Houston Philosophical Society

Minutes of 613th Meeting, November 16, 2006

CALL TO ORDER: 8:10 p.m.

President James L. Kinsey called the meeting to order. Guests were introduced.

The membership elected the following new members to the society: Dr. Earl J. Brewer (nominated for Section E by J. P. Hughes and W. N. Floyd, Jr.), Mr. Robert S. Bruce (nominated by J. L. Kinsey and N. Gassman), Dr. Robert L. Cargill, Jr (nominated by J. L. Kinsey and J. McCleskey), Mr. Lew Eatherton (nominated by W. P. Hobby and Ramona Davis), Dr. James Alan Herd (nominated by W. N. Floyd, Jr and W. T. Harrison), Dr. Robert Ivany (nominated by J. Patrick Hughes and Joseph M. McFadden), and Dr. M. Robert Willcott (nominated by J. L. Kinsey and J. McCleskey).

Jim Kinsey introduced the speaker: Rice's Maurice Ewing Professor of Oceanography, John Anderson, who spoke on "The Uncertain Destiny of the Western Louisiana and Texas Coast: Can We Fix What We Break?"

Dr. Anderson presented a series of slides of the Galveston Island coast showing houses formerly behind the dune line, now out in the Gulf of Mexico; the eastern shore of Galveston's loss of beaches and wetlands; the impossibility of driving the Intracoastal Highway between High Island and Louisiana; beaches littered with debris and seaweed, barricades erected to stop erosion, drainage pipes, eroded walkovers, and the pilings and septic tanks from houses that have washed away. Although the sand is chemically identical to the sand along the white sand beaches of Florida, it is more compacted and less grainy and cars are permitted to drive along the beach.

The shoreline is retreating, not eroding. The problem is trying to stop the migration of the beach, which varies from 0 to 10 feet a year along Brazoria, Galveston, and Chambers County shore. The seawall was built after the 1900 hurricane with extensive beach. In the 1950's it was possible to drive along the seawall, but 400 feet have eroded in 60 years. Now there is some beach at the wall, only because sand has been pumped in.

In Pirate's Beach, million dollar homes are about to be lost. Straw was covered with sand, revegetated, and a sprinkler system installed by FEMA in an effort to stop the retreat of the beach, as a dune replenishment project. FEMA funded geotubes (fabric filled with sand) to replenish the natural dunes. The sand dumped on top washed away in a few months, leaving the tubes littering the beach without stopping the migration. A similar dune replenishment project funded by the General Land Office for the protection of the homes in Jamaica Beach also washed away in a few months. In Anderson's view, moving sand to the beaches is very expensive for taxpayers, disturbs fishing habitats, does not work, and causes damage.

The wetlands are vanishing while most money goes into the protection of private property as dune restoration. Between 1930 and 1995, Galveston beaches retreated at an average rate of 10 feet per year. Builders are not allowing for the fact that the wetlands are retreating and are already lost entirely on West Galveston Island, due in part to building.

The Texas Open Beaches Act protects the right of access to the beach. It requires that when the retreating shoreline overtakes a house, so that it falls outside the vegetation line, the house must be removed at the owner's expense. Lieutenant Governor Dewhurst says that the harsh law will not be

enforced until we determine what causes erosion *and* how to reverse the process. Land Commissioner Jerry Patterson says the owner has to remove the house, but will be reimbursed.

Anderson believes the problem is not easily solved. Beaches retreat when the sea level rises and/or insufficient sediment is deposited from rivers. Both these conditions apply to the Gulf coast. Eighteen thousand years ago the coast was 80 miles further away. Eight thousand years ago the retreat was 50-60 feet a year. The current retreat began 1200 years ago. The current rate of rise is slow and is due to thermal expansion of ocean water as the planet warms and to a smaller degree to the melting of ice sheets. The long-term tide gauge records indicate a few millimeters per year rate of future sea-level rise. That rate has increased in the last 30 years from 1.8 millimeters per year to 3 millimeters, due to heating of the water, which causes it to expand.

World temperatures have increased dramatically since World War II. The rate of rise is greatest at the poles, where it causes melting of the ice sheets. The Antarctic ice sheet has diminished significantly in 5 years; the glaciers have accelerated and are melting faster. If greenhouse emissions continue unabated, the rise will be 50 centimeters by the end of the century, one meter if glacier melt is added.

The east Texas coast is going down faster than we thought due to natural subsidence and ground water use (mostly in the 1960's and 1970's) and oil and gas production, which last may contribute up to 1.5 meters per century to the relative sea level rise. As a result, everything south of Interstate 10 is going down at a subsidence rate of five feet per century.

We need to have great concern about our bays, which have a history of flooding. Eight thousand years ago, when the sea was rising at the same level, the delta was quickly drowned. If unstopped, Bolivar peninsular will become an island. We can anticipate that Sabine Lake and Calcasieu Lake at Lake Charles will greatly increase in size.

If Hurricane Rita had stayed at category 4 or 5 and come ashore at Galveston, many would have been trapped on Interstate 45, there would have been a 22 foot storm tide, NASA would have been under water and Freeport a disaster; the levees would fail; and the seawall's standing would have been problematic. A similar big storm created the beach ridges on Bolivar Peninsula 2000 years ago, taking out half of Bolivar peninsula.

We need to quit bickering about houses on private property and deal with what we can do to combat accelerated subsidence and sea-level rise. We can get better numbers on sediment supply, subsidence, and sea level rise and can construct maps so we can plan. Most rivers are now dammed, so the sediment supply is essentially nil, exacerbating the problem.

Professor Anderson closed by citing his book, "Formation and Future of the Upper Texas Coast."

The meeting was adjourned at 9:00 p.m.

Submitted,

Evelyn Keyes
Recording Secretary