



The Cassandra of Toledo: A Requiem For Mitigation

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This is a guest post by Mike Bendzela.

"Wherefore I perceive that there is nothing better, than that a man should rejoice in his own works; for that is his portion: for who shall bring him to see what shall be after him?" (Ecclesiastes)

I have a lasting impression of Geology Professor Craig Bond Hatfield, University of Toledo, circa 1980: a no-nonsense man in white shirt and skinny tie, flattop buzz cut, and tortoise-shell glasses. At the outset of each class, he would draw a map of North America's coastline as it currently looks in freehand on the blackboard, and then lecture us on the past coastlines and sedimentary basins of the continent. To have several hundred million years collapsed into a few weeks of Hatfield's course in Historical Geology is about as close as I've come to a mystical experience.

"One generation passeth away, and another generation cometh: but the earth abideth for ever."

In late 2003, while reading an on-line article about something called "peak oil," I saw a bottom-of-the-page citation that permanently influenced how I view the subject:

Oil Back on the Global Agenda. Craig Bond Hatfield in *Nature*, Vol. 387, page 121; May 8, 1997.

I decided that if Professor Hatfield was involved in the subject, it was clearly something that must be taken seriously. Another early article, "How Long Can Oil Supply Grow?" first published in 1997 by the M. King Hubbert Center, lays out all the peak oil arguments in a clear and succinct way – several years before forums like this one began giving voice to such concerns. His was among the earliest voices warning of oil shortages to come in the twenty-first century. Some articles of his go back to the early 1980s.

After a couple of years of dawdling, I decided to look up the professor again after not seeing him for over twenty-five years. You see, I never completed my geology major: that career-goal foundered on the shoals of math and chemistry. Now I'm an adjunct professor of English in Maine, and I use my writing course to inform students about the importance of such basic scientific concepts such as evolution and energy.

My visit to Mr. Hatfield's house was not done with this essay in mind. We spent most of the time

catching up. He was curious about my life in Maine, and I was delighted to hear that his children had interests in common with me: His son is a paramedic in Ann Arbor (I'm a volunteer EMT); his daughter, a History professor in Austin, enjoys playing old time tunes on the fiddle, my favorite hobby, too.

Turning to peak oil: I was curious to know – as he hadn't written about the subject in years – if he had written anything lately that showed he was still of the opinion that oil was going to peak soon and that this was a bad thing. Little did I suspect the simple message he would give me:

"Michael, it's too late."

Recently I submitted a list of questions for Professor Hatfield to answer to get a better look at his current thinking on the subject.

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Please summarize how you first got involved in publishing warnings about the energy crisis.

During the late 1960s, 1970s, and early 1980s, I taught annually a graduate course in petroleum geology to geology majors who were just about to complete their master's degrees and enter the petroleum industry in exploration for crude oil or natural gas. Throughout this time, I had to keep up with the current literature in petroleum geology, and by the late 1970s, it had become apparent to me that the petroleum industry, in the U.S. and globally, was becoming progressively less successful at finding oil. That is, in spite of steadily improving technology for exploration and drilling, and in spite of increasing rates of exploration for oil, global discovery rates were declining from a peak reached in the early 1960s. In other words, we were drilling more and finding less. This, coupled with the drop in U.S. oil production rate after 1970, is what made me start writing about future oil supply problems. The timing seemed opportune, because the temporary oil shortages of 1973 and 1979 had made the public aware of our dependence on oil. So in 1979, I started collecting rejection slips from editors of popular magazines and newspapers, and occasionally an article got accepted for publication.

You have called M. King Hubbert "the premier living authority on fossil fuels" (this was several years before he died in 1989). Had you ever met Hubbert?

