat illustrations of Miller’s elaborate model, I wrote about how they all defied it and why and about the inability of any abstract model to represent the contingent circumstances surrounding a given historical event or the production of a given cultural artifact. I also developed an interest in how one age or culture represents others, whether these others are past “golden ages” or feared and dangerous enemies. Finally, the complexities of puritan theology, which resulted in part from a persistent grappling with the question of what it means to be human, demonstrated to me how differently different cultures have defined this term.

These questions—about the contingency of the past, about the ways in which differently located cultures represent others, and about what it means in a given society to be human—continue to inform my research. I now work on Italian Renaissance humanism, a movement that turned to the literature of ancient societies for its own cultural standards and, as a result, confronted both the contingency of the past and the instability of the term “human.” My forthcoming book, *Rereading the Renaissance*, is about how a fourteenth-century poet, Francesco Petrarca, used the writings of a fourth-century North African bishop, Augustine, to express his humanistic cultural ideals. It argues that humanism is best understood not as a stable set of intellectual commitments but as a set of contingent textual strategies that negotiate various relationships between the present and the past, and Augustine—himself no humanist—is the crucial source not for Petrarca’s cultural ideals, per se, but for the reading and writing practices through which he came to articulate and disseminate those ideals in specific contexts.

My current work examines how certain invocations of the term human within the humanist tradition have actually worked to produce differences among people, to include some and exclude others. By studying how such mechanisms of exclusion have functioned within the humanist tradition in the past, I hope to contribute to the ongoing search for true common ground.



P o l D. S p a n o s

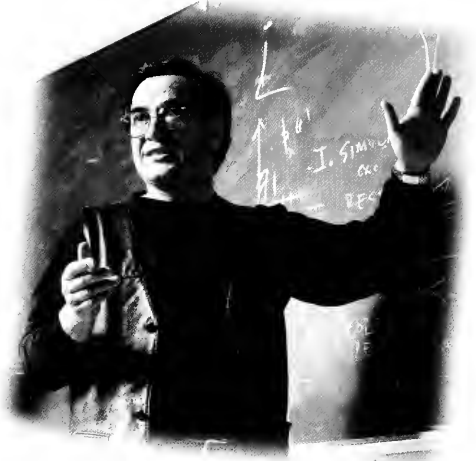
My research efforts focus on the dynamics of flexible or rigid structural and mechanical systems under a variety of loads, with particular attention given to nonlinear and probabilistic aspects. My research group extensively investigates signal processing concepts and techniques such as the recently popularized theory of wavelets. To a lesser extent, we are also interested in fatigue and fracture issues regarding modern composite materials.

I primarily use analytical and numerical methods that often require advanced scientific computational packages and supercomputers. The mathematical models used involve deterministic and stochastic differential equations, with ordinary or partial derivatives, and they are often incorporated in finite element or boundary element algorithms. In this regard, numerical experiments involving the behavior of a diverse class of complex engineering systems that exhibit randomness are often conducted by synthesizing numerically pseudorandom numbers by a digital computer and using mathematical codes to determine the system response. This approach is popularly known as Monte Carlo simulation.

A plethora of federal agencies and industrial organizations have supported my research. Through these funds, seventeen Ph.D. and eighteen M.S. students have received their degrees. Additionally, eight postdoctoral researchers have been funded.



My research contributions span a variety of engineering problems: earthquake-resistant design of tall buildings; flow-induced vibration of large structures in offshore engineering; simulation of the dynamic behavior of large systems in space robotics; certification of payloads in space shuttle missions; ride quality in vehicle engineering; directional drilling in petroleum engineering; and rocking isolation of historical monuments in architectural engineering. My research efforts have also had a healthy impact on the design of several engineering systems.



*Lewis B. Ryan
Professor of
Mechanical
Engineering and
Civil Engineering*



*George R. Brown
Award for Superior
Teaching, 1996,
1995*

R i c h a r d J. S t o l l

I want to begin with a confession: I decided to go to graduate school because of research, not teaching. Like most faculty, I became intrigued by research questions as an undergraduate, and these questions prompted me to go to graduate school. The teaching component of being a political scientist didn't really occur to me until I began leading discussion sessions while I was a graduate student.

