

THE PETROLEUM INDUSTRY IN INDIANA IN 1905.

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For the first time since 1898, and for the second time in its history, the production of petroleum in Indiana fell in 1905 below what it was in the previous year. This decrease in production was due largely to the decrease in price, which, while not below the profit-making limit of 80 cents per barrel, was so much below that of the two years previous that new developments were retarded. Much less wild-catting was, therefore, done during the year, and the area added to the known productive territory of the State was very limited.

It is the custom of this Department to prepare an extended report on the oil industry of the State, with accompanying map, every third year. Such oil reports were issued as portions of the annual reports for the years 1897, 1900 and 1903. Another will be due in the report for 1906. For that reason but brief mention of the more important developments in 1905 will be given in connection with the statistics for the year.

THE TRENTON ROCK OIL FIELDS OF INDIANA FOR THE YEAR 1905

Grant County.—In this county, which in 1902 and 1903 was the principal seat of operations in the Indiana field, but little extension of territory was added during the year. Van Buren Township still continues to be the center of operations. The southwest quarter of section 29 and the north half of the southeast quarter of section 31, both marked undrilled or gassy on the 1903 map, have developed good wells. A deep pay well was sunk on the Wisheart lease in the northeast quarter of section 2 by the Midway Oil Company. This bore penetrated Trenton limestone 347 feet, but found no oil except in the first pay. There are 15 producing wells on this farm, the record of No. 15, completed in July, 1905, being as follows:

	<i>Feet.</i>
Drive pipe	115
Casing	410
Top of Trenton	980
Total depth	1,064

The well was shot with 220 quarts and produced 90 barrels the first 24 hours.

It is stated that the Hudson Oil Company owns 175 wells about Van Buren, which were drilled at the same time as 175 owned by the same company in the Spencerville and Menden fields of Ohio. The Van Buren wells produce large quantities of salt water, and in October, 1905, were yielding 1,100 inches (2,750 barrels) of oil per week, while the Ohio wells, devoid of salt water, were producing but 300 inches (750 barrels) in the same time. This tends to prove that a limited amount of salt water is a good thing in the oil business.

A well on the John Pilkington lease, southeast quarter of section 15, a mile and a half southeast of Van Buren, is ten years old and has produced 60,000 barrels of oil. It still yields 10 barrels per day, though it was bored only 13 feet into the sand and was never shot.

A bore on the Creviston lease, northwest quarter of section 7, showed as follows:

	<i>Feet.</i>
Drive pipe	132
Casing	410
Top of Trenton	1,015
Total depth	1,052
Initial production (barrels)	45

The wells in Washington Township, north and northeast of Marion, are holding up well, though as yet there has been no production west of the Huntington Pike. Two fair producers drilled in 1905 had the following records:

	White No. 6, S. E. $\frac{1}{4}$ sec. 2.	Bragg No. 8, N. W. $\frac{1}{4}$ sec. 12.
	<i>Feet.</i>	<i>Feet.</i>
Drive pipe	320	263
Casing	500	460
Top of Trenton	1,011	1,000
Total depth	1,072	1,062
Initial production (barrels)	75	60

In section 17 a bore on the Bradford lease was drilled for gas, but showed a quantity of oil. It was cleaned out and shot, when

it came in as a gas well with 185 pounds rock pressure and a yield of 1,000,000 cubic feet daily.

On the Evan Pugh lease, close to the Wabash County line, in section 5, Pleasant Township, there are three wells, sunk for gas in 1902, which began yielding oil in 1905, and in October were producing seven barrels each per day.

In Center Township many of the wells in and around the Soldiers' Home fell off in production about 50 per cent. during the summer and fall of 1905. A bore in search of deep pay was put down on the S. Wolf lease, west half of the southeast quarter of section 1. It was sunk 360 feet into Trenton, but developed oil only in the top pay. Another deep pay bore was sunk on the Jesse D. Wright farm, northeast quarter of section 14, this township, in July, the record of which shows:

	<i>Feet.</i>
Drive pipe	200
Casing	390
Top of Trenton	915
First gas	930
First oil	945
First salt water	955
Second oil and gas (showing only)	1,220
Total depth	1,257

The bore was shot with 360 quarts and had an initial production of 23 barrels, all of which was supposed to be from the upper pay. No deep pay wells have been developed in Grant County, though a number of attempts have been made in the last two years.

But little if any new territory has been opened up in Monroe Township since the last map was published. The southern half is still considered gas territory, but will doubtless yield a number of light to fair oil wells in the future.

In Jefferson Township a number of light wells were opened up in old gas territory in the southeast quarter of section 19. Six bores were sunk on the Jones and adjoining leases, which started at about 15 barrels and were yielding about 8 barrels each when 60 days old. An average record showed:

	<i>Feet.</i>
Drive pipe	187
Casing	375
Top of Trenton	933
Total depth	1,035

Quite a quantity of salt water was developed and the wells will, therefore, probably hold up for some time.

The Ohio Oil Company (Standard) was operating but 6 strings of tools in Grant County in the fall of 1905, as against 36 in 1904; the reason given being "the low price of oil," though the magnates at the head of the Standard have the fixing of the price.

Huntington County.—Inside of known productive limits in this county a bore is as sure a venture as one can make anywhere in the United States in the oil business. There was, however, little doing here as elsewhere, in the extension of new territory in 1905.

In Salamonie Township, section 36, near Mt. Zion, was formerly known as salt water territory. The water has now gone down and 25 or more new wells, all good ones, have been drilled. The top of Trenton is here found at just about 1,000 feet, and the borers are sunk 100 feet into that formation. The average well, 18 months old, makes $3\frac{1}{2}$ barrels daily. It is stated that 500 producing wells in this region made an average of 10 tanks, or 2,500 barrels, less per month than in 1904.

