

The Philosophical Society of Texas

PROCEEDINGS

1986




The Philosophical Society of Texas




PROCEEDINGS
OF THE ANNUAL MEETING
AT AUSTIN

DECEMBER 5 and 6, 1986

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AUSTIN
THE PHILOSOPHICAL SOCIETY OF TEXAS
1987



THE PHILOSOPHICAL SOCIETY OF TEXAS FOR THE COLLECTION AND DIFFUSION OF KNOWLEDGE was founded December 5, 1837, in the Capitol of the Republic of Texas at Houston, by MIRABEAU B. LAMAR, ASHBEL SMITH, THOMAS J. RUSK, WILLIAM H. WHARTON, JOSEPH ROWE, ANGUS MCNEILL, AUGUSTUS C. ALLEN, GEORGE W. BONNELL, JOSEPH BAKER, PATRICK C. JACK, W. FAIRFAX GRAY, JOHN A. WHARTON, DAVID S. KAUFMAN, JAMES COLLINSWORTH, ANSON JONES, LITTLETON FOWLER, A. C. HORTON, I. W. BURTON, EDWARD T. BRANCH, HENRY SMITH, HUGH MCLEOD, THOMAS JEFFERSON CHAMBERS, SAM HOUSTON, R. A. IRION, DAVID G. BURNET, and JOHN BIRDSALL.

The Society was incorporated as a non-profit, educational institution on January 18, 1936, by George Waverley Briggs, James Quayle Dealey, Herbert Pickens Gambrell, Samuel Wood Geiser, Lucius Mirabeau Lamar III, Umphrey Lee, Charles Shirley Potts, William Alexander Rhea, Ira Kendrick Stephens, and William Embrey Wrather. December 5, 1936, formal reorganization was completed.

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Proceedings edited by Dorman Hayward Winfrey

attendance was understandable. However, for the great majority of irregular attendees, no apparent reason for failure to attend was evident.

The resolution to be presented next year would attempt to free up those active member positions not now participating in the meetings to allow others interested in regular attendance to be included in the active membership of the Philosophical Society of Texas.

A resolution was adopted by the board of directors for consideration on the agenda of the business meeting at the 1987 annual meeting.

The resolution is drafted to change the by-laws to add a third category, *associate member*. The current by-laws now provide for active members and emeritus members, with only the active members having the privilege of voting at the business session.

The new category of associate member would have the privilege of attendance at meetings without having to meet any requirements for regular attendance and also the privilege of receipt of publications upon payment of dues. In the listing of membership in the annual *Proceedings*, there would be no differentiation between active and associate members.

The resolution would permit any active member encountering difficulty in regular attendance to elect associate member status, losing only voting privileges at the business meeting. The resolution would provide that any member who fails to attend three consecutive annual meetings, beginning with the annual meeting in December 1987, and continuing thereafter, shall automatically revert to associate member status. Return to active member status may occur only by action of the board of directors upon request by the member for continuation or reinstatement.

This resolution is presented today as information only.

Officers elected to serve for 1987 were Elspeth Rostow, president; John Clifton Caldwell, first vice-president; J. Chrys Dougherty, second vice-president; Mary Joe Carroll, treasurer; and Dorman H. Winfrey, secretary.

Following the business session, members and guests were invited by Lieutenant Governor and Mrs. Hobby for a reception in the **Great Room**.

ATTENDANCE AT THE 1986 MEETING

Members registered included: Miss Duff; Mesdames Brinkerhoff, Carpenter, Huey, Johnson, Knepper, Pape, Rhodes, Rostow, Scott, Wilson; Messrs. Thomas D. Anderson, Henry M. Bell, Jr., Paul Gervais Bell, Bennett, Beto, Blanton, Boyd, Brandt, Jack L. Butler, Caldwell, Carmack, Edward Clark, Collie, Cook, Cooper, Crim, Crook, Daniel, Denius, Dick, Doty, Dougherty, Doyle, Charles W. Duncan, Jr., Fehrenbach, Fisher, Durwood Fleming, Jon H. Fleming, Frantz, Garrett, William L. Garwood, Gray, Greenhill, Hall, Hardesty, Hargrove, Harrington, Harvin, Hershey, Hobby, Hoffman, Holtzman, Inman, Kelsey, Harris L. Kempner, Sr., Dan E. Kilgore, William J. Kilgore, King, Kozmetsky, Law, Lawrence, LeMaistre, Levin, Lindsey, Locke, Lord, Madden, Maguire, Margrave, Mark, McCorquodale, McGinnis, McKnight, Middleton, Mills, Newton, Pate, Herman P. Pressler, Jr., Herman P. Pressler III, Risher Randall, Reavley, Seybold, Shepperd, Shilling, Shuffler, Frank C. Smith, Jr., Sparkman, Sutton, Trotti, Vandiver, Ruel C. Walker, Watkins, Wells, Wheeler, Whitcomb, Wilson, Winfrey, Worden, Wozencraft, Charles Alan Wright, Yarborough.

Guests included: Mrs. Thomas D. Anderson, Dr. and Mrs. A. J. Ballantyne, Mrs. Henry M. Bell, Jr., Mrs. Paul Gervais Bell, Mrs. Jack S. Blanton, Mrs. Howard Boyd, Mrs. Edward N. Brandt, Jr., Bob Brinkerhoff, Mr. and Mrs. George Bristol, Mrs. Jack L. Butler, Mrs. Clifton Caldwell, Mrs. George Carmack, Patsy Chaney, Mrs. Edward Clark, Key Collie, Mrs. Marvin K. Collie, Mrs. C. W. W. Cook, Mrs. John H. Cooper, Mrs. William R. Crim, Mrs. William H. Crook, Mrs. Price Daniel, Mrs. Frank W. Denius, Mrs. E. William Doty, Mrs. J. Chrys Dougherty, Mrs. Gerry Doyle, Mrs. Charles W. Duncan, Jr., Ambassador and Mrs. Albert Fay, Mrs. T. R. Fehrenbach, Mrs. Joe J. Fisher, Mrs. Durwood Fleming, Robert Flynn, Mrs. Jenkins Garrett, Mrs. W. St. John Greenwood, Mrs. Ruth Goddard, Mrs. John E. Gray, Mrs. Joe R. Greenhill, Mrs. Dorris Collie Hall, John Hamilton, Mrs. Robert L. Hardesty, Mrs. James W. Hargrove, Mr. and Mrs. James W. Hargrove, Jr., Mrs. M. T. Harrington, Mrs. William C. Harvin, Mr. and Mrs. Tom Hatfield, Mrs. Jacob W. Hershey, Mrs. William P. Hobby, Mrs. Philip G. Hoffman, Mrs. Wayne H. Holtzman, Dr. and Mrs. John P. Howe III, Mr. and Mrs. C. M. Hudspeth, Eugenia Hunt, Mrs. B. R. Inman, Mrs. Mavis P. Kelsey, Mrs. Harris L. Kempner, Sr., Mrs. Dan E. Kilgore, Mrs. William J. Kilgore, Mrs. John Q. Taylor King, Mrs.

George Kozmetsky, Mr. and Mrs. Jim Krier, Mr. and Mrs. H. O. Kunkel, Mrs. Thos. H. Law, Mrs. F. Lee Lawrence, Dr. Duane Leach, Mrs. Charles A. LeMaistre, Mrs. William C. Levin, Mrs. John H. Lindsey, Mrs. John P. Locke, Mrs. Grogan Lord, Mrs. William J. Lowman II, Dr. Elizabeth MacNaughton, Mrs. Wales Madden, Jr., Mrs. Jack R. Maguire, Mrs. John L. Margrave, Mrs. Hans Mark, Dr. and Mrs. Lee McAlester, Mrs. Malcolm McCorquodale, Mrs. Robert C. McGinnis, Mrs. Joseph W. McKnight, Jane McWhorter, Mrs. Harry Middleton, Mrs. Ballinger Mills, Mrs. Jon Newton, James F. Pape, Mrs. A. M. Pate, Jr., Mrs. Herman P. Pressler, Jr., Mrs. Herman P. Pressler III, Herman P. Pressler IV, Mrs. Risher Randall, Mrs. Thomas M. Reavley, Alec Rhodes, Walt Rostow, Mr. and Mrs. David Rude, Margaret Scarbrough, Mary Helen Seibt, Mrs. William D. Seybold, Mrs. John Ben Shepperd, Mr. and Mrs. Max Sherman, Mrs. Roy B. Shilling, Jr., Mrs. Ralph H. Shuffler, Mrs. Frank C. Smith, Jr., Dr. and Mrs. Harlan Smith, Mrs. Robert S. Sparkman, Josephine Sparks, Ada Sullivan, Mrs. John F. Sutton, Jr., Mary Taylor, Mr. and Mrs. Robert Teten, Mr. and Mrs. G. Felder Thornhill, Charles Townsend, Mrs. Robert S. Trotti, Mrs. Frank E. Vandiver, Mrs. Ruel C. Walker, Mrs. Edward T. Watkins, Mrs. Peter Wells, Mrs. John Archibald Wheeler, Mrs. Gail Whitcomb, Will E. Wilson, Mrs. Dorman H. Winfrey, Mrs. Sam P. Worden, Mrs. Frank M. Wozencraft, Mrs. Charles Alan Wright.

TEXAS: PAST, PRESENT, FUTURE/1836-2036

TEXAS AND TEXANS:
A HISTORICAL PERSPECTIVE

T. R. FEHRENBACH

Speaking on the history of Texas in fifteen minutes when the last book I did on the subject went 719 pages may be impossible. It would take me fifteen to twenty minutes just to tell you about the geological formation of the land, but I want to throw out a couple of very broad themes about Texas that I imagine this conference will keep referring to or coming back to.

One is the history, the past of Texas, which has brought us to this moment in place and time. I look upon history in perhaps a slightly non-American way. It is one of my theses that the Texan, among other things, is the most European of American peoples, and I see history as primarily in the movement and struggles of peoples. And Texas has a history. Most states merely have records of economic development. And this is a profound difference, because history makes consciousness; it makes an awareness of place, time, soil, and ancestry.

The themes of Texas history you all know. But out of revolution, out of nationhood, out of wars, out of frontiers, out of direct involvement of Indian troubles (all of which, incidentally, involved the Texas population to a far greater degree than subsequent events have involved the American population as a whole), out of these things developed a definite Texan consciousness.

It is hard to say what this is. It is hard to say what is a Frenchman, what is a Russian, or what is a Mexican. You can go on for hours. There is a continuing intellectual debate in the universities of Mexico as to what a Mexican is, for example. We may not know exactly what a Texan is, but from the Alamo to San Jacinto, from the Lone Star flag, from the Rangers, the Texas Navy, the cattle drives, the Indian wars, and Spindletop, from all came the stuff of legend, from all came a mythos, from all came a frontier experience which very definitely melded the bulk of our native population into very much a people.

I am talking here about the Anglo consciousness and the Anglo mind. Clearly, there are other traditions. There is a black tradition, which is somewhat at variance, at least outside of this tradition.

There is a Hispanic tradition, which sometimes blends with this and sometimes does not. Both of which are, of course, products of history and both of which are part of our continuing history, presenting problems which will be resolved or not resolved in the future.

Beyond this theme of struggle is a successive movement of peoples. In the book I wrote on Texas, I very clearly and consciously made the land the hero. You have probably heard that phrase "In the beginning, before any people, was the land," which I copped out of the Bible. (If you are going to steal something, steal something good.) Well, that established the land. I see that what endures in Texas is the land. This may affront some people who are mired in their own ethnocentrism or mired in the present, like seeing today as a culmination of all past history. I tend, as a historian, to see the present as a strange interlude between the past and the future.

Look at Texas history this way: It is a movement of peoples from time immemorial. First there was the old race, whom archaeologists call Paleo-Americans, then what we call the American Indians (I do not like to call them original Americans because that is propagandistic — they were *not* the original Americans), then the Spanish, the Spanish-Mexicans, followed by the Anglos and others. Successive movement into this place we call Texas over thousands of years.

If you look at this broad movement you will see that the success of each culture depended very much on the adaptation each one made to the land, to the world, and to the times they lived in. If what we call today the Anglo-American culture and civilization won out over the others and is today dominant, regardless of where the blood in our veins came from, it had one thing, and I go back to Walter Webb on this: it was the most adaptive. The old American culture was not adaptive; it went thousands of years and never made spearpoints in any way but one. The American Indian culture was not adaptive; it reached a certain level and then stayed there. Nor was the Mexican-Spanish culture tremendously adaptive; it made one adaptation to the land and then could make no others.

So, you see, in Texas we have had successive economies, something to remember if you are thinking in terms of gloom, disaster, and Chapter 11 tomorrow. The first economy of Texas, and for thousands of years, was a hunting and gathering one. Then, with a little subsistence, agriculture. Finally, the advent of civilization brought a colonial type of economy to Texas. By colonial I mean producing goods or products to be marketed somewhere else in a market in which the producers usually had absolutely no control.

My background does go back to the land, though I never saw a moldboard plow, and I am acutely aware, as many urban Texans today are not, of the fact that we have no control over prices. Cattle prices are good or cotton prices are poor, and these have always had enormous effects, but we have had a colonial type economy. Texas in many respects has been no different from many areas of the third world in the sense of its bedrock economy. The first aspect of this was cotton. Cotton was king. It produced all the great fortunes that were made before the War Between the States. Then we had the cattle economy, which again brought money into the state, gripped the consciousness, and put the few Yankee dollars we had in the postwar period, followed by the petroleum economy.

All of these economies were land-based. They were dependent upon the land. They created an agricultural and a mining complex in Texas, and in a very real sense created the society. I think you can take political scientists or cultural anthropologists from anywhere in the world (and I've done this) and show them a few years ago how most Texans made their livings and where the impetus came from — the money, the hierarchies of power, and so forth — and I've had Swiss, Germans, and Turks immediately call it a conservative society, probably politics of the right, because they stem from this type of situation.

Our history has been one of successive land rushes, since in effect the economy was always based on the land or the products of the land. Even our manufacturing up until the present has largely been dependent upon processing. What we call industry in Texas often is not true industry. We tend to shell pecans, crack petroleum, bail cotton, and call that industry.

Most nineteenth-century settlers from which the bedrock of this state is still formed came here for one thing — land. The struggle for this land, which still goes on, made most of us a race of survivors. This consciousness of being descended from survivors certainly creates and explains many of the attitudes of current Texans, which are different. They are anything but the herd instinct. They are anything but the communal instinct. One of the reasons is that the frontier, and the fact that we were continually winnowed as a people, created this attitude and worship of self-reliance.

Now, finally, look into all of these things as successive transitions — new peoples coming in. You would have counties in Texas like Washington County, the most populous county in Texas following the Civil War, though without any cities. The plantation economy

that had supported it collapses. What comes in? German and Czech immigrants. You can't find them in the rolls; if you try to find Czech immigrants in Texas you will never find them. You will find Austrians. Kids today in school don't understand this because they have never been told that Czechoslovakia was part of the Austrian empire before 1918. Thousands upon thousands of Austrians came to Texas, but they were mostly out of the Slavic portions of the Austrian empire.

So you had this transition of peoples from the frontier made pretty much into one mindset. Cotton gave way in large areas of the state to cattle. Cattle gave way to oil as the dominant thing, but none of them ever disappear. Texas remains big in cotton; cattle never did away with cotton as a whole state; petroleum came in and they complemented one another.

In a picture book I published I show a photo of a cottonfield with cattle moving through it and an oil well in the center. Of course, this was the best of all worlds until this year.

Look at these transitions and what you will find is a continual adaptation, though up to now all of them have been based upon the resources of the soil — all of them. None ever completely supercedes the other, but each in a sense complements the other, and I think this will continue.

We now are in a situation in which we clearly face new frontiers. That is not new; we have had this transition several times. We perhaps will need a new technology. We have always needed a new technology. The Anglo Texan could not defeat the American Indian until the technology of the repeating rifle and the revolver was imported. The Texan could not defeat the prairie west of the 98th meridian until the windmill was invented. The Texan could not improve his stock and move beyond the old, colorful, but very inefficient business of free range without the invention of barbed wire. Nor could he do what he is doing now in the cattle business without biogenetics in that line.

So we are always facing new techniques; we are always facing new frontiers. And I believe that, as always, it will be the adaptability of the people, as well as their toughness, that prevails.

THAT ENDURING SOUND OF TEXAS MUSIC — COUNTRY AND WESTERN

CHARLES R. TOWNSEND

*If you're gonna play in Texas, you gotta
have a fiddle in the band.*

— Lyrics from a popular recording by Alabama

I mentioned to a colleague that I had been thinking about the reasons why country and western music has had such an enduring appeal in Texas. He quickly suggested that the music appeals to Texans for the same reasons it appeals to people in his native state of Alabama. They like it. He is obviously correct; since World War II, country and western music has grown steadily in popularity across the United States and throughout the world. Millions believe it is good music, and they enjoy it simply on that basis.