Once I got into the classroom, I discovered two things. The first was that I really enjoyed the experience. After all, what I was trying to do was to explain to other people things that I found interesting. The second was that I found I was talking about the same things I discussed in my research, although usually at a more basic level. These two things are still true today.

Let me give a few examples of how my research and teaching overlap. One area of my research has involved building a computer simulation of an abstract world in which states are driven to take action by power politics considerations. Together with a colleague in Berlin, I have published a book and about ten journal articles based on this simulation. When I present power politics to both my undergraduate and graduate classes, I talk about the background of our work, and I also talk about some of the findings. But rest easy: I don't display a lot of computer printouts to the class.

Probably the best example of the overlap is in my course on American defense policy (I refer to this class as "Bombs and Rockets").

There is a very close relationship between some of the material I present to the class and my research on the topic: several of the chapters in a book I wrote began as lectures for the course. In fact, the whole idea for the book came about as a result of teaching the course and wanting to press further on some of the lecture topics. I've been doing additional research on national security policy as well, and again, much of my work in progress is based on lecture material from the course. In turn, as I do research and go beyond the lecture material, new findings and conclusions find their way back into the course. If you're interested, you can check out the class Web site: <<http://es.rice.edu/projects/Pol3378>>.

Not every piece of research I conduct has a close relationship to classroom material, but underlying both my research and my teaching is the desire to ask and answer interesting and important questions. That's why I got into this line of work, and that's what I hope to impart to my students, regardless of whether they are freshmen in my introductory international relations course or advanced graduate students in my research seminar.



*Professor of Political
Science and
Associate of Jones
College*



*George R. Brown
Award for Superior
Teaching, 1995;
Amoco Teaching
Award, 1995*



L a r r y S. T e m k i n

For many years, I have argued a thesis most find wildly implausible. Indeed, many believe my thesis *couldn't* be true. Perhaps they are right. But even if they are, I believe my arguments have profound implications for our understanding of the good, moral ideals, and the nature of practical reasoning.

Put simply, my thesis is that “all things considered/better than” is not a transitive relation. That is, I reject *transitivity*: the view that for any three alternatives A, B, and C, if, all things considered, A is better than B, and B is better than C, then A is better than C.

It is difficult to exaggerate the importance of my thesis. Many believe transitivity *must* be true, as a matter of logic. Others believe transitivity is a fundamental principle of consistency, bound up with the very concept of rationality. Transitivity is a key premise of expected utility theory, which underlies game theory, decision theory, and economics. Indeed, most results of economics depend on transitivity. Transitivity also plays a crucial role in everyday decisions. For example, normally in choosing between options—whether of products, careers, candidates, or whatever—if the first option is worse than the second, the first is removed from further consideration while the second is then compared with the third. But this procedure *presupposes* transitivity: There is no compelling reason to discard the first option if it might be *better* than a later option that itself is better than the second. Transitivity rules this possibility out.

Clearly, rejecting transitivity is a radical move with far-reaching implications. Yet I have developed powerful arguments threatening transitivity: My arguments appear in a series of articles and form the heart of my next book, tentatively titled *Rethinking the Good, Moral Ideals, and the Nature of Practical Reasoning*.

Besides my research, I have been heavily involved in launching the Rice University Lecture Series on Ethics, Politics, and Society. The series will bring in first-rate scholars who have helped illuminate the most pressing and fundamental issues of our day. It will afford a rare opportunity for Rice students, faculty, alumni, and friends to explore, with some of academia's brightest minds, our deepest moral, political, and social dilemmas. Too often, the major issues of our day are discussed in a climate of fear and ignorance, where rhetoric and name-calling take the place of deliberation and reasoned argument. Rice University will offer a forum where controversial issues are examined carefully, thoughtfully, and respectfully.

Many clamor for universities to play a greater role in citizens' moral education. The Rice University Lecture Series on Ethics, Politics, and Society will contribute toward that end, and in so doing be a boon to both Rice and the larger community.



