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*MuseLetter #259 / December 2013 by Richard Heinberg*

*The last newsletter of 2013 brings together an essay, an interview, and a blog post, all with the common theme of the intersection between economic growth and energy.*

*Thank you for your support in 2013, and my very best wishes for the Holidays and the New Year.  
Richard*

### **Preface to the Romanian edition of Snake Oil**

In the United States, fracking is widely regarded as the biggest energy development in decades, a revolution that is making America self-sufficient in oil and natural gas. Now the petroleum industry wants to bring fracking to Europe, and promises equally grand results.

But there is a problem: if we look beyond mere claims and promises, and examine the actual data on environmental impacts and on oil and gas production potential, the shale revolution in America is revealed to be a costly, destructive project whose benefits are short-lived. In *Snake Oil*, I offer evidence to back up that assessment. Even more has emerged since the book was first published in the US.

In July 2013, the *Los Angeles Times* published an investigative report by Neela Banerjee based on Environmental Protection Agency internal documents, showing that the EPA had systematically ignored evidence of environmental harms from fracking, choosing not to publicize or act on data collected by its own staff. Evidently the Obama administration finds temporarily rising oil and gas production figures so enthralling that it is willing to ignore the long-term costs to water and air quality, and to the health of humans, livestock, and wildlife.

Meanwhile former Mobil Oil VP Louis W. Allstadt, who spent his career running oil production operations and company mergers, now speaks on behalf of anti-fracking resistance groups, pointing to studies revealing that compromised casings (and resulting instances of water contamination) are far more common than the industry claims.

As a result of these kinds of revelations, citizen-led groups are continuing to form across the country to oppose fracking, and the oil and gas industry is increasingly on the defensive. Wayne County, Pennsylvania activists are currently celebrating the cancellation of

1500 drilling leases covering 100,000 acres of land. New York State's moratorium on fracking remains in effect, despite massive industry efforts to end it. Meanwhile four cities in Colorado have voted to ban fracking altogether.

New evidence also underscores the production limits of shale gas and oil. Recently Shell's US office announced a \$2 billion write-down on its liquids-rich shale assets in North America. The company was simply acknowledging the unprofitability of leases in non-core regions, purchased back when shale plays were being advertised as "manufacturing operations" in which companies could successfully sink a drill bit virtually anywhere.

Europe's desire to get in on the fracking game is understandable, given the hype still emanating from America. Europe struggles under energy prices significantly higher than those in the US, and there is a widespread perception that the region has an even bleaker future: its options include importing more fuel from Russia, relying more on expensive liquefied natural gas (LNG), or burning more coal (most of which would also have to be imported). European economists and politicians who desire to maintain business-as-usual economic growth while pursuing energy independence seem to have no choice but to pin their hopes on fracking.

Geology dictates that most of the oil and gas that will be produced by horizontal drilling and hydrofracturing on the Continent will come from central and eastern Europe. Donald Tusk, the Polish prime minister, has issued a strong statement supporting fracking operations by foreign energy firms, while Ukraine has signed agreements with Shell and Chevron for large-scale natural gas exploration. ExxonMobil and Austria's OMV are negotiating agreements for exploration in the Black Sea. In 2010, Chevron bought access to nearly two million acres of Romanian land in the northern Vaslui and southern Dobrogea regions with the intent to start fracking for shale gas in 2013.

However, Europe's geology is not as favorable for oil and gas production from shale rocks as it is in the US, and the technological infrastructure is not as well developed. Also, the industry faces even more citizen backlash over environmental concerns: in the US, land owners control subsurface mineral rights, and therefore benefit financially from fracking; in Europe, national governments own subsurface rights, and land owners are left unrewarded as they bear the human cost of noise, fumes, truck traffic, bad air, and bad water.

