
Oil at 150: Energy Past and Future in Pennsylvania

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Oil at 150:

Energy Past and Future in Pennsylvania

BY BRIAN BLACK AND MARCY LADSON



Icons shape many of our memories of historical events. This image of Colonel Edwin Drake (in top hat, below) and a local druggist named Peter Wilson at the world's first intentionally drilled oil well was shot by an unknown photographer in 1861. It illustrates the birth of the conspicuous consumption of hydrocarbons in the hills of Pennsylvania. We assume, with our subconscious knowledge of resources, that this oil well sparked a clear change in our usage that resulted in Henry Ford's Model T, "Getting Our Kicks on Route 66," OPEC's embargo, and Americans' fetish with gas-guzzling vehicles like GM's Hummer. Closer to home, we might see the natural connections to Breezewood, Pennsylvania, the city of motels, the Lincoln Highway, or the Pennsylvania Turnpike.

The reality, though, is more complex. The image of Drake, like these other nostalgic reminders of our automobility, suggests the costs and benefits of America's love affair with cheap energy. Pennsylvania takes great pride in Drake's work and a great deal of public attention has been focused on Titusville due to last year's 150th anniversary of his first oil strike there. From an environmental history perspective, however, the anniversary of Drake's striking of the first commercial oil well also guides us to instructive legacies and lessons for the present and future.

Long before Drake sunk his well, people living and traveling in western Pennsylvania knew petroleum existed along Oil Creek. Early European explorers found evidence of earthen troughs dug along the creek where Native Americans collected oil on a significant scale. For centuries, mound-builder-culture Paleo-Indians came to Oil Creek to collect petroleum for use in religious ceremonies. The Seneca tribe who lived in the region during the colonial era skimmed oil from the water's surface to use for ointment and skin coloring.

Lewis Evans's 1755 *General Map of the Middle British Colonies*, which depicts the "Endless Mountains" of western Pennsylvania, contains areas labeled "Petroleum," wastelands to early farmers and loggers. However, travelers were known to soak aching joints in the oil springs and even to imbibe the crude as a castor oil variation. As the oil's reputation grew, settlers collected it from springs

on their property by constructing dams to confine the floating resource.

In the mid-1840s, Pennsylvania entrepreneur Samuel Kier noticed similarities between the oil prescribed to his ill wife and a contaminant in the salt wells on his family's property outside Pittsburgh. He began bottling the waste substance in 1849 and marketed it as a mysterious cure-all. Because Kier's supply exceeded demand, he experimented with using the substance as an illuminant. At this stage, petroleum was still in some ways a resource in need of an application.

The exploitation of Pennsylvania's crude is one part of the complicated story that does not appear with Drake in the 1861 image. In addition to striking oil, development of the commodity required the influence, experience, and financial backing of a web of scientists and businessmen. During the mid-1800s, respected scientist Abraham Gesner promoted a product made from coal called kerosene oil. Its popularity for use in lighting spurred developers to reexamine existing resources, particularly petroleum, which would allow kerosene manufacturers to skip the stage of converting coal

into a liquid form. Dr. Francis Brewer, traveling to Titusville in 1851 because of timber interests, signed the first oil lease with a local resident to collect seepage oil. Businessman George Bissell acquired a sample of Brewer's oil, noticed its similarity to coal oil, and in turn signed a lease with Brewer to develop the petroleum on his lumber company's land.



(OPPOSITE) Detail of east side of Triumph Hill, near Tidioute, Pennsylvania, 1871, and (ABOVE) Edwin Drake and first drilled oil well, in Titusville, Pennsylvania, 1861. Courtesy of The Drake Well Museum, Pennsylvania Historical Museum Commission.



(LEFT) George H. Bissell, (RIGHT) Francis Brewer, and (BELOW) the Phillips and Woodford wells, struck in 1861, all in J. T. Henry, *The Early and Later History of Petroleum, with Authentic Facts in Regard to Its Development in Western Pennsylvania* (Philadelphia, 1873).