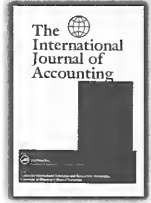
*Professor of
Philosophy and
Associate of Jones
College*

~
*George R. Brown
Award for Excellence
in Teaching, 1995;
George R. Brown
Award for Superior
Teaching, 1992*

*If an individual accepts a nontransitive
relation as deeply intransitive, the nation
will be a happy fabrication.*

Stephen A. Zeff

A “hot” topic of debate in the last twenty-five years has been the process by which accounting standards are set in different countries. As some have said, in an analogy with sports, “The way you score a game depends on the way the game is played,” and accountants score the game of enterprise. There are vested interests in the way enterprise is conducted.



Since the early 1970s, I have published articles and monographs on the evolution of the standard-setting process and the “political” lobbying of the standard setter in five Anglo-American countries: the United States, Canada, the United Kingdom, Australia, and New Zealand. In 1992, I published a major study, together with two Dutch researchers, on accounting regulation in the Netherlands. My twofold interest has been in documenting and explaining the self-interested lobbying that occurs in different countries on different topics and in comparing the standard-setting approaches used in the several countries. The Netherlands presents a special case, since hostile takeovers of companies, which are commonplace in the other five countries, are virtually unknown, owing to a bulwark of defenses available to managements. Company executives in the other five countries, without such defenses, count on the use of accounting figures in their arsenal during takeover battles. The absence of such a need in the Netherlands has been a factor contributing to a much lower intensity of self-interested lobbying. Furthermore, the absence of scandals and of an aggressive financial press have led to a more relaxed and flexible financial reporting environment. The insights from such research enable me to bring to my classes a rich background when explaining the differences in accounting standards found in one country compared with others.



*Herbert S. Autrey
Professor of
Accounting*



*George R. Brown
Award for Superior
Teaching, 1993*

In a related stream of research, I have been focusing on the evolution of a working relationship between the U.S. private-sector standard-setting body and the federal government. In one paper, I examine this relationship with the Securities and Exchange Commission, and in another I trace the series of attempts by key U.S. senators to prevent the U.S. Financial Accounting Standards Board from requiring companies to record the value of their executive stock options as an expense. As a part of my ongoing research, I have gathered considerable documentation for an in-depth study of the Accounting Principles Board, which was the U.S. standard-setting body from 1959 to 1973. The findings from such research are helpful in placing contemporary standard-setting controversies in a useful historical perspective.

I have also published studies on the thought and writings of several major accounting researchers and am currently working on a book on Henry Rand Hatfield.

As can be seen, the thrust of my research is historical and comparative, the results of which I regularly bring into my teaching and lecturing both in the U.S. and Europe.



1996 Financial Report of the University

Report of Independent Public Accountants

To the Board of Governors, William Marsh Rice University:

We have audited the accompanying consolidated statement of financial position of William Marsh Rice University (a nonprofit Texas corporation) as of June 30, 1996, and the related consolidated statements of activities and cash flows for the year then ended. These financial statements are the responsibility of the University's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of William Marsh Rice University as of June 30, 1996, and the changes in its net assets and its cash flows for the year then ended in conformity with generally accepted accounting principles.

As discussed in Note 1 to the consolidated financial statements, in 1996 the University applied newly established accounting and financial reporting standards for not-for-profit organizations. This adoption includes changes in accounting for contributions and marketable securities, as well as changes in the format of the financial statements. These standards were adopted retroactively, and the summarized comparative financial information presented for the year ended June 30, 1995, has been restated.

