We Need to Return to Thinking, and The Great Projects of the FDR Era

These are excerpts from a lengthy interview with the late Prof. Lance Endersbee, which appeared in the Executive Intelligence Review, *June 28, 2002. He was interviewed by* EIR *economics editor Marcia Merry Baker, while he was in Washington, D.C., to participate in a conference of the LaRouche political movement.*

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Endersbee: One of the tragedies is, that we've tended to move away from the capacity to speculate, and to think about issues. And we're always trying to make things black and white, which is never the case. And this means, that we've got ourselves into the crazy situation, where, even in the universities, speculation is not on. And the idea that we can't speculate, is reinforced by this mad system of peer review, and all the rest of it.

I think there's an awful lot of young people in the universities, at the moment, that are being held in a system of thought-control, because all speculation is out of court. Unless you can prove things absolutely, it's not scientific. Well, all of the great scientific discoveries of the world began with speculation.

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Endersbee as a young engineer. In 1952, he was sent by the Australian government to the Bureau of Reclamation in Denver, to learn the skills of designing big tunnels and dams.

EIR: Let's switch for a minute, to another area of control, where it's said, "It's not economical to build great projects. We do not have the money to develop our resources." First, you were in just the opposite position. After the Second World War, you were building things. Can you tell us something about that—the Snowy Mountain project. . . .

Endersbee: Well, let's begin a little bit earlier in America: When Franklin D. Roosevelt came to power—and it's worthwhile listening to his inaugural, because I think it's fantastic—Roosevelt got on with the job, with the TVA (Tennessee Valley Authority) and Grand Coulee. He had the Bureau of Reclamation already going well, and Hoover Dam. And they were absolutely wonderful projects. The important thing was that every one of them was big and challenging. Hoover Dam was, by far, the highest dam in the world. It was an arch dam. They had to develop new techniques for analysis, to work out the stresses in the dam. The mere matter of the diversion of the Colorado River, past the dam site, was a fantastic operation. And then, of course, they had the largest turbo generators in the world. There were ***huge*** steel pipelines. And they have to develop new ways of welding these great pipes, and so on. So, there was a great deal of activity in Hoover, which was exciting and interesting, and it challenged the Bureau.

The same thing was happening in the TVA. And the TVA was an absolutely incredible project, because it covered so much countryside in Kentucky and Tennessee. Hundreds of thousands of people were involved. And, in the case of the Tennessee Valley project, what was absolutely amazing, was that all of the people in the Valley, hundreds of thousands, were all captured by the idea, and they all worked together for a common purpose, and there was no sense anywhere, of people doing their own thing, or individual purposes: Everybody was united towards a common goal. It was an absolutely fabulous time.

Now, I was reading about these sort of things in the technical press, of course. I was watching it all like mad.

EIR: They had music evenings, to give briefings on why they should use electricity!

Endersbee: Yes! Well, it was all a wonderful time.

Now, this was also being monitored, around the world, because everybody was interested in these fantastic steps forward, that Roosevelt was making. And, one of the places where that was noted was, of course, Australia. We'd been thinking about the inland diversion of the Snowy River for some time. And so, after the war, we started getting on, developing plans for the building of the Snowy Mountains project [Figure 1, p. 12].

But, there are other people around the world, also, looking at all sorts of new plans for redevelopment. And we started

Along with the rest of the world, Endersbee was inspired by the Roosevelt-era great projects. Here, Hoover Dam, built by the Bureau of Reclamation, is a National Historic Landmark and has been rated by the American Society of Civil Engineers as one of America's Seven Modern Civil Engineering Wonders.

this project—the Act went through in 1949. We then had an immediate prob-0lem, because we really didn't have the strength in depth, within our organization, to get on with the job. We started off with a commissioner, who was a hard-bitten, old hydro-electric construction engineer—he knew exactly what he was doing, and he was a wonderful leader—and a bunch of young engineers, like myself.

EIR: Tell us more now, how did the Snowy Mountain training come about, that you could go from one thing to another?

Endersbee: Okay. What happened was, that we just had two or three senior people with background and a bunch of young engineers. And the Snowy organization entered into a contract with the United States government, whereby we paid—this is Australian money; no aid or anything, right?—we paid the Bureau of Reclamation in Denver, Colorado, to help us with the design of the first major tunnels and the first two major dams, and in the process help us, by training some of the young engineers.