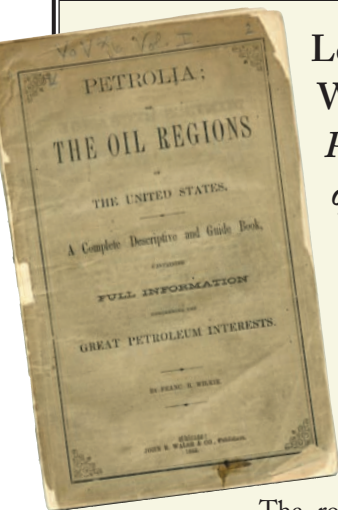
To assess the usefulness of petroleum and to attract financial backing, Brewer commissioned a study by Yale chemist Benjamin Silliman Jr. Silliman reported that 50 percent of the crude could be distilled into lamp oil and that 90 percent of its distillates had commercial possibilities. Bissell then incorporated the Pennsylvania Rock Oil Company of Connecticut to investigate the potential value of petroleum in the Oil Creek Valley. The variables of science, technology, laissez-faire capitalism, and the spirit of 19th-century American expansionism came together to exploit the new resource. The next important step was to increase and regularize the petroleum supply.

In the late 1850s, no one knew how to explore for oil. James M. Townsend, New Haven banker and president of Pennsylvania Rock Oil, asked Edwin L. Drake, a former New Haven railroad conductor, to oversee an effort to drill for crude. Drake's sole qualification for his new job as oil geologist seems to have been that he still had a free rail pass that would get him to Titusville. However little Drake may have known about oil (there are conflicting reports on this), he later wrote, "within ten minutes after my arrival upon the ground . . . I had made up my mind that it [petroleum] could be obtained in large quantities by Boreing as for Salt Water. I also determined that I should be the one to do it."

This is the portion of Drake's story that truly merits iconic status. Despite any added meaning that we attribute to the 1861 image of Drake, in this moment he stands as a representative of classic American values: achievement against the odds, a monument to courage, resourcefulness, and stick-to-itiveness. Drake and his assistant, William Smith, persevered despite repeated setbacks and despite the conviction by most of the people around him that the project was crazy. When the investors in New Haven refused further funding, Drake took out a line of credit and continued his work.

On August 27, 1859, Drake's well finally came in. There was no gusher, just an ooze found by Smith later that day. But that was all it took to touch off the oil rush. Within two years, as the extraction technology changed rapidly, the amount of crude on the market increased astronomically. With the opening of the first well, Drake and Smith unleashed a period of dramatic changes on the regional society. The oil boom of the 1860s offered a new model of industrialization, which combined the allure of gold with the industrial applications of a mineral resource. The challenge that defined the first decade of boom was to get the oil and move it out of Oil Creek Valley.

Oil Creek became a cog in an industrial machine. Certainly no thought was given to the impact on water quality. Producers shipped crude by loading it into small boats, which took a wild ride downstream as they were moved along by freshets—artificial floods released from upstream pools. The skiffs constantly slopped and leaked oil and often were smashed in boat jams. One-third of the extracted crude was spilled before reaching its destination. Wildfires frequently swept up the creek on the permanent debris-laden slick. The wells themselves leaked and spewed uncontrolled geysers. The oil saturated the ground and blackened men and buildings. Oil development denuded the hills of trees and led to the erosion of creek banks and to destructive floods. The mired towns stank.



Letters from Franc B. Wilkie, published in *Petrolia; or, The Oil Regions of the United States...* (Chicago, 1865), excerpt.

OIL CITY, PA., FEB. 24 [1865]

Yesterday was devoted to examining the oil region about Franklin and southwards, and this morning, in company with some dozen or fifteen wagon loads of oil seekers, I came to this noted locality.

The route to Oil City extends eastward from Franklin, along the right bank of the Allegheny, a distance of eight miles, and is probably the most utterly atrocious thing in existence, unless the exception be found in Oil City itself. A dozen vehicles, upon the arrival of the northern trains, start, crammed with oil seekers for Oil City. The road runs along a species of shelf that lies between bluffs and the river at a distance ranging from ten to fifty feet above the latter. It is a broken, narrow, muddy, abominable road, which slants constantly to the precipice on the river side. The vehicle crashes into bottomless abysses; its fore wheels interlock with oil wagons; its hind wheels seem to gravitate everlastingly towards the edge of the precipice. . . .