There are a number of reasons for this. Since the early fifties, young people have dominated record buying and have, to a large extent, determined the direction of American entertainment. That group developed a taste for folk-rooted music such as country and rock. They have preferred the honesty and realism of country and western as well as rock and roll to the more romantic, escapist music of the big bands and pop music in general. Never plagued by depression and world wars, the generation since 1950 has been able to deal with realism in its music. Country music has been ideal for such tastes. The music has not only been of entertainment value; because of its realism, country has also been of great historical value. It is a valuable primary source for the social history of the United States.

Another reason country and western music has broad appeal is the quality of musicians now in the profession. Musicians in other areas of American music, especially those who played in the big swing bands, took great pleasure in belittling the country musicians and the music they performed. Country and western has always had some excellent musicians, but today they are much more numerous. They are no longer "hillbillies" who can play only simple chords. In Nashville and other centers of country music, one can find some of the best musicians in the world, artists who can play everything

from jazz to Beethoven — and play it all well. The music is entertaining, is relevant in satisfying the social needs of its audience, and is performed by artists of highest quality.

Having agreed to all of the above explanations of why the music has broad national acceptance, there nevertheless appear to be reasons why country and western music has had an enduring appeal for Texans and Texas musicians in particular.

The title of a song from a popular Broadway musical is a key to unlocking this phenomenon in the history of Texas music. In the hit show *Fiddler on the Roof*, Zero Mostel, as Tevye, sang the delightful opening song entitled "Tradition." Musically, the people of Texas, like the Russian Jews in the village of Anatevka, are bound by tradition. Both *Fiddler on the Roof* and the history of music in Texas illustrate the powerful force of tradition.

Fortunately, for my purpose of exploring facets of Texas music, *Fiddler on the Roof* opened not only with the song "Tradition" but with a fiddler seated precariously on a roof. The musical tradition that has been so important to the enduring appeal of country and western music in Texas also began with a fiddle and a man.

In the beginning, the music that was to be the basis for what was later called country and western in Texas was a mixture of different types of American folk music and has always been identified with one of America's most popular folk instruments—the fiddle. According to one of the most respected sources, Professor Bill C. Malone, fiddle music is among the purest forms of folk music.¹ Practitioners of the instrument used it to play just about every form of folk and popular music, from breakdowns to waltzes, ballads to schottisches, polkas to marches, reels to rags, blues to hymns. The fiddle was always in the vanguard of the American frontier; it was popular, versatile, and mobile. Indeed, it was the most loved and feared of nineteenth-century musical instruments. The people on the frontier loved it but called it the "devil's own instrument." For many people, proof of its demonic nature lay in the fact that up to the Civil War and beyond, it was a favorite instrument with the blacks. The "nigger fiddle" was part of the "low-down" culture of the black race. By the time the American frontier had reached the western edge of Texas, however, the blacks had begun to abandon the instrument. White Texans never have.

In Texas the fiddle continued to evoke ambivalence. It was a favorite of the people, but its use in Texas fulfilled all the dire predictions associated with the satanic instrument. Texans appeared to

capture the worst of two worlds, black and white, by turning the fiddle into an instrument that played white frontier folk music with the swing of "nigger music." Scholars have discovered there is a distinct Texas fiddle style and that it is the most sophisticated of all fiddle music. Though whites dominated fiddle music in the Lone Star State, Texas Negroes also played it long after most of the rest of their race had given it up. Older New Orleans jazzmen, black musicians seventy-five to nearly a hundred years of age, have told me that long after Negroes quit playing the "violin" in the Mississippi Delta, East Texas blacks still loved the fiddle. The Texas fiddle style is probably another of the musical areas where poor blacks and whites, living segregated but in the same culture, inadvertently collaborated in developing a unique style and sound. The Texas fiddle swung and still swings today.

Tradition — the fiddle in Texas. A popular contemporary singing group, Alabama, illustrates the weight and importance of tradition in Texas music when they sing "If you're gonna play in Texas, you gotta have a fiddle in the band." Furthermore, Alabama suggests you would be wise to play "Faded Love" with that fiddle.

"Faded Love" suggests the man who wrote the song and played a leading role in the development of the Texas fiddle tradition, Bob Wills.² Born James Robert Wills on March 6, 1905, in the "black belt" of East Texas near Kosse, he learned fiddle music from both sides of his family, combined it with musical idioms of the blacks — ragtime, blues, jazz — and began to play music that was later labeled western swing.³ Just who or how many others were playing the same style is not known. Doubtless there were others, both black and white, who played in a similar, or even identical, style. The problem for historians has been that there is little evidence of the music elsewhere before Wills introduced it to the public over radio stations in Fort Worth.

When Bob Wills arrived in Fort Worth in the fall of 1929, most musicians throughout the state of Texas were playing popular songs. Then Wills began playing on KTAT and KFJZ, and music in Fort Worth changed drastically.⁴ Indeed, after Wills persuaded W. Lee O'Daniel, general manager of Burrus Mill and Elevator Company, to sponsor his band over WBAP and the Southwest Quality Network, music throughout all of Texas and the Southwest began to change. In Texas, Oklahoma, New Mexico, Arkansas, and Louisiana, audiences listened intently at noon each day for a pluck on Wills's fiddle and the announcement: "The Light Crust Doughboys are on the air."

This was the beginning of a musical sound that was distinctively "Texas music."

Though still in his teens, Leon McAuliffe was already beginning a career as a professional musician and was therefore sensitive to styles and trends in popular music. McAuliffe first heard Bob and the Light Crust Doughboys in 1931 over the Southwest Quality Network affiliate in Houston, KPRC. "The people in Houston had never heard anything like it," McAuliffe reflected. "There was no western music there at the time."⁵

Bob Wills never let people forget his musical and geographical roots. He called his famous band Bob Wills and His Texas Playboys; and since he arrived in Fort Worth in 1929, one of Texas's most important cultural exports has been its music. Ed Ward, writing in the *Rolling Stone Illustrated History of Rock and Roll*, declares, "Western Swing, the first distinctively Texas music to gain national popularity . . . was as polyglot as it was unmistakable. . . . The idiom's best known exponent [was] Bob Wills."⁶

Though Bob Wills always claimed he did not play country music, he had helped to lay the basis for the development of popular country and western music in his native state.⁷ The "western" part of country and western certainly had reference to his western swing as it did to cowboy music in general. By playing the leading role in the development of western swing, Bob Wills had begun a tradition in Texas music.

Since Bob Wills's style was one of the first to be recognized as distinctively Texan, and since his music gained national recognition as such, two things quite important to the future of Texas music resulted. First, millions of Texans and Southwesterners grew accustomed to the sound of country and western music. At least four generations of Texans have learned to love and appreciate it. Much of modern country music is little different from what listeners of today's great-grandparents heard in the late twenties and early thirties. In short, there is a long tradition in Texas of listening to country and western music.

Secondly, since at least the late 1920s, musicians in Texas have grown up to the sound of country and western. The Light Crust Doughboys, whose specialty was western swing, broadcast on radio for nearly a quarter of a century and did not go off the air until the 1950s. Many other groups played a similar style. Why? Because it was successful in Texas and the Southwest, and Bob Wills and others were outselling most recording artists, making movies, attract-

ing crowds in excess of five thousand a night, and getting rich. There was a tradition in Texas — the if-Bob-can-make-it-so-can-I attitude.

Ernest Tubb was one of the first Texans to make it. Ed Ward saw Tubb's work as an extension of what Wills and Milton Brown had begun in Fort Worth. "Bob Wills," he wrote, "introduced drums, electric guitar and a horn section into country and western, and his successors, such as Ernest Tubb, made honky-tonk dance tunes one of the staples of modern Nashville."⁸ Though the styles and lyrical content of the music of Wills and Tubb were quite different, Tubb and numerous other Texas stars in country and western always reflected musical traditions begun in Fort Worth in the late twenties and early thirties. Their use of stringed instruments and folk-rooted lyrics, as well as their styles in general, reveals the enduring influence of the early Texas tradition.

Still another reason for the enduring sound of country and western music in Texas is the fact that some of the greatest stars in the entire history of the genre have been either native Texans or spent their formative years in the state. Men and women everywhere can identify more closely with people and music of their own state. For example, many country and western singers from Texas, as well as many elsewhere, often use lyrical statements that refer to Texas, its people, its music, and its way of life. No other state, except perhaps New York, has been mentioned in song as much as Texas. This is true in all popular music but especially country and western, where so many performers sing of their native states.

In a brief essay such as this, I can mention only a few of the stars of country music from Texas. The list, though incomplete, is impressive and illustrates the importance of Texas in country and western and vice versa. Vernon Dalhart, Stuart Hamblen, Gene Autry, Al Dexter, Floyd Tillman, Woodward Maurice Ritter, Goldie Hill, Lefty Frizzell, Johnny Horton, Jim Reeves, Ernest Tubb, T. Texas Tyler, and Ray Price were a few Texans who were stars in country music from the 1920s to the 1960s. In recent years, Texans have become some of the superstars of the medium; these include George Jones, Roger Miller, Kris Kristofferson, John Denver, Mac Davis, Barbara Mandrell, Tanya Tucker, the Gatlin Brothers, Moe Bandy, Mickey Gilley, Johnny Rodriguez, Don Williams, Michael Murphey, Johnny Gimble, George Strait, Waylon Jennings, and Willie Nelson.⁹

Why has Texas produced so many distinguished country artists? Tradition again has had a good deal to do with this fact. During

the past fifty years, so many performers from Texas have excelled in the country-western field that young artists in each new generation see no reason why they too cannot succeed. Texas musicians seem to take success for granted. Another reason that Texas produces musically talented people, strange as it may first appear, is the presence of so many blacks in the state. Though few blacks have been country stars, their presence in such great numbers in Texas has inspired white singers and musicians. It is a historical fact that wherever there is a heavy concentration of blacks, society in general will be more musically creative. The more blacks in an area, the more musically creative the whites. The opposite is true: wherever there are few blacks, the whites are rarely, if ever, musically creative.

Finally, I suggest that the proliferation of musical creativity in Texas, among both blacks and whites, has also resulted from the widespread religious fundamentalism in the Lone Star State. Conservative as they have been in many ways, fundamentalists have been ultra-liberal to radical in church music. Most religious fundamentalists, particularly Pentecostals, have been more uninhibited in singing style, more open to musical experimentation in their church worship, and unafraid to pour out their souls and emotions in their singing. In short, the fundamentalists have always been ahead of their time in church music. The more staid and musically conservative churches which claim to be more "worshipful" in their church music have been influenced by the spirited, freer style of the fundamentalists, though most of them are unaware of that influence. Musically, they are now beginning to use some of the techniques and styles the fundamentalists used fifty years ago. Both directly through musical style and indirectly through artists who grew up on this religious music, fundamentalism has had a profound impact on popular music in general and country and western in particular. This impact can never be fully estimated or appreciated.

For these and other reasons, Texas has produced far more than its share of national musical figures. This is not the case in just country and western. Texas has produced some of the greatest performers in the history of jazz — Jack Teagarden and Teddy Wilson, for example. On Broadway, audiences have enjoyed Ann Miller and Mary Martin, both Texans. One of rock and roll's most influential pioneers was a West Texan, Lubbock-born Buddy Holly. Among other Texans who have been important in rock were Roy Orbison, Buddy Knox, and the great Janis Joplin. Harry James grew up in Texas and won his musical bootstraps there before he led one of

the premier orchestras in the great age of the big swing bands. Charlie Christian, born in Texas, was the first guitarist to gain national acclaim as a soloist in swing music, playing in the Benny Goodman band. Blind Lemon Jefferson, Victoria Spivey, Sam "Lightnin'" Hopkins, and other black Texans were among the earliest and best blues singers. Yet in spite of these imposing figures in various areas of American music, the music that continues to be identified with Texas is country and western.

I suggest that this identity has a great deal to do with the fact that Texas has long been identified with cowboys, horses, cattle, and, if you please, the wild and woolly West. And that romantic image of Texas has been reflected in "cowboy" or country and western music. This is true for the "country" side of the genre, but it is especially the case with the "western" part of the name. "Western" in the expression country and western came originally from the term western swing and from the cowboy music of the western films. But even before the outpouring of the cowboy movies in the thirties and forties, Texas was known throughout the world as a place of wide open spaces, filled with cattle, horses, cowboys, and, maybe, Indians.

There continues to be a romantic appeal in the western cowboy image of Texas, and that image plays a significant role in the enduring appeal of country and western music. Since World War II, society has become increasingly more complex; consequently, people attempt to find ways to escape the demands change has wrought. In brief, they look nostalgically for institutions associated with the past, which they think will bring them the freedom and romance that have been lost in modern culture.

To the modern mind, these very qualities existed in the life of the American cowboy. Whether this is true or merely modern imagination does not matter. Within contemporary thought is the concept of a man on horseback, riding across the Texas Plains through a wholesome environment toward a magnificent sunset, emancipated from the complexities of a hurried and worried modern metropolis. His life was simple. The cowboy was carefree and uninhibited. In a sense, he is a hero to the modern mind. Lyrics from a recent country and western song express this thinking best: "My heroes have always been cowboys." The cowboy could live as he pleased without the worry of a nine-to-five job, nuclear holocaust, or international turmoil. In a society where everyone is "free" and yet, to use words reminiscent of Rousseau, there are chains everywhere,

people often experience vicariously through the lyrics and style of country-western music a freedom lost when the age of the cowboy and frontier ended.

There has always been a mystique about musicians. But the mystique of the country-western musician is somewhat peculiar. They are modern in so many respects but at the same time are rooted in a historical past which occupies a nostalgic place in the American mind — the cowboy and the West. During a two-and-a-half-minute recording or on stage or television, these musicians are as free as any cowboy who ever rode the open range. Like a wild West Texas cowboy, Bob Wills hollers “Ah haaa, San Antone!”; Jerry Lee Lewis joyously runs his fingers across every key on the piano as if music is the last thing on his mind.¹⁰ Both Wills and Lewis seem to completely disregard many of the conventional rules that other musicians call “correct.” They and other country-western musicians do what they want to do. Whatever feels good to them musically, they do. Regardless of what one might think of their antics, this takes a great deal of courage. They are themselves in their music, and most fans admire such honesty and courage.

People see in these musicians a revolt against the regimentation of both musical and societal rules. Though as fans they might be quite conservative, they identify with the freedom they see expressed in the performance of these musicians. Even freedom in dress is part of the mystique of the country-western musician. Some musicians, such as George Strait, dress the part of the authentic ranch cowboy, while Willie Nelson, with beard, bandana, and beads, is completely unorthodox. The point is that both the Strait and Nelson dress and lifestyles, at least on stage and in music, evoke the ideas of emancipation, liberation, and escape from the demands of middle-class conformity. There is a little rebellion in everyone, and ordinary people watching these musicians see their freedom and long to possess it as their own. In a society that demands the daily playing of certain regimented roles, people admire men and women who dare to do what they themselves would love to do, but dare not for fear of losing their “respectability” and jobs. There is a time in the life of most everyone when they would love to shout the words of the outlaw country singer Johnny Paycheck: “Take this job and shove it!”

The lyrics in much of modern country music perhaps indicate a growing rebellious attitude among middle-class Americans. Interestingly, and in a sense contradictorily, while the lyrics of a great deal

of country music reflect the realism of contemporary society, the freedom many of the musicians possess provides listeners and viewers a vehicle of escape from lyrical realism. As the public watches country and western performers, they can often live their concepts of that once idyllic life of the cowboy or any of the other parts of the past they admire. Even if but for a little while, that life becomes their own, with all of the romance, freedom, and everything else they have the imagination to envision.

Westerns or cowboy movies added to this image, distorted it, and created myths that will probably never be completely eradicated. The first of the true superstars among the singing cowboys was Texas-born Gene Autry.¹¹ Another was a Texan named Woodward Maurice Ritter. In route to Hollywood, Ritter performed on the Broadway stage and on a radio show over WOR entitled "The Lone Star Rangers," one of the earliest western radio shows in New York City. On the silver screen where he rode, shot, and fought bad guys who wore black hats, he was known as "Tex" Ritter. Ever since that time, a man in cowboy boots and a western hat is often greeted in Hong Kong, London, or Paris as "Tex."

It is one of the strangest of phenomena that Texas, almost alone among the states west of the Mississippi, has the "western" and "cowboy" image. For example, there have always been authentic cowboys, cattle ranches, and good horses in Nebraska. The same is true for New Mexico and Colorado. Yet Nebraska is known for cornhuskers, New Mexico for enchantment, and Colorado for colorful mountains. Texas stands alone as the land of real cowboys. Mythical? Some of it. But myths are nearly always based on reality. Texas has had cattle in more abundance than any place in the nation. Cattle drives originated in the Lone Star State. And even today there are more ranch-type horses, authentic ranch cowboys, and large ranches in Texas than any other place in the world.

