

Interview with John M. Barry, author of *Rising Tide*, for “A Tale of Two Rivers”

Note: This transcript is from a videotaped interview for the “A Tale of Two Rivers” segment of “Great Projects.” It has been edited lightly for readability.

John Barry (JB): Well, there was a flood in 1850 and, to give you a sense of comparison, a levee a few miles upriver from New Orleans was 1.8 feet high. By 1922, the same levee, to hold a lesser flood, had to be 20 feet high. In Morganza, Louisiana, there was a levee that held the flood of 1850 seven-and-half feet high. In 1922, again, a lesser flood, the same levee had to be 38 feet high. And the same increase in the levee heights was true up and down the river. Obviously, if a river can't spread out, it's going to rise up. That's exactly what it did and that, of course, completely contradicted the levees-only theory in policy, but the Corps of Engineers was not listening.

Interviewer (INT): Be more specific in how it contradicted the policy.

JB: Well, according the levees-only theory which was based on a 17th century Italian engineer named Guglielmo Minuti's observations and hypotheses, you wanted actually to increase the water in the river, because the more water in the river, the higher the slope and, therefore, the faster the current is going to move, which is true. And the faster the current was going to move, then the more it was going to scour out the bottom of the river, which is also true. The problem is, it's not going to increase the scour enough to accommodate the extraordinary enormous increase in water, really a geometric progression between low water and a great flood. So, you know, the Corps of Engineers kept sticking to this hypothesis despite the fact that every scientific observation contradicted it. So you had a disaster that was waiting to happen.

INT: What kind of a guy was Edgar Jadwin?

JB: Jadwin was arrogant, very military, which is hardly surprising, considering he was a general, didn't like to be contradicted, and thought he knew all the answers. By the same token, he knew almost nothing about the Mississippi River, which is odd, because I believe he spent some time in New Orleans as district engineer. And in testimony to Congress, the material that the Corps of Engineers handed out actually stated that in a natural state without any levees whatsoever, the Mississippi River did not flood the Yazoo Mississippi Delta. Now this was land that the river had actually made by depositing sediment. And when a congressman from the delta asked Jadwin about that, Jadwin deferred to the information he had handed to him. I mean it was really extraordinary.

And he also was responsive. As you know, he was in the military hierarchy. He had directives from the White House to keep the cost down. And he was insistent upon that. I think that affected estimates -- this is speculation on my part, but I believe it affected estimates on how much water was in the river during the '27 flood, 'cause, obviously, the more water, the more expensive it is to take care of it. And the Corps of Engineers came up with a very low estimate, much lower than civilian engineers who measured the same things. And I think that was all part of that military hierarchy. When the Mississippi River Commission wanted to propose its own plan to Congress, they actually reported to him. And he refused to forward their plan to Congress because it was different from his plan; Congress did get it through the back door, you know, handed to them unofficially, and after they demanded it, then Jadwin agreed to hand over that plan as well.

INT: What was Jadwin's position on levees-only?

JB: You know, he was not an expert on the Mississippi River. He inherited the levees-only policy. Even after the dynamiting of the levee below New Orleans, which, to all intensive purposes, exploded the levees-only theory as well, but even after that, for a few weeks he still insisted the levees-only theory was valid. But, you know, that was basically an institutional thing. I don't personally think that that was a deeply held belief that he had.

INT: Was he towing the party line or ...

JB: Well, the Corps of Engineers had been for the levees-only policy for 40 years, if not longer, and he was the head of the Corps of Engineers. So he was not about to change that policy.

INT: Jadwin did seem to come up with a plan that worked to some degree.

