

eliminate non-productive time (NPT) due to these issues. Solids control equipment and waste management improvements were developed. The use of chemically thinned, fresh water muds was declining in popularity. The use of both organic and inorganic brines as drill-in fluids was being established for regular drilling.

2001 to today – Wellbore stability techniques and wellbore strengthening products and systems became the industry norm. A move toward automation has resulted in the development of new testing protocols and equipment. The development of products and systems, both water-based and non-aqueous, are being developed to solve current and future extremes in pressure and temperature. The movement to establish solids-free drilling fluids is ongoing.

ARCHIBALD GEIKIE AND THE ESTABLISHMENT OF THE SCOTTISH SHALE OIL INDUSTRY

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The Scottish geologist Archibald Geikie (1835-1924) played a fundamental, but largely unrecognized, role in the establishment of the Scottish oil shale industry by providing James ‘Paraffin’ Young with the critical information about the location, thickness and likely areal extent of the organic-rich shales during their field visit together in 1858. Young then used the information to establish where to buy leases to extract the shales for commercial oil production ahead of his competitors. Geikie acquired this critical knowledge as a result of his work preparing the first map of *The Geology in the Neighbourhood of Edinburgh* published in 1859 and the accompanying Memoir, published in 1861. In 1866, Young’s Paraffin Light and Mineral Oil Company Limited opened the Addiewell works, the largest oil works in the world at the time. By the late 1860s, there were no fewer than 120 works distilling oil in Scotland, mostly from the shales of the Lothians, to the southeast of Edinburgh. Eventually, more than 22 million gallons of crude oil a year was produced in the Midland Valley of Scotland in an industry that employed nearly 40,000 people. Although the Scottish Shale Oil Industry eventually closed in the 1960s, there is now a renewed interest in extracting oil and gas from British shales. This is, perhaps, the most important legacy of Archibald Geikie’s involvement in the Scottish shale oil industry.

FROM NUCLEAR TECHNOLOGY TO THE PETROLEUM INDUSTRY: THE STORY OF TERRATEK

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KEYNOTE ADDRESS

The story of how the Salt Lake City company *TerraTek* emerged from nuclear effects research starting in the 1960’s is a story of successfully adapting technology from one application to another application.

PIONEERING WOMEN IN PETROLEUM GEOLOGY—CELEBRATING 100 YEARS!

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If not recorded, vast annals of history are lost. Pioneering women in petroleum geology entered the field very shortly after men became valued and accepted in the oil exploration... and women were first employed in 1917—the year the American Association of Petroleum Geologists was founded! This was a result of men having been conscripted for World War I. And, notably, this was before women’s suffrage.

Women became subsurface geologists at a time when the tools of the trade were rocks (no electric logs, no seismic, no paleontology) and surface surveying equipment. Interestingly, some of the greatest men in the profession were responsible for hiring, training, promoting, and keeping women in this career—names like Sidney Powers, Everette DeGolyer, George Matson, Alex McCoy, Wallace Pratt, and E. T. Dumble. Unfortunately, women were required to quit, usually, when they married and mostly only single women survived in the industry after WW I. Some as entrepreneurs, some as well site geologists, and a few, astoundingly, in corporate management. The rare company, Amerada Petroleum, welcomed married women to continue working.

Soon after World War I women were responsible for the biggest technological advancement in subsurface petroleum exploration...working out stratigraphy with micropaleontology...which, without well logs and seismic, became absolutely essential within all oil companies. This led almost immedi-