

## **BTB #126: San Antonio: Great Plains and Texas Crossroad**

**It's a TAA tradition: Geographer [Robert W. Christopherson](#) opens each annual TAA conference with a "geo-primer," a one-hour crash course on geography and "place." For this year's visit to San Antonio, the award-winning geography textbook author explored the city as a point of convergence in geography and history, from the physical setting in the southern Great Plains to the challenges to settlement posed by dryness and vast distances.**

**Professor Emeritus of Geography, [American River College](#), Robert Christopherson is the author of the leading physical geography texts in the US and Canada, all published by [Pearson Prentice Hall](#).**

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This podcast was recorded at the 2009 Text and Academic Authors Association (TAA) Conference in San Antonio, Texas. TAA is the only nonprofit membership association dedicated solely to assisting textbook and academic authors. TAA's overall mission is to enhance the quality of textbooks and other academic materials, such as journal articles, monographs and scholarly books, in all fields and disciplines, by providing its textbook and academic author members with educational and networking opportunities. For more information about TAA, visit <http://www.TAAonline.net>

CHRISTOPHERSON: This is the Geo Primer for San Antonio and I call this a crossroads in many ways. Great Plains, Texas, Gulf Coast in terms of climate, in terms of our company, this is a remarkable place. We're right along the Balcones Escarpment and you can see that on the road maps or on old line drawings where San Antonio's located. That's why it's here, it's



where they broke freight as they came inland, it's where springs emerge from the ground, so it had a water source, a break in transport, and it became very critical to the Spanish era. On maps, you can see the Great Plains of the grasslands coming down from the north and the coastal plain right along the escarpment and there's San Antonio. Here's New Orleans and the Gulf Coast. Here we are. You can see the grey area of the urban tissue of San Antonio right along the edge of the Edwards Plateau, the Balcones Escarpment. Houston, and you can see the sediment washing in along the coast. I'm going to take you to Bolivar Peninsula, and we'll take a look at Galveston, and then work our way up through the cattle country to San Antonio.

The Mississippi River, the Red River, the Trinity River, the Brazos River passing down, emptying into the coastal waters. This thing is having a mind of its own. There's San Antonio off there, where I've put the red dot. You can see the grey tissue right at the edge of the escarpment. This edge of the Edwards Plateau, as we'll see, gives birth to the springs of the Edwards Aquifer. And this is Bexar County – Texans pronounce things differently than they're spelled – B-E-X-A-R. We learned that when we went to Bolivar Peninsula and found it was Bolivar Peninsula. This was called the refreshing waters, so this'll come up later in our story. Here's our hotel, up here on Lexington, near Fourth. There's Memorial Auditorium. The River Walk, which in May extended this additional distance up to here, we can follow down more than 80 restaurants, the Alamo, and so forth in this layout of San Antonio. By the way, the blue trolley, you can step right out in front of the hotel, get on the blue trolley. It'll take you right down to Hemisfair Park, \$1.10, get back on it, and it drops you right off in front of the hotel. It's the easiest way to get down there.

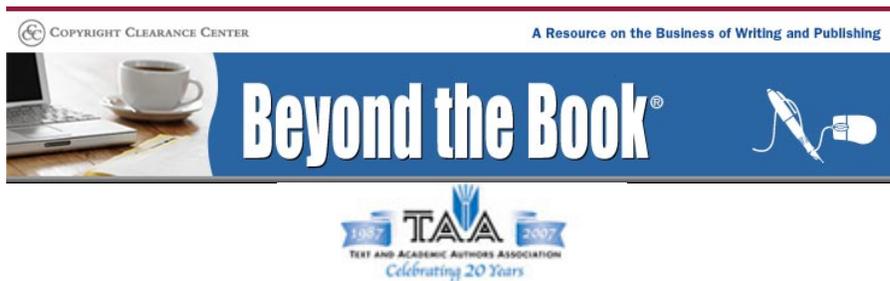
The name first appears around 1691. The first Europeans through here and San Antonio de Padua, named after Saint Anthony's day, was the origin of the name. And for refreshing waters, in 1718, this was established this as the Bexar Presidio, the main settlement in Spanish Texas, a pivotal location in the history of the United States and of this region. The county itself is almost completely filled with San Antonio. You'll see the population distribution. San Antonio has 1.6 million people. It's seventh in the US, just ahead of San Diego, and that's always a surprise to people about how large this city is here. The metropolitan area is now just over two million people in Bexar County.