In Jefferson Township, sections 7, 8, 17 and 18 are now all productive. This territory was formerly mostly owned by the Huntington Light and Fuel Company, and utilized for gas. It was sold to the Wagner Oil Company and opened up for oil in the spring of 1905. This company drilled 6 test wells and, on October 4th, sold them and 1,300 acres of leases to the Beatty-Nichol Oil Company for \$15,000 cash.

The Wagner Oil Company still controls 4,000 acres in southwestern Jefferson and southeastern Wayne townships. On this territory there is plenty of gas for operating. But little water is encountered, 2-inch tubing being used in all the wells. Two pay streaks are found, one at about 25 feet, the other at 52 feet in the Trenton. Each pay runs 5 to 20 feet in thickness.

On the John Bond farm of 100 acres, in the west half of section 36, Wayne Township, there are 10 wells, drilled in 1904 and 1905, all of which started at about 100 barrels. One of these was drilled 349 feet into Trenton in search of a deep pay, but without results. The 10 produced 243 barrels the week of August 19th, and 184 the week of October 14th.

Well No. 5, on the Hamilton lease, southwest quarter of section 25, Wayne Township, finished August 14, may except in production be taken as an average for this territory, its record being as follows:

	<i>Feet.</i>
Drive pipe	221
Casing	512
Top of Trenton	1,001
Total depth	1,064
Initial production (barrels)	100

The Wagner Company had on November 1, 1905, 120 producing wells on its leases, and claimed never to have drilled a dry hole, the lightest starting at about 10 barrels. The production of the company in March, 1905, was 7,646 barrels; in June, 7,076 barrels, and in August, 7,235. To this the royalty of $\frac{1}{8}$ should be added.

Well No. 6, on the D. K. Pinkerton lease, northeast quarter of section 13, Jefferson Township, had the following record:

	<i>Feet.</i>
Drive pipe	170
Casing	520
Top of Trenton	971
Total depth	1,023 $\frac{1}{2}$
Initial production (barrels)	143

Many of the old gas wells of the Huntington Light and Fuel Company in Huntington and Grant counties were drilled in only 30 feet. When redrilled to 90 feet and shot they are as productive as a new well. No productive wells of any size have been drilled in Huntington County west of the Marion and Huntington pike.

Wabash County.—In the southwest quarter of section 34, Liberty Township, this county, a well was drilled for gas on the 99 acre tract of J. H. Scott, in the fall of 1903. It showed a little oil and in July, 1905, was drilled 40 feet deeper and shot, when it started at 25 barrels and was making $7\frac{1}{2}$ barrels after 30 days' pumping. The original record was as follows:

	<i>Feet.</i>
Drive pipe	202
Casing	470
Top of Trenton	945
Total depth	965

This well is close to the county line, just south of Lafontaine. Several years before another well, $1\frac{1}{2}$ miles west, started at 45

barrels, but afterwards went off to salt water and was pulled. The Scott well was the only one drilled in Wabash County during the year. Four of those near Rich Valley, in Noble Township, were abandoned.

Blackford County.—But 65 new bores were sunk in this county during the year and no one of them opened up any new territory. Of the 65, 10, or 15.4 per cent., were dry, while the initial production of the others averaged less than 8 barrels each.

Wells County.—The only new territory opened up in this county was near Poneto, in section 6, Nottingham Township, and section 31, Harrison Township, where several light wells were drilled. Many new wells were sunk between the old locations in Nottingham, Chester and Jackson townships, but, for the most part, they had an initial production of 10 to 60 barrels, as against 50 to 200 for the older ones. Probably the best well drilled in the county during the year was No. 44, on the Terhune lease, in section 5, Chester Township, which started at 140 barrels. A bore on the Bryant farm, northwest quarter of section 19, Nottingham Township, was sunk 370 feet into Trenton in search of a deep pay, but without results.

Adams County.—But little new territory was added to the known productive area of this county. Only 94 bores were sunk as against 262 in 1904. Of the 94, 11, or 11.7 per cent., were dry. The productive wells averaged a little less than 10 barrels initial production, as against 13.1 barrels the year before. The northern part of Adams County may, in time, develop some oil, as a new well east of Decatur, near Wren, Van Wert County, Ohio, was drilled in October, which started at 120 barrels. This was several miles north of any previous development in that region.

Jay County.—It was in this county that the greatest extent of new territory was added to the productive limits during the year and its area was nothing to brag of. This territory was mainly east of Bryant in Bear Creek Township. One of the best producers of the year was completed October 16, on the R. Dehaff lease, southeast corner of section 17. It is said to have flowed and pumped 300 barrels the first day and would have done better if sufficient tankage had been available. On October 28th it yielded 185 barrels in 21 hours. The record was as follows:

	<i>Feet.</i>
Drive pipe	88
Casing	240
Top of Trenton	989
Total depth	1,026

This was number 4 on the lease, the other 3 having started at 70 barrels each or better.