In October 2013 the EU tightened its regulations on fracking. According to the rules approved, shale gas projects will need audits based on "the direct and indirect significant effects" on human health, species and their habitats, land, water and climate. Meanwhile, in that same month, several hundred angry farmers from the village of Pungesti in Vaslui county in Romania formed a human chain to stall Chevron bulldozers on their way to clear land in order to build drilling pads for fracking. The government came to Chevron's defense, deploying riot police.

It is of course impossible to know exactly how fracking will evolve in the European context. However, the most likely scenario goes

something like this: The next few years will see increasingly heated controversy and conflict as drillers push for access to favorable sites, and as citizens push back. Initial drilling in the very best available locations will yield some expensive-to-produce oil and gas in limited quantities, but production will decline rapidly unless operators can turn both a profit and gain access to many thousands more drilling locations. In the best case (for the producers), the oil and gas that is extracted will be sufficient to provide a small, temporary boost to the European economy, but even then it will not be enough to change the European or global energy equation very substantially, or for very long. Meanwhile, wherever the technology is deployed the usual problems with air and water quality, human health, and the health of livestock and wildlife are almost certain to follow. Citizens need to continually remind policy makers of these essential facts, as fossil fuel companies tend only to point to the (largely unrealistic) promise of jobs and tax revenues from fracking.

In Romania, hydrofracturing for shale gas needs to overcome four formidable challenges. One is the environmental costs and risks of the practice—which is predicably based on the US experience with this technology. The second is geology: Romania is as earthquake-prone as California. Memories are still vivid of two major tremblors that devastated Bucharest and some smaller cities in 1940 and 1977. While the underground injection of toxic wastewater has not yet triggered a Big One in the USA, there is a rich record of earthquakes at the level of Magnitude of 3 to 5, which would be enough to damage poorly constructed buildings in Romanian villages and cities.

The third challenge has to do with local laws. With fragmented land ownership and 30% of its population living off their subsistence and semi-subsistence farms, Romania is certainly not Colorado or Texas. The Romanian media claims that Chevron has leased some 6.300 square kilometres in Moldova and 2.700 in Dobrogea, but such claims cannot be verified since the leasing contracts are secret. In the village of Pungesti, Chevron needed the agreement of three landowners to drill just a test well for shale gas—but two owners have already backed out from the deal and the one who stayed is the pro-fracking village mayor.

The fourth and final reason Romania is a poor prospect for the fracking “revolution” is economic. Romania is a major conventional gas producer in Europe and is overall a net energy exporter. Why take so much risk with fracking when the country is not desperate for energy?

We must reject the assertion that fracking is Europe’s (and Romania’s) best hope for maintaining a business-as-usual energy economy. In fact, sooner or later, all the world’s nations face the reality of declining fossil fuels, declining energy availability, and a contracting economy.

Rather than attempt to stave off this inevitable future by extracting and burning ever-more expensive and ever-more environmentally ruinous fossil fuels, we must begin now to build a functioning post-growth, renewable energy economy that supports people and protects nature. In this context, Romania’s most valuable asset might not be its gas but its soil (the Chernozem, the most fertile topsoil in

the world), along with its huge and undepleted aquifers, its mineral waters, its biodiversity, and its rich cultural heritage.

It is in nature and culture—not efforts to preserve and extend a fundamentally unsustainable fossil fuel-based economy—that we will find our best and most realistic hopes for a humane and survivable future.

Richard Heinberg  
Santa Rosa, California  
November 15, 2013

[\*Snake Oil: How Fracking's False Promise of Plenty Imperils Our Future\*](#)  
*is available in book and ebook formats.*

### **Do We Really Need Economic Growth?**

**Marcin Gerwin: For most heads of states, the prime minister of Poland included, the central point of economic policy is maintaining or increasing economic growth. The aim is to encourage people to consume every year more goods and services so that the Gross Domestic Product continues to grow. Do you think it's a realistic approach?**

**Richard Heinberg:** Over the short term it is, at least in many countries. But it's becoming harder and harder all the time. That's especially true for the older industrial nations like United States, Europe and Japan. Ultimately, economic growth can't be maintained in any country simply because it implies increased extraction and use of resources. After all, we live on a finite planet. This was understood actually by many of the great early economists, including Adam Smith, who foresaw that at some point the global economy would reach limits and will stop growing. There is overwhelming evidence that in fact we are reaching those limits now and that growth is becoming more and more difficult.