Texas, Texans, and various forms of popular culture all help perpetuate the mythical as well as the true western image of the state. For example, should Prince Charles visit Houston, the Chamber of Commerce will attire him in a Stetson hat and Nocona boots, take him neither to a ballroom in a leading hotel nor to a symphony but to Gilley's, where the Prince and Lady Diana do the Texas two-step to "San Antonio Rose" and then dance the cotton-eyed joe. Before the royal couple leave Gilley's, they sample Lone Star beer and Bob Wills music and end up watching the urban cowboys and cowgirls ride the mechanical bull. In Fort Worth they are treated

to a night at Billy Bob's (reputed to be the world's largest dancing and drinking establishment), which again features cowboys, cow-girls, a Texas-style rodeo, and, of course, country and western music. Before leaving for "jolly ole England," Charles and Diana are entertained by "America's Team," named appropriately, the Dallas Cowboys. Finally, the royal couple is back in England, where the people there informed me in March that "Dallas" is the most popular television show. At the Royal Victoria Theatre the most popular musical in London, *Starlight Express*, features various forms of folk-rooted American music, some of which is country and western, while a good deal of the rest of the music is greatly influenced by country-western.

The week following my stay in London, Loretta Lynn and other country performers (some of them Texans) were appearing at London's Wimberley Stadium. You can rest assured that the Texans (as well as other performers at Wimberley) wore Texas boots and hats that further strengthened the concept that cowboys and country-western music go together. Little wonder that when I visited Cambridge University, wearing my own Texas boots and hat, a young fellow with a group of schoolchildren pointed at me and said: "There is J.R." I'm surprised he didn't say: "Hey, Tex! Where is your horse and guitar?"

The remarkable thing is not that the sound of Texas music, country and western, has endured. The remarkable thing, in light of the social, cultural, and musical history of Texas, would be if country and western music had not endured. Young George Strait, in Texas hat, Texas boots, and blue jeans, sings "Amarillo by Morning" and "Right or Wrong." Willie Nelson still sings "Stay a Little Longer" and makes an album entitled *San Antonio Rose*. Cliff Bruner, one of the pioneers of western swing during its infancy in Fort Worth, fiddles Bob Wills's "Faded Love" in this year's Academy Award-winning film *Places in the Heart*, while Waylon Jennings sings: "I grew up on music we called western swing. It don't matter who's in Austin, Bob Wills is still the king."¹²

The fiddle, the guitars, country and western music. The group Alabama captured the essence of the musical traditions of Texas when they sang: "If you're gonna play in Texas, you gotta have a fiddle in the band." As it was in the beginning, is now, and ever shall be.

¹ Bill C. Malone, *Country Music, U.S.A.: A Fifty-Year History* (Austin: University of Texas Press, 1968), 26. In the near future, the University of Texas Press will publish a new edition of this superb work, which will bring this history of country music up to the present.

² I do not mean to indicate that Bob Wills began the tradition of fiddle music in Texas. The fiddle tradition Bob Wills did more to popularize than anyone else was the use of the fiddle in western swing. Wills was quite influential in making the fiddle an important instrument in popular music in general, first in Texas then throughout the United States.

³ Charles R. Townsend, "A Brief History of Western Swing," *Southern Quarterly: A Journal of the Arts in the South* 22, no. 3 (Spring 1984), 31-51.

⁴ For a discussion of Wills's years in Fort Worth, see Townsend, *San Antonio Rose: The Life and Music of Bob Wills* (Urbana: University of Illinois Press, 1976), 44-87.

⁵ *Ibid.*, 73.

⁶ Ed Ward, "The Sound of Texas," *The Rolling Stone Illustrated History of Rock and Roll*, ed. Jim Miller (New York: Random House, 1976), 190.

⁷ Wills was correct in this analysis of his own place in American music. Though he had an important influence on the development of country music in Texas and throughout the nation, his own style was and still is so distinctive that no term, country and western or any other, can adequately describe it. His music was dance music and is simply "the Bob Wills style." There was never a sound like it before or after he developed his musical style.

⁸ Ward, *Rolling Stone History of Rock and Roll*, 190.

⁹ See Larry Willoughby's discussion of the Texans in country and western music in *Texas Rhythm — Texas Rhyme: A Pictorial History of Texas Music* (Austin: Texas Monthly Press, 1984), 11-23, 25-35, 97-111.

¹⁰ See Townsend, Chapter 8, "Music Out of a Straightjacket," in *San Antonio Rose*, 98-111.

¹¹ For an excellent discussion of cowboy music, as well as the development of western swing within cowboy music, see Malone, *Country Music U.S.A.*, 145-183. See also Douglas B. Green, Chapter 5, "Singing Cowboys: Back in the Saddle Again," *Country Roots: The Origins of Country Music* (New York: Hawthorn Books, 1976), 87-108.

¹² *Waylon Jennings Dreaming My Dreams*, RCA Records, A PL 1-1062. For a discussion of the enduring influence of western swing and its revival in the seventies and eighties, see Townsend, "A Brief History of Western Swing," *Southern Quarterly: A Journal of the Arts in the South*, 43-48.

ON BEING A WRITER IN TEXAS

ROBERT FLYNN

Being a writer in Texas is having your eyes opened to truth and beauty. A friend and I were standing in the cotton field one day. It was one of those hundred-degree North Texas days when the hot wind blows — and the wind always blows, and it always blows either hot or cold. And the only thing there is to move is sand. And the sand moves every time the wind blows. We were leaning on our hoes, and way off in the distance we could see a pickup truck going down a county road and leaving a cloud of dust behind it. We must have stood there, transfixed, for ten or fifteen minutes, just admiring that cloud of dust on the horizon. My friend said, "Ain't that the prettiest thing you ever saw?" It was my introduction to beauty.

My introduction to truth was not so dramatic. My grandmother was born in Vermont in 1842. That was the year the Webster-Ashburton Treaty was signed between the United States and England settling the boundary of Canada west of Lake Superior. She married my grandfather, an Irish immigrant, and followed him to Texas, where he helped build the Fort Worth and Denver Railroad. Grandmother bore him three sons, all born at a constantly moving end of the track. Near Chillicothe my grandfather bought a piece of land. A few years later, 1897, he was murdered. Grandmother hung on to that piece of land, and she doomed her children to do the same.

Every day, both going and coming from the two-room country school I attended, I had to cross over the railroad tracks my grandfather helped to lay. And in both directions the tracks ran as far as the eye could see. A few miles to the east and we would have been in an oil field. A few miles west and we would have been on land good for nothing but running cows and chasing jackrabbits. Slowly, the truth appeared on the horizon. My grandfather had been tricked into buying the only place in twenty miles that would grow cotton.

The cotton field is one of the great classrooms of life. Put a young man in a cotton field, place a sack on his back or a hoe in his hand, and right away his thoughts will turn to truth and beauty. A far-off look will come into his eye. Put a young man in a cotton field and he will take up prayer. "Lord, if you will just get me out of this, I will never again as long as I live look at the women's underwear in the Sears catalogue."

It was in the cotton field that I first learned the power of the English language. I had a girl friend who chopped cotton with me. She was called a hoe hand. I know because my mother told me. As I stood there all alone in the cotton field — my girl friend had been sent home because I used the wrong word — it came to me like a flash of light that if the wrong word like hoer had the power to move my mother to such action, just think what using the right word like hoe hand could accomplish.

That was when I first got the notion of being a writer. I knew it wasn't going to be easy. We didn't go in much for writing at the country school I attended. Writing was something that was done by fairies and other New Yorkers. Real men studied penmanship. We made little push-pull lines all over the page. And row after row of spirals. It was called the Palmer Method and was invented during the Spanish Inquisition as a means of turning boys from writers to pray-ers. "Lord, if you will just get me out of this I will never touch another pencil. And I will never again drop my eraser and try to look up Myrtle Bailey's dress."

But we knew what a writer was. A writer was somebody who was dead. And if he was any good, he had been dead a long time. And if he was real good, people killed him. They killed him with hemlock. Hemlock was the Greek word for diagramming sentences.

The country school I attended was closed and we were bused to Chillicothe. Chillicothe had a teacher who had seen England. From a boat. She had discovered truth and beauty from eight miles offshore and had come to Chillicothe to share her vision with picturesque rustics. With some timidity I confessed that I too hankered after truth and beauty.

Chillicothe is small. Chillicothe is so small there's only one Baptist church. Chillicothe is so small you have to go to Quanah to have a coincidence. For a good coincidence you have to go to Vernon. Chillicothe was fairly bursting with truth and beauty, and my teacher encouraged me to write about it.

I decided to write about my father. My father, the youngest of three sons, was born in a boxcar at the end of the track that has since come to be called Chillicothe, Texas, thus becoming the first child born in my hometown. The boxcar served as the station house for the railroad, and was, with the exception of a dugout that served as a store, the only building in town. I wrote that my father was born in the finest house in Chillicothe. My teacher told me to write

something that had an epiphany. For an epiphany you had to go all the way to Wichita Falls.

I wrote about Delmer Lance's pet heifer, Snuggles. Snuggles was raised on a bottle and was as friendly as you'd want a heifer to be. Until Delmer locked her in the barn with his range bull, Bradley. The next morning, Snuggles was gone. Also the barn door. The top rail off the fence.

Delmer chased that cow all over the county, but Snuggles went wild as a new rope. One night Delmer was driving down the highway and ran over Snuggles. Delmer said he recognized her when she passed over the windshield by the puzzled look on her face. That was an epiphany. I spent half my life thinking I could recognize a bad girl by the puzzled look on her face.

My teacher said to write about something that had happened to me. I wrote about the year there was a blizzard and everybody from the two-room country school — two teachers, thirty-eight pupils, and three adults who had sought refuge in the school — had to walk two miles through the snow to our house to spend the night. I remembered it because that was the day my father came home with four hundred baby chickens and it was so cold we had to keep them in the house. All over the house it was butts and feathers. All night it was cheep and shit. Cheep and shit.

Forty-two chickens were squashed in the linoleum. Three drowned in the chamber pot. One was crushed when Ed Byars put on his boots. When Mother lighted the gas oven, thirteen went up like a torch. Three more were scorched so bad that Dad threw them out in the snow. Ed Byars spent the rest of his life minus the end of his nose because he preferred frostbite to the smell of singed chicken feathers.

My teacher said I didn't know the first thing about truth or beauty. I promised to go to England the first chance I got. Or at least Korea. She loaned me books that were not available in the Wilbarger County Library, books that had been written by real writers.

Real writers wrote about such things as I had never heard of. Damsels. Splendor falling on castle walls. For splendor we had to go to the Fort Worth Fat Stock Show. Since I wasn't overly familiar with damsels and splendor, I tried reading what real writers wrote about rural life. "Dear child of nature, let them rail. There is a nest in a green vale." Which was pretty mystifying to me. I remember asking Bubba Spivey, "Don't writers get chiggers like everybody else?"

I set out looking for a green vale to make a nest in, and when I got there I found out what made it so green. When it comes to vales, a cow will get ahead of you every time.

I wrote a story that contained the wisdom of the world in eight poetic pages of arcane words and mysterious imagery full of towers, turrets, and spires. My teacher loved it. She had never met a symbol she didn't like.

Assured of success, I went to college to become a writer. I knew what I wanted. I wanted to reveal the false hopes, the futile dreams, the fleeting victories, the glorious visions, the hidden desires, the sudden and secret joys, that bind us into one humanity. I wanted to refine the language, to explore the avenues of communication, to stretch the limits of understanding, to probe the mysteries and futilities and glories of man, to heal his broken spirit, to restore his sense of purpose, to discover the nature of beauty and truth, and to sell it to the movies for a million dollars. After which I intended to marry a movie star and move to Paris. Or at least Commerce.

My instructor told me the way to find truth and beauty was to write about heroes and villains, good people versus bad people. The best people I knew did bad things, and the worst people I knew did good things. We weren't heroes or villains, we were just puzzled. How could I write about the people I knew when I was attending a college that did not approve of dancing. Smoking. Swearing. Drinking. Dating members of the opposite sex. Dating members of the same sex. I used to pray, "Lord, if you will just get me out of college I will never be a Christian again."

We were told to write a love story containing truth and beauty. I was petrified. I had never seen a moat or a moor. I had never known a knight or a knave. I was the only great lover I knew. The only time I came close I began nuzzling the girl's ear and lost my chewing gum in her hair. It was Fleer's bubble gum and I hadn't gotten all the sweet out of it. I spent the next hour and forty-five minutes alternating between kissing her eyes and frisking her scalp, and holding my hands over her eyes while chewing her hair. Her mother called her three times before my jaws came unstuck.

I wrote about a boy and a girl. He is true. She is innocent. They have found a nest in a green glade. They smoke a Salem. They speak of truth and beauty.

I threw the story away. I wrote about a boy and a girl. The boy is generally true. The girl is relatively innocent. They find a meadow. The sun is hot, the wind roughens their complexion. They smell

of sweat and Salem cigarettes. He speaks of love with some truth. She has a puzzled look on her beautiful face.

I tore up the pages. A boy and a girl. He is a bastard. She is a bitch. They are lying in a pasture among cow dung. Scratching chigger bites. The blazing sun raises blisters on his back. He has a herpes on his lip. She has bologna breath. He whispers obscenities into her ear. He loses his gum in her hair. It is Fleer's bubble gum and still has some of the sweet in it. Her mother calls. He gnashes his teeth.

I tore my hair.

I wrote about Bud Tabor. Bud was a married man, and Sherry McIlroy's father shot him through Box 287. Ed McIlroy was the postmaster, and when Bud came in to get his mail, Ed stuck a pistol in the open end of the box and shot Bud in the eye. Ed was a conscientious man. He waited until Bud opened the box and looked inside so as not to deface government property.

They never found Bud Tabor's eye. Buried him without it. They fixed him up with a glass eye for the funeral, but Sherry and Bud's wife got in an argument over who got to keep it as a souvenir. Sherry won. Put it on a chain and wore it hanging down between her breasts. Folks used to say Bud may have gone to hell but his eye went to heaven. Some folks' idea of heaven is mighty small. Larger on one side than the other.

My instructor said it was not a love story.

Delmer Lance had some sheep that developed an unnatural affection for an old yellow dog. They followed the dog wherever it went. No pen could hold them for long, and once on his trail, the dog couldn't shake them. In desperation the dog ran away from home, the sheep right behind him.

From time to time the dog and sheep would show up at someone's tank or feed trough, the dog looking gaunt and haunted-eyed, the sheep looking all unraveled. Elmer Spruill shot the dog. Elmer said he couldn't stand the puzzled look in the dog's eyes.

My instructor said there was no beauty, no truth, and no moral.

Lowell Byars came to the county with his wife Lou. They lived in a dugout and poor-boyed, working as long as there was light to see. There was no time for visiting neighbors, or going to church, just day after day of chopping weeds and carrying water, with nothing to eat but biscuits and gravy, and nothing but the gritty quilts Lou's mother had given them to sleep on.

The roof of the dugout caved in during a rainstorm, they were dispossessed for two days by a skunk, the crops blew away in a sandstorm. But Lou stuck it out, and if she cried of loneliness or despair it was when Lowell was away from the dugout. One morning Lowell got up early as usual and said, "Get dressed, Lou, we're going to Quanah to see the Mollie Bailey show."

Lowell milked the cow, fed the mules, hitched the wagon, and when he got back to the dugout he had to fix breakfast. Lou was still brushing her hair. They drove to Quanah and watched the wagons come in, drawn by elephants. They looked in the store windows and stared at the crowd of people in town. They drank lemonade and had a supper of sardines and crackers and saw the show and it was over. Time to get in the wagon and start for home.

It was a long way back to the dugout. Lowell knew he would have to get up early the next morning to make up for the work he had missed, but he didn't care. The moon was bright, a thousand stars twinkled in the sky, and he had shown his wife a sight. Lowell was feeling pleased with himself.

"It ain't so terrible being married to me is it?" he asked Lou, who was sitting silent and sleepless beside him. Lou began to cry. She cried all the way home. She cried all night. When he got up the next morning she stopped crying to fix his breakfast, but she wouldn't speak to him for three more days until he cut his hand heading red-top maize and she had to ask how he was.

Lowell promised to take her to the Christmas dance, and rather than disappoint her they drove fifteen miles in an open wagon in the face of a norther. Lou danced every set of the all-night dance. She went home with a fever, took pneumonia, and died of frivolity.

I had found a story with a moral but I also found it wasn't easy writing about people I knew. I got all puzzled. I didn't know what was beautiful, and what was foolish, and where truth lay. Was Lou Byars a silly girl unsuited for a rugged country? Was she the innocent victim of a foolish dream? Or was she a tragic heroine who knew that the quality of life was not measured by the years endured in twilight, but by the moments spent in the candle's flame?

