

ON THE PETROLEUM INDUSTRY IN INDIANA IN 1901.

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The year 1901 was the most active in the history of the Indiana Petroleum Industry. The number of wells sunk and barrels of oil produced were far in excess of those of any previous year. Notwithstanding these facts, the area of known productive territory was but little increased. No new pools of importance outside of the main field were opened up, and that field had added to it only a few square miles of territory near Marion, Grant County, and small areas in one or two other places, less than a dozen square miles in all. Steady drilling inside the limits of productive territory was the rule during the year. Fewer wild cat bores were sunk, and most of such ventures proved abortive. A good average price was obtained for the oil, better than in any other year except 1900. The fluctuations in price were less than for a number of years, the variation between the minimum and maximum prices being only 15 cents per barrel. The average initial output of producing wells was slightly higher than in 1900, thus showing that the main oil territory of Indiana has not as yet reached the zenith of its output.

There is no doubt but that, as the gas pressure declines and the supply of that valuable volatile fuel ceases, the greater part of the present gas territory will produce oil. Both gas and oil had a common origin, viz., the destructive distillation of the plants and animals of the old Silurian days. Neither is being formed in commercial quantities beneath the surface of Indiana at the present time. The gas is but the volatile portion of the oil which has risen into the higher porous portions of the Trenton limestone, the mother rock, productive of both. When gas ceases to flow, the hydrostatic pressure behind the oil will press the latter into the spaces which formerly held the gas. As a result, many bores formerly sunk for gas, when cleaned out and drilled a little deeper, will produce oil. Many of the first wells sunk for gas were drilled only 20 to 35 feet into Trenton, whereas the experience of recent years has shown that much of the oil is secured between 40 and 70 feet in that formation. But few have found oil below 75 feet in Trenton.

Not all the present gas-producing territory will yield oil, as over much of it the gas doubtless occupies porous portions of the Trenton which lie to one side rather than above the bodies of oil which in the past have yielded the gas. It must always be remembered by persons who seek to develop both gas and oil, that gases and liquids possess some properties which are widely different. Every gas possesses the property of diffusion, which causes it to occupy all the space into which it can find its way. Its particles move freely among one another and the interspaces between these particles vary greatly in size according to the pressure to which the gas is subjected. For example, a gallon of natural gas, poured into an air-tight room will, in a short time, permeate every portion of that room; each cubic foot of space in time holding a like number of molecules of the gas. In like manner natural gas has found its way through very minute pores or spaces of the Trenton limestone into areas of such limestone, perhaps quite distant from the mother pool of oil. The latter, on account of its being a liquid with far less freedom of motion among its molecules, does not possess this power of diffusion and occupies only those porous portions of the Trenton in which it has been collected by gravity or by the hydrostatic pressure of the water behind it. Thus it will be seen that these reservoirs of oil may be immediately below the gas and often with their surface levels reaching in places a slope of an anticline to which bores may be sunk without penetrating the gaseous reservoir in the crest of the anticline; or they may be at some distance to one side of the gaseous reservoir to whose contents they have given origin. Wherever gas is found, a body of oil is likely to be found at no great distance in the same formation. Oil, however, may be struck in a territory and no gas be found; the latter product, if formed, having by its property of diffusion, escaped into the atmosphere, or disseminated in small quantities throughout the neighboring rocks. It may be also that the conditions for the volatilization of any large portion of the oil have been absent; the liquid, by strong and never ceasing pressure, having filled all the space in the pores of the rocks which it occupies. In such a case the quantity of gas would be small or wholly lacking.