JB: Yeah. The flood control plan that the Corps of Engineers put in after the '27 flood is basically what's in place today, with some adjustments. And, of course, Jadwin didn't write the plan. In fact, he had a very sharp engineer who had been in the Corps, but actually was then a civilian -- he had a physical disability that forced him to retire from the Army -- who wrote the plan. And it was a good plan, you know, once they gave up the hypothesis of levees-only. You know, there were a couple of gaps in it and there were some political problems with it -- chiefly, in effect, the plan would have allowed the flooding of the State of Arkansas and Louisiana, essentially using that as a natural reservoir. Originally the levees in Arkansas were going to be lower than the levees on the Mississippi side, so the river would naturally flood in Arkansas. That was ultimately taken care of by what was then a very controversial policy called cut-offs. The river moves like a dollar sign, in S's. And a cut-off is like the straight line through a dollar sign. It straightens the river and, therefore, it carries more water faster. But there were a lot of people who thought cut-offs were not going to work. And, in fact, they've worked pretty well, not perfectly. They shorten the river by 150 miles in total, and that lowered the flood plain in Greenville, Mississippi, for example, by 15 feet, which is an enormous lowering. That was initially. Now since the cut-offs have been put in, the river has regained probably one-third of that length and some of the lowering of the flood plains -- some of those benefits have been lost. And ultimately the river will probably regain all the length. And then you make more cut-offs, I guess.

INT: What's the biggest flaw with the Jadwin plan?

JB: I don't think the Jadwin plan--and let's talk about Project Flood, which is not the same thing as the Jadwin plan -- the Corps currently calls it Project Flood. I don't think the plan itself is flawed. I think the question is how much water can it accommodate. And the figure that Army engineers used for the 1927 Flood is lower than the figure that most civilian engineers used for the 1927 Flood, in fact, a lot lower, more than 500,000 cubic feet a second. And, to give you a sense of how much water that is in a flood, Niagara Falls is 200,000 cubic feet a second. So you're talking about a difference, not total amount to water in the river, just a difference between the two estimates of two-and-half the amount of water going over Niagara Falls. And the Project Flood has a margin of error over the lower figure for the '27 flood. But even with the margin of error, if it works as

designed, it's not going to handle as much water as the civilians said was in the river in 1927. This was up at the mouth of the Arkansas. So even if it works perfectly, if you get that much water again at that spot, you're going to have an extraordinary disaster that might be bigger than '27. On the other hand, the Army might have been right. It might have been the lower figure, and that might have been a 10,000-year flood or a 20,000-year flood. We don't know.

INT: What about the Achapalaya, trying to capture that?

JB: Well, the Achapalaya is obviously a major problem, and the Army is doing, I think, as well as anybody could do there. It's an extraordinary complex issue, handling the sediment load whether or not you're going to silt up the entire swamp, whether or not the Mississippi River is going to continue to flow past Baton Rouge and New Orleans or shift down the Achapalaya. There are a lot of people who think that the river is ultimately going to go where it wants to go. There are others who think that they can hold it in place, or even if it shifts down there in some major flood, during the next low water they may be able to recapture it and send it down the present channel.

INT: Describe the power of the Mississippi River in a flood mode.

JB: There's really nothing like the rising Mississippi. It's just an extraordinary force. I mean you can look out on the surface and even on the surface it won't look the same in two different spots. You can see sometimes it's almost as if a whirlpool is trying to form. You'll see the level of the water at one spot, you know, six inches, maybe a foot, sometimes more than that, higher than the water level not far away. And there's not one current in the river. There's a current on the surface, many currents on the surface. There's different current ten feet down, 20 feet down, 30 feet down, friction with the riverbank, friction with the river bottom. The last several hundred miles the bottom of the river's actually below sea level. So it's got no reason to flow at all. It's only the force of the water pushing behind it and the force of the water on top that's sort of rolling over it like an ever-breaking wave that keeps the river moving. And when the currents are -- I mean in flood -- you can get a sustained current of 13 feet per second -- that's almost nine miles an hour. So you've got a force that can be well over a mile wide, hundred, hundred and fifty feet deep, and close to 200 feet in New Orleans, moving at nine miles an hour. I mean if you can imagine that, it's -- it's you know, literally an awful thing to look at in the in the literal sense, full of awe.

INT: What's the force comparable to?