These are the unpleasant features of a ride from Franklin to Oil City. There are others that are not so unpleasant, among which is the wild scenery on either side, the clang of machinery and the evidences of mining success are prominent. Almost the entire distance between the two places was occupied by a down-going string of wagons, each of which was loaded with seven or eight barrels of petroleum. These are the substantial evidences of prosperity afforded by the mining interests, and demonstrate that with all its kite-flying attachments, the petroleum industry has a solid foundation. . . .

But as our French friend says, "return we to our muttons," which in the present case is Oil City, a place situated at the point where Oil Creek debouches into the Allegheny. It extends for a short distance east and west along the north bank of the river, and for a short distance up both banks of the creek. A narrow shelf lies at the foot of the high bluffs and the river and creek, and upon this are a narrow street, a row of shanties, a large number of refineries, and these are Oil City. The street runs close to the base of the bluffs, which rise up almost perpendicularly for nearly or quite two hundred feet. On the other side of the street is a long, straggling row of houses, built of coarse lumber, and resembling nothing so much as the shanties erected on railroads by Irish laborers. Some of these are stores, some hotels, some saloons, and others banks and dwelling houses.

One sees little but oil save mud, and even this has none of the stickiness of usual mud, owing to the universal presence of oil. Wagons in endless length pass southward loaded with oil; the air is tainted with oil. The refineries are blue with it; people talk of it incessantly; and it fills the soul of every man, woman and child in the place. . . .

Despite its discomforts, Oil City is a position of no small importance. North of it are the oil lands of Oil creek, Cherry run, and Cherry Tree, the last two of which, and part of the former, find their outlet at Oil City. When oil was first discovered, there were but one

or two houses where there are now all the crude elements of a large city. Large amounts of supplies are collected here for the use of the mining country, and here it is that the two streams of travel unite, the one flowing westward from Franklin, and the other down the Oil creek valley from Titusville and Corry, railroad stations connected with the great eastern and western lines of travel. . . .

To-morrow I am going up the Oil Creek valley, and when I reach a halting place, I will give the result of my examination of this and other diamond valleys. . . .

SHAFFER'S FARM, PA., FEB. 25

Shaffer's farm lies on the right bank of Oil creek twelve miles above Oil City and eighteen miles above Franklin. . . .

The average width of the valley through which this portion of Oil creek runs is about one-fourth of a mile wide, of which the stream occupies a width of some seventy yards. From bluff to bluff, and from Oil City to Shaffer's the derricks are as thick as they can possibly stand. They resemble a close forest, or a crowd of masts along the wharves of some empire city. A short distance above Oil creek there runs in the east bank of the creek a stream known as Cherry run, whose valley, for miles above, is as thickly studded with derricks as is the valley of Oil creek. Not far above Cherry run, another stream, called Cherry Tree run, empties into the opposite side of Oil creek, and its valley presents the same forest of derricks that are shown by the others. . . .

. . . In addition to these numberless derricks, there are engine and other buildings so thickly built that, for the entire distance, the appearance is that of a populous city. . . .



West Side of Triumph Hill, near Tidioute, Pa., showing strip with over 150 producing wells. These wells produced an average of 25 barrels per day. From *Views of the Penna. Oil Region*, published by Frank Robbins, Oil City, Pennsylvania. Society Photograph Collection.

The potential for great wealth lends a false feeling of permanence to places formed around resource extraction. Particularly for oil, permanence inevitably is shown to be an illusion.