Ideas are so neat. You can outline an idea. You can label an idea. Ideas don't bleed. They don't cry. They don't blame you for their unhappiness. They don't die of frivolity. But a person has many faces. And some of them are evil, and some are vain, and some are foolish, and some are beautiful, and many are secret.

It looked like for truth and beauty you had to cross Red River. All I knew about was a little place called Chillicothe. And it wasn't even the Chillicothe that was on the map. It was a little place that existed only in my mind. And all I had to go by was my grandmother, who died at the age of ninety the year I was born, and my father, who was born in a boxcar at the end of the track. Would truth and beauty as I wrote it stand up against the reality of my grandmother? Would my father believe it? And could it happen within the territory I had staked out for myself?

I wrote the love story of Grover and Edna Turrill. When he was sixteen Grover had married Edna, at the request of both families. Grover's father gave them a milk cow, and Edna's father gave them a steer. Grover yoked them together and started to California. It was his promise to Edna.

They crossed Red River and stopped near Preston, where Edna had a baby boy with no one to help her but Grover. They started again as soon as she was able to travel, Edna and the baby in the wagon, and Grover walking beside the wagon, prodding the ox and milk cow, and picking up firewood.

One day Edna placed the sleeping baby in the back of the wagon and got out to walk beside the cow. Grover found a tree stump and, not knowing the baby was in the back of the wagon, threw in the stump, killing his child. Some cowboys found them, two teenagers traveling across the prairie with a dead baby wrapped in a quilt. The cowboys buried the child.

Grover and Edna were still on their way to California when the milk cow died near Chillicothe. They lived in the wagon while Grover broke the land with the steer and planted a crop. Later they built a house and had two more children. When Billo was twelve he went hunting on Wanderer Creek with some older boys. They ran a coon up a dead tree, and Billo was sent up the tree to shake the coon down. A pile of brush had been washed up under the tree and the older boys set it afire so that Billo could see. The dead tree caught fire and Billo was burned so badly he couldn't lie down. Edna and Grover took turns holding him the four days it took him to die.

A few years later, when Polly was thirteen, she complained of a stomachache. Polly wasn't fat but, like Edna, she was slope-shouldered, solid, and a good eater. When she was unable to eat breakfast, Grover hitched up the wagon, made a pallet in the back, and with Edna to comfort Polly, they started for the doctor in

Chillicothe, several miles away. The wagon had no springs, the road was just a set of ruts across the prairie, and Polly whimpered the whole way although Grover drove as slowly as he dared.

When they got to Chillicothe, they found that Dr. Vestal had been called out of town. Over near Medicine Mound, folks thought. Expected to be gone all day. Polly was too sick to wait so they started for Medicine Mound, sending word ahead by Buster Bryant, who volunteered to carry the message.

It was August and the sun was hot and Polly cried out at every bump. So Edna stood and held a quilt to shade her, and Grover drove the mules as fast as he dared. They met Buster Bryan, who had missed Dr. Vestal somehow. The doctor was on his way to Bull Valley. Grover turned the mules toward Bull Valley with Buster racing ahead.

Dr. Vestal had left Bull Valley for Red Top. Buster rode to head off the wagon. The mules had played out, and Grover was walking beside them to lighten the load. Edna was standing with her feet spread, holding the fat little girl in her arms, trying to absorb the bumps and shocks of the wagon with her own body. Buster told them to go home. He would find Dr. Vestal and meet them there.

It was almost dark when the wagon got back home and Buster and the doctor were waiting. Edna was sitting beside Grover holding Polly, who was so big she lay across both their laps. The mules stopped of their own accord and neither Grover nor Edna made a move to get down. Dr. Vestal started to the wagon but Grover said, "I don't want you to touch her. We've been praying for you all day and listening to her die. I know it ain't your fault, but I don't want to see you now."

Buster stayed with the Turrills, but he didn't dare go into the house. He unhitched the mules and fed them and sat out on the porch. After a while Grover came out. He sat on the porch and stared at the dark, empty, treeless miles over which he had ridden that day, listening to the shriek of the wagon wheels and the dying cries of his last child.

After a while Edna came out also and leaned against the porch post, hugging it as though it were a child, her head hanging down a little as though permanently bent from ironing clothes and chopping cotton. She waited while the last light of day faded and one by one the stars came out, watching the prairie that under moonlight had a sheen like a silent sea.

"If that cow hadn't died, we'd be in California," Grover said.

“Old Boss,” Edna said, remembering the name over all the years, recalling the dreams they had as they traveled across the prairie in the wagon.

“Goddamn country,” Grover said. “Washes away ever time it rains. Blows away ever time there’s a wind. Hail or grasshoppers ever goddamn year. Hot as hell or cold as hell. Flood or drought. Too dry to plant or too wet to plow —”

“Yeah,” Edna said, nodding her head in the darkness. “But ain’t it purty.”

Truth in the mythical kingdom of Chillicothe was neither comic nor tragic, neither big nor eternal. And it was revealed through the lives of common folk who belched and fornicated, and knew moments of courage, and saw beauty in their meager lives.

But Grover Turrill gave me some problems. Some readers thought the vocabulary was offensive. I could not write about the people I knew without using the vocabulary they knew. My father did not believe a cowboy said “golly bum” when a horse ran him through a barbed wire fence.

I went to see Clifford Huff. Clifford was a horseshoer and he had been kicked, bitten, or stepped on by every horse in the county. It gave him an extensive vocabulary. I asked Clifford the worst words he knew. He said they were “yes and no.” He had said yes when his wife, Letty, asked him if he was playing around and he had said no when she asked him if the gun was loaded. They had been married thirty-three years when Letty shot him once through the pantry and twice up the stairs.

Words are not casual things. They are powerful. Even explosive. Words can start wars, or families. Words can wound; they can shock and offend. Words can also heal, and explain, and give hope and understanding. Words have an intrinsic worth, and there is pride and delight in using the right word. Anyone who chops cotton with an axe is a hoer.

I don’t know whether or not Travis drew a line at the Alamo. Maybe that story is myth. I do know that every writer draws the line. Must draw the line. Whether he is dealing with teachers, advisors, well-wishers, editors, publishers, critics, or the public. This is my kingdom. These are my people. I know them better than anybody. They will not jump through hoops for the amusement of casual readers. They will not temper their speech for prudish ears. I may not respond the way they do, but I respect them for what they are. And that’s where I draw the line.

I wrote a book about people my grandmother would have spoken to, and they used words my father would have believed. A few people heard of it. Fewer read it. My closest friends bought it. And loaned it out. After a while the book disappeared from bookstores to make room for a best seller written by a man who had never met an adverb he didn't like. It was about an oilpatch hooker who falls in love with a Soviet spy but turns him over to the CIA to save the Battleship Texas from being stolen by Nicaraguans. When it comes to writing, hoers have it all over hoe hands.

But I had already turned down the next row. Writing is a lot like chopping cotton. It's a long way to the end of the row, and when you get there, there's always another row to turn down. A friend was disturbed that I was spending so much time at something so unrewarding. "There's no money in it," he said. I couldn't argue with that. "There's more fame in selling used cars. There's more fun in running a gas pump." I didn't argue with him. He was right.

I just kept chopping on down the row, knowing when I got to the end of it, there would be another row to turn down. And another. And another. And as the day wore on it wouldn't get any easier. Maybe it wouldn't get any better. Perhaps no one would come out to the field to see if I was still working. I might not even hear the dinner bell. It didn't matter. He thought I was a hoer. But I am a hoe hand.

THE TEXAS FUTURE IN SPACE

HARLAN J. SMITH

A principal theme of the Philosophical Society meeting this year is the subject of where Texas and Texans will be fifty years from now. The burden of my message is that a substantial number of Texans should and will be in space.

Predicting the future is risky, but we might be guided by a remark of one of the wiser people of our time, Arthur Clarke. He noted that we usually overestimate how quickly certain anticipated developments will occur, but we almost invariably underestimate what the future will bring. Over the years I have collected a few choice examples of this phenomenon:

- "Can anything be more palpably ridiculous than the prospect held out of locomotives traveling twice as fast as stage-coaches?" (*Quarterly Review*, 1825)
- "The popular mind often pictures gigantic flying machines speeding across the Atlantic carrying innumerable passengers in a way analogous to our modern steamships. It seems safe to say that such ideas are wholly visionary." (1910, William Pickering — leading astronomer and scientist of his day, who would no doubt have been surprised to learn that less than seventy-five years later it was hardly even possible to buy a steamship ticket across the Atlantic)
- "There has been a great deal said about the 3,000-mile rocket. In my opinion such a thing is impossible for many years and I think we can leave that out of our thinking." (1945, Vannevar Bush — engineer and physicist who directed U.S. scientific research and development throughout the Second World War)
- "Landing and moving around the Moon offers so many serious problems for human beings that it might take scientists another 200 years to lick them." (*Science Digest*, 1948)
- "As chairman of the Senate Subcommittee responsible for NASA appropriations, I say not a penny for this nutty fantasy [the colonization of space]." (Senator William Proxmire, October 1977)

Space will be one of the major areas of human enterprise in the twenty-first century. Very modest seeds planted now will grow into some mighty operations, for the fundamental reason that — whereas the Earth is limited in room, raw materials, and energy — these exist in virtually infinite amounts in space once we learn how to reach out and draw on them. Great strides have been taken in this direction over the past three decades, but our level of space development is still effectively where aeronautics was in the age of the World War I wood and cloth biplanes, not yet properly speaking an industry.

Nine years ago at Galveston, I spoke to the Philosophical Society on human uses of space, especially the energy which is there to be tapped. I've been asked to come back and update matters, and perhaps help to point us toward the year 2036. This time I wish to review some of the history of the world's space program, with stress on the competition and how it is currently running away with the show.

Three men, each knowing nothing of the others, independently developed the concepts essential for space travel and utilization. Last on the scene but greatly influential, Hermann Oberth published an effective book on the subject in the late 1920s which led directly to the development of the German Rocket Society, thence to the V2's and the giant rockets of today. Robert Goddard in the United States, beginning ten years earlier, not only independently developed most of these themes but himself designed and built the first successful liquid-fuel rockets, control system for rockets, etc. However, he was a lonely voice in the American wilderness; there was virtually no encouragement or follow-up of his activities in this country until after the Second World War. The earliest of these pioneers was Konstantine Tsiolkovsky, a Russian schoolteacher who began in the late 1800s to study and write on this subject. Although he developed essentially all of the basic concepts which are still in use today, as well as some we have not even yet achieved, his work remained virtually unknown outside of Russia. After the Communist revolution, he was picked up as a national hero and has long since entered the Soviet pantheon of great leaders and innovators about whom Soviet children are deeply educated. His ideas also led to domestic development of rocket studies in the Soviet Union before and during the Second World War, so that a strong nucleus was present on which to graft captured German specialists (Von Braun

and other German specialists whom we brought had to start their program in this country almost from scratch).

A closer study of Russian activities along these lines should have made it no surprise when they launched the first Sputnik. Perhaps less well-known than Sputnik is that the Soviets have been first in a large number of space developments. A partial list includes orbiting the first very large payloads, the first living passengers (dogs), the first human to orbit the Earth (Yuri Gagarin), the first woman astronaut (Valentina Tereshkova), the first two-man crews, the first three-man crews, the first casualty in space (Vladimir Komarov, followed by three others), the first scientific satellites to detect what we later came to realize are the Van Allen belts, the first "interplanetary" missions to photograph and send back pictures of the back side of the Moon, the first lunar soft landings, the first totally automated soil returns from another object (the Moon), the first (albeit relatively unsuccessful) Mars landing, the first probes to explore the Venus atmosphere and to land successfully on its surface, the first automated supply ships to men in orbiting space stations, and many of the first experiments to begin to utilize space for commercial manufacturing best done in zero gravity.

During all of this first thirty-year period, the Soviet space program never flagged. It began at about the level of the U.S. Apollo program but continued steadily to expand. During the Johnson-Kennedy years, when for a brief decade the U.S. operated a strong space program, we made faster progress because of our far more efficient scientific, technical, and economic systems. But following the incredible success of NASA in getting us to the Moon within a decade, an unbroken succession of only lukewarm presidential support, visionless OMB's, and Congress and the American people being preoccupied with other issues allowed funding for the space program to drop swiftly to about one-third of its Apollo levels, where it has remained ever since. Understandably, this led to many of the best people leaving NASA, to a shut-down and wipeout of nearly all of our productive capability for launching large-scale payloads, to a gradual emasculation of our space science and solar system exploration programs, and the forcing of NASA to put virtually all eggs into the shuttle basket.

The shuttle concept is valid — indeed it is the proper way to begin a space program, to be followed by a large and readily expandable space station in Earth orbit, then by basic activities of commercialization and space industrialization, finally by the building

of true spaceships for travel to and utilization of the Moon, Mars, and other objects and places in the solar system. Unfortunately, as was pointed out from the very beginning by NASA engineers, funding for the Space Shuttle was only about half of what was required to do the job right. The Challenger disaster is a direct consequence of this (as well as, to be sure, several critical errors of judgment on the part of NASA managers).

In contrast, the Soviet program has continued to thrive without interruption, as is relatively easy to do in a society controlled by technocrats rather than accountants and where the government can in effect levy whatever taxes are needed for programs believed to be important in the long run. As a consequence, for the past decade the Soviets have launched nearly ten times as many space missions as the United States. On the average, about every three or four days a giant rocket takes off from one of their several major cosmodromes. For the past fifteen years there have been few days in which there have not been at least a few Soviet astronauts in orbit. Recently they have put up the world's first true space station, of large capacity and almost indefinite flexibility for future expansion. It is likely that from now on there will always be Soviets in orbit, their numbers growing steadily with time.

Now that the Soviet Union and the U.S. have pointed the way, and have each spent the equivalent of well over \$100 billion in developing the basic technology, the rest of the world is beginning to waken to the future importance of space. The Europeans were the first to do so with the French-led Ariane rocket facilities, which have captured over the last few years a major share of the world's commercial launch activity. Very strong competition is coming from the Japanese, who are building a superb series of rockets that will shortly enter the commercial launch field in a very competitive way. The Chinese, following up on their ballistic missile rockets, are now offering low-cost commercial space launches, while India, Brazil, and other countries are also beginning to enter the field. For many years the United States provided the only effective commercial Landsat service. However, fiscal roadblocks have prevented this country from modernizing those capabilities, and it appears that France, Japan, and the U.S.S.R. are likely soon to take over this multi-billion-dollar per year aspect of space commercialization.

To summarize the above points, beginning from a slow start the U.S. over only a decade achieved unquestioned world leadership in every aspect of space. We were often — even usually — second

to the Soviet Union, but we developed far better the ability to launch payloads of all sizes up to stupendous, the ability to put people in space in good working conditions, the ability to reconnoiter the Earth, the ability for space industrialization and commercialization activities on a large scale, and the ability to do space science in an unparalleled way. However, in 1967-68 we began a rapid dismantling of the lion's share of this activity; accordingly, the mantle is passing to the rest of the world. A slowly growing number of influential Americans are beginning to realize what is happening, but as yet, with each passing year, we are generally still falling farther behind. When and if the country wakes up we can recapture leadership in many, although perhaps not all, of these areas. But in any event we must surely try to remain a major player in this game involving the widest future for the human race.

Now for some predictions. What *is* coming in the next fifty years? Some items are already in relatively advanced stages of design or conception, hence their dates can be predicted with reasonable plausibility. A partial list should read about as follows:

Permanent space stations: U.S.S.R., 1986; U.S., 1997(?); Europe/
Japan/China, 1999

Beginning of serious space manufacturing of specialty zero-g products: early 1990s

Beginning of space tourism: 1997

Substantial space solar power: U.S.S.R. and Japan, 2005

Permanent lunar base: U.S.S.R., 2000; Japan, U.S. 2005

First human visits to Mars: 2005

Permanent Mars base: 2015-2020

What about the subsequent fifty years — where will we be a century from now? With this question, we are deep into Arthur Clarke's words of caution. To capture some sense of how far wrong any such predictions are likely to be, one should ask how many visionaries in 1887 would have predicted today's world of electricity, automobiles, airplanes, radio, computers, and on and on. About the only thing we can be sure, barring a catastrophic war, is that the human race will be truly a space-faring civilization. There will be gigantic, largely robotic, space manufacturing facilities, and an immense tourism industry. There will be lunar and Martian towns and cities. There will be enormous free-floating space colonies with large populations. By then the methods of getting into and traveling through space will be radically different from the simple primitive

rockets used today. Development of the outer solar system will be in progress. And people will already be planning the first interstellar probes.