JB: Well, it can attack a buzz saw and rip right through it. And less true today because of various protections on the riverbank and so forth but in its natural state it would just take acres of the river bank in one shot -- the trees, you would hear them crack. It would sound like cannons firing one after another as a tree snapped. And, of course, the river actually made all the land from Cape Girardo, Missouri to the Gulf of Mexico. It owns that land. It created that land by depositing sediment upon it. So that natural flood plain in the Mississippi is 34,000 square miles. The river has -- the mouth of the river has been as far east as the State of Mississippi and as far west almost to Texas. It just goes back and forth. And, as I say, it created all that land. It owns that land. Going back to the levees-only theory, the idea that man could contain that force within a couple of mounds of earth is just ludicrous.

INT: Explain the shifting river phenomenon.

JB: If you imagine a garden hose and you lay it out on the grass and you turn the water pressure up, after a while the hose'll start to bounce around. And that's exactly what happens with the Mississippi River. It deposited sediment in one place, at its mouth, and that would build up the land there. So then it would naturally want to roll off to someplace where the land was lower. And then it would deposit sediment there, build it up, and then roll off, and then it would shift sideways back and forth from east to the State of Mississippi, west almost to Texas. And the current mouth of the river's only been there seven or eight hundred years. Forget about geological time in terms of eons. I mean we're talking about a few hundred years; not much more -- longer than before Columbus discovered America. So it's really a recent phenomenon.

INT: Can you hear the crest come?

JB: No. People think of a flood crest if you don't live near a river maybe as an ocean wave. But that's not it at all. It's much more gradual. And it's not something that you see coming down the river. You watch the river rise. If it's rising really rapidly, it might go an inch an hour. That's fast. That's a couple feet a day. On extremely rare occasions, at least when you're talking about the Mississippi, which, obviously, takes a lot of water to affect it, it might go faster than that. But when the crest comes, it usually hangs around for a while. That's another thing about floods on the Mississippi; they tend to be slow. So it's an enemy that you have to fight against over an extended period of time. And the river is perfect. Man is not perfect. So if man makes a mistake against the Mississippi, the river is certain to find it, and if it has time, it will exploit it.

INT: Through what kind of mistake?

JB: Well, there are a lot of mistakes you could make. One is a policy mistake, such as the levees-only policy. The other is some weakness in the levee. It needs to be maintained. They can settle. You have to keep rebuilding them. There's a levee, a fairly lengthy stretch of levee, in the state of Mississippi right now that is eight feet below grade for Project Flood. Eight feet is an enormous distance. I mean that is a lot of water. Eight feet of water, you know, a mile wide moving at eight or nine miles an hour, just think of how much water that is that you've got to take care of for eight feet. But there are a lot of little things that can destroy a levee. In the old days -- this doesn't happen anymore -- but if during the construction somebody left a log or even really a branch in the levee, it rots and creates a cavity. That's a weakness. When the water saturates a levee, which it will do automatically in a flood, it finds that little cavity and starts to eat away at it. Even some crawfish nests. A crawfish builds a nest in the levee and that -- that's a cavity. The water comes in and starts to erode that, and pure pressure as well. Just the weight of the water pressing against the sides will push water through the levee and it'll come out on the other side. Some of this seepage is perfectly safe. Some of it is quite dangerous. And you can get what's called sand boils and a sand boil is really like a miniature volcano. It looks just like a volcano, and it'll spout water in a sort of a gusher. If the water is clear, then it's safe. But if the water is muddy, that means that it's eroding the levee. The water, as it runs through the levee, is taking the earth of the levee with it. And that has to be taken care of immediately. And, again, just the constant pressure of the water against the levee, the levee can slough off. That has to be supported. I mean there are an infinite number of problems that can arise.

INT: Describe how houses were swept off foundations.