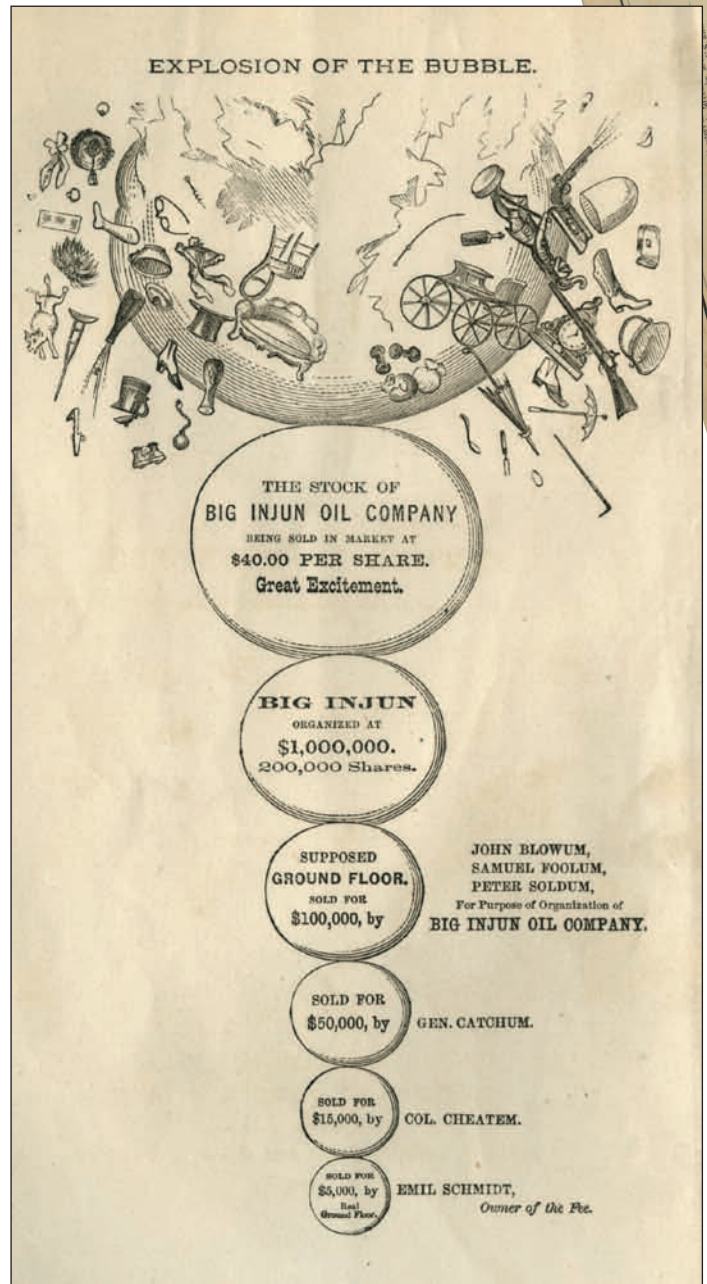
Boomtowns, more camps than real communities, sprang up to serve as tools for oil collection. The town aptly named Pithole suggests some of the consequences of Drake's discovery. In particular, it models the fates of resource-driven communities that are so dedicated to a single-minded goal that everything else is sacrificed—especially the landscape. Photographs and diaries record the ugliness and squalor that resulted in this concentrated point of individual initiative and unregulated resource exploitation. In boomtowns, all is temporary. Only a year after Pithole was incorporated and instantly became one of the state's busiest towns, its oil supply dwindled. People left, businesses failed, and buildings burned. Pithole boomed and busted in only three years.

The potential for great wealth lends a false feeling of permanence to places formed around resource extraction. Particularly for oil, permanence inevitably is shown to be an illusion. Depletion and decline are inevitable. As recently as 1995, Quaker State, an oil company that remained in the Oil Creek area, followed Pennzoil's lead and moved its headquarters from Oil City to Dallas. Despite its size and history, Oil City's population declined after Quaker State's exodus. In the first five years afterwards, the town issued just 1 building permit for new home construction. It has issued only 11 such permits in the last 15 years.

Despite a lack of new business, the extraction of crude appears to have had little noticeable impact: forests have recovered, waste crude has disappeared into the soil, and Oil Creek is a well-known stop for fly-fishermen. Below the surface, though, there is a different story. Clear water wells have proven particularly difficult to find in some locations. Residual contamination from refining and chemical manufacturing is also a problem in some areas.

Although oil is an important part of Pennsylvania's past, a new energy resource may prove to be a boon—or a bane—for its future. The year 2010, however, is in a wholly different era than 1861. The outcomes of extraction—boom and bust economic cycle and the consequences for the water supply—are disquieting Pennsylvanians as they explore the possibility of developing vast natural gas reserves contained in the Marcellus Shale formation.