Here in United States the highest rates of growth were achieved in 1950's and 1960's. Since that time growth has been more anemic. It's been purchased with spiraling levels of debt. Households in the US have taken on more and more debt in order to finance increased consumption. However, there are limits to debt. Beyond a certain point people are unable to make increasing payments and banks don't want to loan them more money. We seem to have reached that point in just the last decade. Now household debt is not growing substantially but that's being made up for with increasing levels of government debt – deficit spending and quantitative easing on the part of central banks. So growth is being maintained in the US but it's being financed with enormous levels of government debt. This is not a sustainable situation.

At the same time the energy situation is weighing on growth as well. The economy depends on energy. In fact it's energy that makes the world go 'round, not money or military power; without energy nothing happens. During the 20th century we achieved economic growth largely because we had enormous amounts of cheap, concentrated energy in the form of fossil fuels. We're not about to

run out of fossil fuels; however, we have extracted them using the “best first” principle. In other words we extracted the cheapest, the most concentrated, highest quality coal, oil, and gas first. That means that what the industry produces today is ever more costly, both in terms of capital investment and energy inputs (ever-increasing amounts of energy have to be invested in drilling, mining, and refining). So even though the world is producing record levels of oil, coal, and gas, once the energy expenditures in producing these fuels are taken into account, on a net basis useful world energy has effectively leveled off and (in the case of oil) begun to decline.

As useful net energy declines, the real economy of goods and services shrinks. The only way to achieve the appearance of growth is through financial bubbles, but that always end in a crash.

**MC: Is GDP a good measure of progress then?**

**RH:** It’s actually a very bad measure of economic progress. Many economists would agree with that statement.

**MC: Why?**

**RH:** It just measures the amount of money that’s being spent in an economy on an annual basis. It’s a good gauge of consumption, but of course we can’t continue to increase our rates of consumption forever. So if we aim to continue improving our society then we have to look for ways of doing so that don’t involve increased consumption. GDP can’t help us do that, but indexes that measure quality of life and status of the environment directly could be useful. The Genuine Progress Indicator was developed back in the 1990’s and it’s being used successfully in many places including the State of Maryland here in the United States for economic reporting and forecasting. Also the little Himalayan nation Bhutan has developed Gross National Happiness (GNH) as an economic measure. There are efforts at the United Nations to explore the broader use of GNH in other countries.

**MC: If we assume that we don’t need economic growth, what would the economy look like? It wouldn’t be possible for the banks to give loans with interest as economic growth is necessary to pay the interest back.**

**RH:** Certainly the financial system will have to change in a no-growth economy. For clues about the future, we should look to the past. The no-growth economy was the norm, historically, up until the 19<sup>th</sup> and 20<sup>th</sup> centuries; in fact it was the expected condition of economies throughout most of the human history—it’s certainly not something that has never existed before. However, a steady-state or a post-growth economy does pose serious challenges for our current financial system, which has gotten hooked on growth. High returns on investments are not feasible in a post-growth economy. We would need a banking system with a 100 percent reserve requirement. The charging of interest on loans would also be problematic. That’s why charging of interest was considered sinful or even criminal in societies that did not experience economic growth.

**MC: Would the changes also affect the way that cities function?**

**RH:** As fossil fuels become more scarce and expensive we're going to have to change a great deal of how society works—including how we design our cities, to reduce the need for transportation so that people live close to where they work and shop. We will be less mobile in a post fossil fuel society. Even if we increase our production of renewable energy very substantially, transport will occur at much lower level than we're currently used to. So we must re-localize our food systems and reduce fossil fuel inputs in our food systems. That means we'll need more farmers. So even though urbanization has been the dominant social trend of the past few decades, it is very likely that we will eventually see cities begin to shrink in size as people abandon living arrangements that no longer function and look for ways of subsisting closer to the land.