In Bear Creek Township the depth to top of Trenton ranges from 1,014 to 1,035 feet, due mainly to the variation in surface level, there being an actual difference of 12 to 15 feet in the exact level of the Trenton in different parts of the township. The majority of the wells drilled in had an initial production of 20 to 70 barrels, though a few ran from 100 to 150 barrels. The following table gives the location of the new territory in Bear Creek Township and its relative rank:

S.W. $\frac{1}{4}$ sect. 4.....	light
E. $\frac{1}{2}$ sect. 9.....	fair
S.W. $\frac{1}{4}$ sect. 10.....	good
S.W. $\frac{1}{4}$ sect. 12.....	fair
W. $\frac{1}{2}$ sect. 13.....	fair
E. $\frac{1}{2}$ sect. 14.....	fair
N.E. $\frac{1}{4}$ sect. 16.....	light
N.W. $\frac{1}{4}$ sect. 16.....	fair
S.E. $\frac{1}{4}$ sect. 17.....	good
N.W. of S.W. $\frac{1}{4}$ sect. 19.....	light
N.E. $\frac{1}{4}$ sect. 20.....	good
S.W. $\frac{1}{4}$ sect. 21.....	fair
S.E. $\frac{1}{4}$ sect. 23.....	light
S. $\frac{1}{2}$ of N.W. $\frac{1}{4}$ sect. 24.....	fair
N. $\frac{1}{2}$ S.W. $\frac{1}{4}$ sect. 24.....	fair
N.E. $\frac{1}{4}$ sect. 26.....	light
S. $\frac{1}{2}$ sect. 28.....	fair
N.E. $\frac{1}{4}$ and S.W. $\frac{1}{4}$ sect. 32.....	light
N. $\frac{1}{2}$ sect. 33.....	fair

In addition to the above, there are 2 large gas wells in the southwest quarter of section 14, 1 in the southeast of the northwest of 22, 1 in the northwest of the northeast of 27, 1 in the northeast of the northwest of 27, and 1 in the northeast of the northwest of 29. Some of these are packed and closed, while gas from 1 or 2 is being used west of Portland in burning lime.

In the south half of Bear Creek Township, the Trenton below 35 feet from the top changes to a brownish, nonproductive limestone. Many of the wells which make only a light showing when first completed, after shooting come in as fair to good producers.

In old abandoned territory northwest of Bryant a number of fair to good wells have been lately completed. One of these which started at 100 barrels is on the Callahan lease, southwest quarter of section 7.

In Wabash Township the west half of section 17 produced 3 or 4 fair wells during the year, while several in the south half of 32 started at 10 to 30 barrels each. Dry holes in the southeast quarter of 9, the northwest quarter of 21, the northeast quarter of 22, the northeast quarter of 27, and the northeast quarter of 28 condemned much undeveloped territory in this township.

In Noble Township 2 light producers are located on the northeast quarter of section 4. Several other bores, in the southeast of section 8 and the southwest of 17, developed quite a volume of gas, the rock pressure running 300 pounds or over. This is utilized by the Citizens' Gas Company of Portland.

In Pike Township there was no extension of territory, though 2 or 3 light producers were drilled in on sections 8 and 9, bringing the production up to about 300 barrels per month.

In Greene Township a bore on the northeast of the southwest of section 19 started at 60 barrels and filled a 250 barrel tank, but the company had no money to sink other bores. The oil was found in second pay sand at a depth of 80 feet in Trenton.

In Penn Township some old wells which had been drilled into Trenton only 30 feet with good results, but which had fallen off in production, were re-drilled to a second pay at 65 feet and started off at 60 to 75 barrels each, and promise to hold up well. Several of these were located on the northeast quarter of section 25 and the east half of section 35.

The deep pay wells, sunk in 1904 about Redkey, have mostly been overcome with salt water. A half dozen or so bores have been sunk in search of deep pay in other parts of Jay County, but all of them were failures. One of these, in the northeast quarter of section 6, Wayne Township, was shot and got a small production from the upper pay. One in the northwest quarter of section 20, Wabash Township, was sunk 500 feet into Trenton. Another, in the northeast quarter of section 20, Penn Township, was sunk 450 feet in. A third, in the northwest quarter of section 10, Jefferson Township, was also sunk 450 feet in and a good gas supply obtained in the upper pay. A fourth was located in the

northwest quarter of section 24, Greene Township, and a fifth in the northeast quarter of section 32, Jackson, both of which penetrated the Trenton 500 feet.

Randolph County.—But little new territory was opened up in this county during the year. Several small producers were finished in Jackson Township, near the Ohio-Indiana State line. Two of these, on the Clough lease, northeast quarter of section 9 and northwest quarter of 10, were sunk 285 feet into Trenton, and started at about 20 barrels each. Three or 4 others were drilled on the southwest quarter of section 3 and the southeast of section 4, about 15 miles southeast of Portland. One of these started at 50 barrels. About 1,200 barrels of tankage was filled and a pipe line put in. Other bores just to the west developed gas only, 1 or 2 showing a rock pressure of 300+ pounds and a volume of 1,250,000 feet.

A small producer was drilled on the Huber lease, 1 mile northeast of Deerfield, and another on the Warner farm, in section 25, north of Saratoga, both in Ward Township.

The most extensive operations in Randolph County were in Stony Creek Township, close to the Delaware line. On a tract of 1,200 acres, leased by the Parker-Marion Oil and Gas Company, part in Perry Township, Delaware County, but mostly in Stony Creek Township, 8 test bores were sunk, all of which were practically dry holes. The company bought the leases, paid rentals for 2 years, spent in all more than \$20,000, and got nothing. The record of one of the dry holes on the Thornburg lease, in the southeast corner of section 32, Stony Creek Township, may be taken as the average. It showed:

	<i>Feet.</i>
Drive pipe	64
Casing	320
Top of Trenton.....	956
Total depth	1,307

Five of the other dry holes were located as follows: One just south of Windsor; 1 in the northwest quarter of section 32, Stony Creek; 1 in the southwest quarter of section 4, in the extreme southeastern corner of the tract; and 1 in the northeast quarter of section 1, Perry Township. One bore on the Swingley lease, in the northwest of 33, Stony Creek Township, started at about 5 barrels per day, the oil being found in the upper pay.