SURFACE INDICATIONS.—One other thing I would mention in this connection. *In Indiana there are no surface indications whatever which denote the presence of gas or oil in the underlying rocks.* Scarcely a day passes but I am in receipt of a letter from some portion of the State, in which it is stated that bubbles of gas are continually escaping from some pond, spring or stream, or that a light scum of oil occurs upon the surface of some body of water. The

persons writing believe that such bubbles or scum are certain indications of the presence of large quantities of gas or oil in the vicinity. In this they are always mistaken. Gas and oil are found in commercial quantities in Indiana only at depths ranging from 500 to 1,600 feet below the surface.* Between the formations containing the gas and oil, namely the Trenton limestone and the Corniferous sandstone, there are always one or more close-grained shales 50 to 300 feet in thickness. These shales are wholly impervious to both gas and oil; i. e., no particle of either of these fluids can find its way through them. In fact, such a shale is an absolute necessity to the presence of a commercial body of either gas or oil, else both these would have long since found their way upward into the atmosphere. The bubbles of gas, noted as escaping from water, are, in almost every instance, marsh gas, which is formed by decaying organic matter at the bottom of the water, or in some deposit of carbonaceous material near by. The oil has exuded in minute quantities from some shale, clay, limestone or sandstone, as all such rocks contain some oil. But a drop or two is necessary to form many square feet of film or scum over the surface of a spring or pool.

Again, the oil-producing rocks in Indiana follow no definite direction, as in some other States. There is no northwest-southeast, or northeast-southwest axis or trend which the intelligent operator can follow and sink a productive bore 99 times out of a hundred. His operations in Indiana have always an element of chance connected with them. If he keeps well within the bounds of productive territory his chances of failure are much fewer than if wildecating on the outside of such limits. But on the best area of productive territory an occasional bore will come in dry. In the early history of the Indiana field these dry holes, especially if they were a little to one side, were thought to condemn large tracts. However, some of the best wells of recent years have been sunk on such condemned areas.

OIL SMELLERS.—A number of letters have been received in recent months asking if there is any instrument by which oil can be located in paying quantities. Some of these letters are from parties who have employed so-called "oil experts." Mr. Charles E. Wyman, of Martinsburg, Washington County, in writing of his experience, said: "The expert whom I employed came from Chicago. He would get out of the buggy about every quarter of a mile and go to the rear in such a position that I could not see what he was doing. He

*The Jasper County field is an exception to this, a heavy form of oil being there found at 100 to 120 feet below the surface. However, a shale impervious to the oil lies between it and the surface.

would only be gone a minute or two, and I could not get a chance to see the instrument which he claimed to have. Both he and his companion assured me that they could locate oil if in paying quantities within six miles of them. Do you know of any instrument or substance that oil will attract or repel, or have I just been duped? It would be a great thing to know where oil lies in paying quantities before the wildcat bore is put down."

With this last statement I fully agree. There would be no wildcat bores if such knowledge were possible. To all such inquiries I reply that there is one instrument, and but one, that can be used in locating oil, and that is the drill. All others are and ever will be humbugs; and all men who claim to be able to locate oil in commercial quantities by instruments, hazel rods or what not, are either harmless innocents or fakirs of high degree. They may by chance locate one or two productive wells, but there is no guarantee but that the next half dozen bores will be as barren of oil as a dried codfish is of water.

FAKE OIL COMPANIES.—The discovery of oil in large quantities in Texas, in the spring of 1901, led to the formation of scores of "get-rich-quick" oil companies in different parts of the United States. These companies have filled the papers with glittering advertisements of shares that could be purchased for five to twenty cents on the dollar, but which, in a few days or weeks, would increase twenty to a hundred-fold in value. Prospectuses have been scattered broadcast, which have told in glowing terms of the immense profits to be made in a year or two. Stock certificates by tens of thousands, representing the finest specimens of the engraver's art, with pictures of derricks on each corner, and tiers of barrels in the background, have been issued to the gullible. The average American citizen likes to be humbugged, and the fake oil company promoter has, during 1901, given such citizen the best opportunity he has had for years.