In the idea of vernacular cultural region, the mental map of how people perceive where they live, people here perceive that they live in the Southwest. Southwest, that's in the vernacular. And our country is laid out by advertising and when you fill out those little warranty cards, it might ask you which part of the country you live in and they database that. You might see your part of the country to see what vernacular you live in. We are up here, just beyond Pacific and in west. So here we are, in the Southwest in our popular cultural region. In terms of dialects and accents, this accent, and we always joke about it, those without accents are actually jealous that we don't have one, that we have the California broadcast blank accent but this is the west Texas and sometimes it's called the west and south Texas or the western and southwestern dialect. The east Texas accent is more like the northern Louisiana accent and you'll hear that parodied by comedians and stuff when they joke about accents. So there's our upper Midwest from next year's Minneapolis meeting.

So we're in the Southwest, we're in the southwestern dialect area. In our drive from Sunday to get here to TAA, my wife, Bobbe, and I, we talked to four different people at last count that were purposely suppressing accent. Because we would say, you're not from here. Oh, I've lived here all my life. Well, you don't have an accent. Well, I work at that. And I thought that was interesting. They were young people, like food servers. Now, we can go back to historic Texas is Tejas, which is the confederation of Native American tribes, so the name derives there. I already told you about the name San Antonio. 1709, this area was reported as favorable for a settlement site because of the river. A mission complex in 1724 at Alamo Plaza. Five missions were established there, the ruins of the San Juan mission and you can see these about. The reason for the missions or the presidios or the pueblos is because the Spanish people couldn't be convinced to move to the New World. They were disinterested in this place.

So the Spanish set up this tri-way of settlement, where they had the army, the Church, and the village, and they were going to convert the Native Americans or even bring islanders here from out in the Atlantic and have the army, have the workforce, and use the Church as the hammer. And that was the Spanish settlement pattern. So here, you'll see the discussion of a presidio or a mission that's part of this triple settlement pattern. Here is the Loreto Chapel that's built within the la Bahia Fort, down in Goliad, Texas. This was the site of a horrible massacre and I don't want to talk about it. But anyway, you'll see that three-pronged approach, and it was because of the disinterest that they set that up. Government offices of Spanish Texas

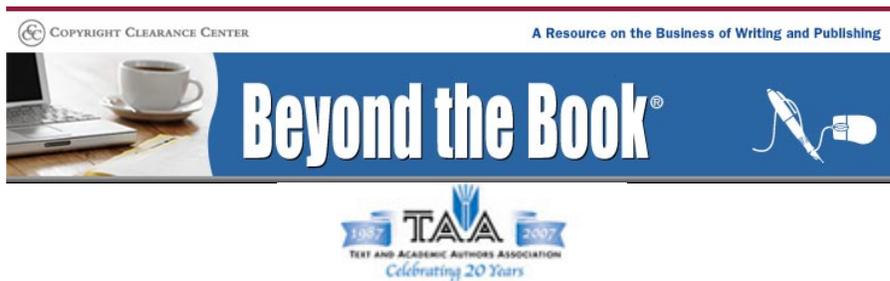


moved to San Antonio, but probably the greatest geographical event here was what Zebulon Pike and later, Long, did.

What they did was they wrote on maps that this was the Great American Desert. And this extended all the way up into Colorado in this area, and that stayed on the maps for about 50 years and discouraged settlement, discouraged migration, forced people farther north, and it was a myth. It was a lie. They just wrote it there. People were always shocked when they came here and didn't find the Great American Desert, so this is one of those geographical lies that stuck until the railway surveys hit. And when the railways surveys came out in around 1805, that's where we saw the – 1855 – that no, this wasn't a desert. 1811, the uprising to break Mexico free from Spain started in Spanish Texas. In San Antonio, Stephen Austin, name comes up around 1821.