I met M. King Hubbert twice. The first time was in March, 1956, in San Antonio, Texas, at a meeting of petroleum geologists and petroleum engineers. I was a 21-year-old undergraduate student at the time, and one of my geology professors had been kind enough to let me come along with him to the meeting. I heard Dr. Hubbert give the talk in which he first publicly predicted that U.S. oil production rate would reach its maximum between 1966 and 1971 and permanently decline thereafter. This was the talk on which his 1956 paper Nuclear Energy and the Fossil Fuels was based. Being a typical undergraduate student, I didn't know my ankle from my elbow, so I did not have enough critical information to be able to evaluate his talk. But his conclusion about future U.S. oil production was clear enough. My professor introduced me to him after the talk, and I got to shake his hand. I was thoroughly impressed by all this, because Hubbert was already well known in geologic circles for his contributions to geophysical techniques useful in subsurface exploration. My second meeting with Dr. Hubbert came thirteen years later, in April 1969, at the annual meeting of the American Association of Petroleum Geologists in Dallas, Texas. We met on an elevator in the convention hotel, and I told him that I had heard his 1956 talk and asked him if he still thought that U.S. oil production was about to stop growing and start declining. He said it would start to decline within the year. We talked for maybe an hour sitting in the hotel lobby – mostly about fishing. He was an avid fisherman (fresh water lakes – not deep sea).

You mentioned that you stopped publishing after your retirement in 1999 because "it's too late." Was there a specific moment or incident that prompted you to say "enough"?

Because development of large-volume, economical substitutes for oil is likely to require many years if not decades, and because I think that global oil production rate is likely to start declining around the year 2010, it seemed to me that, by 1999, when I retired, we probably no longer had enough time to develop substitutes for petroleum adequate to compensate for the coming decline in oil production rate. Also, on a more personal note, retirement meant that I no longer had to teach courses or direct master's theses, which in turn meant that it was no longer necessary to keep up with all the diverse and voluminous literature on petroleum geology and other energy matters. I eagerly anticipated this release but also realized that abandoning the current literature on energy would soon render me incompetent to write about oil supply problems. Besides, by 1999 I was in my mid-sixties and had been writing about long-term fuel supply problems for twenty years without discernible beneficial effect. This was discouraging; I was tired, and my wife and I were looking forward to permanent vacation, travel, play, and no alarm clocks.

Your 1994 article for the Journal of Geological Education, "A Permanent Solution to the Fuel-Supply Problem," states, "World oil production is likely to begin its permanent decline by...about 2020." Yet you mentioned to me that you were "pressured" by a representative of the USGS to use that date instead of your own estimate (mentioned in the Washington Post in 1997) of a "permanent decline before 2010." Have your ideas about the date changed?

I still think that global oil production rate is likely to reach its maximum and begin to permanently decline around the year 2010. Such a forecast, of course, is necessarily imprecise and is influenced by several unpredictable variables both geological and political. I would not be surprised to see world oil production rate start to decrease any time between now and 2013. I will if it does not start to diminish until after 2015.

You said that you haven't read the oil journals since you retired; yet you mentioned having read your friend Kenneth Deffeyes' recent book "Beyond Oil." Do you have any thoughts about his prediction (now a post-diction) that world oil production peaked at the end of 2005?

I think that Kenneth Deffeyes' prediction of Thanksgiving Day, 2005, as the time of maximum world oil production rate was a playful reflection of his sense of humor and was meant to draw attention to the fact that no one can know precisely when oil production rate will peak or precisely when it will begin its long-term decline. He probably thought that an obviously facetious forecast, far more precise than available data can permit, might at least draw some attention to the problem and its urgency. More power to him! Anything that might interest the public in this problem is worthwhile.

You stated pointedly in the Chicago Tribune, "Today's population and living standards cannot be maintained without continuation of the profligate fuel consumption that fostered them." That was back in 1983, when world population was a mere 4.6 billion (it is now circa 6.5 billion). Do you still believe, as you say at the end of that article, "we will experience...truly catastrophic effects" when fuel supply begins declining?