**MC: It seems to me that it may be hard for many people to believe that there is a need to prepare for reduced amounts of fossil fuels. We are told in the media, that the untouched reserves of shale gas in Poland are huge and that the US has reserves of shale oil so large that it could become the next Saudi Arabia.**

**RH:** The supply of shale gas in the US has been substantially overestimated. We did a study at Post Carbon Institute looking at 65 thousand currently producing shale gas and tight oil wells. We've found that the rates of production in most individual wells decline very rapidly. In each of the areas that produces shale gas or tight oil there's typically a small core region where production is fairly prolific and profitable. But outside that region initial production rates are lower and production declines by 60% or more within the first year. This means very high rates of drilling are required to keep production going. But as the best drilling sites are taken, that means the over-all decline rate just gets worse, and eventually a point is reached where drillers just cannot keep up. We will likely arrive at that point around 2017 in America. When the decline begins it will probably be very steep because of the very high per well decline rates. It's very unrealistic to think of the United States as being the next Saudi Arabia.

Poland has placed considerable hopes on its shale gas, but initial exploratory wells have shown those expectations are unrealistic. It's likely that only small amounts of shale gas will be produced in Poland and other Central European countries.

**MC: What should the prime minister of Poland do in this situation? He insists on maintaining economic growth. However, since it would not be possible, what kind of policies should he focus on?**

**RH:** I would advise economic policy that supports subsistence agriculture, that encourages craft industries and small-scale, local manufacture. These will be the backbones of the economy of the future. Rapid urbanization and economic growth are unsustainable over the long run, so prioritizing them now is not a good strategy.

**MC:** Hmm, that could be problematic because most people in Poland dream of something else. They want to catch up with the levels of material wealth that are present in Western Europe, like in the United Kingdom or in Germany, for example. Their dream is to earn more money, and that's the policy they would like to see – earning more money. So in order to change the economic priorities the values of the society would have to change first.

**RH:** Yes, for a nation that still has a large rural population it's important to begin to value and support farming and rural culture. Countries that are highly urbanized and that have gotten used to a high rate of economic growth are going to have further to fall. Life is not going to be good in those places. Countries like Poland—and Romania, to an even greater extent—that have large proportion of the population still working the land actually are in a very good position to weather the kinds of economic changes that are on the horizon.

Cities have been with us for thousands of years and will certainly be around for the foreseeable future. However, urbanization requires high rates of energy consumption, and so the end of the fossil fuel era also means the end of the kind of urban development that the industrial world has pursued over the past few decades.

*This interview first appeared in Dziennik Opinii in Polish.*

## **Krugman Goes Splat**

I was fairly amazed to read Paul Krugman's latest op-ed in the *New York Times*, titled "[A Permanent Slump?](#)" He seemed to be coming remarkably close to saying what several of us have been trumpeting for the past few years—that world economic growth is ending and we'd better retool accordingly. "What if the world we've been living in for the past five years is the new normal?," he writes. "What if depression-like conditions are on track to persist, not for another year or two, but for decades?"

Wow. That's a gutsy statement, given that it's coming from one of the high priests of the Religion of No Limits (otherwise known as economics).

What's even more remarkable is that Krugman's sudden insight was evidently triggered by comments from Larry Summers (who was almost nominated to be the next Fed Chairman), in a [speech at a recent IMF conference](#).

Evidently, Respectable People are starting to discuss The End of Growth. Wow.

But read further. Why does Krugman think the economy has slowed? Because population growth (especially in the US and other industrialized nations) has tapered off. "A growing population creates a demand for new houses, new office buildings, and so on; when growth slows, that demand drops off." True. So I guess the solution is to aim for an infinitely large human population so that we will

never have to worry about slower economic growth. Hmm. Might be some problems with that.

