Helium Gas - Dexter

The postoffice opened October 27, 1870, at Dexter, Kansas, with Isaac B. Todd as postmaster. The office had to get its mail from Eureka as best it could, usually being brought by anyone who happened to be coming. In March of 1871 the mail route from Eureka to Howard City was extended to Arkansas City and Dexter was supplied by it. The office remains open. See story in Cowley County Heritage book.
The small community of Dexter has received international advertising for many years because of the chance discovery in 1903 of helium on the farm of William Greenwell.
The well was drilled by the Dexter Oil Gas and Development Company and was financed by Kansas City interests with John Bagnell in charge. The well, which went only 560 feet deep, was drilled with standard tools and a Manila line by C.A. Boggs (brother of C.M. Boggs of Kanotex Refining Company) and "Shorty" Nye. The tool dressers were listed as Charley Moore and "Kentucky Joe."
It was the morning of May 11, 1903, that the gas was struck in a 10-inch hole. The well came in with such strong force that the roar of the escaping gas could be heard for blocks. It was reported flowing at seven and a forth million cubic feet a day.
Dexter townspeople were excited over the event and talked of piping gas to their homes for heating and cooking purposes, perhaps even laying lines to neighboring Arkansas City and Winfield.
Two weeks after the discovery, it was decided to have a great celebration to climax with the lighting of the gas from the well at night. Throngs of spectators arrived for the event with the Missouri Pacific railroad running excursion trains to Dexter for the event.
As the public awaited the demonstration, a torch was applied to the flow of gas from the pipe, only to have the flame instantly blown out by the gas. Several attempts were made to ignite the gas, all without success. A bonfire was made of trash and the flow of gas directed at the fire. This also failed.
Gloom spread over the gathering, which quickly dispersed. Dexter was chagrined and disappointed. In derision the gas was called "wild gas" because it refused to burn.
Two years passed before someone thought to send a sample to the University of Kansas where Professors Cady and McFarland, after exhaustive tests, surprisingly discovered the sample not only was 80 per cent nitrogen but also contained 1.84 per cent non-inflammable helium.
Helium, a basic element, first was discovered in 1868 by a British scientist named Lockyear, in the gasses surrounding the sun. Hence the name helium, derived from a Greek word meaning "the sun." In 1895 another British scientist, Sir William Ramsey, discovered helium in certain uranium bearing minerals found on earth, including meteoric iron in Augusta County, Virginia.
Helium later was found to exist in minute quantities in the atmosphere and in gas from mineral springs in the Black Forest in Germany. But for the first time in all history it was discovered as a constituent of natural gas in the Dexter well.