The territory tested was about 2 miles long from east to west and $1\frac{1}{4}$ miles wide. The bores were sunk 300 to 470 feet into Trenton, and the results show that the territory southeast of Windsor is practically worthless.

Several good bores were drilled in section 21, Stony Creek Township, during the year, 1 on the Deeds lease, in the northwest quarter, starting at 200 barrels. A number of other good ones were drilled within the limits of known productive territory in Monroe Township, north and east of Parker.

Delaware County.—As far as new development was concerned, the bottom may be said to have dropped out of the oil business in and around Muncie in 1905. The great boom of 1904 when, as it was said, every citizen who had 50 cents invested it in oil stock, collapsed in the spring of 1905. In the 1904 directory of the city of Muncie there were listed 49 different oil and gas companies and promoters of oil properties. In October, 1905, but 13 of these were in existence. Three causes may be given for the slump, viz.: (a) The low price of oil; (b) too many small companies with not enough capital behind them to operate successfully; (c) water coming in and the production falling off. The great majority of the Muncie citizens who invested in the oil business lost their money. The men who made money in the Delaware County field were from the East and understood their business. They got hold of large leases, partly developed them and then sold for a good price.

Many of the deep pay wells drilled in the Delaware County field in 1904 were sunk too deep. They were drilled through a second pay in search of a third and got salt water instead of oil. These were too expensive to operate and many of them were drowned out.

On the T. B. McCullough lease, about 4 miles north of Muncie, in the south half of section 24, Hamilton Township, a deep pay well was finished October 22, which started at 180 barrels and was producing 150 or more on October 30th. Several fair to good wells have since been sunk in the same region which heretofore was undeveloped.

On the W. A. Bell farm, southwest quarter section 7 (21 N., 10 E.), a bore 1,376 feet deep was drilled through the Trenton, which was found to be 476 feet in thickness. Just below the

Trenton was a blue shale 20 feet in thickness, and below this a sandstone with an abundance of salt water. In a bore near Losantville the Trenton was found to be 525 feet in thickness.

In Delaware Township a number of fair to good productive wells were completed during the year. An average record in the western part of the township is that of No. 5, on the Chas. Marsh lease, southwest quarter of section 17, finished July 28th:

	<i>Feet.</i>
Drive pipe	40
Casing	348
Top of Trenton	936
Total depth	1,235
Initial production (barrels)	40

The 5 wells on the lease, 3 of which were drilled in 1905, were producing 70 barrels daily in October.

On the William Reed farm, in the southwest corner of section 30, Delaware Township, 3 bores were completed, the record of No. 3 being:

	<i>Feet.</i>
Drive pipe	42
Casing	335
Top of Trenton	925
First pay	1,148
Total depth	1,200
Initial production (barrels)	50

The 3 wells were making 35 barrels in October. A number of scattering wells are located between De Soto and Albany, on the west side of the L. E. & W. Railway, but no rich territory has, as yet, been developed.

On the county farm lease of 240 acres, 27 bores have been sunk, 6 being drilled east of the buildings in 1905. Of these 25 were pumping on October 26th, the combined output being about 200 barrels per day.

The gas supply in the Selma-Parker region is exhausted, and the Republic Iron and Steel Company were furnishing operators with gas from northern Delaware County at 50 cents per 1,000 cubic feet. About 6,000 cubic feet per day are used in each ordinary gas engine.

Two large leases which were very active in 1904 were the Black lease and the Dunkin lease, in the west half of section 14, Liberty Township. These had been, for the most part, drowned out by

October, 1905. The L. Winget lease of 40 acres, near the center of section 14, Liberty Township, which was one of the first opened up in this territory in 1903, was producing 5 tanks a month from 10 wells. A 1-6 royalty yielded the owner \$118 in September. The largest royalty he ever received was \$1,112 in 20 days. This was just after the third well had been finished. Of the 10 wells, 4 were sunk to deep pay, though 1 was afterward filled and shot in shallow pay. On the Sarah Winget lease of 60 acres, just to the east, 6 wells were producing 67 barrels per day in October.

The property of the Republic Iron & Steel Company, consisting of several thousand acres of leases and 350 producing wells, was estimated at \$1,100,000 in June, 1904, and \$500,000 in June, 1905. On October 27, 1904, the Lewis lease, just north of Smithfield, operated by the Republic Company, was yielding 600 barrels a day from 21 wells. On October 26, 1906, 23 wells on the same lease were producing 120 barrels a day. Of the 25 wells drilled on this lease, 23 were productive.

Another operator was, in 1904, offered \$65,000 for his holding of 146 acres and 7 wells in the Selma field. In September, 1905, he tried to sell for \$15,000 and could not get it.

The Senior and Scotland Oil Company sold, on December 12, 1904, to the Ohio Oil Company (Standard) 120 acres of leases and 21 producing wells located in section 13, Liberty Township, for \$110,000. The wells were drilled between March and December, 1904, and yielded as follows in that year:

	<i>Barrels.</i>
March	249
April	148
May	1,082
June	6,191
July	7,117
August	8,029
September	10,798
October	12,528
November	10,080
December 1 to 12.....	4,010
Total	60,232

The production as given does not include the royalty of 1-6. The Ohio Company also purchased the property just north, con-

sisting of 310 acres and 21 wells, for \$40,000. One of the managers of the Ohio Oil Company is said to have stated that they would lose \$50,000 on the 2 properties. These facts are given to show the magnitude of the slump in the oil business in Delaware County in 1905. Such is the nature of the business, however, that as correspondingly large gains may be made in 1906.