And so, in 1952, I was sent to Denver, Colorado, and I was told by the Snowy, that I had to learn to be an expert in tunnels and underground construction.

EIR: In how long?

Endersbee: Oh, as quick as possible!

And so, I was sent to Denver. And the Bureau engineers sat us down. And I sat down at an empty drawing board, and I started to draw up the first tunnel—the 14-mile-long Eucumbene-Tumut diversion tunnel. And so, I did that, and I was beavering away there for 12 months. And it was wonderful working with these Bureau engineers, because they were all 20 and 30 years older than me—they had all this experience.

And they would just saunter up to my desk and say, "Why don't you think about this?" or "Have a go at that." And, every now and again, they'd disappear and they'd come back with a book or a specification, with a few things marked in it for me. And there was this wonderful relationship between these older Bureau of Reclamation engineers and the team of 12 young Australians.

And, you can imagine, being Australians, there's lots of banter, and everybody had a good time. But, there was a wonderful human relationship there. And after 12 months, I was going back to Australia, with a bundle of drawings and specifications, so I was hoping I could answer all the questions, when I got home, and the details!

And so, we then got on with calling tenders, and getting on with the construction of the projects.

And then, there was another nice development: The Bureau of Reclamation had a number of older engineers, in their late 60s-70s, who had been construction engineers, resident engineers, on Glen Canyon, or Grand Coulee—you name it. Some of them had been on the Colorado—Big Thompson. And they had these construction engineers, who'd been there and done it, and so, we arranged for them to come and stay with us for periods of 12 months or so.

And they sat down with us, and they helped us with the administration of these ***very*** large contracts—you know, these were multimillion-dollar contracts; quite huge things, in those days. And once again, the relationships were rather wonderful. Because we'd get into a problem with a contract, and we were worrying about this and that, and they'd say, "Well, this is the way we did it, at Palisades"! And, off they'd go and they'd come back with some data for us.

Of course, there were absolutely wonderful relations there. By then, some of us were a bit older; we had children, and they were part of the grandfather circuit in the young Australian community, the relationships were absolutely fantastic.

So, the project was built on time and within the estimate, and it was a great, complex project, and it was this sort of harmonious relationship with the Bureau that helped it along.

▲ *Six generators at Tumut 3 power station. Two of them can provide enough electricity to power a city the size of Australia's capital, Canberra.*

The six pipes of the power station Tumut 3 are each 487 meters long, 5.6 meters in diameter, and collectively contain 10,260 tons of steel. ►

EIR: So, the examples of this, which I know have been recently published and available in Australia in the CEC periodical *The New Citizen,* are very appropriate to the Franklin Delano Roosevelt approach today. Because they're directly a spin-off, thanks to people like you.

And then, you built more underground power facilities and that kind of thing.

Endersbee: See, when you start off with a rocket behind you, which happened to me—this applied to most of the young Australians who were involved in this, because of the fact that they were expected to become experts, without trying to be experts—within about eight years or so, we were operating at a world frontier. And the interesting thing is, that we had already been working on the design and construction of two large underground power stations, and, at that time, the Bureau of Reclamation had not designed and built an underground power station.

. . . And now, the Bureau of Reclamation—they were watching us!

EIR: So, these were underground turbine stations.

Endersbee: Oh yes, absolutely: Large underground power stations. There are two in the Snowy scheme, and I worked on the first one of those. But, by then, as we were completing this first large underground power station, I was then invited to go to Tasmania, where the Hydro-Electric Commission in Tasmania was designing and building *their* first underground power station. So I went to Tasmania, and once again, we had a government instrumentality—a government utility—and we had an interesting charter from the Tasmanian government as a government utility.

Tasmania is a hydro-electric island, and, in effect, the orders from the government were, we were to generate the lowest-cost hydropower in the world, so that we would attract industries to Tasmania.

And so, in other words, as a government department, we were ordered by the government, to operate at the frontiers of technology, design, and construction, to keep the prices as low as possible. And you can only do that by technical excellence. And so, we were encouraged again.

We were the first in the world to use hard-rock tunnelling machines, boring tunnels. And that was an interesting exercise, in that we wanted to drill several miles of tunnels through hard rock, and hard sedimentary sandstones, and things like that. And, we found that, in America, there was a firm that had built a soft-shale cutting machine. . . . This was at the Missouri River diversion—on one of the Missouri projects. And this was [an Army] Corps of Engineers project, and they had used—for a fairly short distance—a soft-shale cutting machine.