"Another important factor may be persistent trade deficits, which emerged in the 1980s and since then have fluctuated but never gone away." Okay, this could be another contributing factor for the US. But . . . is that it?

These are the only reasons Krugman lists. He seems blithely ignorant of the logical truism that economies simply *cannot* grow forever on a finite planet. Further, he shows no awareness of the role of high oil prices in choking off economic expansion in the older industrial nations.

Krugman does discuss problematic high levels of household debt in the US. The ratio of household debt to income "was roughly stable from 1960 to 1985, but rose rapidly and inexorably from 1985 to 2007, when crisis struck. Yet even with households going ever deeper into debt, the economy's performance over the period as a whole was mediocre at best, and demand showed no sign of running ahead of supply."

So household debt rose in order to maintain growing levels of consumption, but even so actual GDP growth became more anemic with every passing decade, right up until the bursting of the housing bubble. All true. Krugman doesn't take the next crucial step of introducing his readers to evidence that household debt has reached its natural limits (on the whole, people can't afford to make larger payments and the banks don't want to lend them more money).

Krugman (and Summers) appear, then, to have some dawning awareness of our actual economic predicament. Wonderful! So what does the *Times's* favorite economist suggest we should do?

It's here that Krugman goes splat, right on his face.

"If our economy has a persistent tendency toward depression," he opines, "we're going to be living under the looking-glass rules of depression economics—in which virtue is vice and prudence is folly, in which attempts to save more (including attempts to reduce budget deficits) make everyone worse off—for a long time." In other words we should all stop saving and the government should keep up its deficit spending.

Krugman appears uncomfortable about having to offer what some people would consider to be counterintuitive economic advice.

"Economics is supposed to be about making hard choices (at other people's expense, naturally). It's not supposed to be about persuading people to spend more."

Let me get this straight. One of the key solutions to our ongoing economic crisis must be to get people to spend more, presumably to buy more stuff, even if they don't need it and can't afford it. By implication, I suppose we should also try to persuade people to have more children (shouldn't we at least try to get our population growing again?).

Well, Krugman's right that all of this truly is vice rather than virtue. Will it actually help? Not if we are facing debt, resource, and environmental sink limits (as I argue in my book [The End of Growth](#)). If we are, then it's better to think of the industrial economy of the 20<sup>th</sup> century as an aberration, not a mean or norm. The world is entering an entirely different economic regime, one of persistent overall contraction—which will continue (with periodic relative ups and downs) until consumption is occurring within the bounds of Earth's long-term resource budget. Adaptation is the name of the game. We should be stabilizing population, reducing consumption, re-localizing and decentralizing economies, downsizing our financial system, and using the powers of government to minimize human and ecological casualties during the transition. Deficit spending may indeed have a good use in this context, but only if it is geared toward funding basic economic restructuring—such as building public transportation, local food systems, and renewable energy capacity. On a personal level, we should share more while also becoming more self-reliant—two ways of reducing our dependence upon markets to fulfill our needs.

That's a very different diagnosis, and prescription, from Krugman's.

Here's my conclusion from reading "A Permanent Slump?": Paul Krugman is just beginning to come to terms with the reality that the US economy is not reacting to Keynesian stimulus the way it's supposed to (the way slumping economies in the early industrial period did). Yet he remains trapped in the conventional assumption that growth will *eventually* resume—because, after all, growth is the normal condition of a healthy economy. And given the fact that we've built our current economy upon the expectation of ever-rising consumption and ever-growing population, a return to economic health demands that we consume (and reproduce) more!

His essay suggests that Krugman does not understand resource limits. He does not understand population limits. He does not understand why our economy is not growing, and he doesn't know what we should do to adapt to converging limits.

Perhaps in another few years mainstream economists will make a bit more genuine progress in understanding our predicament. I'm not holding my breath. Meanwhile, it's apparently up to us "consumers" to pursue virtue rather than vice, prudence rather than folly.