The Texas volunteers took San Antonio in '35, but in '36 is where the myth was born, and Santa Anna attacked the Alamo and we've all seen that in movies. And the John Wayne Alamo movie set, though, is out in west Texas, inland from Del Rio. And if you want to do a visit there, I don't know, I guess they have John Wayne stuffed in the museum or something. I don't know. But this was the heroic story. And you'll notice that's February. By April 21, Santa Anna lost to Sam Houston at San Jacinto in an 18-minute struggle. And then, Santa Anna signed the resignation papers down near Goliad Texas, Bahia, south of here. So there is a whole history as Mexico broke loose from Spain in 1821, and then the struggle for Texas to become independent from Mexico.

The word Alamo started to appear in documents back around the turn, there, of the century, 1803. San Antonio de Valera or Bexar, referring to the Presidio de Bexar, and the word Alamo or el Alamo appears in journals. In 1807, among the 25 men from the Alamo, without the el as the name of the place. 1807, your lordship should give heed to the necessity of horses to the troops at Bexar, Bahia, and Alamo. And Bahia is that site south of town I showed you the picture of, and there's the word Alamo, and these are from different archive translations of where the name appears. The Alamo, from a model, about the time of the big battle with Santa Anna. And then in 1850. In 1890, this Hugo and Schmeltzer. Unbelievable Google, you can type that in and it'll come up, and they'll tell you about these guys that bought the convent in 1890 and built this commercial establishment along here and all this stuff, and there's the Alamo tucked in against it. In fact, my reading of this is that there was a period where the Alamo might have gone

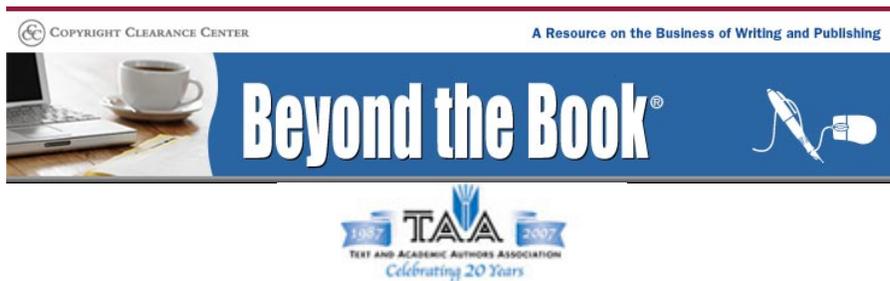


out of existence, might have been plowed up and sold and it was on the auction block.

And here's 1900. And then, in 1908 and there was a woman and one other fellow that worked very hard, beginning around 1920 as part of the Masonic because so many masons died at the Alamo. And there's a plaque over on the Alamo commemorating the masons to preserve it, to preserve it as a site. So the myth started to build on the historical events of 1835. 1911 was the first Alamo movie. John Wayne's movie was in '60, and the way the Alamo looked the other night. Bobbe, my wife, is the nature photographer so I have my personal photographer and you'll see her photos here. So there's a whole interesting history of this place tied in with the Spanish settlement pattern, with mission presidio and pueblo tied in with the cessation of Texas from Mexico, tied in with US annexation. So this was the Republic of Texas. Here's the disputed area, 1836. This was what was annexed as the State of Texas in 1845.

Now, in settling the Great Plains, in settling these grasslands, in settling Zebulon Pike's Great American Desert, you had to contend with vast distances, tremendous distances, Chicago to Denver being the same as London to Rome. Deeper groundwater, you couldn't hand dig a well like in New England. That was a problem. Very few trees, so how do you build a house, how do you make fence posts, how do you do anything that required wood because the trees were only along the rivers and were quickly logged out. The grasslands, the 20-inch rainfall line, which I'll show you here in a minute, was like the dividing line between the tall-grass prairies to the east and the short-grass prairies to the west, and the sod was deep and impenetrable. You could not get through it. The obstacle of traditional farming practices breaking down.