But we saw that they had the electric

▲ *Endersbee was a world authority on rock behavior and tunnelling. Here drilling at the Tooma-Tutmut tunnel, part of the Snowy Mountain Scheme, in 1959.*

Construction ► *at the Snowy Mountain Scheme's underground power station Tutmut 1, in 1958.*

motor drive-system, which we wanted. So we got in touch with this firm in Seattle, and there were some financial problems there, with the firm. And, in essence, the Hydro-Electric Commission in Tasmania provided funds to re-float this company in Seattle. So here's a government department doing this sort of thing, to help us design and build this hard-rock tunnelling machine, which we were going to ship to Tasmania.

And it worked. We sent our plant engineers over there. They worked with the firm in Seattle, and then, they came back to Australia with the machine. We put it up to the face, and it worked like a charm. We realized, we couldn't get the muck away quick enough, we were doing so well. So, we had to redesign the conveyor belt system, and everything else, to move the muck quickly—and we were breaking world's records.

EIR: This is the positive idea of building infrastructure. But we all know, wherever we live, almost, that the last 20 years, things lagged, there was a pause. And you are now saying, that, not just in power generation, but in railroads, you have a peculiarly dramatic situation in the railroad gauges in Australia. Can you tell us, in your expert opinion: If we were to start tomorrow to have that same spirit and technology commitment, what should we be doing there?

Endersbee: Well, the wonderful thing about Roosevelt is, that he identified not only problems in America—but helped to inspire a similar approach around the world. And you only have to look at the situation in Africa, in South America, parts of Asia, and so on: There is a need to match new infrastructure. And, the problem is, that the world is divided in various ways: In Africa, the sort of projects that should be built, involve several countries. In the Middle East, the problems of groundwater are sort of heading towards warfare, almost.

And so, it's really a matter of trying to overcome the political problems. If you can put the political structure together, the rest is easy.

EIR: You've developed maps to show Australia, in political-social terms—how it's part of a whole region of 4 billion people (if you count India and China and East Asia and Southeast Asia), so that it could be a positive location, not a strife location.

Endersbee: We have to look at that market. You see, we're just 20 million people, in Australia. And one of our problems today, is that our Constitution, which to a certain extent was based on the U.S. Constitution, preserved sovereign power at the state level.

EIR: Not Federal, but state.

Endersbee: At state level. That means that the various states of Australia agreed to the Constitution, on the basis that they preserved sovereign power. And the Federal government was only granted powers for defense and foreign affairs, and trade, and so on. That meant the states were responsible for water, electricity, and transport, and you name it. And so, that meant that the states—and for the last hundred years—have hung onto, not only the separate ports, but separate rail systems, *and of different gauges.*...

But, you see, at the time of the Con-

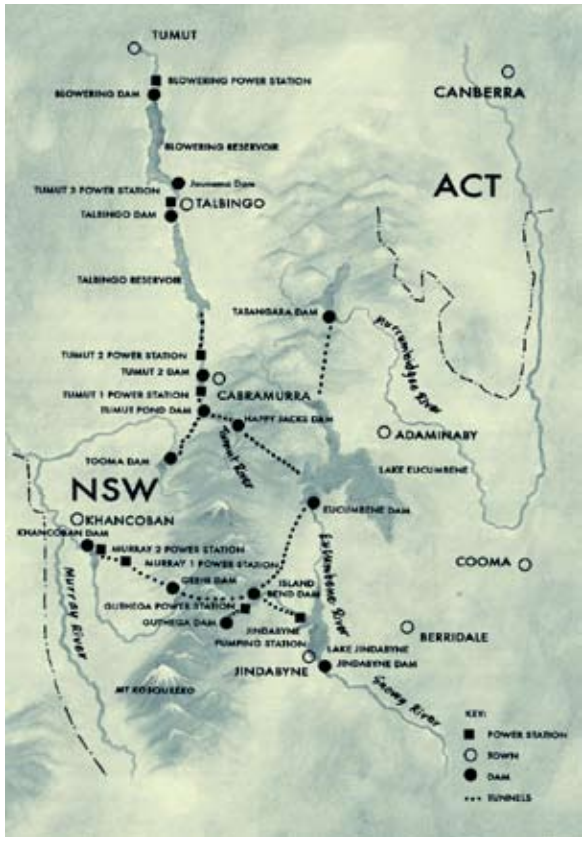


Figure 1
THE SNOWY MOUNTAIN SCHEME
The Snowy Mountain project covers an area of 7,780 square kilometers, with 16 dams and 7 power stations. Like the Hoover Dam, the American Society of Engineers rated it as "one of the seven engineering wonders" of the modern world.