JB: Well, you've got to understand that when there's a crevasse, it's not simply the water flowing over the top of the levee as if it were overflowing a bath tub. What you get is tremendous turbulence, unbelievable forces at work, and in a great crevasse the river will gouge out a hole in the earth and the greatest crevasse on record, which was in 1927 about 15 miles north of Greenville, Mississippi, you know, the hole in the levee was about two-thirds of a mile wide. And they sounded it with a hundred-foot line and found no bottom. It was later they figured out that it was 130 feet deep. So you had this hole, you know, over, as I said, about two-thirds of a mile wide, 130 feet deep pouring water onto the land. Obviously, that is a ferocious current when it first hits the land. So a house is not gonna stand up to that under any circumstances. In fact, trees, forests, whatever, they're just simply wiped out, but as the water spreads out and slows down, you know, people with some experience in the delta would, for example, leave their doors open to allow the water into the house, 'cause if they closed everything off, then it had this resistance and it would -- it would just, you know, undermine it or overpower it. But if they let the doors and windows open, the water could flow through it. That was one of devices for people who had experience with floods.

You know, the 1927 Flood was two stories. It was man against nature, but it was also man against man. And part of the story in man against man involved the city of New Orleans, which in 1927 was a much more vibrant and vital city than it is today. It was, by far, the leading city in the South, economically dwarfed, literally double and triple Miami, Houston, Dallas, Nashville, Louisville, any of its rivals. And one of the things that the people in New Orleans who ran the city were concerned about was fear of their investors, who were mostly in New York and Boston, of what the Mississippi River might do to New Orleans in a big flood. So here, you had this tremendous flood coming down the river and, oddly enough, it didn't threaten New Orleans. And the reason it didn't threaten New Orleans was because there was no possible way that that water was ever going to make it to New Orleans. The levees upriver had to break. They had to, as, in fact, they did. For example, the river spread out 70 miles from Vicksburg to Monroe, Louisiana. But before that happened, while people in New York were worrying about whether or not they should put more money into New Orleans and invest in the port and so forth, the city fathers decided to demonstrate that they would never, under any circumstances, allow the river to threaten the city. So what they did was decide to dynamite the levee about 13 miles below the city and flood out their neighbors. Race had nothing to do with this. They were almost all poor whites who were flooded out.

INT: Describe what happens when levees break upriver.

JB: When the levees upriver break, it lets water out of the river. So, therefore, the level in the river gets lower. In fact, in every flood there's concerns about sabotage, 'cause if the levee on one side of the river breaks, that side floods, but the people on the other side of the river are safe. And, in fact, there were at least a dozen people killed in separate gun battles in 1927 over attempts to sabotage the levee. And, in fact, in Vicksburg, the record on the Vicksburg gauge is not 1927. The reason is the water had spread out to Monroe, Louisiana, 70 miles away. So, obviously, that's going to lower the water level.

INT: Tell me Jadwin's response and Hoover's response when they were asked to weigh in on the levy.

JB: Well, before the City of New Orleans could do this, they needed permission. And they needed it from both the governor and the federal government. Hoover was then Secretary of Congress. He and Jadwin were actually coming down the river on an inspection boat and one of the New Orleans elite took a motorboat up the river to meet on board. And Hoover and Jadwin greeted this New Orleans delegation warmly and as soon as the people from New Orleans started to explain what they wanted, Hoover stood up and walked out. He wanted no part of it. He was already running for President and this was too dirty for him. He simply said, "That's General Jadwin's business," 'cause Jadwin had the legal authority. And Jadwin finally went along only if New Orleans promised to, among other things, fully compensate the victims of the dynamiting, which they freely promised. And, in fact, 54 leading men of New Orleans, the president of every major business, the president of every trade association, the city council, the mayor, and so forth, they all signed a pledge that they would, in fact, compensate the victims fully. A couple years later when the claims came in, they'd paid off pennies on the dollar and there were roughly 10,000 who were flooded out of their homes. When the water went through, there was absolutely nothing left. And their homes were gone, their means of making a living disappeared, and they got an average of \$80 a person, something like that.

INT: Briefly describe the communities that were wiped out.