Arthur Andersen LLP

Houston, Texas
October 25, 1996

William Marsh Rice University
Consolidated Statement of Financial Position

AS OF JUNE 30, 1996

(With Summarized Financial Information as of June 30, 1995)

(Dollars in Thousands)

	<u>1996</u>	<u>1995</u>
ASSETS:		
Cash and cash equivalents	\$ 4,937	\$ 1,296
Accounts receivable and other assets	26,679	25,366
Loans receivable, net	6,298	6,090
Pledges receivable, net	27,148	32,774
Investments	1,859,097	1,550,725
Property, plant and equipment, net	<u>239,602</u>	<u>212,583</u>
<i>Total assets</i>	<u>\$2,163,761</u>	<u>\$1,828,834</u>
 LIABILITIES:		
Accounts payable and accrued liabilities	\$ 29,813	\$ 24,831
Actuarial liability for annuities payable	63,016	54,279
Federal student loan and other advances refundable	4,908	4,700
Assets held in trust for others	<u>9,669</u>	<u>8,546</u>
<i>Total liabilities</i>	107,406	92,356
 NET ASSETS:		
Unrestricted	1,614,567	1,354,857
Temporarily restricted	100,930	75,004
Permanently restricted	<u>340,858</u>	<u>306,617</u>
<i>Total net assets</i>	<u>2,056,355</u>	<u>1,736,478</u>
<i>Total liabilities and net assets</i>	<u>\$2,163,761</u>	<u>\$1,828,834</u>

The accompanying notes are an integral part of this financial statement.

William Marsh Rice University
Consolidated Statement of Activities

FOR THE YEAR ENDED JUNE 30, 1996

(With Summarized Financial Information for the Year Ended June 30, 1995)

(Dollars in Thousands)

	1996				1995
	Unrestricted	Temporarily Restricted	Permanently Restricted	Total	Total
<i>OPERATING REVENUES:</i>					
Endowment distribution	\$ 83,017	\$ 1,754	\$ —	\$ 84,771	\$ 80,415
Student tuition and fees	45,687	—	—	45,687	41,615
Grants and contracts	41,934	2,044	—	43,978	39,134
Gifts and pledges	12,038	3,984	—	16,022	11,565
Gifts and trusts released from restrictions	4,768	(4,535)	(233)	—	—
Auxiliary enterprises	20,520	—	—	20,520	19,722
Other revenues	6,656	575	31	7,262	6,408
<i>Total operating revenues</i>	<u>214,620</u>	<u>3,822</u>	<u>(202)</u>	<u>218,240</u>	<u>198,859</u>
<i>OPERATING EXPENSES:</i>					
Educational and general activities	176,845	—	—	176,845	166,212
Auxiliary enterprises expenditures	28,078	—	—	28,078	25,848
<i>Total operating expenses</i>	<u>204,923</u>	<u>—</u>	<u>—</u>	<u>204,923</u>	<u>192,060</u>
<i>Net operating income</i>	<u>9,697</u>	<u>3,822</u>	<u>(202)</u>	<u>13,317</u>	<u>6,799</u>
<i>NONOPERATING CHANGES:</i>					
Gifts and trusts for plant and endowment	—	8,825	16,146	24,971	22,218
Endowment gains and earnings, net of operating distribution	247,716	15,170	26,272	289,158	245,896
Net assets released from restrictions	1,325	(1,325)	—	—	—
Gain (loss) on disposal of property, plant and equipment	972	—	—	972	(579)
Present value adjustment on annuities payable	—	(566)	(7,975)	(8,541)	(6,335)
<i>Net nonoperating changes</i>	<u>250,013</u>	<u>22,104</u>	<u>34,443</u>	<u>306,560</u>	<u>261,200</u>
<i>NET INCREASE IN NET ASSETS</i>	259,710	25,926	34,241	319,877	267,999
<i>NET ASSETS</i> , beginning of year	<u>1,354,857</u>	<u>75,004</u>	<u>306,617</u>	<u>1,736,478</u>	<u>1,468,479</u>
<i>NET ASSETS</i> , end of year	<u>\$1,614,567</u>	<u>\$100,930</u>	<u>\$340,858</u>	<u>\$2,056,355</u>	<u>\$1,736,478</u>

The accompanying notes are an integral part of this financial statement.