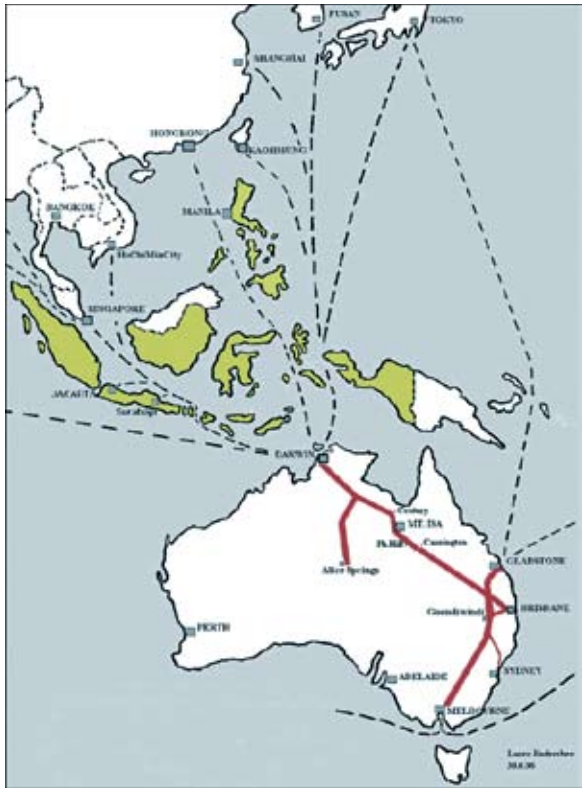


Figure 2
ENDERSBEE'S PROPOSED ASIAN EXPRESS
Endersbee proposed a rail program that would link Australia to the entire East and Southeast Asia region, opening up a market of 4 billion people. His Asian Express plan is a high-speed train from Melbourne to Darwin, which would revolutionize Australia's export potential.

stitution, that was regarded as a plus, because the separate gauges leading to each port, meant that the other states wouldn't interfere.

EIR: Oh, wouldn't compete for the hinterland traffic!

Endersbee: No—and, if you like, this idea of separate state sovereignty still remains. I was in the Northern Territory, two or three years ago, and one of the local bureaucrats told me, very proudly, how the Chief Minister of the Northern Territory (which is probably about 200,000 or less people) had recently been in Beijing, and had signed a memorandum of understanding with the Premier of China! You know, I thought, "Ahhh! What madness this is!"

But, okay, if you look at the situation from the Australian point of view, there is still enormous potential in the north and south [see Figure 2]. And, if you look at the markets to our north: Darwin, for example, the distance from Darwin to Singapore is the same distance as the length of the Mediterranean Sea.

So, we can be communicating with all of that part of Asia, and entering into trade with Asia.

If you see the map, and you see the distances between Singapore and Japan; at any one time, half of the world's container ships are in the seas between Singapore and Japan. Half of the world's containers are there. So, it's a huge area, based on maritime trade, and that's easy to understand, when you think of all the islands of the Indonesian archipelago—so, we are in a good position to trade with that area, and also to be a source of food.

EIR: So, this would help define infrastructure, to build up ports.