When a rancher in Nevada goes to Congress and says he needs 20,000 acres and the Colonel Culpepper from Virginia is saying well, do you know how many slaves that would take? I can only do 20 acre. There's no comprehension of the West and the size of the challenges and irrigation on a massive scale. And the Native Americans, extremely efficient, resourceful, moving with the resources, somewhat self-sustaining, the mounted warrior on the horse. It's so strange to me in these movies where the cowboys have the guns and the Native Americans ride around in a circle and get killed. The Native Americans used guerilla tactics. If John Wayne stood up with his rifle and got off a shot, there'd be seven arrows in his chest. A Comanche warrior on the side of his horse shooting under the neck could

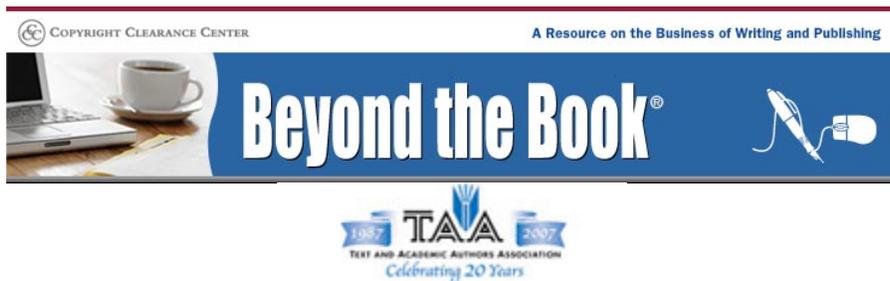


get seven arrows launched before John could get off his first spit. Well, so what were they going to do with this?

Well, interestingly, the Midwest and West and Southwest, they were all solved by Eastern inventions. We didn't come out on the prairie and innovate. The innovations came from the East and came out. John Deere in 1837 had the self-scouring steel plow, giving birth to the sodbuster. And Colt introduced the six-shooter through the Texas rangers and this upset the advantage over the mounted Comanches, so the Colt revolver changed the balance of power. In 1854, the windmill company using the available winds to pump the water because remember, the groundwater's deeper than it was in New England. In 1859, the oil-drilling techniques developed by Drake in Titusville, Pennsylvania, those techniques came out to be used with water. Of course, the Homestead Act in 1863. Glidden developed and patented the Glidden barbed wire, and that barbed wire patent is what made the fencing material. Remember there aren't enough trees to do fences, so you got steel posts with barbed wire. In '80, '81, you can see over a million pounds of barbed wire was sold. And then finally, in 1860, there were more railroad tracks operating in the United States than in the entire rest of the world. And of course, '62 was Lincoln signing the railway act that was the big land giveaway to the railroads.

So each one of these technological innovations had spatial implications. Spatial. It allowed us to go out and to conquer these problems out on the prairie, a different thing facing everyone. So that's important to remember, I think. The Iowa State constitution is almost identical to the New Jersey constitution. The innovations were in the East and came out. I know it's nice to think of this cocoon of the prairies and the people came out and gave birth to resplendent independence and everything, but it's the wild-ass guys that were in Philadelphia that left, so they all concentrated in the wild-ass West. And I always like to think that the Oregon Trail split into two junctions, one went to north with the quieter, more sedentary, peaceful folks that lived quietly and the other one cut south with the more concentrated wild-ass, get-rich-quick people that became Californians. And so I don't know if that's true.

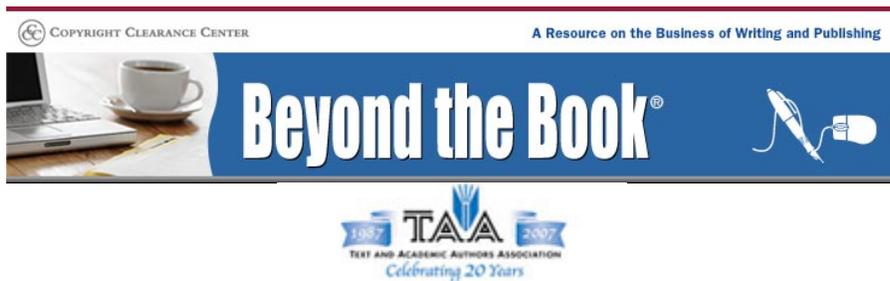
The Texas independence, the US did not immediately jump into the picture. There was about a two-year delay before Texas declared itself a republic, and it is the only state that ever went through that. The delay was over slavery. Texas did not become recognized by the US until 1845, so there was a delay in there and Texas was this republic. That nine years or so is