The potential impact of natural gas production on Pennsylvania communities is related to the volatile nature of energy development. According to studies of communities affected by the business of resource extraction, locals who welcome development tend to overestimate the economic benefits and underestimate the negative social effects. The industry creates jobs, but long-term residents of the area may not be willing or able to fill them. Small local governments have little control over development but are expected to provide services. As newcomers flood in, town infrastructure—the schools, police force, housing supply, public utilities—is overwhelmed, undermining quality of life. The local cost of living increases, pinching residents on fixed incomes. Retailers may experience increased income but



"Explosion of the Bubble," cartoon depicting how an oil bubble forms and explodes. Frontispiece from Samuel P. Irvin, *The Oil Bubble* (Franklin, PA, 1868). (OPPOSITE) Detail of *Lloyd's Map of the Great Oil Region of Allegheny River, Cherry & Cherry-Tree Runs, and Pithole Creek; In Cornplanter, Cherry-Tree & Allegheny Townships, Venango County, Pennsylvania*, November 1864.



AMERICAN PETROLEUM CO., Capital \$5,000,000, President J. S. Burdick, Vice-President W. C. Clegg, Secretary J. S. Burdick, Treasurer J. S. Burdick, General Manager J. S. Burdick, Oil City, Pa.

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LODGE'S MAP OF PENNSYLVANIA, 1850. THE GREAT OIL REGION, 1864. VENANGO COUNTY, PENNSYLVANIA.

LLOYD'S MAP OF THE GREAT OIL REGION
 OF ALLEGHENY RIVER, CHERRY & CHERRY-TREE RUNS, AND PITHOLE CREEK, IN CORNPLANTER, CHERRY-TREE & ALLEGHENY TOWNSHIPS, VENANGO COUNTY, PENNSYLVANIA.

Specially Surveyed for this Map by our own Engineers
 And its correctness vouched for by all Owners of Oil Wells in the District.
 November 1864.
 J. T. LLOYD, PUBLISHER, 23 Cortlandt St. New York.
 No. 1 Strand, London, England.

LATONIA
 OIL CITY

Scale of Chains

often must radically change the way they do business. The failure rate among small businesses in boomtowns is actually higher than the national average.

For towns, after the period of energy production, an inevitable bust comes with the final depletion of the resource. But first, long before the resource runs out, there is a transition from the construction phase of drilling to the energy production phase, which is much less labor intensive and causes dramatic loss of jobs and population. Then, shifts in the energy commodities market can cause economic bust, as happened in the western oil-producing states during the 1980s. Because substituting natural gas for coal results in less atmospheric carbon, the amount of drilling can also vary with fluctuating concerns about climate change.

The pressure on state and federal government to ensure the supply of energy needed to maintain our culture's current consumption levels may lead to the same disregard for environmental degradation that characterized the 19th-century oil industry. Then, landscapes were sacrificed to the individual drive for wealth. Now, we have greater environmental awareness and regulation, but the stakes are higher—the needs of a global economy addicted to cheap energy. We are not that far removed from the 19th-century worldview—we tolerate man-made changes to the biosphere in the name of resource utilization for the common good on a scale undreamed of 150 years ago.

The area disturbed for the construction of one natural gas drilling rig is approximately the area of one house. However, the potential impact of drilling on the water supply is large. The



Shooting Oil Well, Pennsylvania. Keystone View Company Collection.

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1,000 Acres of Coal Land to sell or lease.