William Marsh Rice University
Consolidated Statement of Cash Flows

FOR THE YEAR ENDED JUNE 30, 1996

(With Summarized Financial Information for the Year Ended June 30, 1995)

(Dollars in Thousands)

	<u>1996</u>	<u>1995</u>
CASH FLOWS FROM OPERATING ACTIVITIES:		
Changes in net assets	\$319,877	\$267,999
Adjustments to reconcile changes in net assets to net cash provided by (used in) operating activities-		
Depreciation	12,793	13,222
(Gain) loss on disposal of property, plant and equipment	(972)	579
Net realized and unrealized investment gains	(305,728)	(267,940)
Equipment gifts in-kind	(316)	(575)
Present value adjustment on annuities payable	8,541	6,335
Decrease (increase) in-		
Accounts and loans receivable and other assets	(1,521)	(292)
Pledges receivable	5,626	4,485
Increase in-		
Accounts payable and accrued liabilities	4,982	1,577
Contributions restricted for permanent investment	(36,235)	(28,656)
<i>Net cash provided by (used in) operating activities</i>	<u>7,047</u>	<u>(3,266)</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Proceeds from sales of investments	782,089	419,602
Purchases of investments	(784,733)	(410,887)
Proceeds from disposal of property, plant and equipment	1,067	-
Purchases of property, plant and equipment	(39,591)	(27,730)
<i>Net cash used in investing activities</i>	<u>(41,168)</u>	<u>(19,015)</u>
CASH FLOWS FROM FINANCING ACTIVITIES:		
Contributions restricted for permanent investment-		
Endowment	25,680	15,444
Plant	9,372	9,369
Trusts and other	1,183	3,843
Increase in federal student loan funds	208	227
Net increase (decrease) in assets held in trust for others	1,123	(10,067)
Payments on annuities payable	(399)	(536)
Increase in annuities payable resulting from new gifts	595	4,645
<i>Net cash provided by financing activities</i>	<u>37,762</u>	<u>22,925</u>
NET INCREASE IN CASH AND CASH EQUIVALENTS	3,641	644
CASH AND CASH EQUIVALENTS:		
Beginning of year	<u>1,296</u>	<u>652</u>
End of year	<u>\$ 4,937</u>	<u>\$ 1,296</u>

The accompanying notes are an integral part of this financial statement.

William Marsh Rice University

Notes to Financial Statements

JUNE 30, 1996

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES:

Basis of Presentation

The financial statements of William Marsh Rice University (the University) as of June 30, 1996, and for the year then ended have been prepared in accordance with generally accepted accounting principles. Accordingly, the accompanying financial statements have been prepared on the accrual basis of accounting and include the accounts of the University and all wholly owned subsidiaries. All material transactions between the University and its subsidiaries have been eliminated.

The summarized 1995 financial statements have been reclassified and restated to conform to the 1996 financial statement presentation as a result of the adoption of new accounting pronouncements discussed below.

New Accounting Pronouncements

During fiscal 1996, the University adopted Statement of Financial Accounting Standards (SFAS) No. 116, "Accounting for Contributions Received and Made," SFAS No. 117, "Financial Statements of Not-for-Profit Organizations," and SFAS No. 124, "Accounting for Certain Investments Held by Not-for-Profit Organizations," and applied these standards on a retroactive basis to July 1, 1994.

SFAS No. 117 establishes standards for external financial reporting by not-for-profit organizations and requires that resources be classified for accounting and reporting purposes into three net asset categories according to externally (donor) imposed restrictions or by law. SFAS No. 116 requires that unconditional promises to give (pledges) be recorded as receivables and revenues and requires the organization to identify contributions received for each net asset category in accordance with donor-imposed restrictions. SFAS No. 124 requires that the University's marketable fixed income and equity securities be valued at fair (market) value rather than cost. Other investments are stated at cost or amortized cost.

A description of the University's three net asset categories follows.

a. Unrestricted net assets include the following:

- (1) All revenues traditionally classified as unrestricted resources of the University, including tuition and fees, unrestricted gifts and income on unrestricted endowments, recovery of facility and administrative costs from grants and contracts, and auxiliary enterprise revenues.
- (2) Revenues related to sponsored research agreements which are considered exchange transactions.
- (3) Gifts and endowment income with donor-imposed restrictions if the restriction is anticipated to be met within the current operating cycle of the University.