JB: Louisiana, as you know, is a mélange of many cultures. And the people who lived down there were called *Islanos*. They were actually from Spain. When Spain ruled Louisiana briefly, they brought these people over to try to settle the area and create a Spanish population. They were very isolated. Many of them continued to speak Spanish, in fact, an 18th century version of Spanish that hadn't evolved. And they were mostly trappers. They would go out in the marsh and trap muskrats and sell muskrats. As primitive as that is as a way of making a living, they could make very good money. It was not at all unusual for them to make \$7,500, even \$10,000 a year. And to give you a sense of proportion, the starting salary for a prohibition agent was like \$1,200 a year. And the salary of the governor of Louisiana was \$7,500 a year. So they made very good money. And they also had a quite lucrative [trade] as bootleggers. It's one of the prime bootlegging or importing areas in the country.

INT: Describe the rescue operations.

JB: In this flood there were actually several hundred thousand people who were picked off rooftops or levees or from trees. And Hoover gathered together a fleet of over 800 boats and there were a few steamboats, major paddle wheelers that rolled down the river. In some cases they would actually roll on what had been land and they would act as a mother ship and there would be, a smaller boats that would go out usually in a given area that would go with a mail man, who knew the routes, knew where the houses were or at least had been, knew what certain signs were and they would go look for people. And they did an absolutely extraordinary job. I mean literally a hundred thousand people were picked off rooftops and trees. I mean it was an unbelievably well organized rescue operation. But the whole area was known, from the great crevasse at Mound's Landing in the State of Mississippi, I know, for more than 50 miles to the east to the hills, there was nothing but

water. And for 75 miles south from that break there was nothing but water. That's an inland sea. On the other side of the river, the river went from Vicksburg to Monroe, Louisiana, and that's 70 miles. Again, all of it essentially under water, some of it under five feet of water, some of it under a good deal more water. In central Louisiana further south in the Chafalaya Basin, again, you know, hundreds of thousands of people. In total, there were roughly a million people living in the lower Mississippi region that was flooded by the river. Almost two-thirds of them were fed by the Red Cross. The rest basically left and went to stay with relatives outside the area. There were 330,000 people living in tents for months. And the population of the United States at the time was roughly 120 million people. So what you've got is nearly one percent of the entire population of the United States was flooded in 1927.

INT: How did Hoover deal with this?

JB: Well, Hoover was at his best in this. He was a brilliant organizational genius. He knew how to cut red tape. He knew how to get things done, and one of the things he did was decentralize so that there would be no delays, but he also was extremely prepared, and well in advance he would get predictions of what levees might break, and well in advance of the levee break he would send orders to a local Red Cross committee and tell them to set up a camp, a refugee camp for eight thousand or 15,000, however many it was, and he'd send the plans along with it. And, you know, detailing everything from latrines to electricity. You know, he did not, of course, do this all by himself, but part of it was he had good people around him and he relied on 'em. I mean he was an organizational genius, without a doubt. And he had a lot of experience with this kind of logistics. At the beginning of World War I before the US ended the war, he fed occupied Belgium, and that was something that initially was opposed by both the British and the Germans -- didn't want him doing that.

INT: How did Hoover benefit from the flood?

JB: I don't think there's any doubt but that the '27 flood made Herbert Hoover President of the United States. Before the flood there was an astute political magazine handicapping the 1928 race, listed eight to ten to twelve candidates -- I don't remember exactly. Even listed three people it called dark horses. And Hoover's name was not even on the list. He simply had no natural constituency. He had lived outside the United States his entire life from the time he graduated from Stanford until the time he came back in the middle of World War I. So he had not even voted in an election during that period. So there was no state behind him. There was no political group behind him. What did he have was the media. In fact, he, during one period of his life, owned two newspapers, one in Washington, D.C. and one in Sacramento, California, because he wanted to, as he said, "get in the big game somehow." And he said, "The world lives by phrases." He believed in the media and he had a tremendous press operation, not that he didn't do a great job in the flood, but he made sure that his name was on the front pages every day and the flood news, you can imagine. I mean we have a little flood today and it makes the network news. And this flood was a tremendous, extraordinary story that went on not just for days or weeks, but for months. And there was always a new level of suspense. "Is this levee going to break?" Yes. "Is the next levee going to break?" Yes. And Hoover made several national radio addresses when, in itself, a national broadcast in the '20s, was news. I don't think there's any doubt, and he knew it himself. In the

middle of the flood he turned to a friend and said, "I shall be the nominee. It's nearly inevitable." I mean the media definitely created his candidacy.