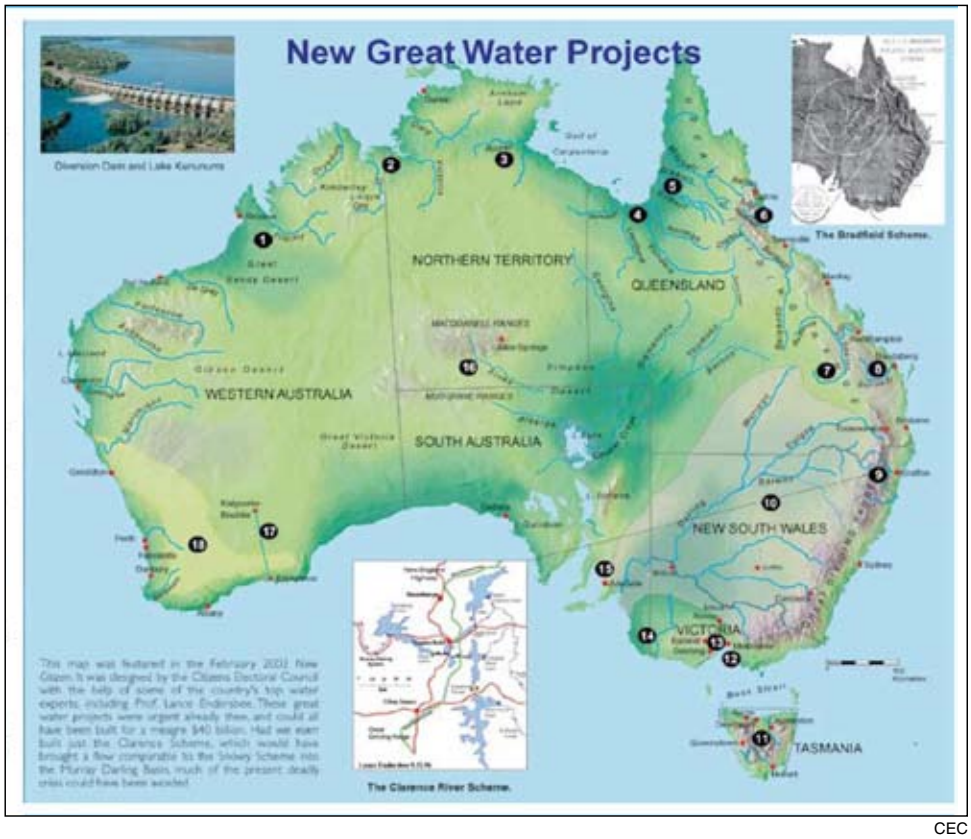
Endersbee: Absolutely. This is what I'm getting at, is that the 4 billion market, and their needs, drives infrastructure development in Australia, because, in effect, we would be designing and building, to sell Australian produce and our goods, into that market.

EIR: Tell us something about the new railroad plans, or new irrigated farming plans—you have a terrific climate in Australia.

Endersbee: Well, I've been working on a new railway system, that goes up through the middle of Murray-Darling Basin—it's a great irrigation area, at the moment. The Murray-Darling Basin—we can double or triple the output, by getting a better access to market.

See, in Australia, we have what they call, a "tyranny of distance." And economic development depends on access to markets. If you change the access to markets, you improve the value of crops; you change the sort of crops you grow; it changes the value of water. So, if we have, if you like, rapid transport systems that connect Australian farms effectively to Asian markets, it changes what we grow, it changes the value of land, it changes everything.

And so, I've been looking at transport projects to bring Australian produce to these markets. Now, if we can do that successfully, we can easily support another 20 million people in Australia.



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Lance Endersbee and other national water experts collaborated with the CEC in 2002, to outline 18 great water projects in Australia, shown on this map.

EIR: And also, besides the rail, then, you're thinking of inter-island and rapid marine travel. Have you been involved in that?

Endersbee: Well, down in Tasmania, they've been designing these twin-hull catamarans. And these are fairly rapid, in fact, a twin-hull catamaran, made in Hobart, holds the speed record across the Atlantic. Average speed of about 45 knots, I think. One guy, who was a student at the faculty, when I was dean, did some wonderful work with them, with the builders of this machine.

You can imagine, with a twin-hull catamaran; it's a devilish problem if you're running into a cross-sea. You're going like this, you see: One hull will hit the wave before the other hull. And so, this graduate student (he's 40-odd) was able to devise a sensing mechanism on a computer program, so the flaps at the stern of the catamaran, would go up and down, like this. And so, he had a sensing device to monitor the sea state, determine which hull was going to hit the water at which time, and the whole thing was adjusted—and it was just as steady as can be. And they used that on the Atlantic crossing.

Now, these fast catamarans—they're very good—and this chap's got designs for them with 500 or 1,000 containers, which are good for, if you like, inter-island travel, such as in the Indonesian archipelago. A bit of fun!

EIR: So, the technology is there.

Endersbee: Oh! It's the will. You see, with a lot of these things, every one of them requires a leap-frog in thinking. And we've been talking at this meeting over the last few days, about the railroad, which could go from China all the way through Kiev, into the heart of Europe; and you'd have Russia and China all connected up, as one common market—a fantastic rail project, which could go ahead.