- (4) Investments in plant assets stated at cost or fair value at the date of gift, less accumulated depreciation, computed on a straight-line basis over the estimated useful lives of the assets. Equipment is removed from the records at the time of disposal.
- (5) All expenditures of the University.

b. Temporarily restricted net assets include gifts and income from restricted endowments for which donor-imposed restrictions have not been met. The category also includes annuity and life income activity and pledges receivable for which the ultimate purpose of the proceeds is not permanently restricted.

c. Permanently restricted net assets include gifts, trusts and pledges which require by donor restriction that the corpus be invested in perpetuity and only the income be made available for program operations, and those gifts which the donors have specified are to provide loans to students.

Expirations of temporary restrictions on net assets or subsequent donor release of restrictions are reported as reclassifications between the applicable classes of net assets.

The effect of adopting SEAS Nos. 116, 117 and 124 on the July 1, 1994, previously reported fund balances is summarized as follows (in thousands):

July 1, 1994, fund balances	\$1,068,889
Adjustments-	
Marketable securities from cost to market	393,192
Pledges receivable, net	37,259
Life income and annuity funds	(26,388)
Government advances for student loans	(4,473)
July 1, 1994, net assets, as restated	<u>\$1,468,479</u>

Contributions

Contributions, including unconditional promises to give and irrevocable trusts held by others where the University is the beneficiary, are recognized as revenues in the period received or promised. Contributions restricted for the acquisition of land, buildings and equipment are reported as temporarily restricted revenues. These contributions are reclassified to unrestricted net assets as the assets are placed in service. Promises to give, subject to donor-imposed stipulations that the corpus be maintained in perpetuity, are recognized as increases in permanently restricted net assets.

Conditional promises to give are not recognized until the conditions on which they depend are substantially met. Contributions of assets other than cash are reported at their estimated fair value at the date of gift. Contributions scheduled to be received after one year are discounted at a rate commensurate with the risk involved. Amortization of the discount is recorded as additional contribution revenue.

Operating and Nonoperating Activities

The statement of activities reports the change in net assets from the University's operating and nonoperating activities. Operating activities do not include (a) gifts and trusts related to plant and endowment (including annuity and life income trusts), (b) release from restrictions of contributions restricted to the acquisition of buildings and equipment, (c) endowment earnings in excess of the University's operating needs as defined by University spending policy (see Note 3), (d) present value adjustment on annuities payable or (e) unrestricted bequests.

Investments

Investments are made within guidelines authorized by the Board of Governors. Investments are initially recorded at cost at date of acquisition or fair market value at date of donation in the case of gifts. Investments in marketable securities are stated at market value. All other investments are stated at cost or amortized cost. Property taxes and maintenance costs on certain undeveloped real estate interests in the endowment have been capitalized (accumulated costs of approximately \$2,700,000 at June 30, 1996).

Ownership of investments is recognized as of the trade date. Items traded which have not settled as of June 30, 1996, are recognized as accounts receivable or accounts payable.

Property, Plant and Equipment

The educational plant is stated at cost for purchased assets and fair market value at the date of donation in the case of gifts. The University depreciates its educational plant assets (excluding library books and works of art) using the straight-line method over their estimated useful lives. Repairs and maintenance of property, plant and equipment are expensed as incurred.

Annuity and Life Income Trusts, Gift Annuities and Agency Arrangements

Annuity and life income trusts arise from donated assets for which the University's subsidiary generally acts as trustee and periodically pays specified amounts to the designated beneficiaries. Generally, beneficiary payments are a fixed amount or percentage for annuity trusts and based on the income earned on the donated assets for life income trusts. At a date specified in the gift instruments, usually the beneficiary's date of death, ownership of the donated assets will transfer to the University and the beneficiary payments will cease. The University also receives gift annuities which arise from gifts for which the University takes ownership of the assets at the date of gift with an obligation to periodically pay specified amounts to designated beneficiaries. Assets held in these trusts and gift annuities are included in investments. Contribution revenues are recognized at the date the trusts or gift annuities are established after recording liabilities for the present value of the estimated future payments to be made to the donors and/or other beneficiaries. The liabilities are adjusted during the term of the trusts or gift annuity term for changes in the value of the assets, accretion of the discount and other changes in the estimates of future payments. The University has also received certain agency funds for which the University serves as custodian. Agency funds are included in investments with a corresponding liability (assets held in trust for others) in the accompanying financial statements.