To return to the original point, the question is whether Texas can and will play a significant role in all this. I believe the answer is *yes*. While lagging far behind California and even some other lesser states, Texas does have some toes in the space water. Foremost among these, of course, is the Johnson Space Center, with its annual budget of well over \$1 billion a year (however, it should be noted that most of this budget leads to contract work going out of state). We have university space activities, notably at Texas A&M. The University of Texas has a Space Research Center and the McDonald Observatory. University of Texas at Dallas has an active space science program, and there are other strong activities, especially at Rice and the University of Houston. The Houston Area Research Council is developing a growing space component. The privately endowed Space Foundation began in Houston, and with its branches scattered around the country is proving an effective means of catalyzing business interest in space. A number of small companies are springing up especially in the Houston area to begin private entrepreneurship for launching, space manufacturing, and related activities.

Some of these Texas seeds will surely develop. But we should remain aware that the state is very far behind California, primarily because of the seventy-five-year tradition there of the finest public and some of the finest private higher educations in the nation. This emphasis generated a pool of talent in California that propagated many space and space-related activities for the past four or five decades, beginning with the Jet Propulsion Laboratory at California Institute of Technology. It is also humbling but salutary to note that tiny Johns Hopkins University in Maryland has more federal research dollars than all Texas universities put together, and nearly all of this Hopkins activity is space-related.

What could and should Texas do to do better? Suggestions range from no cost through relatively substantial developments. First, it would cost nothing to declare Texas a "space state." It would be a propaganda gesture, but these sometimes have a modest positive effect. Texas universities can be encouraged to develop and broaden degrees connected with space activities. The state Science and Technology Council could and should be given a strong space element. Our members of Congress can be encouraged to improve the support of Texas space activities. It would be desirable to establish a Texas

Space Council and to follow the lead of California in having a legislatively supported several-million-dollar-a-year Texas Space Agency, whose specific job it is to seed research and entrepreneurship in space-related fields.

Other activities are more expensive but extremely important. In particular, Texas must somehow face up to a stronger level of support for education at all levels, including the higher education which alone produces the people who have the ideas and ability to carve out a major role for our part of the world in these future developments. Secondly, the state might take seriously the recommendations of its Higher Education Committee to enhance support of research, including a strong space component. Research and development fields which are closely connected to space include transportation, studies of the biosphere, automation and robotics, space medicine, software engineering, artificial intelligence, and materials research.

Some of this is bound to happen in any event. I sincerely believe the more of it that happens the healthier Texas will become. In any event, I'm sure that at least part of the original question can again be answered: Where will at least some Texans be in 2036? In space, on the Moon, on Mars — building a better future, toward the stars.

POPULATION, POLITICS, AND THE ECONOMY IN TEXAS'S FUTURE

CYNDI TAYLOR KRIER

I am delighted to be with you this afternoon. And equally delighted that you are meeting here in the Texas Senate this year.

This chamber is special to me — and I hope to all Texans. I have grown comfortable here over the past two years, yet I also feel a certain sense of awe each time I walk onto the floor. The eyes of Texas heroes — and a few heroines — look down on us from the walls. The Lone Star shines down on us from the chandeliers. We sit — many of *you* are sitting — at the original desks commissioned during construction of the capitol and used in every legislative session held in this building since the first in 1889.

I feel that same sense of awe to have been asked to address the Philosophical Society of Texas — for your membership, like this panel, is made up of people to whom politicians, like me, should *look* for advice rather than *give* advice.

I gave up one of my favorite holiday traditions, Galveston's Dickens on the Strand Celebration, to be with you this weekend because I was charmed by your challenge — much like that of Charles Dickens — to look at the past, the present, and the future. Rather than his ghosts of Christmases past, present, and future, we are challenged to look at the spirits of Texas's past, present, and future.

I have been asked to share with you my thoughts on our future, from now through the year 2036, with a focus on population, politics, and the economy. It is against conventional wisdom for a politician to look beyond the next election, let alone to attempt to look ahead fifty years into the life of this state. There is an old American proverb that defines a politician as “an animal who can sit on a fence, and yet keep both ears to the ground.” In this posture, it should surprise no one if the politicians cannot see very far in front of themselves, let alone into the future.

Indeed, ever since the United States began, government officials have proved themselves maladroit seers. When Pierre L'Enfant designed Washington, D.C., he got things off to a bad start. He had to guess which direction the city would grow. He naturally decided that it would grow to the east and develop around the commercially

promising harbor. Therefore, he faced the Capitol eastward. Inevitably, the city developed to the west, and the Capitol faced the wrong way — a fact that *western* state politicians and citizens have long realized.

Here in Texas, many of our great accomplishments have been similarly unpredictable. In fact, accurate predictions were often ignored. While Texas was still a province of Mexico, the great French historian de Tocqueville observed:

For some years, the Anglo-Americans have been penetrating as individuals into that still-underpopulated province, buying land, getting control of industry, and rapidly supplanting the original population. One can foresee that if Mexico does not hasten to halt this movement, Texas will soon be lost to her.

The rest, as they say, is history. And that later history of Texas was even more unpredictable.

In 1836 there were only some 50,000 inhabitants in all of Texas. Who could have predicted that 150 years later we would have grown more than 300-fold and be the third most populous state in the United States? In fact, some thirty Texas cities are today larger than the entire Republic was a century and a half ago. Who could have reliably predicted that the underpopulated region known as Texas would grow to become a leader among all American states in agricultural acreage, cattle, sheep, goats, cotton, grain, sorghum, watermelon, cabbage, and spinach? Who could have predicted that Texas would produce a substance of so much economic importance — oil — let alone produce more of it than any other state? And more recently, who believed those who predicted that our very dependence upon the economic riches borne of oil and agriculture would one day be talked about as the source of our decline?

Simply put, the phenomenon we now call Texas is *not* the product of predictions — either rosy or dire. It is instead the product of tenacity and freedom — of people trying new things and, by the sweat of their brows and minds, accomplishing them.

Texas is presently in the midst of demographic, economic, and political flux, and no one knows precisely where it is heading. The future is much like the present — it just lasts longer. The year 2036 is not in all senses fifty years away, for decisions made during the baker's dozen years remaining in this century will shape our state in the century to come. We cannot afford to dwell on the past, the

“good ole days.” Nor can we be caught up in living just for today. We must look to the future. Questions need to be raised, and the search for answers needs to begin.

This is a time of choices and of change. Will we make the right choices? Will the changes be welcomed or will we be frightened by them? Is it the end of good times or the beginning of new times? Is it our twilight or our dawn? Shall we face it as optimists or pessimists? Shall we as Texans despair or persevere and adapt? Will we panic or plan? Will we settle for mediocrity or strive for excellence? Can we meet our challenges, or will we be overwhelmed by them?

It is the answers to those questions, the choices we make, which shall determine Texas's future. One thing of which we can be assured is that the future will come. We cannot stop it. We can help to shape it or be shaped by it. We can follow the future or lead our way into it, but the future will come. And to fail to make conscious choices is a choice in itself.

I visited one of the schools in my district last week to learn more about the new appraisal process for teachers — but that is another speech. In a high school English class for gifted and talented students, I became a student too, entranced by their discussion of an imaginative theory that the past, present, and future are not separate blocks of time, but rather that a collection of memories from the past and from the future are implanted in man's unconscious mind and come together in the present to motivate and inhibit. The notion that the “past is prologue” is not a new one, but I especially like the idea that we learn not only from the past but also from the future, as we are challenged by it and prepare for it. It is critical for us to use this era positively, to examine our state's and its citizens' needs, to reexamine our priorities. It is also important for us to focus on long-range planning: where we want our state to be in the future, rather than limiting our focus to current problems.

You know, Texas and its people are known for bragging. It's part of our heritage. And now is not the time to stop. We've all heard Texans brag — and have done it ourselves. We have the most, the biggest, the best — and *some* of it was even true. Bragging comes from a sense of confidence. We'll need that in the future. Such confidence is an attribute which can prove beneficial, so long as it does not hide from us the realities with which we must deal. Positive thinking alone cannot build our future; but negative thinking can stop us from reaching our potential.

Perception, particularly at this time, is almost as important as reality. Both how we are perceived by others and how we perceive ourselves will play a big part in shaping our future. What are the perceptions of the state's population, its politics, its economy, as we move from our sesquicentennial this year to the Philosophical Society's sesquicentennial next year, through the next biennium of 1988-89, past the sesquicentennial of Texas statehood in 1995, into the twenty-first century, and forward to our state's bicentennial in the year 2036?

Texas's most valuable resource is its population. The recently completed mid-decade report by the U.S. Census Bureau showed our state with an estimated population of 16,370,000 in 1985. As challenging as it is to count all our people, it is even more of a task to make accurate projections into the future.

In researching such projections for this presentation, I was struck by the wide variances I found among major, reliable demographic experts. Looking ahead to the turn of the century, the U.S. Census Bureau projected the highest state population — 20,739,400. In making its estimates, the Census Bureau relies strictly on population figures and ignores economic factors. This means the bureau didn't attempt to guess how many people may leave Texas in the next decade if oil prices remain at their present low levels. The next highest projection — at 19,339,000, almost 1.5 million less than the Census Bureau figure — came from the U.S. Commerce Department's Bureau of Economic Analysis. It takes the opposite approach to the Census Bureau's. It tries to anticipate future economic activity in each state and assumes that population will follow industrial demand. The lowest estimate came from the National Planning Association, a private, nonprofit group based in Washington. In estimating Texas's population in the year 2000 at 18,801,800, it is some ten percent less than the Census Bureau figure, and was calculated by a combination of economic and demographic methods. Only our own Bureau of Business Research at The University of Texas School of Business has been bold enough to attempt to take their projections forward to the year 2036, when they estimate our state will be inhabited by some 22,533,000 Texans — 6 million more than today.

Part of the apparent statistical conflicts emerge from the differing methods used in calculation; however, equally perplexing is the fact that changes in state population seldom remain constant over

even a ten-year period. "If current demographic trends continue . . ." is a phrase we hear often but rarely see.

Migration has been the primary source of Texas population growth in this decade. More than one million new residents moved to Texas between 1980 and 1984. After peaking in 1982, the number of persons moving to Texas has declined each year since. The state comptroller projects that next year those leaving our state will outnumber newcomers by more than 132,000. Over the next twenty-five years, as the state's economy rebuilds, net migration into Texas is predicted to return. But it will not come close to matching that of the past decade, when it accounted for two-thirds of the state's total population growth. During the next twenty-five years, the Bureau of Business Research projects this proportion will fall to only seventeen percent. Yet, even with those projections, Texas is expected to pass New York and become the second most populous state in the early 1990s.

At the risk of putting a damper on Texas braggadocio, in the interest of accuracy, I should note that the Bureau of Business Research says we're not likely to catch up with California unless most of that state falls into the Pacific Ocean.

Enough of statistics. These numbers reflect people . . . Texans. Who are they? They increasingly live in our cities. Though many still think of Texas as a rural state, more than eighty percent of Texans live in urban areas of 50,000 or more population. One impact? There will be more "Yuppies" than "Bubbas" in tomorrow's Texas.

Like the rest of our country, the Texas population is an aging one. And with continuing gains in life expectancy and lower birth rates, the proportion of persons aged sixty-five and older, now ten percent of all Texans, will double by 2036.

Today, minorities make up thirty-eight percent of Texas's population. Twelve percent of Texans are black, and that percentage of the population is fairly steady. Almost one-quarter of Texans are Hispanic, and that percentage is projected to grow to 26-30% by the year 2000. Whether that will lead to significant changes is difficult to project. Texas Hispanic writer Fernando Piñon recently cited studies which have shown that in another generation or two Hispanics will be almost indistinguishable, in values, beliefs, norms, and attitudes, from the rest of the Texas population.

The entry of women into the work force has been as significant a factor in Texas as throughout our country: 58.2 percent of work-

ing-age women in our state work. At the same time, more and more baby boomers are choosing not to have babies. Half of marriages this year will eventually end in divorce. Three out of every five children born this year will be raised at some point in a single-parent family. Only twenty percent of parents ordered to pay child support will do so regularly, and almost thirty percent won't pay at all. Persons live alone in almost one out of every four households. Texas ranks third in the nation in teenage pregnancy rates — and all of these children will be growing up between now and 2036.

As you can see, fewer and fewer American and Texan families conform to traditional stereotypes — a fact that is sure to impact upon our political process in the coming years.

So let us turn to politics on our journey into the future. Where will Texas be in 2036? Will we rank in the top ten states in education or remain near the bottom? Will we be perceived as a low-tax state or high-tax state? Will we have eliminated illiteracy, disease, poverty, and crime? Probably not. But hopefully, we will have made progress.

Gerald Mann, often a chaplain for our legislative bodies, recently wrote in his newspaper column: "Of all the words in the English language, the two that belong together the least are 'political' and 'science'." Hence, no guarantees are offered on this segment of this speech.

One change in our state's political makeup will be felt next January when, for the first time in Texas history, more than one woman at that time will serve in the Texas Senate. Hopefully, by the year 2036, so many women will have been elected to office it won't make a difference whether a candidate is male or female. For I strongly believe women have talents to contribute to government and a responsibility to do that just as men do.

Perhaps the likelihood of unpredictable changes on our political scene over the next fifty years can best be understood by looking back over the last fifty years of our state's political history. As late as the 1950s, sixty-six percent of Texans identified themselves as Democrats; a brave six percent admitted they were Republicans. Yet by the 1980s, only a generation later, just as many Texas voters were calling themselves Republicans as Democrats. The recent 1986 elections in Texas were continuing evidence of that trend. Republicans picked up a legislative seat — an unexpected result in a nonpresidential year. The number of Republican county judges doubled. Republicans reported a net gain of 139 local Republican

officeholders across the state. And, of course, Republicans recaptured the governor's office.

Democrats continued to run strongest in South Texas and in the inner cities. Republicans continued to run best in suburbs, the Panhandle, and West Texas. The biggest change came in the rural vote where, led by Governor Clements, Republicans ran surprisingly well. And the biggest disappointment had to be that Texas had the third lowest voter turnout of the fifty states. Only 28.5 percent of our state's voting-age population cast ballots this year.

One cannot look far into the political future without considering the redistricting process that occurs on a decennial basis, and which will occur five times before 2036. Whether Texas is truly a two-party state on all governmental levels in the year 2036 will be determined in large part by redistricting.

As a Republican, I recognize our party still has some growing to do, both in terms of electing more candidates and in governing. It is no longer enough for us to oppose Democrats' programs. We must develop our own innovative and effective solutions to the state's problems.

The idea of less government is very much in vogue today. I have been known to utter, and believe, "that government which governs least, governs best." Yet, I also recognize the need for creative political leadership — especially in Texas, especially at this time. To show you the need for creativity, let me mentally take you to my district in San Antonio. The half-million people I represent are a diverse group. My district includes the suburbs and the barrios; the highest and lowest per capita income census tracts in Bexar County; the wealthiest school district in the area and one of the poorest in the state; and high-tech business and farmland. It is fifty-three percent Hispanic.

At first, I thought it would be impossible to fairly represent so diverse a district. Now I try to convince myself that if I can do it, I will also be acting in the best interests of our diverse state.

To talk of Texas's political future in only partisan terms would be not only divisive but also unrealistic. Most of the critical issues affecting our state's future — diversification of our economy, education, economic development — are nonpartisan and can best be solved on a bipartisan basis.

It is not accidental that all of those issues relate to economics. With that thought in mind, let's turn to a discussion of our Texas economy.

Politics and our state's population will come together to shape our state's economic future. Even in our free enterprise system, the role of government as an economic stimulator — or deterrent — must be considered. And government is equally dependent upon the economy, as events of the past year have made so clear. Recent economic reports on our state suggest that while the boom times of the past decade have not returned, and while some sectors of our economy and some areas of our state continue to be hard hit, there is no cause for panic over our immediate economic future — much less through our sighted year of 2036.

At the "New Texas" Conference hosted by The University of Texas last month, Baylor economist Ray Perryman said his twenty-year economic prediction for Texas showed a 2.9 percent growth rate for the state — slightly higher than expected national growth. Likewise, the Bureau of Business Research predicts "relatively rapid growth" over the next twenty-five years, also at a rate somewhat above the national average.

Over the last decade, the drama of the Texas economy was focused on growth. Over the coming decades, the focus of that drama will shift to a restructuring of the economy.

A consensus has clearly emerged that even when prices rebound, oil and gas production will never again be the mainstay of the Texas economy. Along with agriculture, they will continue to be important components, but the commodities of cotton, cattle, and oil have been succeeded by a concept as we look into our state's economic future.

"Diversification" has become the word of the day. And, clearly, a state as diverse as ours is well suited for such an approach. We have a diversity of natural resources, climates, wide open spaces, and high-density population areas. Geographically, we have the coasts and near deserts, the mountains and the plains. Ethnic and cultural diversities season our typically American melting pot.