probably more important at developing and molding the Texas mentality than any other period in the history of this place. In fact, Governor Perry tried to stroke that a few weeks back when he talked about Texas secession, which is a totally ridiculous, unpatriotic, unbelievable concept because then, the other 49 states want everything back that's federal. No, you can't have swine flu courses. No, we want the freeway back. We want this. It gets crazy after that but keep in mind that that mental image of the republic and independence, how important. Texas became the 28<sup>th</sup> state, San Antonio was the county seat, but Austin was the capital. About 3,000 people lived here at the midcentury, many were Germans. And in fact, today, north of San Antonio is the German Hill Country. If you drive back up in there, you'll see German names on some of the towns and businesses. 1851, I just threw this in, the ice cream soda was invented in San Antonio, bragging that you needed a straw and a spoon. Texas seceded in '61 and readmitted to the country in '69.

Now, the era of the cattle from '67 to '80 and up to the turn of the century is an interesting part of history. It was 1852 when Richard King established the King Ranch, 1852. And this area, from San Antonio to the Gulf, this is the core of the original cattle country. So the drives originated here early on the Shawnee and Chisholm Trail, and then later the Great Western and the Goodnight Trail, gradually moving westward towards Dodge City as a terminus. Look at the head population of cattle and how that went up in just a two-year period as these were moved northward. In the vernacular of language, the word maverick comes from Samuel Maverick, who was from San Antonio, and he was a guy that refused to brand his cattle. And so when you saw a cow out there without a brand on it, oh, that's a maverick. And by the midcentury, that had caught on across the United States as somebody that's a maverick. Like all of the textbook authors, our editors have learned that we're mavericks.

So here's a modern slaughterhouse outside Dodge, and this place actually processes 6,000 head a day, six days a week. Bobbe took this shot when we rented a light plane to go take a look at some of the countryside around there. It's just an amazing demand for beef and crops. Now, if you drive down south of San Antonio, you get in the heart of this cattle country. The entrance to vast ranches, the iconic windmill pumping with the storage tank, the former prairie highly modified by grazing, doesn't look anything like the tall- and short-grass prairies that were there originally, but just a beautiful drive we had through there a couple of days ago. This is the Hanging Tree in Goliad, Texas. The courthouse dates to 1894 but evidently,

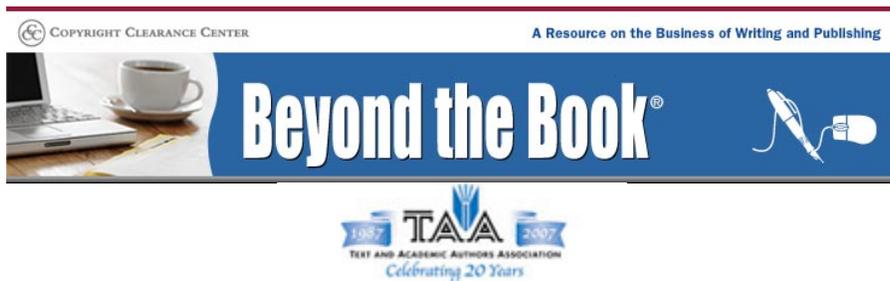


the few people that were hung from this was in the late 1850s, where they held court under the tree and then hung them. Even though that was 150 years ago, the name sticks as the Hanging Tree and we had lunch at The Hanging Tree Restaurant across the street. A beautiful old oak.