Cash and Cash Equivalents

Cash and cash equivalents consist of resources, other than those assigned to investment managers for long-term investment, which are invested in money market funds and certificates of deposit with original maturities of 90 days or less.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from these estimates.

2. PLEDGES RECEIVABLE:

Unconditional promises are included in the financial statements as pledges receivable and revenue of the appropriate net asset category. Pledges are recorded after discounting to the present value of the future cash flows. Unconditional promises are expected to be realized in the following periods (in thousands):

In one year or less	\$12,734
Between one year and five years	12,075
More than five years	4,172
Less- Discount of \$1,425 and allowance of \$408	<u>(1,833)</u>
	<u>\$27,148</u>

Pledges receivable at June 30, 1996, have the following restrictions:

Permanently invested	\$11,000
Buildings	10,864
Support of University programs and activities	7,117
Less- Discount of \$1,425 and allowance of \$408	<u>(1,833)</u>
	<u>\$27,148</u>

5. *INVESTMENTS:*

Investments at June 30, 1996 and 1995, are as follows (in thousands):

	<u>1996</u>	<u>1995</u>
Marketable securities (cost of \$999,537 in 1996 and \$852,320 in 1995)	\$1,820,366	\$1,510,434
Developed real estate*	29,112	29,243
Undeveloped real estate*	6,306	6,623
Mortgage loans*	2,508	3,340
Oil and gas properties (net of accumulated amortization of \$25,815 in 1996 and \$25,675 in 1995)*	805	1,085
	<u>\$1,859,097</u>	<u>\$1,550,725</u>

*Stated at cost or amortized cost

Marketable securities in the table above include annuity and life income funds securities of \$113,246,000 (cost of \$69,857,000) and \$99,867,000 (cost of \$65,489,000) as of June 30, 1996 and 1995, respectively.

The University has adopted an endowment earnings distribution policy based on total investment returns, as permitted by the Texas Uniform Management of Institutional Funds Act. Under this policy, the Board of Governors approves an endowment earnings distribution which is based on the earnings distribution of the preceding year and the market value of the endowment assets. Sources of this distribution for each restricted endowment, in the order utilized, are (a) earned income as traditionally defined (interest, dividends and rents), (b) reinvested earned income from prior years and (c) capital gains where not prohibited by the gift document. Sources of this distribution for the unrestricted general endowment, in the order utilized, are (a) earned income as traditionally defined (interest, dividends and rents) and (b) capital gains.

The following tables summarize investment income and net gains for the years ended June 30, 1996 and 1995, by source and net asset classification (in thousands):

Investment	Year Ended June 30, 1996			Total	Year Ended
	Net Gains		Total		June 30,
	Income	Realized			Unrealized
Marketable securities	\$47,537	\$141,903	\$161,540	\$350,980	\$314,721
Oil and gas properties	8,906	119		9,025	4,335
Other investments	11,758	2,166		13,924	7,255
	<u>\$68,201</u>	<u>\$144,188</u>	<u>\$161,540</u>	<u>\$373,929</u>	<u>\$326,311</u>

Investment	Year Ended June 30, 1996			Total	Year Ended	
	Unrestricted	Temporarily	Permanently		Total	June 30,
		Restricted	Restricted			1995
Investment income	\$ 55,682	\$ 2,171	\$10,345	\$ 68,201	\$58,371	
Net gains on investments	275,051	14,750	15,927	305,728	267,940	
Total endowment gains and earnings	330,733	16,924	26,272	373,929	326,311	
Endowment distribution	83,017	1,754		84,771	80,415	
Endowment gains and earnings, net of operating distribution	<u>\$247,716</u>	<u>\$15,170</u>	<u>\$26,272</u>	<u>\$289,158</u>	<u>\$245,896</u>	

Endowment earnings, net of operating distributions, are reinvested under the University's endowment earnings distribution policy in the investment pool as net assets functioning as endowment.