Dexter's helium field has had an up and down existence. At first no use could be found for this new gas. Eventually it became known as an excellent ingredient for the inflation of aircraft balloons. There now are 150 uses for helium, other than in airships. By using helium as a shield around an electrode, magnesium alloys can be successfully welded. Helium can be blended with atmospheres for divers and caisson workers, for asthma suffers and others requiring the administration of oxygen. Because of the lightness of helium, it can be mixed with oxygen so that more life-giving oxygen may be breathed into lungs with the same effort. It is used in anesthetics and in other various processes of industry.
[ARTICLE ABOUT HELIUM GAS IN KANSAS.]
Arkansas City Traveler, Friday, August 4, 1922.
(From K. C. Journal-Post)
The spotlight of the world again is centered on Kansas.
A scientific discovery and the richest helium containing gas field in the world, a combination which promises to make dreams of American inter-city travel by dirigible and even privately owned airships a reality, rather than freak laws and queer political pranks, this time is drawing the attention of the entire nation and Europe to the Sunflower state.
For it was Hamilton P. Cady, professor in chemistry at the University of Kansas, that first identified helium gas as a part of the natural gas of the Midcontinent field, and as a war service he and David F. McFarland and other associates perfected a commercial method of extracting the helium at a cost that is not prohibitive even for the man of average means to use.
Natural gas bearing the largest helium content of any field in the world is now found at Dexter, in Cowley County, Kansas, a little more than 200 miles from Kansas City.
The value of helium gas lies in the virtue that it will not ignite save under an enormously high temperature, which makes it valuable for use in balloons and dirigibles, since its use eliminates all possibility of explosion and renders the use of a gasoline motor, mounted directly under the gas bag, safe and practical.
Helium gas is considered a very rare product and not until recently was it discovered that the Dexter product was sufficient to be a factor in our national business affairs.
The story of helium is one of the romances of science. Probably nothing in the scientific world, except radium, compares with it in human interest. Helium is one of the best examples of a discovery in pure science that has wide commercial application.
Erection of a $1,000,000 plant at Dexter, with a capacity of 50,000 feet daily, has been announced by Kansas City and New York interests.
The only other plant in the United States formerly was in Fort Worth, Texas, which is operated by the United States government. The helium from this plant is used exclusively in army and navy dirigibles, and the scarcity of the gas in this field makes the cost of production too high for commercial use.
The first well was drilled near Dexter in 1903. After the gas was discovered, a sample was sent to the University of Kansas for analysis. In the analysis made by Prof. Cady and Prof. McFarland, it was discovered that the helium content of the gas was 1.82 percent. After the test was made, Prof. Cady procured samples from all the gas fields of Kansas. The Dexter sample contained the larger percentage of helium than any of the other samples obtained in the state. Recent investigation showed that the Dexter field contains the largest amount of helium of any field in the world.

Helium gas was never in great demand until the United States entered the world war. In 1917 an experimental station was built by the government at Fort Worth. This plant grew to be a very large station, and at the time the armistice was signed had shipped 150,000,000 feet of helium gas in steel containers to England.
Geological investigations demonstrated the possibility of supplying helium from natural gas.
The first flight of an airship filled with helium gas took place on December 16, 1921, when the C-7 blimp of the United States navy sailed over the capitol at Washington. A ship of that size requires 180,000 cubic feet of helium. During the war the cost of enough gas to fill the ship would have been $350,000. The cost of filling the same size balloon under present conditions would not be more than $18,000 as helium is now extracted at a cost of about 10 cents a cubic foot.
Pure helium has about 93 percent the lifting power of hydrogen. Helium diffuses through a fabric at approximately 75 percent of the rate of hydrogen.
The process of separating helium from natural gas is one of refrigeration. The refrigeration of the gases reduces all of the other gases except helium to a liquid.
A disaster such as happened to the Roma at Hampton Roads, early in February, in which thirty-four lives were lost, could have been prevented

had the bag been filled with helium, according to a report made Wednesday by the investigating committee of the war department.
If the Germans had been able to use helium to inflate their Zeppelins, the story of the world war might have been different. From experience gained in the defense of London, it was learned that the dirigible was vulnerable against a well-organized attack. The Germans too recognized this point and invariably made attacks on England at night, operating from a high altitude in order to minimize the attacks from airplanes, as a single incendiary bullet fired into a dirigible inflated with hydrogen would quickly bring the ship down in flames. The inflammability of the hydrogen was the one weak point in this method of attack.
The constant fear of a swift and terrible death had its effect also on the operating crews, lessening their efficiency.
The non-inflammability of helium also makes it possible to place the engines in the framework of the dirigible, giving greater control of the craft and increased speed.
The formation of inter-city and interstate passenger and freight carrying dirigible services are expected to be made soon after the commercial plant at Dexter is in operation. The low price of helium as compared with the cost of hydrogen, which the passenger-carrying dirigibles of Europe use, is expected to make air passenger and freight traffic on a large scale much more successful in this country than in Europe. The minimizing of danger will be the largest factor in the promotion of an American air travel line.
A privately owned dirigible with a small motor and comparatively small gas bag is not out of the realm of possibility since the discovery of helium in quantities.
And all of this the world owes to Kansas and a Kansas man.
[PLANS COMPLETED FOR HELIUM PLANT AT DEXTER SOON.]
Arkansas City Traveler, Saturday, August 5, 1922. Front Page.