Now, in terms of railway construction. The railroads, by 1860, there were 30,000 miles laid out, and about two-thirds of that was in the West and about one-third in the East. The first railways hit San Antonio in the 1870s. Now, in 1851, the Flying Cloud, that clipper, it was 89 days from New York to San Francisco in 1851. The rails, by the 1930s, had cut that to three days, so you could go from New York to San Francisco in three days. If you got on an airplane in 1930, it was 36-hour with 18 hops. Can you imagine the luggage loss? The flight attendants, appropriately, were dressed as nurses. They were. And so you see the time scale as time reduces this travel. So these are the veins and arteries of economy and culture, spreading out across the country and reaching this part of the world. 1901 was when the oil was hit at Spindletop, and of course, that started another whole Texas wave of the oil derricks and oil fields. About 33 million barrels were taken out around San Antonio and we saw some grasshoppers down along the cattle country.

All right. Quickly coming up to speed, the ship canal expanding here, the San Jacinto River around Houston, that was about 1915. The four air bases, Kelly was the name of the first military pilot killed and they named the air base after him. And 1930, cotton production, that spread from the South and was part of the pre-Civil War issues. The modern economy, you see oil and gas, beer brewing, heavy construction, soft drink bottling. Printing and publishing, there are 260 firms listed in Bexar County. Sixty-five percent of the county's in farms and you can read the livestock and so on. Our modern mixed economy for San Antonio.

Now, in terms of climate, which is really going on outside and hopefully, there'll be some cloud again to bring the daytime peak down. We're running about 10 degrees above normal on the maximum high and the minimum low. The normal for today would be right around here, the high around here, and we're hitting up in this area of heat extreme. It last rained in San Antonio on May 25, 0.03 inches, so they're in a major drought. Precipitation here is supposed to be about 30 inches. And then, we've got this thing called the heat index, which you want to know about more than anything else. If the temperature today hits 104, right there, and let's say the humidity is around 50%, you can see that translates to about 120

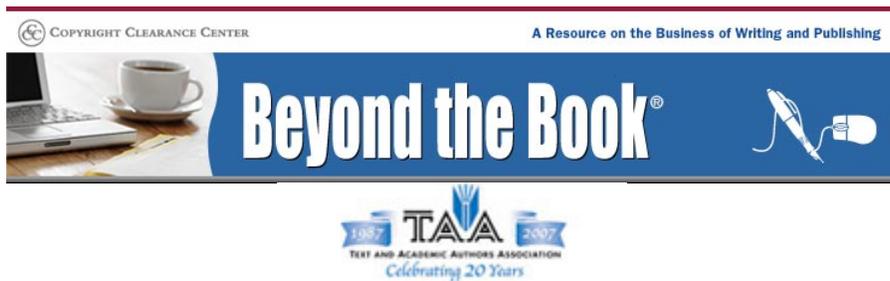


degrees Fahrenheit. Now, that's based on the sensible or apparent temperature because when you sweat, it doesn't evaporate, you don't cool, you feel 120. So if you're going to walk downtown, keep that in mind if you're not used to 120 degrees. This is for real, heat index. Yesterday, I stopped joking about that we left the hotel and by the time we got to the River Walk, we were looking for Swedish people with branches to beat our backs because it was certainly a sauna and we wanted to complete the picture there. So heat index is a combination of humidity and temperature and as temperatures rise this century, it's going to be a key item you'll see reported on the weather.

Now, precipitation is the normal supply and you can see San Antonio here, 30 inches a year. As you drive towards Houston, it rises to 40 inches a year. That can be thought of as the supply. The potential evapotranspiration is the natural demand for water and you can see the demand is over 43 inches. The supply is 30, the demand is 43, so there's a natural deficit, soil moisture, storage situation here. If you're going to do agriculture or you're going to live here, you're going to have to make up for that somehow, redirect water supplies or augment it by pumping ground water and that would make up for the precipitation. So we're in a humid continental climate, but right here is the hot semiarid step and we're right on the crossroads of that.