From one standpoint, the current slump in Texas's economy provides us with a great opportunity — an opportunity to integrate all segments of our population into the work force. While all states are grappling to find ways to do this, Texas will be able to do so without being tied to an existing labor structure. Jobs in entirely new sectors of the economy will open up — sectors in which all applicants will be newcomers. By providing adequate training in these new sectors, Texas will ensure that its entire population will start out on the same footing when seeking employment.

By 2036, Texas may be one of the few states with a fully integrated work force. This, however, will depend on business, government, and education leaders developing a coherent plan for the state's future.

I find it significant that three of the four panelists and the moderator of our look into the future bring with them a direct link to education in our state. We cannot comprehensively discuss the future of Texas without discussing the role education will play in preparing us for that future.

Many of the leaders who will guide our state in 2036 are yet to be born. The others are, for the most part, in our classrooms today — our public schools, our colleges and universities. It is bad enough that our state's oil prices are dependent on OPEC. We cannot afford to have funding for our state's education dependent on Arab sheiks as well.

One of my favorite Bill Hobby ideas is his notion of "intellectual wildcatting" — that we break out of this oil and gas slump by mining our minds. To do that will require quality institutions of learning at all levels.

There is reason for concern for both public and higher education. An October Coordinating Board survey of public colleges and universities in Texas indicates that our state is experiencing a significant number of faculty resignations and difficulty in recruiting new faculty. Reasons cited included higher salaries at out-of-state institutions, greater research support, general economic conditions in Texas, and a fear that our state will not support higher education.

An equally alarming educational study released in November showed one out of every three Texas public school students who were in the ninth grade in 1983 dropped out of school. Yet it is these young people, as much as those in our colleges and universities, who will shape our future. For they will determine how we allocate our resources. The drop-out problem is costing the state billions of dollars in foregone income and lost tax revenues and increased costs in welfare, crime and incarceration, unemployment insurance, and adult training and education.

Throwing money at educational institutions will not yield automatic returns. It must be spent wisely. Yet to cut funding for education to save money is like stopping your watch to save time.

In closing, may I suggest to you that while it is a start, it is not enough to think or talk about the future. We must work to form and shape it.

As this discussion has suggested, Texas has been the beneficiary of many forces beyond its control. Our economy flourished when OPEC cut oil production and drove up prices. Our political system opened up in the 1980s with in-migration to our state. Our population grew as our economy boomed. Now, as we reach the limit of those forces and recognize the extent of our vulnerability, we must work to gain control of the forces that will carry us into the future.

The Texas Science and Technology Council has outlined a process for moving forward into the future that is instructive for our entire state. We must start to plan, and that planning must be an ongoing process, continually monitored, adjusted, updated, to take advantage of new opportunities, new ideas, and new challenges. It will require both short- and long-term planning, an openness to new approaches, hard work, commitment of necessary resources, and a maintenance of the Texas Spirit.

In the final analysis, the future of Texas — much like its past — will depend not just on government, but on the efforts and innovations of its people.

As a UT ex-student, it is tough to acknowledge that “The Eyes of Texas” is not our state song. However, the official state song has words which strike me as particularly instructive as we move through this era. It speaks of the destiny of our past and looks to a prosperous future. Listen closely the next time it is sung:

Texas our Texas! All hail the mighty state!
Texas our Texas! So wonderful, so great!
Boldest and grandest, withstanding ev'ry test;
O Empire wide and glorious, you stand supremely blest.
God bless you, Texas! And keep you brave and strong,
That you may grow in power and worth
Throughout the ages long.

THE TEXAS FUTURE:
WHAT WILL TEXAS BUSINESS AND
ECONOMIC STRUCTURE BE BY 2036?

GEORGE KOZMETSKY

It is important that I set forth at the outset my approach on how we may develop the future of Texas business and economy. As dedicated Texans, we are deeply concerned with the future well-being of our state and its communities. I wish to acknowledge and thank the Board of Regents of The University of Texas System for affording me a rare opportunity to devote the past four years — since giving up the deanship of the College and Graduate School of Business at The University of Texas at Austin — developing Texas's economic future in my role as Executive Associate for Economic Affairs.

Any approach to futures involves speculations. These speculations may consist of an exhaustive set of conjectures about every important element of the future; or they can be an attempt to predict some particular aspect of the future. Using this approach, such speculations can be provocative; they can be pleasant; or they can, perhaps, be pessimistic.

Let me briefly elucidate on what I mean. It may be provocative to speculate on how to tax robots by the year 2036 and how these taxes will compare to current state tax revenues from oil and gas. This conjecture, depending on your view, can be interesting, challenging, and has a highly pleasant quality. On the other hand, it lacks the required seriousness to answer the question, "What will Texas's economic structure be by the year 2036?" Nor does it have much to do with how we could go about changing from becoming to being.

Change in today's society requires a broader range of human intervention and involvement than ever before. Business and economic changes that encompass a fifty-year horizon, in my opinion, must involve the leadership of academia, business, and government — separately and in unison.

My work for The University of Texas System has reinforced my belief that any discussion of the economic future of Texas must have a clear notion of how our society "hangs together," how its parts are related to one another, which elements are more susceptible to change than others. These discussions must also take into account

the interplay of values, motivations, and resources within the constraints of custom and the privilege of change. Leadership needs to provide the necessary catalyst that assures a creative environment for change, which empowers others "to translate intentions into reality and sustain it." Texas needs more than "managers who do things right"; we need "leaders who do the right thing." In her letter to Thomas Jefferson in 1790, Abigail Adams put this proposition as follows: "These are the hard times in which a genius would wish to live. Great necessities call forth great leaders."

Texas has had more than one hard time to call forth great leaders.

Let me now provide some benchmarks to build upon for my vision of what this state's business, industry, and economy can be like in 2036.

1. The current state of Texas business in oil and gas, banking and finance, high technology, agriculture, retail trade, and real estate and land development is depressed both economically and attitudinally.
2. Many Texas managers are following the conventional approach that things will somehow turn around. They are awaiting the next period of boom in the hope that somehow everything will be all right again.
3. Very few question that Texas will become the second largest populated state by 1990, despite the current net out-migration being experienced.
4. The next Congress will have Texans in key federal positions that we have not seen since 1969.
5. Higher education in Texas has begun to realize that its role and mission must include being a catalyst for economic development in its respective communities and regions.
6. Most Texans are still proud of their "can-do" approach to crises and problems.
7. During the 1980-1985 period, the state government and a large number of Texas communities began to take independent initiatives to encourage high technology.

Let me now pull together what I consider to be the emerging consensus on the role of technology in the Texas economy:

1. Research spawns new industries and jobs.
2. A continuously educated and well-trained work force is necessary for stable economic growth.
3. Universities are the appropriate institutions for scientific research activities.
4. It is important to stimulate the formation of entrepreneurial firms as well as attracting out-of-state companies.

5. State government should provide science and technology policies, as well as resources for economic growth and the required incentives and removal of regulatory barriers, to incorporate technologies that will maintain the viability of Texas industries and encourage new home-grown firms.

Today's economic crises in energy, agriculture, and high technology in Texas have become the drivers for transforming our economy. Texas leadership must focus on establishing priorities for economic development and enhancing the collaborative efforts of the private sector, academia, and state and local governments to achieve the goal of building a future-oriented Texas economy that results in world-class innovation centers and world-class manufacturing centers using Texas-based resources.

Now let me give you my basic assumptions for building Texas's business and economic future.

We need to develop our own future within a broader context than ever before. In my opinion, the future of Texas is no longer entirely within its own control. Nor is it adequate to adjust only to the opportunities of our country's economy. We must develop Texas's own specific future within a global economy that is both competitive and cooperative. That is the challenge that faces Texas leadership.

Texas businesses and its economy have changed permanently and irrevocably. The state's ability to regain or to maintain its global competitiveness must become a major goal for all Texas leadership. Our goals cannot be to catch up with California or Massachusetts. These states are beginning to realize that their industries are not globally competitive. We should raise our goals to utilize our state's unique resources, both natural and human, that give us a global competitive edge as well as provide a basis for cooperation with other states and nations.

Texas economic structure by 2036 will be heavily dependent on three things; namely,

1. the quality and quantity of our intellectual resources;
2. the capacity of developed and emerging Texas technologies; and
3. the ability of Texas leaders for the transformation process as well as how effective they will be to empower in a timely and effective manner the translation of visions into reality and in sustaining them.

Strategically, we must recognize that there are now two kinds of manufacturing that have different impacts on employment. One is

the traditional manufacturing of raw material into goods. The second kind of manufacturing is for products that are more knowledge-based. More and more rights to knowledge-based products are sold and manufactured at home and abroad. This area is the primary basis for growth in domestic manufacturing employment and foreign trade in the future. The strategic implications for Texas are that knowledge workers will be the center of gravity of the labor force and outnumber blue-collar workers.

A final strategic factor for Texas leadership is to recognize that capital movement has become a major driving force in the world. We must begin to enhance our abilities for twenty-four-hour financial services and to establish major financial centers for global trade and competition.

Let me now succinctly set forth Texas business and economic structures for 2036. In this respect, I shall present as a retrospective my views on the newer structures by regional spheres of influence of the state and the critical changes in the business, industry, and commercial areas. I will consider what the shorter term steps were — those that needed to be looked into tomorrow and not the next decade. I would like to put them in the context of world-class innovations and manufacturing and services centers that may be appropriate in each of these regions. I shall try to indicate some of the more critical catalytic leadership roles required by specific examples.

The Denton-Dallas-Fort Worth-Waco-Tyler-East Texas sphere of influence has become an internationally recognized manufacturing center in terms of both traditional and knowledge-based manufacturing. In April 1987 the University of Texas at Arlington dedicated its Advanced Robotics Research Institute. By 1992, it made significant breakthroughs. Many of you may be pleasantly surprised that “robots” as such were not the institute’s major area of concentration. Rather, they had been able to perform systemic integration for generalized manufacturing assembly and fabrication operations. They also were able to modularize the hardware with its required software so that one could adapt manufacturing modularized work stations and machining tools for a specific system. This means that one could design manufacturing systems in a manner that permitted purchasing from mail-order catalogs.

By 2005, there were over 100 indigenous companies employing more than 125,000 persons developing and globally marketing ad-

vanced manufacturing systems. More than sixty percent were involved in software development. By the year 2010, there was a burgeoning machine operations center in this geographic area. Both Japanese and West German firms had established research and development centers in the Dallas sphere of influence.

By 1993, the Advanced Robotics Research Institute provided the ability to develop and successfully simulate flexible manufacturing centers. These breakthroughs made the corridor in 2030 a major world-class center for metal cutting.

Another impetus came from the federal government. The Department of Defense approved in 1989 a major federal government laboratory in Texas for advanced flexible manufacturing of advanced materials (such as alloys, amorphous metals, rare metals, and composites), automated assemblies that delivered weapons parts to order, automated and integrated inspection equipment with integrated quality assurance. They also included research in adaptable input and output materials handling. Finally, they also conducted advanced research on automated and paperless warehousing and logistical support on a worldwide basis. This federal laboratory was located and was operational by 1992 in the home district of the 1987 Speaker of the U.S. House of Representatives.

The University of Texas Health Science Center at Dallas, in cooperation with the Dallas mayor's office and the Dallas business community, was the catalyst in developing a number of indigenous companies in biotechnology. Most of these companies were involved with the diagnostic market. However, a number of them developed products for supporting recombinant DNA research for selected pharmaceutical companies. In the year 2036, Dallas was a major center for health care in selected fields outside of cancer.

Because of time, let me just list some of the highlights of the business, industry, and service centers in the Denton-Fort Worth-Dallas-Waco sphere of influence as of 2036.

1. *Manufacturing Center*
 - a. Advanced Manufacturing Factories
 - b. Military Missiles, Aircraft, and Avionics
 - c. Telecommunication Systems and Components
 - d. Integrated Semiconductor Subsystems
 - e. Garments
2. *Innovation Center*
 - a. Advanced Robotics and Factory of the Future
 - b. Biotechnology for Diagnostics

3. *Service Center*

- a. Worldwide Twenty-four-hour Financial Services
- b. No. 3 Insurance Center of the World

The next sphere of influence I would like to briefly cover is the San Antonio-Austin-College Station Crescent. The major business and economic changes that occurred came from the early catalytic leadership at MCC, The University of Texas at Austin, and from Texas A&M. This crescent earned its reputation as a major innovation center in the U.S. that truly created a unique three-pronged major technopolis. Where the Dallas sphere of influence developed a worldwide manufacturing center, the San Antonio-Austin-College Station sphere developed innovation centers.

The steady stream of advances in biotechnology, especially based on novel techniques of DNA technologies, cell fusion, and industrial botany, was overwhelming at The University of Texas Health Science Center at San Antonio, the colleges of natural science, engineering, and pharmacy at The University of Texas at Austin, and the agricultural science, veterinary medicine, and engineering colleges at Texas A&M University. More importantly, the cooperation among these institutions and with the pharmaceutical and agricultural companies in other states and nations resulted in over 150 research and development laboratories located in the crescent. The continuous number of small companies being started by both graduates and former employees reminds one of the heydays of the Silicon Valley.

By 2036, there were over four centers of excellence in biotechnology for medicine, agriculture, animals, and plants in the Austin-San Antonio-College Station Crescent. All of them were formed early on with funding from the federal and Texas governments and in joint sponsorship with private businesses. Most are self-supporting in 2036, through winning competitive grants, through license and royalty fees, and from equity in spinoff companies.

With MCC's continuing progress in advanced electronic developments, a number of the electronics-based manufacturing companies established their R&D centers in the crescent. At least two had moved their headquarters into the crescent's sphere of influence. MCC's good work was augmented by the outstanding research by the Computer Sciences Department and our Semiconductor Research Labs at The University of Texas at Austin.

A private Manufacturing Software Consortium of fifty major firms had been formed and located in the crescent. Sometime in 1990, the U.S. antitrust laws were amended so that private con-

sortia were more effective than they were in 1986, when they were restricted to joint R&D efforts. By 1990, the laws were amended to include joint manufacturing breakthroughs as well as joint global market studies so that Texas and other companies could compete more effectively in the global marketplace.

By the year 2036, San Antonio had over 120,000 persons working in biotechnology. In 1986 there were less than 30,000 employed in the San Antonio Medical Center, Southwest Research Institute, Southwest Foundation for Biomedical Research, USAF School of Aerospace Medicine, Wilford Hall Air Force Hospital, and Brooke Army General Hospital.

By 2036, six companies based in San Antonio made the Fortune 500 list in the biotechnology field. One of these companies specialized in laser surgery instruments. Another Fortune 500 company was based on one of the early technological breakthroughs at Los Alamos in biomagnetism; and another was a spinoff from the Air Force's drug test program for worldwide armed forces personnel. San Antonio was the center for such drug testing and had specimens flown in from all over the world. The private company took the best of the Air Force's procedures as well as Federal Express scheduling and their own. Later, the armed forces privatized their operations to this company.

The University of Texas at Austin and Texas A&M University, as Texas's flagship universities, continued to play a significant role in maintaining the state's worldwide recognition as major technology innovation centers. In 1987 The University of Texas at Austin was instrumental in getting major programs in materials sciences that became the nucleus of one of the three major federal laboratories for materials sciences in the U.S. The other two are in Boston and Huntsville.

Texas A&M University agricultural biotechnology breakthroughs in the basic sciences and their subsequent use for improving Texas agriculture, especially in arid regions, have been spectacular. Texas A&M researchers worked successfully with Texas Tech. By 2036, they were growing special sorghum and other plants in West Texas — on Permanent University Lands as well as on private lands for the extraction of chemical and pharmaceutical agents. The scaling up of the manufacturing involved cooperation among other Texas academic institutions, U.S. industry, and Japanese companies.

The next sphere of influence is the Houston-College Station-Beaumont-Galveston-Corpus Christi Zone, together with the other

Texas coastline cities. The University of Houston provided the early leadership along with the Houston Area Research Center (HARC — comprising the University of Houston, Rice University, Texas A&M University, and The University of Texas at Austin) in developing the commercialization of space through space stations and the colonization of the Moon. By 2036, the Johnson Space Center was spending over fifty percent of its budget within the Houston sphere of influence.

Space manufacturing development companies in 2036 were growing much like the biotechnology companies in 1980-1982. They were manufacturing crystals for advanced semiconductors. They were processing specialized materials and pharmaceuticals. They were providing services for research and experimentation in space. The spinoffs from the space research programs were being commercialized as key components and equipment for the future manufacturing plants. There were already significant spinoffs of artificial intelligence for medical diagnosis. Many companies established both large diagnostic data bases in conjunction with the University of Texas Health Science institutions, as well as with Baylor Medical School, that were tied in with AT&T and IBM's worldwide communications network. Texas A&M also played a key role in this sphere. It expanded its research park to include both space engineering and oceanographic services.