In connection with the story published yesterday by the Traveler on the proposed helium gas plant at Dexter, the Traveler has received the following information from Charles E. Rador, attorney, Kansas City, Missouri.
“For your information we wish to inform you that the organization of the Dexter Helium Company of America, at Dexter, Kansas, is completed and the declaration of trust filed for record in Jackson County, Missouri. Furthermore, we are pleased to inform you that we have completed an underwriting agreement for the securities of the corporation to provide funds to carry out its plans.
“A New York broker, who is interested in this underwriting agreement, is now in Kansas City; and a representative of oil interest in Tulsa has joined the underwriting so that mid-west investors will have the same opportunity as eastern investors to join in the enterprise.
“As a matter of further interest, Martin W. Baden, a geologist of Winfield, Kansas, is in Kansas City and has been engaged by the Dexter Helium Company of America as its geologist. Mr. Baden has just completed a temporary and very favorable report concerning the holdings of the company, which are known to contain the richest helium gas bearing sands in the world today according to Kansas and national geologists.”
[UPDATE.]
Arkansas City Traveler, Monday, April 17, 2000.

Kansas celebrates its role in discovery of helium.

Dexter field cited for importance in finding ‘odorless gas’ 95 years ago.

LAWRENCE (AP)—The odorless, colorless, lighter-than-air gas that has come to be known as helium is rooted in Kansas history, and that role was celebrated during the weekend at the University of Kansas.
On Saturday, the American Chemical Society marked the 1905 discovery in Kansas that helium is not extremely rare on Earth, but found in abundance in natural gas.
The Kansas building where the discovery was made—Bailey Hall—was named a National Historic Chemical Landmark. A plaque was presented to the university by the American Chemical Society, the world’s largest scientific society.
Bailey Hall, used by the chemistry department until the 1950s, is the 32nd landmark identified by the chemical society since 1992.
Since astronomers discovered helium in 1868, the gas has been used in everything from balloons to magnetic resonance imaging to the space shuttle’s rocket boosters. The gas lifts blimps, protects deep-sea divers, and makes those who breathe it sound funny.
The story of helium’s discovery in natural gas begins in May 1903 in Dexter, Kansas, about 45 miles southeast of Wichita.
The town put on a daylong celebration of a local company’s discovery of a natural gas well, including the release of a stream of natural gas. The gas was supposed to explode and light up the sky when it came into contact with a hay bale set on fire above it.
Instead, the natural gas extinguished the burning hay. Several more trials also fizzled.
Erasmus Haworth, a Kansas geology professor who was puzzled by the incident, sent a cylinder of the Dexter gas to the University of Kansas. The university had just built a chemistry building and had acquired a liquid air machine, the only one of its kind west of the Mississippi.

On Dec. 7, 1905, Professor Hamilton Cady and Associate Professor David McFarland analyzed the sample and discovered that it was nearly 2 percent helium.
“At the time, they just shrugged it off because they didn’t know of any use for helium,” said Grover Everett, a retired Kansas chemistry professor who researched the story. “It was a number of years before its importance was realized.”
In the decade that followed, helium remained a curiosity and the entire U.S. supply rested in three glass tubes on a shelf at KU, the American Chemical Society said.
That changed in 1917, when the British suggested that the United States produce enough helium to raise lighter-than-air craft for the Allied war effort.
Large-scale production to inflate blimps came too late for World War I. But the helium-filled blimps and anti-aircraft balloons were used extensively in World War II.
The town of Dexter, population 400, is planning a centennial celebration for the town’s role in the discovery. The town’s historical marker on U.S. 166 declares helium as “The Gas that Wouldn’t Burn.”