The new developments of the year in the Selma field were mainly about Windsor, southeast of Smithfield. On the Howell lease of 80 acres southwest of southeast of section 28 and southeast of southwest of the same section, Liberty Township, 3 good wells and 1 old gas well were located in March, 1905. The lease was making a tank a day and sold at that date for \$27,500. The new owners put down 4 bores on the west side of the lease, all of which were very light producers. In this case the slump in value was due to absence of the article sought.

One of the best leases in eastern Liberty Township is that of J. M. Patterson, in the south half of the northwest quarter of section 13. An average of the wells shows :

	<i>Feet.</i>
Drive pipe	95
Casing	360
Top of Trenton.....	983
First pay	1,258
Total depth	1,273
Initial output (barrels)	300

The J. W. Odle lease, in the northeast quarter of section 25, Liberty Township, is a large producer, but there is little yield east of this section.

Snowdon Bros. & Evans sold, in September, 1905, to the Norton Oil Company, of Massachusetts, leases between Smithfield and Windsor aggregating 397 acres, with 37 producing wells. The settled production of the property was 300 barrels a day, and the price received was \$250,000. The wells were located around the borders of the leases, the central portion of which has not yet been tested. There is room for 40 additional locations without crowding. In the wells drilled the top of Trenton ran from 945 to 969 feet, with the pay uniformly about 280 feet lower. A machine for making gas for fuel purposes from crude oil will soon be installed on this lease. Such a machine costs about \$500 and

has a capacity of 100,000 cubic feet per day, the cost running about 10 to 12 cents per 1,000.

In this part of Delaware County the big wells fall down rapidly while some of the fair ones hold up remarkably well. One of the latter, belonging to the Snowdon-Evans Company, made 40 barrels per day at the beginning of the year and 32 at the close.

On the Mary C. Cline lease, east of Smithfield, 4 bores were sunk in 1905, of which the best was No. 1, with the following record:

	<i>Fect.</i>
Drive pipe	76
Casing	325
Top of Trenton	940
Total depth	1,227
Initial output (barrels)	100

No. 4, located 1,200 feet due south of No. 1, was a dry hole with a record as follows:

	<i>Fect.</i>
Drive pipe	92
Casing	335
Top of Trenton	920
Total depth	1,198

In October, 1905, there was not a well operated in the town of Smithfield, though during the boom in June, 1904, there were 40 producing wells in the hamlet. Such is the short life of a town lot proposition in the oil business.

In the Muncie field, in October, 8-inch 28-pound drive pipe was worth 92 cents per foot; 6¼-inch casing, 35 cents per foot. The price paid for drilling was 50 cents per foot down to 50 feet in Trenton and below that point 75 cents per foot. In 1904 the price was \$1.00 per foot below 50 feet in Trenton. Each well rigged up to pump in the deep pay area costs about \$1,600. This does not include cost of power house, power and tanks. Drillers were receiving \$4.00 per day; helpers or tool dressers \$3.00, and pumpers \$60 per month.

A pumping station was erected by the Indiana Pipe Line Company half a mile northwest of Smithfield in the fall of 1904. To it gravity lines run from most of the surrounding leases, and from it the oil is pumped to Montpelier. A similar station is located near Selma. The following table shows the

Number of Barrels of Oil Piped or Shipped from the Muncie-Selma-Parker Oil Field in 1904 and 1905, by Months.

	1904.	1905.
January	42,835	358,483
February	33,081	282,773
March	40,869	321,650
April	46,504	305,129
May	73,162	320,287
June	115,048	311,030
July	176,624	277,177
August	240,050	255,854
September	311,098	230,970
October	384,380	218,052
November	356,173	210,724
December	382,302	200,163
Totals	2,202,126	3,292,292

While the output for 1905 was 1,090,166 barrels, or almost 50 per cent. greater than in 1904, it will be noted that there were but 3 months in 1905 that the yield was as great as it was in any one of the last 4 months of 1904. It will also be seen that the output gradually decreased each month from May to December, 1905.

Madison County.—No extension of territory of any importance was made in this county during the year. The number of bores sunk was 55, of which 25, or 45.4 per cent., were dry. The 30 productive wells had an average initial output of 15.7 barrels each.

The production of the Alexandria field fell off 63.4 per cent., as is shown by the following table, which gives the

Number of Barrels of Oil Piped from the Alexandria (Ind.) Oil Field in 1904 and 1905, by Months.

	1904.	1905.
January	19,705	4,244
February	19,537	4,455
March	20,745	6,264
April	21,639	7,854
May	23,646	8,892
June	29,207	10,359
July	28,666	9,085
August	28,012	8,155
September	6,834	6,963
October	6,071	5,119
November	7,128	3,806
December	5,446	4,014
Total	216,636	79,210

Miami County.—In this county but 5 bores were drilled during the year, 1 of which was a dry hole. The 4 productive ones had an average initial output of 9 barrels each. The production of the pools at Peru and Rich Valley fell off slightly, as is shown by the following table:

Number of Barrels of Oil Piped from Peru and Rich Valley Oil Fields in 1904 and 1905, by Months.

	1904.	1905.
January	4,554	3,332
February	2,907	2,498
March	3,903	4,648
April	4,550	4,146
May	4,061	5,045
June	5,453	5,400
July	4,988	4,758
August	5,675	4,710
September	5,374	4,023
October	4,478	4,553
November	5,241	3,550
December	3,356	4,089
Total	54,540	50,752

Marion County.—No new wells were drilled in the Broad Ripple field during the year, and the production consequently fell off 23.1 per cent., as shown by the following table:

Number of Barrels of Oil Piped from the Broad Ripple Oil Field in 1904 and 1905, by Months.