And, the question is: Where is all the money going to come from, and everything else? And, the fact is, that the money is, in many cases, relatively easily found.

EIR: Well, in North America—you may have something to say, about the idea that that railroad should go from Kiev eastward through China, under the Bering Strait and into the Yukon and Canada. Do you have a tunnelling expert's opinion?

Endersbee: There are various technologies which are available, now, these days. You have to look at the costs; but, with a tunnel like that, you'd want to stay away from problems in the rock underneath. And you'd want to stay away from a floating bridge or bridge-tunnel arrangement.

But it is possible to have a tunnel made of pontoons, constructed in the dry. And then, taken out to the site, and in effect floating, submerged—above the seabed. They could be floating submerged, anchored to the seabed. And, so you could have a floating tunnel, and just join it up. So, you're independent of the rock conditions underneath, and you're inde-

pendent of the sea state, and it's just a matter of paying for the box, and screwing it to the floor. And make sure there are no holes.

You see, that's an easy fix. You'd use longitudinal pre-stressing, all sorts of things to make sure it would work very nicely.

EIR: Is one of those in place?

Endersbee: No, not that I know of. They may be, but the Bering Strait is the sort of place, where that sort of thing could be done.

EIR: This could be the challenge that the projects of Franklin Delano Roosevelt were, in the 1930s.

Endersbee: He had the courage to have a go!

EIR: You said that after you retired—you're a civil engineer, actively retired—you're now in your most exciting thinking period in your life. So, your priority is setting straight the groundwater misconception?

Endersbee: No—primarily in national development: You see, when you're practicing, and, as I was working with the government, or when I was at the university, you are largely constrained by the system telling you what to do. Now, if you're an employee, you have to do what the boss says. If you work in the government, you have to do what the government says.

When you're in a university, and particularly these days, with privatization and all sorts of things, you're totally dependent on what money people give you for research. So, your research is totally determined outside, and the idea of free scholarship is totally lost.

So, since I retired, I've been a free scholar. For the first time in my life, I've been totally free, and I can think what I like, do what I like, travel where I want to—if I've got the money to do it. But, the important thing, is that, when you're as free as all that—all of a sudden, a great world of opportunity opens up, and there's *so* much to be done!

And, there are so many blockages: governments all around the world with problems.

EIR: One thing is, you're making available the levers and handles to reconceptualize, to push ahead. You mentioned Professor Gold, Professor Gregory, Professor Kerry, these other people. Do you think, among hydrologists and geochemists, you can force things through in the near future? What's your view?

Endersbee: I am hoping that there are young people out there, I'm hoping that there are young minds, who see these opportunities and grab them and run with them. And the more courage they have to think for themselves, and work things out, the better.

One of the things that worries me, is that our entire generation of young people are being conditioned. And they've lost this capacity to think independently. I could go on, and mention my concern about American teenagers. . . .

The problem here, is that there's a whole advertising and other industry, preying on the American teenager, because the American teenager's got money to spend. And, the money that American teenagers spend every year, themselves, is about $100 billion. The money that their parents spend on their behalf, is another $50 billion. So, the American teenage market is worth $150 billion every year: You could build an awful lot of things for $150 billion a year. You know, from my point of view, $150 billion on spiky hairdos and bare midriffs, is a total waste of money.

EIR: Whereas if you put it, you mean, in building projects and create natural resources?

Endersbee: Absolutely. But you see, the system is actually preying on these young people, and limiting their ability to think for themselves. They are being driven, so that, in effect, they worship the corporate sponsor. And they don't listen to their parents or their teachers, and that means that they're losing the capacity to work together. . . .

For Further Reading

"Ocean Temperature and CO_2: Global Climate Change Has Natural Causes," by Lance Endersbee, *EIR* March 7, 2008

"The World's Water Wells Are Drying Up!" by Lance Endersbee, *21st Century,* Spring 2006

"Australian FDR-Era Engineer: Let's Resume Great Projects. Interview of Lance Endersbee by Marcia Merry Baker, *EIR,* June 28, 2002

"TVA, Mekong, and China's 'Heroic Civil Engineering,'" Interview of Lance Endersbee by Gail and Michael Billington, *EIR,* Dec. 6, 2002.