INT: Were a lot of people using radio at this time like he was?

JB: Remember, he was Secretary of Commerce, and that actually gave him control over radio. Radio was so new that it was only in the early '20s that they first began to advertise on it. People believed initially that you couldn't make money with radio. Of course, that was obviously mistaken. But it was a brand-new medium. I guess the Jack Dempsey fight had been broadcast by them but national radio hook-ups, by themselves, were news. And for him to make two national broadcasts about the flood, in addition to which, again, his name is on the front pages day after day after day, and he's always portrayed heroically, justifiably so but he made sure that if there was ever the slightest hint of criticism, he responded to it. One major political consultant today, James Carville, grew up on the river and he read the book and called me afterwards and he told me afterward that Hoover had a better operation than any politician he knows today.

INT: Talk about the physical ramifications of the flood.

JB: Sure. Let's say you had situations up and down the river. You've got 335,000-340,000 people living in tents, many of them for months. In some cases the only dry land is the levee itself. The river's on one side, flooded territory's on the other side. The levee has got a crown eight feet wide, a little bit more than that is out of water, and these refugee camps stretch for miles up the levee. In many places it's very difficult to supply. In several places dogs were being shot for fear of rabies. There was fear of epidemics. There's livestock being penned up next to these refugee camps. The whole scene really looks like the devastation of a war. And when the river went through towns, again, it's not high water generally, but when this river went through, there was just tremendous devastation left everywhere.

INT: Comment on the '92 flood.

JB: I don't pretend to be an expert on the '93 flood, but while it was occurring I had already started working on this book. And I was amazed. I had started my book reading about the levees-only theory and whether levees were good or levees were bad. And this was material that was written in the 1830s and the exact same debate was going on after the '93 flood in almost the exact same language. If you change the grammar a little bit, you could simply interchange the arguments, which I found more than just amusing. "Amusing" is not the right word. But the issues are political issues largely at this point, much more than technical issues any you know, what are you going to do with the flood plain? A lot of that flood plain is awfully valuable and I personally think it's right to take much of that and use it. Some of the flood plain may not be so valuable or protecting it is too expensive. But that's really the debate, the political issues. You know, there are, obviously, some technical problems, particularly in the upper river, and lack of coordination and things like that which contributed greatly to the disaster in '93. But ultimately the society has to make a political decision on what it's going to do with that river's flood.

INT: Give a specific argument.

JB: Well, I mean the basic argument is what impact levees have. And, of course, they will protect, -- when they work -- some land, but then they pass the problem both up and down the river. They pass the problem along to neighbors. There was, when I started work, I started researching this book, I spoke to a gentleman named Michael Robinson. And one of the things he said to me was, "All water is local." And, of course, he was playing on Tip O' Neil's line that "All politics is local." But I quickly learned there's nothing as local as water, because what one person does directly affects his or her neighbor.

INT: Did the Jadwin plan actually make the Achapalaya problem worse?

JB: No. The flood made the Achapalaya problem worse.

INT: Looking at the work that's been done on the Mississippi, what's been accomplished?

JB: I'd say the work done on the Mississippi, obviously. Historically it's been chiefly to protect people living along the river and to allow them to develop the river. And to a significant extent, it's achieved that goal. Now the question is whether or not the society wants to continue to pay the price to protect all that land, whether the river, for reasons of beauty or environmental health or flood control, should be allowed to reclaim some of that land, whether in natural reservoirs and other wetlands. I think it should, you know, and probably most people would agree with that. The question is--and here's where the fight is--where you draw the line, over how much you allow to river to reclaim and how much you continue to protect and at what cost.