	1904.	1905.
January	153	588
February	655	294
March	154	147
April	595	592
May	627	...
June	548
July	647	458
August	575	...
September	579
October	610	...
November	542	299
December
Total	4,558	3,505

Hamilton County.—Three wells whose initial output ran from 15 to 25 barrels, were drilled in the Fisher's Station pool in Fall Creek Township, in the southeastern corner of this county. Several small producers had been yielding in this field since 1901. The output by months for 1905 is shown in the following table:

*Number of Barrels of Oil Produced in the Fishers Station Oil Field in 1905,
by Months.*

January	289
February
March	543
April	1,051
May	837
June	1,363
July	639
August	1,106
September	1,190
October	692
November	618
December	196
Total	8,525

STATISTICS OF THE INDIANA TRENTON ROCK PETROLEUM
INDUSTRY FOR 1905.

As already mentioned, the production of Indiana Trenton Rock petroleum fell off in the year 1905. While the loss was slight, being but 3.4 per cent., it was sufficient to mark a backward step.

The tendency in prices during the first half of the year was downward, and during the latter half slightly upward. The fluctuations were, however, at no time very great, there being but 15 cents difference between the minimum and maximum prices paid. Starting the year at the maximum price of 96 cents, it dropped, on January 5th, to 93 cents, and again on the 11th to 90 cents, which figure it held until February 1st, when it dropped to 88 cents. This price was paid until March 25th, when it began slowly to decline, and on May 27th reached the minimum of 81 cents. This was maintained until September 12th, when it began again to rise, reaching 91 cents on October 28th. On November 11th it

dropped to 89 cents, which price was paid till the close of the year. The average price for the year, taking both time and amount received into consideration, was 84 4-5 cents, as against \$1.07½ in 1904, and \$1.14 3-20 in 1903.

The total production of Trenton Rock oil in Indiana in 1905 was 10,892,438 barrels, which, at the average price of 84 4-5 cents, had a value of \$9,236,788. Compared with 1904, this shows a loss of 388,592 barrels, or 3.4 per cent., as against a gain in 1904 over 1903 of 21.3 per cent. However, on account of the much lower average price, the amount received by the producers was \$2,890,319, or 23.8 per cent. less than in 1904.

The first of the following tables gives a complete record of the monthly production of petroleum from the Trenton limestone fields of Indiana for the 15 years beginning January 1, 1891, and ending December 31, 1905. This does not include the amount used in the field for fuel and other purposes, or that wasted by the burning of tanks or the leaking of pipes, but only that shipped or piped by the companies who purchase the oil from the operators. The second table shows the annual production, the average yearly price and the total value by years for the same period:

I. TOTAL PRODUCTION OF TRENTON LIMESTONE PETROLEUM IN INDIANA FROM 1891 TO 1906, BY MONTHS.

(Barrels.)

MONTH.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
January.....	6,171	15,841	111,824	259,000	300,568	365,582	290,746	317,014	297,291	353,451	425,140	554,038	651,355	714,594	1,038,324
February.....	5,981	18,946	96,025	232,107	230,559	241,743	309,922	272,780	220,440	302,493	384,735	460,073	568,789	664,058	1,041,100
March.....	5,159	24,794	134,549	282,376	310,303	386,586	341,961	325,301	290,257	364,590	432,922	573,412	724,969	797,133	1,037,320
April.....	4,973	26,184	146,493	287,330	352,077	395,032	328,779	310,034	325,774	381,804	447,261	579,711	680,921	804,121	964,242
May.....	5,757	31,033	186,939	321,502	397,001	417,963	340,023	311,208	344,831	426,363	482,118	635,752	751,348	851,071	1,011,859
June.....	8,136	40,888	209,616	333,479	403,569	434,167	369,803	320,477	334,282	446,492	481,807	633,452	809,438	940,391	1,011,965
July.....	10,809	49,203	241,666	327,349	434,376	422,968	375,249	314,861	329,086	437,087	506,065	696,911	831,005	998,229	937,960
August.....	11,603	56,109	248,353	345,031	420,132	407,238	371,921	332,777	347,621	466,127	523,106	697,040	838,615	1,084,560	916,803
September.....	16,500	66,034	245,615	319,588	409,169	415,675	362,528	326,264	332,283	418,716	519,087	672,611	857,117	1,104,771	840,804
October.....	19,029	95,399	252,568	339,424	393,153	394,283	408,179	319,490	326,781	467,521	532,960	725,973	873,160	1,139,000	791,881
November.....	20,801	129,270	245,607	304,030	373,789	337,311	430,958	300,644	326,802	406,684	510,788	656,457	778,323	1,098,832	765,078
December.....	21,715	144,067	236,038	337,450	361,436	362,164	423,069	300,457	332,266	441,347	479,485	650,131	796,291	1,084,270	772,102
Totals.....	136,634	698,068	2,335,293	3,688,666	4,386,132	4,680,732	4,353,138	3,751,307	3,807,714	4,912,675	5,725,474	7,535,561	9,161,331	11,281,030	10,892,438

II. PRODUCTION OF TRENTON ROCK PETROLEUM IN INDIANA FROM 1891 TO 1906, WITH VALUE.

	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Total production (barrels of 42 gal.)	136,634	698,068	2,335,292	3,688,666	4,386,132	4,680,732	4,353,138	3,751,307	3,807,714	4,912,675	5,725,474	7,535,561	9,161,331	11,281,030	10,892,438
Total value at wells of all oils produced, excluding pipe-age	\$54,787	\$260,620	\$1,050,882	\$1,774,260	\$2,807,124	\$2,954,411	\$1,871,849	\$2,228,276	\$3,331,750	\$4,740,731	\$4,775,045	\$6,450,440	\$10,457,659	\$12,127,107	\$9,236,788
Value per bbl.....	\$0 40	\$0 37	\$0 45	\$0 48	\$0 64	\$0 63	\$0 43	\$0 59½	\$0 87½	\$0 96½	\$0 83½	\$0 85½	\$1 14½	\$1 07½	\$0 84½

From the first of the above tables it will be seen that the largest production of Trenton rock petroleum in Indiana in any one month was in October, 1904, when 1,139,000 barrels were brought to the surface. The total production of Indiana Trenton rock oil for the 15 years reached the enormous sum of 77,346,223 barrels, which sold for \$64,121,729, or an average of \$4,274,782 per year.