So here's another crossroads for this place. It's right at the crossroads of the biomes between the short grass prairie and the tall grass prairie. This area we're in is such a transition region. The climate computer models show that the Palmer Drought Index is going to increase significantly over the next half-century and 21<sup>st</sup> century, and so that's going to be an extension – my dot moved – but an extension of this semiarid this way. So this drought they're having, rather than being an anomaly is more like a hint and a preview of things to come based on the computer models of how the drought is going to move. Now, this is the 20-inch-a-year annual precip. This is the historical 100<sup>th</sup> meridian. Here's the 98<sup>th</sup> meridian and San Antonio is here, so it's right at that historic break point based on precipitation looking from east to west.

So the grasslands, the vast grasslands stretching from southern Canada all the way down to San Antonio, the Edwards Plateau and Balcones Escarpment is regarded as the southern terminus of the grassland but with the cattle modification, there are prairie-looking grasslands that go farther south. This is the bison region. Look at this quote from Walter Prescott

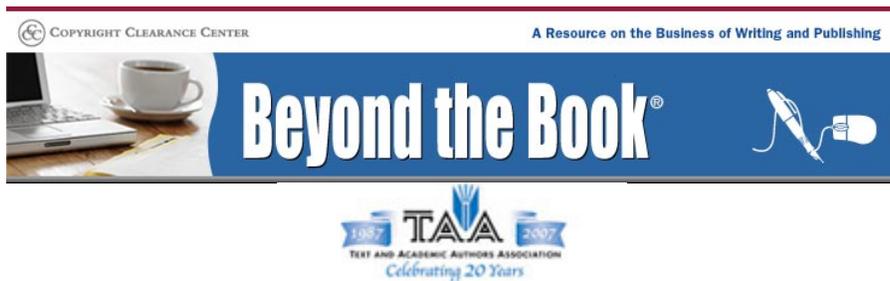


Webb. “Historically, the buffalo had more influence on man than all other Plains animals combined. It was life, food, raiment, and shelter to the Indians. The buffalo and the Plains Indians lived together, and together passed away.” So Bobbe got this shot of a herd out there. There are about 500,000 buffalo today that are in controlled herds. They’re slaughtered, about 40,000 a year, for meat. That’s recovered back from just a couple of hundred that were left. Part of what they were thinking is that they kill all the buffalo, the Indians would go away. And a real brilliant strategy but unbelievably foolish, going from tens of millions to 100 or so.

If you think of North America as a stage and the weather is a play, the actors are the air masses. And so we’re here at another crossroads between the maritime tropical gulf, there’s our humidity and our moisture. In the summertime, the continental tropical hot, dry, high pressure, and these change and fluctuate during the year, these air masses. They’re doing it in ways, though, that the scientists have never seen before. The projected future climate of intensified aridity in the Southwest is caused by a poleward expansion of subtropical dry zones, high pressure. The drying of subtropical land imminent or already under way, as unlike any in the climate state we have seen in the instrumental record. In science, you read that kind of stuff in the peer-reviewed journals all the time. This is a remarkable moment and we happen to be here for our conference, experiencing it. So as the weather systems cross the country, interchanges of warm, moist, and cooler, and life on the prairies, as these cyclones move through, bringing the air mass actors into battle. And right now, the hot, dry, high-pressure actor is more powerful. Tornados. Tornados, we’re averaging about 787 a year for the US. These are the numbers of tornados for these years, 1,800, 1,200, 1,100, more than 2,000 in 2008. Something’s happening where we have more than double. Four minutes. I’ve got my watch right here.

F: You have four minutes.

CHRISTOPHERSON: OK. So another part of San Antonio is going to be tornado activity on the increase. Tropical cyclones and hurricanes. Here’s Hurricane Ike, here’s a map where I added in Dolly and Erin and Ike and Ingrid and Gustav, \$255 billion damage in just a couple of years. That’s bailout-level money and people aren’t talking about it. The hurricanes are increasing in intensity because of the temperatures, because of the climate change. So that’s going to be a feature here. Thirty-five thousand evacuees came to San Antonio. Here is Bolivar Peninsula before. Look at the two