The most fascinating thing was how the universities, the energy and chemical companies, and the construction companies were able to blend breakthroughs in deep ocean drilling with deep space developments. The common element between these two industries provided the Houston sphere with a stronger industry base than either energy and chemical or space industries singularly.

In the Houston sphere of influence, supercomputers were being used for large-scale research projects, as well as for design of construction projects and for data processing. In fact, Houston had become one of the more important supercomputer application centers in the U.S. By then, it was an obscured fact that The University of Texas System and HARC had pioneered supercomputer applications in 1985.

The medical institutions in Houston and Galveston provided the early catalysts for health services, medical instrumentation, biotechnology diagnostics, and delivery systems. The small companies proliferating in this area reminded one of how M.I.T. played a leading role in the development of Route 128.

The Houston sphere of influence by 2036 had done a great deal to develop the resource potentials of the Texas Coastal Zone. This area, together with South Texas, became the new tourist mecca. More importantly, it began to show growth from retirees moving in from the Midwest, much like the Northeast and central states' retirees provided Florida in the 1970-1990 period.

The final sphere of influence is that of West Texas. Under the early leadership of the Institute for Flexible Manufacturing and Material Sciences at The University of Texas at El Paso, the Center for Energy Research and Economic Diversification at The University of Texas of the Permian Basin, and Texas Tech University, West Texas developed the advanced manufacturing for the twin borders.

In 2036 the basic industry of manufacturing for automobiles, personal computers, smart terminals, consumer electronics, and defense was very dominant in the twin border program. Employment was provided by U.S. firms and by foreign firms from the United Kingdom, Japan, and West Germany. By then, the border was extended in width by 100 miles.

The universities played an ever-increasing role in educating the Mexican scientists, engineers, managers, and other technical specialists. Beginning in 1988, housing for the Mexican students was provided on the Mexican side of the border, while most of the classes were held in El Paso, Texas. By 2036, there were sister universities established in Mexico proper.

In 2036 the oil and gas industry in West Texas was alive and well. The in-fill drilling reserves that centenarian Dr. Bill Fisher, who was director of The University of Texas at Austin's Bureau of Economic Research, predicted had proven to be conservative. The use of oil for higher-value products than fuel had also been developed through joint research between the major oil companies and the universities of Texas, A&M, Rice, and Houston. In fact, these breakthroughs provided a stable petrochemical industry base for West Texas.

The diversification of the West Texas economy by 2036 was a jewel in Texas's economic crown. Here were to be found companies that produced the newer crystals for semiconductors, pharmaceuticals derived from plants, and large-scale industrial botany production, including the use of household plants in highly automated factories by combining high technology solar systems with fiber optics to distribute sunlight in an optimum manner.

The communities of West Texas had not only begun to work more closely together but had also developed their unique transportation systems. These led to the development of a uniquely dependent infrastructure: hides were now converted into leather goods, footwear, and apparel; wool, cotton, and synthetics (derived chemically and bacterially) were transformed into materials. While these materials were marketed in the Dallas sphere, nationally and globally, the local area had its own garment industry. Of course, the advanced manufacturing plants were designed locally but were constructed in the Dallas sphere of influence, with software coming from the San Antonio-Austin-College Station sphere.

By 2036, El Paso had made the required linkages with New Mexico to participate in the Rio Grande Economic Corridor. This gave the city the wherewithal to participate in civilian and military space programs and advanced weapon system testing and development. Few Texans in 1986 thought about commercial launching in the West Texas-New Mexico region by 2036.

The final program I would like to call to your attention is the multinational, large-scale macroengineering program between Mexico and the U.S. This program recognized that the twin plant programs needed an infrastructure which provided adequate water and a transportation system for effectively moving materials, people, and goods north and south and globally. This encompassed more than roads on both sides of the border. It involved seaports, airports, and spaceports. Its financing was also a joint effort among Japan, the U.S., the World Bank, Brazil, and Mexico.

Let me conclude on the note where I began: what Texas business and economic structure will be like is highly dependent on how the leadership of academia, business, and government work separately and in unison. During the past twenty years, I have observed and participated in the seeding and developing of the many multifaceted developments that I have enumerated in all spheres of the Texas economy and geography as of the year 2036. Each of our communities has leadership. Each of our communities has taken bold steps to transform its economic and social conditions. What is needed now is an overall state leadership that broadens and links our horizons and provides the necessary vision to make the future of the great state of Texas globally competitive and cooperative.

SCIENCE, AGRICULTURE, AND THE LAND OF TEXAS IN 2036

H. O. KUNKEL

At the outset, we can be certain that land surfaces will continue to be the primary resource base for the food chain of the future. The energy costs of other sources of food — harvests from the sea, or production of food from biomass through biotechnology or through chemical synthesis in manufacturing plants — will simply be too great to provide more than a fraction of the requirements for food through these means, unless some new, inexpensive source of energy is developed. This point alone assures us that Texas land and Texans will be engaged in food and other agricultural production and manufacture in the decades ahead. The issue before us, then, is what shapes Texas agriculture and land usage will take through the next fifty years.

But forecasting the future of Texas agriculture seems especially tricky in 1986. Difficult times have fallen on parts of agriculture, particularly crop agriculture, and we see evidence of fundamental change in Texas's second largest industry. The debt-to-asset ratio for many farmers is precariously high, as land values and farm income have declined. Many farm units are becoming obsolete as operating units because of their size and location. Yet some segments of Texas agriculture are prospering. And there are new eruptions of biological science — centered in recombinant DNA techniques — and of new capabilities of information technology which, in turn, promise a significant surge in new applications of science and technology in agriculture. While we can evaluate past trends and accommodate what we have seen, we stop short of defining what the trends ultimately are.

The trends so confidently forecast in the mid-1970s would scarcely have predicted the dilemmas of agriculture in the mid-1980s, though too much faith in the trends that were forecast in the 1970s may have contributed to the dilemmas of today.

Are we then left without a vision of the future? Not really, for we can visualize out of the heritage of agriculture certain constraints and alternatives in the evolution of the system. And out of science and confidence of the future we can visualize the possibilities.

Every agricultural system carries with it the experiences of ancestors, those practices upon which new technology builds and which constrain the innovations that are possible. The construction of an agricultural system is not simply the sum of its components and instructions for building the system. The system is also the product of descent through evolutions of culture, tradition, and the soil itself, as well as economics, political policies, and science. It is a legacy that is revealed in its uses of resources, the productivities of the system, and the marketabilities of its products.

Agriculture and the uses of land in Texas fifty years from now will be descendent of the "traditions" that are forming today.

Production agriculture of the twenty-first century will be less intensive in the areas of energy and labor than it is today, but more people will be involved because they want to be. It will have a greater diversity of products, principally among high-value crops. The farmers of fifty years hence will be part urban, part rural, and selective in what they grow. And the crops that the many farmers grow will be specialty crops (some that are common now and some that are not), Christmas trees, pastured ruminant animals, and fish and other aquatic animals, all of which can fit smaller farms and plots. (Hatchery-based aquaculture, however, will take on larger commercial dimensions than pond-sized productions.) Interspersed in the urban scene will be an agriculture of ornamental plants, shrubs, trees, and grass designed to enhance the aesthetic value and alter the microenvironment of homes, work places, landscapes, and recreational areas. But vast acreages of land will still be occupied with the production of food grains (wheat, if not rice) and feed grains (corn, if not sorghum), of beef cattle and of wild game, both native and exotic. We are less sure of the place of cotton and soybeans fifty years from now because these are crops that other agricultural nations can supply; but more efficient technologies can assure their place. The current traditions of beef cattle feeding, principally as a marketing system, of dairying, and of poultry production are likely to remain fairly constant. These systems will be concentrated and separated from the land, although they will use the products of vast acreages. Only guessed at can be the extent of land that will be used for production of biomass for energy and biotechnological transformations.

Texas agriculture in 2036 could well be part of an American agriculture which again would be the dominant supplier of food for the world. We can expect three billion more people in the world

by 2036; the world is adding a billion people every twelve years now. But whether Texas agriculture fits such a global supply system will be a function of science in the other great agricultural areas of the world — China, Brazil, Canada, Australia, India, Southeast Asia, and southern Africa — as of science and technology in the United States and Texas. The high technology revolution is worldwide, and there is no stopping it. The potential returns are too great.

Texas agriculture surely will not be a significant feature of the global supply of food unless education, science, and technology are a part of the state's agricultural infrastructure. In 2036 most of the production of field crops in Texas will be under the conditions of rainfed agriculture; that is, under the conditions which are regarded today as those with risk and uncertainty.

We presume that the special land ethic that is Texas — pride in ownership with expectation of the rights of private ownership — will remain the tradition of Texas. Albeit so, some Texas farmers are leaving the business. And some of the farms that they leave are turned over to creditors, both public and private. Some farms may revert to pastures, weeds, and brush. Others are sold to investors who gamble that farming cannot get worse and prices of land will rise. And some farms will be sold to farm-management firms that are fast-expanding elsewhere in the United States. But greater forces are apparent.

The rural agricultures of the future will be bimodal, with concentrated and large units on the one end and greatly subdivided areas at the other. Farming of commercial commodities favors large firms: those that can grasp advantage of new seeds and propagations, innovative methods of production, economies of scale, and bulk transport of products. Subdivision provides for nonbusiness needs as well as limited agricultural production and will change the nature of lands along highway corridors and near cities. It will leave a large landscape with an increasingly partitioned ownership that is not likely to be reversed.

With resurgence of the Texas economy, cities will continue to grow at the expense of the countryside even as the flight from the distant countryside is accelerating. But the population that is growing is the outer-outer suburbs, areas so far out they are effectively in the countryside. The houses creep out, each set in an acreage, and they colonize the fields, pastures, and woods. Rural towns and farms are swallowed, and some crossroads are transformed into small cities with office blocks, parks, and shopping malls. Las

Colinas, near Dallas, and City Post Oak, outside of Houston, are examples. And committed refugees from urban life move still farther out seeking a plot they can afford if not the idyll of their imagination (see *The Economist*, November 6, 1986, p. 37). One in five sales of land today is for use in recreation and retirement.

But what of commercial agriculture?

In the suburbs of the cities and along the highway corridors will be islands of farms and gardens. The major agricultural operations are likely to be clustered around a processing and marketing center, perhaps along the evolving model of the Texas forest and cattle feeding industries of today. There will then also be acreages of land in the hinterlands, uncultivated, untilled, and inhabited only by wild and feral animals; lands that may also serve recreation and nonbusiness values of land or as watersheds but are abandoned by agriculture.

The land used for agriculture in Texas is in retreat and will consist of substantially less acreage in 2036. But the productivities of agriculture will be enhanced and protected by education, science, political policy, and entrepreneurship.

Agriculture in Texas, as well as elsewhere, has been driven and structured by science. The fields and grasslands bear visible witness of that: Cotton fields are populated by smaller, more numerous plants harvested weeks earlier than they were a decade ago. Sorghum fields are filled with hybrid plants, waist-high and even in height. Wheat and rice are also short in stature, semidwarfs, resistant to lodging. Potatoes, onions, and wine grapes are becoming increasing elements on the Texas scene. The cattle herds in most of Texas are multicolored, bearing allegiance to a cross-breeding regime devised through years of experiments in animal breeding. Concentrations of tens of thousands of cattle in feedlots and of hundreds of thousands of chickens in single units can be seen in Northwest Texas and East Texas, respectively, attesting to the scientific development of formula feeds and effective methods of disease control.

But though science and technology have been the architects of the plants and animals, and have adapted them to the Texas environment, culture, tradition, economics, and the soil and climate dictate what is planted and what is bred and fed. Texas agriculture has a uniquely Texan flavor. The state has become a region of large cattle feedlots, significant poultry production, and a growing dairy industry, in spite of the current buy-off program, but produces only a very small fraction of the pork produced in the U.S., although the relevant

science in Texas has been excellent. Texans are simply not disposed to be pig feeders, even though pork production is an honorable enterprise.

So it will be in the future of Texas, that attending the changes in agriculture and its related economic biological systems will be the iterative interactions of science — guiding, propelling, providing feasibility to new crops and new uses of the land, providing the means for better decisions. Texas has some strong institutions of agricultural science — Texas A&M University and the Texas Agricultural Experiment Station, Texas Tech University, the USDA units in Texas, the relevant basic studies in the laboratories of The University of Texas. And we presume their strength will be maintained. Improved technology will offset the consumption of land resources for nonagricultural purposes and the jeopardy of an uncertain, risky environment. Economics and nutritional science will develop new markets. Research will contribute to the development of opportunities in the land for recreation and tourism. The systems approach will maximize the uses of forests and rangelands. Research will find the means to protect the quality and maximize the value of water supplies. The risks of weather, disease, and pests will be reduced. Science will provide the technology for development of new “crops” for Texas: exotic animals for hunting and for specialty restaurants, aquatic animals such as shrimp and redfish, blueberries and grapes, turfgrass, trees, shrubs, foliage, flowering plants, and so on. Biotechnology and food science will not only enhance the technology of agriculture but foster new high-technology industries, investment opportunities, jobs, and economic stability. And the new biological sciences, aimed as they are toward fundamental understandings of the biologies of plants and animals, will set the bases of agricultures that will be competitive in global, national, and regional markets.

The arena that could have the most substantial impact on Texas agriculture during the decades ahead are those sciences and developments in technology that impact the conversion of food and fiber commodities and forest products into consumer and industrial goods. The so-termed value-adding industries can facilitate meeting both the needs of a changing market and marketing agricultural products. A case in point now: aided and abetted by developments in food technology and changing dietary habits, the poultry industry is on the edge of commanding a larger per capita consumption of meat products than does the beef industry. We will soon eat more chicken

than beef. The beef industry has seen the model and is responding — with a program of its own.

The science and technology that will make a difference in the decades ahead is related to information technology. Robotics and other elements of knowledge-based systems, including expert systems, are being geared to the management and economics of future agriculture. These trends will regard agriculture as a heterogeneous population of units rather than homogeneous populations. The decision will be specific to the field or farm (ranch) or operation or system. Thus the agricultures of 2036 and their infrastructures will be operations that are intensely managed.

But the users of the new technology developed out of science may or may not be owners of the land. Ownership of land will remain important to those who use agriculture for recreation and those who have family ties to the farm. But technology will provide many opportunities for separating ownership and management. The commercial farmer of 2036 will likely be an educated, skilled manager, less driven by or distracted by land ownership or financing. His managerial skills would be leveraged by the management of land owned by others. Considerations for the farm manager will be technical economies of scale, diversification of risk management, and financial advantages. And though our instincts and heritage may call for a closer tie of ownership and operation, ownership of land may be but a separate investment which may come to be bought and sold as corporate stocks are now — without affecting the operation.

This is as we believe it will be. And land-based agriculture will still be a substantial part of the vitality of Texas in 2036.

TEXAS: THE MYTH, THE CORPORATION, THE NATION

ELSPETH ROSTOW

I know only two things about the year 2036. One is that probably the majority of those in this room will not be around to find out how accurate the predictions we have just heard will turn out to be. The second point is more challenging, and that is that what 2036 turns out to be will indeed depend on what we as Texans do over the immediate future. I would say that the next five years will crucially determine what 2036 looks like.

We have been hearing not three parts of the whole that I thought we would hear, but rather three different views of Texas: 1) Texas as a myth or a concept; 2) Texas as a corporation; and 3) Texas as a nation. This is what I will attempt to do, to put in what I believe to be perspective the extraordinarily interesting day and a half that is now concluding.

First, Texas as a concept, a hypothesis, a dream. We are, more than other states, a willed entity, just as the United States was a self-created nation. We developed our ideas and thought that we could determine our future out of our land, our people, and some sense of destiny. The country as a whole liked the phrase "manifest destiny." We looked in Texas at our own past, as Mr. Fehrenbach so eloquently told us yesterday, as something that should be utilized for a historical purpose. This sense, then, of the meaning of Texas was transcendent; it was beautifully expressed often in song, but often pungently expressed in less lofty terms.

We were urged to think of Texas as, in a sense, a memorial to Bob Wills. We were also asked to think of Texas in terms of the past that is now receding, when Texas and dirt were closer to one another than in one sense, in these antiseptic quarters, we think of Texas today.

This mythic concept of Texas was built on a variant of a national trait, which has been described as relentless optimism. I like this phrase because optimism that is relentless can carry you through all kinds of privation and can make the future seem worth the trials of the present.

Coming to Texas in 1969 as a displaced New Yorker, I have seen a great deal of the relentless optimism of the past still alive

in Texas. And I trust that it will remain alive, because it is the stuff out of which progress is made, and without it, without a sense of special destiny, there is really little purpose in a great deal of the activities that involve us on a day-to-day basis.

