Burton McCollun had purchased his own Torsion Balances to complement his instruments, adding to the competition. By the end of 1929 De Golyer and Karcher reported that 44 salt domes had been located with refraction seismic and 11 by the Torsion Balance. These discoveries, coupled with other discoveries in Texas and elsewhere from 1894 to 1930, produced a glut of oil. This, combined with the stock market crash in 1929, resulted in the departure of the German Companies (NAMEX in 1930 and Seismos in 1931). Schander's photos document the work with both Torsion Balance and Seismic as well as many oil fields in the US and Europe http://www.gshtx.org/en/photos/albums/v/22. The Geophysical Society of Houston and the SEG have instruments like those used in the *Dawning of Geophysical Exploration*.

THE FUNK WELL

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The historical significance of the Drake Well as the discovery well of the great Pennsylvania Oil Field is universally recognized. What has been forgotten is the impact the A. B. Funk Well on Oil Creek had on the very early American oil industry, an impact arguably greater than that of the Drake Well. Written accounts from the time indicate Drake Well No. 1 pumped 25 to 30 barrels of crude per day in late 1859, somewhat less in 1860, an above average production number at the time. Such dependable numbers, and the early prices of $20 to $30 a barrel, were sufficient to attract the interest of producers who leased land along Oil Creek and its tributaries, around Tidioute and around Franklin. The Venango Spectator reported in late November 1860, fifteen months after the Drake Well discovery, some 75 wells were in production in the early Oil Region. All but three of these wells were on the pump. The largest producer, at 50 barrels a day, was the Plumer, Eveleth, and Bissell Well on the Clapp Farm. The average well was producing just over 15 barrels a day.

The Spectator reported the Oil Region was producing about 1,100 barrels a day toward the end of 1860, a number that suggests no more than 300,000 barrels of crude were produced in all of 1860, probably less. Such numbers were sufficient to maintain interest in production. However, at the prevailing price of $4 a barrel toward the end of 1860, the best operators were only paying expenses. The relatively low price of crude reflected the lack of demand in the refinery market for crude. Though a few entrepreneurs, notably Charles Lockhart and William Frew of Pittsburgh, invested in new, large refineries built to refine crude petroleum only, the established coal oil refiners of the day were hesitant to change their operations or alter their coal supply contracts on what was perhaps just a passing footnote of history. Seventy-five small oil wells in remote Venango and Warren Counties producing together barely enough to fill one typical iron storage tank in a week was not enough for the nation's illuminating oil refiners to turn their backs on coal. At the end of 1860, the petroleum in the Oil Region remained just a curiosity to industrialists in Pittsburgh, New York and Boston. It would take some extraordinary developments in 1861 along Oil Creek on the land owned and developed by A. B. Funk to alter this perception of oil.

Captain A. B. Funk, a successful Warren County timber operator and former steam boat owner, purchased in the Fall of 1859 the Upper and Lower Mc Elheny Farms on Oil Creek. About six months after Drake's discovery, Funk had his son begin drilling on a site near the Creek on the Lower McElheny. After months of kicking down the well, Funk provided his son a steam engine and boiler to drill deeper. In May 1861, the Funks struck a producing sand, the Oil Creek Third Sand, 460 ft. below the valley floor. The well began to flow and came in at 300 barrels a day. A small postal village, Funkville, grew around the site. Concurrently on Funk's Upper McElheny Farm just up the Creek from Funkville, John Fertig was kicking down a well on a lease A. B. Funk had offered him. John Hammond, an Erie businessman, invested in Fertig's lease and provided him with a steam engine. With the engine, Fertig found the Oil Creek Third Sand in July. The well flowed at 300 barrels a day. Very near Funk's Well, Bennett & Hatch drilled throughout the summer seeking the Oil Creek Third Sand. In September 1861, their great Empire Well came in at 3,000 barrels a day. A stone throw away on the Espy Farm that same September the Buckeye came in at 1,000 barrels a day from the Third Sand. A few miles south, producers on the Blood Farm aware of Funk's success drilled to the third sand and brought in three big flowing wells in early October. William Phillips drilling the Phillips No.2 for the Pittsburgh firm of Phillips and Frew on the Tarr Farm found the Third Sand at one in the morning. This well came in October 19,1861, at over 4,000 barrels a day. Production in 1861 increased by a factor of seven, up to 2.1 million barrels. The price of crude fell to 50 cents per barrel and less.

Oil was no longer just a curiosity. It clearly was a new natural resource the American refining industry could invest in. The A. B. Funk Well demonstrated to the world petroleum could be found in large quantities plentiful and cheap enough to not only challenge coal oil but to displace it as the primary source for refined mineral oil products. Drake's Well began the development of the Pennsylvania Oil Field, but the Funk Well allowed the new oil industry to stand up and seize its destiny.