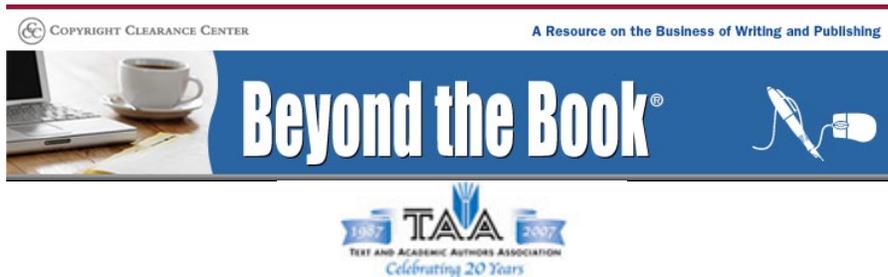
blue roofs after. And then, Bobbe and I were down there and she captured these shots. It is unbelievable to see the power of this, complete wipeout. These environmental refugees are going to be part of San Antonio's future.

This is in Galveston. Look at the force on that handrail. And this damage will sit there for years, the Katrina stuff is still there. The solution, put the houses on 30-foot stilts. Instead of having fun at the beach, we're having fun over the beach. This is the new style. Sea level rise this century, the current working estimate is 1.4 meters. All these barrier islands that they're rebuilding on will be under water, all the leach fields of the septic tanks will be floating. In San Antonio, there has been a zone change in the heartiness index that you look at when you go to the gardener. One full zone change in just 15 years, so this is happening to the plant structure. Imagine the climate of Illinois, Michael, being like the climate of east Texas by midcentury.

M: (inaudible)

CHRISTOPHERSON: Yeah. Now, the aquifer. Here's San Antonio, here's the aquifer, here's the Edwards Plateau. When the water table drops, the stream levels drop, so here's the Arkansas River, completely dry because of the well next to it. That's called influent. The River Walk, when you go along the San Antonio River, that is maintained by recycled water. You're looking at recycled water there. And this is what's happened. On June 15, the Edwards Aquifer dropped below 648. Two nights ago, it was at 642.7. Last night, it was at 642. It dropped nearly a foot in one day, so they're moving to a stage three drought alert here, and you'll read about that in the papers, so this is happening as our conference happens.

And of course, that requires education and that requires authors. This is the Menger, where we met twice in '89 and 2001. Try to get over to Hemisfair Park, the Tower of the Americas. This was on the 250<sup>th</sup> anniversary, the World's Fair was held here. One of the pavilions is a Texas museum, another pavilion turned into the federal courthouse and the training center for judges. So Judge Karen, they've got weight training, they've got treadmills over there. They're training judges. Here's the tower and an excellent dinner we had there, just beautiful views of the region. As you look down, there's the Alamo and Alamo Plaza. There's our hotel there in white. So looking down on San Antonio. Oh, in terms of urban morphology, look at this Church. There's no lateral praying. It has to go up



as it's surrounded by the Mall, Rivercenter Mall. OK, Kim, just one or two more.

Here we are looking out towards the northeast. The major sports team here, NBA, WNBA, hockey, and baseball, they play at the AT&T Center. The Babe was here in 1930. The Yankees played the San Antonio team. This is the Alamodome, which is a cargo cult structure that was built to attract a pro football team and it never happened, so the Alamodome is there and you've seen some TV ball games from there and maybe the Army-Navy game. And then, there's the River Walk, part of a WPA project from 1939, starting to debate in the 1920s, Paseo del Rio. And this is a really beautiful urban landscape. And there's the San Antonio River south of town. Remember the drought.

One last thing to mention about the economy here is wind power. Texas is sixth in the world if it was a country. This is going to be a major source of income, employment, and manufacturing in this region. There is the look of the land. The new six-megawatt turbines, 120 windmills equals one nuclear power plant. It's that easy, it's under three cents a kilowatt-hour, it involves no foreign resources, and produces no pollution. There are the blades. This is at Freeport, Texas, where this is the largest importation port in the United States for wind turbines. These are coming in from India. They should be manufactured here, instead. So this is the future and it looks very bright if a transition crossroads like San Antonio can respond as it responded culturally. Now, we're responding climatically and economically.

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