The mythic Texas, then, has changed. Yes, it is changed from rural to urban. Yes, it is changed from small to large. Yes, it is also changed in, I would say, a diminution of brag talk. We heard a reference to that this morning. I associate brag talk with a sense of weakness, and I think that I see an increase in self-confidence in Texas in that I hear less of it than I used to when I was young. So, when I say confidence, I am not suggesting that it be the over-weaning caricature of Texans of the past. I think that is much less descriptive of the way we are, in part because we have become a more self-confident state.

If mythic Texas is a part of what we have been listening to, then the second approach to Texas we have heard in extraordinarily interesting fashion. This is Texas as a corporation.

Imagine for the moment that you are a hard-nosed investor coming in from outside and thinking of this state as a business enterprise. What we have heard is that we would look pretty good. We look good in terms of our resource base. We could apply technology more effectively in oil — and we will. We could utilize our land more effectively, and, as Dean Kunkel so clearly described, we are in the process of doing that. We could certainly move in the direction of finding a better use for those of us who are not employed at this time. There are many ways in which we can better utilize both our labor force and our resources, but it is happening. We are a better educated state than we were, and that makes us a better corporation.

So I would like you to think of Texas, then, in the second fashion as a business enterprise that at the moment may look a bit bleak. Outside, for example, the *New York Times* sells papers and possibly lines of advertising by more frequent stories about the ills of Texas than I recall reading in a long time. Every time something happens that affects the Hunts; every time there is a reference to former governor Connally; every time some indices go down that were going up but a short time ago, the *New York Times* has an almost obscene level of pleasure in reporting these happenings and celebrating them.

We seem outside to have met the fate that non-Texans think we so richly deserve. The notion that you should celebrate the fall of

the mighty has biblical sources, but it still reflects a certain human inclination.

But, nonetheless, the Texas corporation is in good shape. We will find, as we thought we would explore in the seventies, what were then called the post-1985 technologies, and we will use them — because there will not be an indefinite oil glut; there will not be an indefinite period when energy is abundant. And we in Texas have many alternate resources that we will utilize.

More important to the corporation is its labor force. It is an admirable resource, and going from not only those whom we cannot count — who vote their approval of Texas by coming across the border at night or in the back of pickup trucks or in some other informal fashion — to those who are post doc's in our excellent institutions. What we are doing is to develop a labor force which is variegated and which will serve the needs of a still-growing state.

So if you will look, then, at the second level of resource aside from what is under the soil and on top of it, the phrase that we have heard, that the human mind is the oil and gas of Texas's future, seems a cliché but, as with many clichés, it is also a truism.

This indeed is where the strength of the state will lie, because it will be in human imagination that we best utilize not only our resources but the possibilities of new policies for the state that will even better serve our needs. At the moment there are many things that need to be done with this working force. Some of it is underutilized, and also some of the educational approaches we have used in the past have manifestly been deficient. I say this as one who right now is correcting some forty-four student papers, and I assure you there is a frontier to be crossed in terms of undergraduate literacy.

Texas as a corporation is, as with all corporations, suffering a temporary decline. But you need only to listen to the magnificent projections of George Kozmetsky to see where we may go. I say *may* because if I have any lesson to my closing remarks it is that history is not linear nor is it self-enacting. What is happening now will not necessarily continue to happen. This is the plight of many investors who do not understand the volatility of a market or an economy. In terms of self-enacting, there is no guarantee that the bright world that Dean Kozmetsky sketched before us will occur if certain things do not happen.

The health of the Texas economy is good. The health of Texas as a corporation is in need of certain improvements and tampering but not in basic restructuring.

I am saving the third view of Texas we have for the last. This is Texas as a nation. We are larger than France. We are more diversified, in many respects. We have linguistic differences that occasionally make it necessary for me to ask some of my students to repeat what they say and for them often to ask me to correct my deficient New York speech. There are certain words, for example, that I have to write on the board because I know that when I say "*electoral*" this will not be easily understood by those who believe it to be pronounced "*electoral*."

There are wonderful variations in this state. I'm afraid they are going to diminish, and I deplore it.

I like regional differences, whether they are in speech, in music, in literature, or in culture. But we are all the victims of technology as represented by radio and above all by television, and I'm afraid that we will see a more homogenized speech, and in that sense, a more homogenized Texas. It seems to me that I see Texas becoming less atypical than I believed it to be when we came in 1969. I wish very much that we could maintain that sense of special identity.

N E C R O L O G Y

H. J. ETTLINGER

1889-1986

HYMAN JOSEPH ETTLINGER WAS BORN SEPTEMBER 1, 1889, IN St. Louis to Abraham Ettlinger and Pearl Shucart Ettlinger. He was the second child in a family of six children. Young H. J. attended the St. Louis public schools, and when he graduated from high school he was awarded a four-year scholarship to Washington University. In college he was a member of the debate team and the varsity football, basketball, and baseball teams. He earned All-American honors in football, and in one basketball game, in which Washington beat Missouri by something like 24 to 16, he personally scored more points than the entire Missouri team.

From 1910 to 1913 young Ettlinger was in graduate school at Harvard University, majoring in mathematics. At Harvard he studied under such luminaries as George David Birkhoff, Maxime Bôcher, Julian Lowell Coolidge, Edward Vermilye Huntington, and William Fogg Osgood.

In 1913 Ettlinger joined the faculty of the Department of Applied Mathematics at The University of Texas and began a fifty-six-year teaching career and a seventy-three-year association. He later moved to the Department of Pure Mathematics. In 1953, when the two departments were combined, he became professor of mathematics. In 1960 he went on modified service and in 1969 was named professor emeritus of mathematics. He lived on until June 8, 1986, still exhibiting a keen interest in mathematics, an undiminished interest in college sports, and a continuing concern for contemporary social, religious, and financial matters.

Ettlinger had attended a Jewish school in St. Louis and had learned to read Hebrew. As a graduate student at Harvard, he continued that interest in Jewish affairs, particularly with the Menorah Society. When he moved to Austin in 1913, he became a member of the Congregation Beth Israel, later serving as secretary and as president. He helped organize a Menorah Society for Jewish students at The University of Texas, and for many years was closely associated with the local Hillel Foundation, raising scholarship funds, administering fellowship awards, and finding jobs for students. He chaired

a fund-raising drive for a new Hillel building, for which he is commemorated by a photograph and a plaque.

Yet Ettlenger's interests were not narrowly Jewish. He was a strong supporter of the National Conference of Christians and Jews. He helped get divisional and local offices established in Dallas, San Antonio, and Austin, and over the years he served the conference as a member of the National Board of Directors, of the National Executive Committee, and of the Commission on Education Organization.

In 1918 he married Rosebud Segal, who had just graduated from The University of Texas. The Ettlengers had two children, daughter Yetta, who died in infancy, and son Martin Grossman Ettlenger. Martin wrote a master's thesis in mathematics under the direction of his father's friend and colleague R. L. Moore, but he turned to chemistry for his doctorate. At his father's death he was associate professor of chemistry at the University of Copenhagen in Denmark.

Dr. Ettlenger became a member of Phi Beta Kappa at Washington University, and both his wife and his son were elected to Phi Beta Kappa at The University of Texas — a remarkable trio.

Ettlenger was interested and visible in many professional mathematics associations and activities. He was a charter member of the Mathematical Association of America, organized in 1915. At one time he organized the Grass Roots Educational League, when he thought professional educators had taken the wrong direction in college preparation. He served as state director of an annual mathematics contest for high school students, and he directed a special summer program for gifted high school juniors, sponsored by the National Science Foundation.

But his enjoyment of life and his contributions to it went on and on. He served as foreman of the Travis County Grand Jury. He was one of the original incorporators of the First Federal Savings and Loan Association (of Austin) and served as a director for over fifty years. In 1940 he became a member of the Philosophical Society of Texas.

At The University of Texas he taught some undergraduate courses, including the beginning course in calculus (for which he and his colleague Milton Brockett Porter had written a textbook). He was a pioneer supporter of the Plan II program, and for many years he taught a freshman course in number analysis for Plan II students. In 1959 he received a Teaching Excellence Award from the Students' Association.

Over the years he wrote over twenty technical papers and a number of book reviews, and he co-authored technical reports for The University of Texas Defense Research Laboratory and two textbooks. He supervised the dissertations of twenty-two doctoral students and served on the committees of many others. He directed the master's theses of at least 105 students, again serving on the committees of many others.

Ettlinger's mathematical specialty was the solutions of systems of differential equations. He was particularly interested in Sturmian theory for ordinary differential equations. His colleague Milton Brockett Porter had worked with the finite difference analogue to Sturmian differential equations. Bôcher and Birkhoff had made contributions in the first two decades of the twentieth century. Professor Ettlinger made his contributions mostly in the third decade. Many of his students carried on in new developments in the same field. As is often true with creative mathematicians, his own creativity inspired and was followed by the further work of his graduate students.

Hyman Joseph Ettlinger was dedicated to athletics and exercise. He regularly played handball and swam until late in life. He was an assistant coach to the varsity football team in 1917 and was the director of Intercollegiate Athletics in 1928-30. For years he served as an official at the spring Texas Relays and at the spring Inter-scholastic League track meets. During the football season, he refereed at games throughout the state — university, college, or high school. He was a charter and life member of the Southwest Conference Football Officials Association and in 1973 was elected to the Longhorn Hall of Honor.

A typical Friday in the fall would find Ettlinger rising at an early hour and driving a hundred miles or so to the scene of action. On arrival, he would report in at the local school. There, he might address the school assembly, or perhaps one or two mathematics classes. At noon he might address a local service club, pleading for stronger support of mathematics or of scientific endeavors. At game time he would fearlessly play his role as official, then afterwards drive back home, having enjoyed every one of the day's events.

In his retirement years Professor Ettlinger continued his service to the university. In particular, he personally funded or raised the funds for three projects. The first was the preparation of what has been called the UT Mathematical Family Tree. An effort was made to list all the recipients of Ph.D. degrees in mathematics at UT

by supervising professor, and follow that with all the Ph.D. degrees granted by each such graduate, whether at UT or elsewhere. The list thus included the mathematical grandchildren, then the mathematical great-grandchildren, and so on — an extensive and fascinating tabulation.

A second project was the funding of the Richard T. Fleming Writings Collection award. Mr. Fleming, a member of the Philosophical Society, had amassed an extensive collection of books and monographs authored by UT graduates and faculty, and after his death in 1973, Ettlinger funded a \$1,000 award for the best "item" published by a UT faculty member or UT graduate. The first winner was John Edward Weems of Waco for his book *To Conquer a Peace: The War Between the United States and Mexico*.

A third project was the R. L. Moore – H. S. Wall Mathematical Prize, named after two colleagues in the Mathematics Department. This \$3,000 award was for the best book or research paper in mathematics by a UT student or graduate or faculty member. In 1976 the first Moore-Wall Prize was awarded to Professor William Eaton.

When Ettlinger turned ninety in 1979, his birthday was celebrated in a round of parties — by Temple Beth Israel, by the directors of the First Federal Savings and Loan Association, by the Department of Mathematics, and by friends and family at the Ettlinger home. He lived on for another seven years, but for the most part they were years of decline, with increasing physical handicaps. His hearing and sight became seriously impaired, but his mind remained clear. He read books and journals, either the ordinary or talking type, voraciously. He followed sports through newspapers, radio, and television. And he always welcomed letters and visits from former pupils and friends and seemed to have an unusual faculty for remembering them.

In 1986, after a series of illnesses, he became increasingly feeble and died on June 8, 1986, aged ninety-six years and nine months. Who among us can expect to live so long, so vigorously, accepting triumphs and defeats, enjoying life and contributing so fully and so heartily to the lives of others?

— W.S.L.

(University of Texas Professor Emeritus Robert E. Greenwood also contributed to this sketch.)

DENTON RAY LINDLEY

1905-1987

D(ENTON) RAY LINDLEY, FORMER PRESIDENT OF TEXAS CHRISTIAN University and former president and chancellor of Mexico City College and of the University of the Americas at Puebla, died on January 30, 1987. Memorial services were held at Conroe, where Dr. and Mrs. Lindley lived in retirement.

With M.A. and Ph.D. degrees from Yale University, Dr. Lindley's main career was in academic administration, in which he excelled. He was also a noted preacher, public speaker, professor, and author.

Lindley was born at Pioneer, Texas, on May 27, 1905. Early in his life he chose the vocation of Christian ministry and received ministerial education at Phillips University (Enid, OK) and TCU's Brite Divinity School. In 1941, after a decade of notable pastorates at Weatherford, Big Spring, New Orleans, and San Antonio, he joined the faculty of Brite Divinity School and became its dean after completing his doctorate at Yale. Following a 1950-1953 tenure as president of Atlantic Christian College (Wilson, NC), he returned to Texas to become administrative vice-president of TCU, then president, in association with Chancellor M. E. Sadler. In 1962 he became president of Mexico City College, one of the few private and independent institutions of higher education in Mexico. As president he built that institution into the multicampus University of the Americas, with a new principal campus at Puebla. He later served the university as chancellor. Following retirement in 1975, and until shortly before his death, he continued to represent those institutions.

Dr. Lindley was formerly vice-president of the International Convention of the Disciples of Christ and served as a delegate to the World Conference on Faith and Order at Lund, Sweden. Memberships included the Disciples Panel of Scholars, the Disciples Commission on Restructure, Commission for Christian Higher Education of the Association of American Colleges, and the Commission on Church-State-College Relations of the Protestant Council of Colleges.

He held numerous honorary degrees and received many recognitions, the latest of which was the 1982 Outstanding Educator of the Year by the Religious Heritage of America Foundation. As a

writer he produced *Alexander Campbell: Herald of Religious Liberty*, as well as *Calling a Minister* and *Apostle of Freedom*.

He is survived by his wife Maybon, well known in literary and artistic circles, and by two sons, Gene Ray Lindley, M.D., of Houston and Dr. Neil E. Lindley, minister of the First Christian Church of Port Arthur.

— J.M.M.



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*Edward Randall	1944
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*Mrs. George Alfred Hill, Jr.	1964
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Abner V. McCall	1982
*Leon Jaworski	1983
Wayne H. Holtzman	1983
Jenkins Garrett	1984
Joe R. Greenhill	1985
William Pettus Hobby	1986
<u>*Deceased</u>	

MEETINGS OF THE PHILOSOPHICAL SOCIETY OF TEXAS

December 5, 1837 — Founded at Houston	1960 — Fort Clark
January 18, 1936 — Chartered	1961 — Salado
December 5, 1936 — Reorganizational meeting — Dallas	1962 — Salado
January 29, 1937 — Meeting and inaugural banquet — Dallas	1963 — Nacogdoches
December 4, 1937 — Liendo and Houston	1964 — Austin
1938 — Dallas	1965 — Salado
1939 — Dallas	1966 — Salado
1940 — San Antonio	1967 — Arlington
1941 — Austin	1968 — San Antonio
1942 — Dallas	1969 — Salado
1943 — Dallas	1970 — Salado
1944 — Dallas	1971 — Nacogdoches
1945 — Dallas	1972 — Dallas
1946 — Dallas	1973 — Austin (Lakeway Inn)
1947 — San Antonio	1974 — Austin
1948 — Houston	1975 — Fort Worth
1949 — Austin	1976 — San Antonio
1950 — Houston	1977 — Galveston
1951 — Lufkin	1978 — Houston
1952 — College Station	1979 — Austin
1953 — Dallas	1980 — San Antonio
1954 — Austin	1981 — Dallas
1955 — Nacogdoches	1982 — Galveston
1956 — Austin	1983 — Fort Worth
1957 — Dallas	1984 — Houston
1958 — Austin	1985 — College Station
1959 — San Antonio	1986 — Austin
	1987 — Kerrville

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(NAME OF SPOUSE APPEARS IN PARENTHESIS)

- ALBRITTON, CLAUDE CARROLL, JR. (JANE), Hamilton Professor of geology, emeritus, and senior scientist, The Institute for the Study of Earth and Man Dallas
- ALLBRITTON, JOE LEWIS (BARBARA), lawyer; board chairman, Riggs National Corporation Houston
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- ANDERSON, WILLIAM LELAND (ESSEMENA), retired financial vice president of Anderson, Clayton & Co.; former president of Texas Medical Center, Inc.; awarded Navy's Distinguished Civilian Service Medal in 1945 Houston
- ANDREWS, MARK EDWIN (LAVONE), president, Ancon Oil and Gas Company; former assistant secretary of the navy Houston
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of Texas School Laws Austin
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- CROOK, WILLIAM HERBERT, former U. S. ambassador to Australia;
former president San Marcos Academy; commissioner
U. S.-Mexican Border Development San Marcos

- DANIEL, PRICE (JEAN), member, Texas State Library and Archives Commission; former associate justice, Supreme Court of Texas; United States senator, attorney general and governor of Texas; author *Liberty and Austin*
- DARDEN, WILLIAM E., president, William E. Darden Lumber Company; former regent, University of Texas *Waco*
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