To gain an appreciation of the economic effect of decline in oil production rate, it may help to remember the oil shortages of the 1970s. Those shortages were largely political in origin, very temporary, and minor as well. Demand exceeded supply by a very few percent. Yet, we had rampant global inflation. We briefly had double-digit inflation even here in the United States. The world experienced economic hardship and strain on the global monetary system. Economic

growth was severely impacted. If we can envision that situation on a permanent rather than temporary basis, with world oil production rate declining every year indefinitely into the future, then we can begin to appreciate the magnitude of the problem. Today, because of more efficient fuel use, we get more economic product per unit of oil consumed than we did in the 1970s. But this does not mean that economic growth and oil consumption have been decoupled. They are still strongly coupled. What I envision is, after a few years of decline in oil production rate, a situation reminiscent of the depression of the 1930s, except that this depression will be permanent and worsening rather than temporary and improving – until we develop a large volume, inexpensive substitute for petroleum.

You gave a talk titled "Limits to energy" in 1998 at the Gordon Research Conference on "Assessing Resource Limits." What sort of persons attended this conference, and what was the response?

I gave my talk...to the most prestigious audience I have even been honored to address. They included researchers in physics, chemistry, geology, biology, various fields of engineering, environmental studies, geography, and economics. Included were faculty from Harvard, Yale, Princeton, Berkeley, Penn State, MIT, Carnegie Mellon, Columbia, Stanford, and various universities in Europe, Australia, and Japan. Others worked in research and development at AT&T, Bechtel Corporation, Alcoa, General Electric, Worldwatch Institute, Monsanto, the EPA, the USGS, Motorola, General Motors, World Resources Institute, Bell Labs, and the National Science Foundation. Because of the nature of the audience, I prepared more fully than for any other talk I've ever given, made super-clear, colorful power-point slides to accompany my statements, and even rehearsed my answers to every question that I could imagine might come in response to my talk. I was loaded for bear, and I gave what I am certain was the best talk of my career. Questions after the talk continued for about twenty minutes, and, luckily, I had anticipated every one of them. The response was the most positive I have ever received for a talk. I felt profoundly grateful for this good fortune with such an elite audience.

You've probably heard of Matthew Simmons' book "Twilight In the Desert," an expose of "the Saudi miracle." In the wake of declines in Burgan (Kuwait) and Cantarell (Mexico), everyone on The Oil Drum seems to be waiting with bated breath for confirmation that the super giant Ghawar field is also in decline. Do you think this to be as imminent and catastrophic as Simmons makes it out to be?

I did read Matthew Simmons' book. I lack expertise on the Ghawar oil field, but I have heard statements from other petroleum geologists who do have experience with the Ghawar field and whose views are not very different from those expressed in Twilight In the Desert. It will be interesting to see how long secondary recovery efforts can maintain Saudi oil production at or above its present level.

One of my favorite quotations for my writing students to ponder comes from your piece in the Hubbert Center Newsletter of 1997:

Our nation's current attitude toward this dilemma is serene apathy. We have no long-term energy plan. We don't even seem to recognize the existence of a long-term problem. Rather, we simply vacillate from panic to complacency in response to short-term shortages and surpluses.

Recent events have certainly borne that out. I find it ironic that complacency now reigns at \$61 a barrel. Have you done anything to prepare for a possible Mother of All Panics?

A financial advisor whom my wife and I use did his master's thesis in geology under my direction

a few decades ago. After working in petroleum exploration for several years, he left the oil industry and, with some additional training in other areas, joined A. G. Edwards as a financial consultant. He's been there for many years now. He has helped me choose energy stocks for our portfolio as a hedge against the coming oil supply problem, but he admits that owning the right energy stocks probably will not be adequate protection for the economic difficulty that declining oil production will bring. I have asked him what we should do, and he answered, "I don't know."

My thanks to Professor Hatfield for taking the time to provide such articulate answers.

"And I gave my heart to seek and search out by wisdom concerning all things that are done under heaven... and, behold, all is vanity and vexation of spirit...."

For in much wisdom is much grief: and he that increaseth knowledge increaseth sorrow.

Articles by Craig Bond Hatfield

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