The endowment earnings distribution includes investment income of \$620,000 and \$492,000 in 1996 and 1995, respectively, for operating funds which are invested in the investment pool (see Note 4).

4. NET ASSETS:

The University's unrestricted, temporarily and permanently restricted net assets are summarized as follows (in thousands):

	Year Ended June 30, 1996				Year Ended
	Unrestricted	Temporarily Restricted	Permanently Restricted	Total	June 30, 1995
Operating-					
Undesignated	\$ 4,583	\$ —	\$ —	\$ 4,583	\$ 3,418
Designated or restricted by donor, including pledges	9,737	24,290	—	34,027	37,753
Internally designated for specific programs	26,541	—	—	26,541	21,899
Net investment in plant	210,085	16,578	—	226,663	201,325
Endowment and designated for long-term investment, including pledges	1,362,555	57,193	298,625	1,718,373	1,429,033
Annuity and living trusts	—	2,869	40,400	43,269	40,325
Loans	1,066	—	1,833	2,899	2,725
	<u>\$1,614,567</u>	<u>\$100,930</u>	<u>\$340,858</u>	<u>\$2,056,355</u>	<u>\$1,736,478</u>

The Board of Governors has designated certain unrestricted and temporarily restricted net assets for long-term investment. Substantially all net assets designated for long-term investment and endowment assets participate in one common investment pool of marketable securities (see Note 3).

5. EDUCATIONAL PLANT:

Property and equipment of the educational plant at June 30, 1996 and 1995, are as follows (in thousands):

	Estimated Useful Lives		
	(Years)	1996	1995
Land	—	\$ 9,656	\$ 9,656
Buildings and improvements	20-50	177,144	174,923
Equipment, furniture and library books	2-20	173,092	157,967
Construction in progress	—	33,714	10,814
Less- Accumulated depreciation	—	(154,004)	(140,777)
		<u>\$ 239,602</u>	<u>\$ 212,583</u>

The University's charter requires that at least 10 percent of unrestricted endowment income be specifically set aside each year to fund a portion of plant improvements.

Certain capital projects and major maintenance projects for auxiliary enterprises are funded with interest-bearing advances from unrestricted net assets. The advances for capital and major maintenance projects bear interest ranging from 4 percent to 19 percent.

6. EXPENDITURES:

Educational and general expenditures of the University by major functional category for the years ended June 30, 1996 and 1995, are as follows (in thousands):

	1996	1995
Instruction and departmental research	\$ 80,690	\$ 78,307
Sponsored research	37,123	32,883
Library	7,576	7,398
Scholarships and fellowships	22,494	20,063
Student services	6,627	6,041
General administration	12,577	11,830
Institutional development and other	9,758	9,685
<i>Total educational and general</i>	<u>\$176,845</u>	<u>\$166,212</u>

The above table includes depreciation expense of \$12,348,000 and \$12,802,000 and operations and maintenance expense of \$13,815,000 and \$14,524,000 for the years ended June 30, 1996 and 1995, respectively, which were allocated to the major functional categories based on space usage.

7. RETIREMENT PLANS:

Substantially all employees are eligible to participate in defined contribution retirement plans which are administered by outside agencies. The contributions of the University and the plan participants are applied to annuity contracts. The University's contributions to these plans of \$7,100,000 in 1996 were recorded as expenditures in the appropriate functional category.

8. COMMITMENTS AND CONTINGENCIES:

There are several suits and claims pending against the University, the effect of which cannot be estimated at this time; however, officials of the University and legal counsel believe that the ultimate uninsured liability, if any, will not be material to the University's financial position and activities.

The University was committed under contracts at June 30, 1996, for capital improvements and major maintenance of approximately \$26,686,000 to be financed primarily from gifts and net assets designated for long-term investments. Other commitments of \$4,969,000 were also outstanding at June 30, 1996.



The Rice University Board of Governors

(As of November 4, 1996)

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