In the third table there is shown the number of wells completed in Indiana by months from June, 1891, to January, 1906:

III. NUMBER OF WELLS COMPLETED IN THE INDIANA TRENTON LIMESTONE OIL FIELDS FROM 1891 TO 1906 BY MONTHS.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1891.....							6	6	15	15	15	8	65
1892.....	11	13	18	13	17	19	17	30	25	52	33	47	295
1893.....	20	30	31	36	45	47	47	55	27	72	56	76	542
1894.....	90	103	103	80	110	107	84	123	100	107	97	85	1,189
1895.....	61	45	81	111	122	153	132	140	129	106	102	85	1,267
1896.....	76	90	86	136	148	150	113	121	70	58	66	66	1,180
1897.....	41	35	40	47	49	52	60	45	55	89	119	54	686
1898.....	41	23	29	43	38	55	53	80	72	82	92	86	694
1899.....	75	48	68	64	87	99	77	104	106	118	106	105	1,057
1900.....	113	67	98	118	165	163	158	155	135	152	118	108	1,580
1901.....	111	72	81	121	167	171	167	169	184	207	220	132	1,802
1902.....	176	113	169	182	247	237	288	279	323	295	320	243	2,932
1903.....	168	178	233	236	331	408	377	387	337	366	375	290	3,686
1904.....	235	157	234	202	296	393	394	383	378	388	320	344	3,724
1905.....	194	130	149	185	196	157	159	145	130	108	163	166	1,882
Total													22,581

From this table we learn by subtraction that 1,842 fewer bores were sunk for oil in the Trenton rock fields of Indiana in 1905 than in 1904. This was a loss of 49.5 per cent.

From the table it may also be learned that, up to January 1, 1906, 22,581 bores had been drilled in the Trenton rock fields of Indiana for oil alone. On that date there were 16,266 producing wells in the field, as against 15,228 on January 1, 1905, a gain

of 1,038 for the year. By subtraction it will be noted that of the total number of bores sunk for oil in the Trenton rock fields of the State, 6,315 have proven dry, or have been abandoned as nonproductive. The number abandoned in 1905 was 607, or 396 more than in 1904, while the number of dry holes drilled during the year was 237, or 146 less than in 1904. Of the total number of bores sunk in 1905, 12.6 per cent. were dry, as against 10.2 per cent. of those drilled in 1904.

On October 15, 1905, there were approximately 16,030 producing wells in the Trenton rock fields of the State. The production of oil for the entire month of October was 791,881 barrels, or an average of 1.59 barrels per well for each day of the month. The average daily output in October, 1903, was 2.54 barrels for each productive well. This loss was due in part to the greatly decreased number of new bores sunk during the year, but mainly to the rapid falling off of the production in the deep pay wells of the Muncie-Selma-Parker field.

The following table shows the number of producing wells, number of dry holes, total bores and average initial production of wells drilled in each of the Trenton rock oil producing counties of Indiana in 1904 and 1905, and also the abandoned wells by counties for the year 1905:

COUNTIES.	Producing Wells, 1904.	Producing Wells, 1905.	Dry Holes, 1904.	Dry Holes, 1905.	Total Bores, 1904.	Total Bores, 1905.	Percentage of Dry Holes, 1904.	Percentage of Dry Holes, 1905.	Average Initial Production of Productive Wells, 1904.	Average Initial Production of Productive Wells, 1905.	Abandoned Wells, 1905.
Adams.....	237	83	25	11	262	94	9.5	11.7	13.1	9.5	104
Blackford.....	201	55	21	10	222	65	9.4	15.4	9.3	7.3	95
Delaware.....	831	570	121	83	952	653	12.7	12.7	44.4	32.6	16
Grant.....	977	369	91	34	1,068	403	8.5	8.4	11.2	10.7	139
Hamilton.....	0	3	0	0	0	0	0	0	0	15.	0
Huntington.....	324	159	8	2	332	161	2.4	1.2	13.2	19.3	35
Jay.....	277	171	52	33	329	204	15.8	16.1	17.1	15.8	41
Madison.....	35	30	15	25	50	55	30.	45.4	10.5	15.7	13
Miami.....	5	4	3	1	5	8	37.5	20.	6.4	8.7	2
Randolph.....	86	46	27	34	113	80	23.9	42.5	43.2	36.8	0
Wabash.....	0	1	1	0	1	1	100.	0	0	6.	11
Wells.....	368	154	19	4	387	153	4.9	2.5	12.	11.4	151
Totals.....	3,341	1,645	383	237	3,724	1,882	*10.2	*12.6	*21.6	*20.6	607

* Denotes average.

From the table it will be seen that all the large producing counties fell off greatly in the number of productive wells drilled,

the average loss running about 50 per cent. The average initial production of new wells drilled during the year fell off only 1 barrel, which goes to prove that the loss in total production is not due to the failure of the field but to lack of sufficient new development to offset the loss in output of the old wells.