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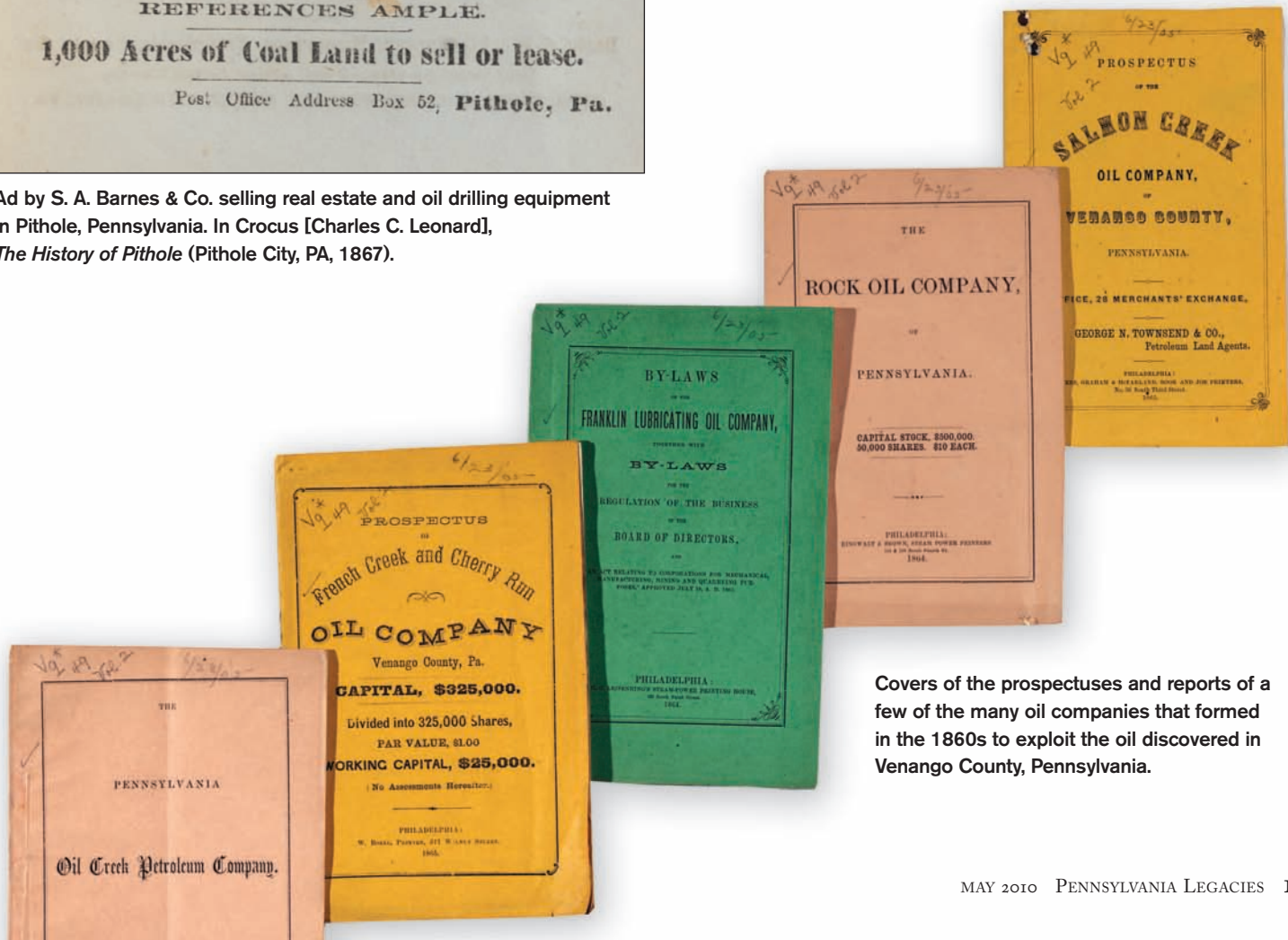
Ad by S. A. Barnes & Co. selling real estate and oil drilling equipment
 in Pithole, Pennsylvania. In Crocus [Charles C. Leonard],
The History of Pithole (Pithole City, PA, 1867).

new extraction process, known as slick-water fracking, can require
 over a million gallons of water for one well. Freshwater streams
 and groundwater could be depleted and conventional wastewater
 treatment plants cannot process the mineral contamination.

In 1861, there was neither oversight nor litigation by concerned
 organizations to regulate or halt resource development. In 2010,
 the Chesapeake Bay Foundation filed a challenge against the
 Department of Environmental Protection. It charges that the
 Pennsylvania EPA is streamlining the approval process for gas
 drilling, eliminating the requirements for technical review and
 public comment. Permit oversight has been stripped from local
 conservation districts, which CBF maintains are best able to eval-
 uate erosion, sedimentation, and storm-water impact on local
 waterways and wetlands.

The early Pennsylvania oil industry provides a clear example
 of an ethic—of exploiting a place for the common good and
 extracting a needed resource at the cost of all else in that locale—
 that would power American industry into the modern era. Now,
 150 years later, Drake's oil derrick might be seen as a lighthouse,
 warning of the dangerous shoals nearby. ■

*Brian Black is a professor of history and environmental studies at
 Penn State Altoona. He is the author of several books, including
 Petrolia: The Landscape of America's First Oil Boom (2003)
 and the forthcoming Contesting Gettysburg. Marcy Ladson recently
 graduated from Penn State Altoona with a double major in history
 and environmental studies.*



Covers of the prospectuses and reports of a
 few of the many oil companies that formed
 in the 1860s to exploit the oil discovered in
 Venango County, Pennsylvania.