In Delaware and Randolph counties, where there was a great gain in initial production in 1904, due to the heavy output of the deep pay wells, there was a corresponding loss in 1905, showing that the deep pay is not holding up to what it promised in the beginning. In Delaware County the loss was 11.8 barrels per well, while in Randolph it was 6.4 barrels per well. That the deep pay wells still surpass the shallow pay ones of other portions of the field is shown by the fact that of the 33,887 barrels of new production in the entire field during the year, Delaware County alone furnished 18,608 barrels, or 54.9 per cent. The number of productive bores sunk in this county was 570, or 34.6 per cent. of the entire number put down in the field.

Huntington County again leads all the older producing counties with an average initial output of 19.3 barrels, and with but 2 dry holes out of 161 bores sunk, a record that has never before been equaled in the history of the Indiana field. Wells County ranks next with only 4 dry holes out of 158 bores, or 2.5 per cent. against 1.2 per cent. for Huntington. Grant County dropped to second place in number of bores sunk, while her percentage of dry holes and average initial output differs but little from that for 1904. From a careful study of the table one can learn many other facts regarding the relative importance of each county in the field.

CORNIFEROUS ROCK PETROLEUM.

No new territory producing petroleum from corniferous limestone was opened up in Indiana in 1905. That formation is producing only at Terre Haute, near the western margin of the State, and in Jasper County in the northwestern part.

At Terre Haute the Phoenix well has been productive since the summer of 1889. It is located near the center of the city, and for 12 or more years yielded an average of more than 1,000 barrels per month. In the last few years this has gradually lessened and in 1905 the average was 483 barrels per month.

The Phoenix was one of the few wells which continued to produce oil in quantity after the famous strike in May, 1889. The top of the oil bearing stratum at Terre Haute ranges between 1,569 and 1,630 feet. Some 40 bores were sunk in 1889 and 1890 within a radius of 3 miles of the Phoenix well, but only half a dozen or so produced oil in commercial quantities. Several other small producers were sunk about 10 years later, and 1 of these and the Phoenix are the only 2 now producing oil in the territory. Their combined output for 1905 was 7,064 barrels as against 8,303 in 1904. This was sold to local consumers at an average price of \$1.10 per barrel, the whole amount received being \$7,770.

There is little doubt but that a large quantity of oil occurs in the corniferous rocks beneath the city of Terre Haute and vicinity, else the yield of the Phoenix well could not have been so long continued. The porous area or reservoir containing the oil must, however, be narrow, and this bore probably struck it at just the right point to get the best results. Some people who know little or nothing of the geology of Indiana believe that the Phoenix well struck a crevice, which extends to the main oil field of the State. Such belief is, of course, preposterous, as the corniferous rock which contains the oil at Terre Haute outcrops before the main oil field is reached, and is not pierced by any bore sunk in that field. Moreover, it is a younger and much thinner formation than the Trenton limestone, and for that reason there is little chance of developing an oil output near Terre Haute in any way comparing to that of the main Indiana field.

In the Jasper County field the corniferous or oil bearing limestone is found from 100 to 115 feet below the surface. On account of this shallow depth the output is small in quantity and heavy in quality, being a bluish or very dark green lubricating oil with a viscosity of 1274 at 90° Fahr. and a gravity of 19.4 Beaume. The output of the field for the year fell off about one-half from that in 1904, when it was 9,800 barrels.

HURON SANDSTONE PETROLEUM.

Petroleum from this formation is now produced in Indiana only in the vicinity of Princeton, Gibson County, in the southwestern corner of the State. In this field the top of the oil-bearing

stratum, which is a bluish gray, sharp-grained sandstone, is found at an average depth of 890 feet below the surface. The oil is found at about 40 feet below the top of this sand. It is darker and thicker than that found in the Trenton limestone, registering about 31° Beaumé. For a long time the Indiana Pipe Line Company paid 35 cents less per barrel for it than for the Trenton limestone product, but on August 15th, 1904, advanced the price to the same figure.

On January 1, 1905, there were 45 wells producing oil, 8 yielding gas and 13 dry holes in the Princeton field. During that year there were drilled 34 additional bores, but 1 of which was dry. The average initial output of the 33 productive wells was 10.3 barrels. The output of the field by months for the years 1904 and 1905 is shown in the following table:

Number of Barrels of Huron Sandstone Oil Piped or Shipped from the Princeton (Ind.) Field in 1904 and 1905, by Months.

	1904.	1905.
January	1,412	4,043
February	1,399	3,637
March	2,920	5,400
April	1,319	5,262
May	2,047	5,559
June	2,315	4,523
July	2,971	5,569
August	2,991	6,296
September	3,345	6,141
October	3,093	6,865
November	4,554	6,116
December	3,841	5,395
Totals	32,207	64,806

By subtraction we learn that the production of the field was 32,599 barrels, or a little over 100 per cent. greater in 1905 than in the year preceding, which is an excellent record. The total value of the oil produced was \$55,413, an average of 85½ cents per barrel.

Adding to the output of the Trenton rock petroleum fields that produced by the corniferous limestone at Terre Haute and in the Jasper County field, and by the Huron sandstone at Princeton, we find the total production and value of petroleum in Indiana in 1904 and 1905 to be as follows:

TOTAL PRODUCTION AND VALUE OF CRUDE PETROLEUM IN INDIANA FOR
THE YEARS 1904 AND 1905.

	1904.		1905.	
	Barrels.	Value.	Barrels.	Value.
Trenton Rock Petroleum.....	11,281,030	\$12,127,107	10,892,438	\$9,236,788
Corniferous Rock Petroleum.....	18,103	21,040	12,064	13,270
Huron Rock Petroleum.....	32,405	28,951	64,806	55,413
Total.....	11,331,538	\$12,177,098	10,969,308	\$9,305,473
		Barrels.	Value.	
Loss in 1905.....		362,230	\$2,871,625	