The available assets of most of these companies consists of little more than a superb allowance of gall, and a hundred or two dollars invested in prospectuses and stock certificates. A number of these companies have bought room enough on the crest of Spindle Top Hill, near Beaumont, Texas, for a derrick to stand upon; have leased or bought a small tract of wholly undeveloped and probably barren territory somewhere within a hundred miles' radius of that noted field, have put down a single productive well on Spindle Top, and then have promulgated the news in all ways possible that they have "brought in a gusher," and that the proceeds from the sale of the

200,000 or more barrels which it is daily producing, and of others which they will soon bore, will make millionaires of all the stockholders in the company. No more palpable fraud was ever devised to separate the citizen from his hard-earned dollar than these mushroom oil companies. Not one person in ten thousand will ever get a cent of dividend on the stock he has purchased. Not one in a thousand will ever again see the principal he has invested. The oil sharper finds it a great deal easier and more profitable to sell the highly engraved certificates of stock than to drill oil wells or develop any actual oil property. The Oil City Derrick, in commenting on the multiplicity of such companies, said: "There are honorable exceptions, and companies are in the field, officered by gentlemen of the highest integrity, with no other purpose than the prosecution of a legitimate business upon business lines. They can be enumerated with ease, identified without difficulty, and indicated by the fingers on one hand. The square companies have no stock for sale. All the rest are fake organizations, or, what amounts to the same thing, organizations on paper, with no assets except the green goods in which they deal—in this instance green-tinted paper called certificates—which might as well be sawdust or paper waste so far as current value is concerned."

If such companies had confined their operations to Texas, but little would be said about them in this connection, but several of them, organized in Chicago and elsewhere, have bought up or leased small holdings in Indiana, and have been selling their worthless stock to the citizens of this and adjoining States. One of these, located in Chicago, leased 326 acres near Wilders, Indiana, and then issued an attractive prospectus, one of the main features of which was a portion of the report on the Jasper County oil fields made by this department in its annual report for 1900. The paper, as prepared and published by me, was, in this prospectus, garbled in every conceivable way to make it conform to the best interests of the Chicago Oil Company. Words and whole sentences were omitted or changed, as the interests of the said company demanded. Their prospectus stated that they had seven producing wells in operation, with an output of 75 barrels daily, and that the net profits from the output of these wells in one year would be \$100,000; and from 100 wells, which they expected to sink, \$675,000 per year. Mr. C. K. MacFadden, of Geneva, Indiana, the well-known superintendent of the main Jasper County field, visited, without making known his identity, the offices of this company in December, 1901. From his letter to me regarding this visit, I quote as follows: "Never in my life have I seen such

a brazen and deliberate steal attempted by people who put up an outward appearance of respectability and honesty. Their statements, almost without exception, were absolutely false, and instead of having a production of 135 barrels daily, my field superintendent informs me that the total production from their wells would, in his judgment, not fill a teacup with oil in twenty-four hours' pumping, and that their oil which is used for exhibition purposes must have been taken from either our tanks or from those of our neighbors."

Another fake oil company, located in New York City, but incorporated under the laws of South Dakota, also sends out an attractive prospectus, stating that they have secured 320 acres of land located in Indiana, 75 miles from Chicago; that they propose to sink four wells to each acre, which wells will average two barrels per day. This product, when sold at \$2.00 per barrel, will yield a net profit of \$967,000 annually, to be divided among the stockholders. Fifty thousand shares of stock at 20 cents each are offered to a gullible public.

The whole Jasper County field, at the present rate of production, will not yield in 20 years, what a single one of these companies offers to produce in one year. Better it would be for the person who has money to invest, to buy grass seed and scatter it abroad for the sparrows, than to invest in the stock of these or other similar companies. The assurance of some kind of returns from the investment would be infinitely greater.

There are doubtless many legitimate oil companies in Indiana and elsewhere which are operating valuable holdings, and which have stock for sale. The remarks above made apply in no manner to such companies. For the most part they do not advertise their stock by the methods mentioned. If each person who has money to invest would investigate, either personally or through some reliable party who is known to him, the oil property of the company whose stock he is thinking of buying, it would lessen the profits as well as the number of such fake companies as we have mentioned. In investing in oil stock or anything else, it never pays "to buy a pig in a poke."

SHALLOW BORES IN CENTRAL-SOUTHERN AND WESTERN INDIANA.—Investigations carried on during recent years in the central-southern and western portions of Indiana and records of many bores which have been sunk in those regions, have led me to believe that the majority of the drill holes sunk therein in search of gas and oil failed to reach Trenton limestone, the rock formation which produces the most of the gas and oil in this State. This failure to sink the bores deep enough was due to several causes, chief among which

is the great difference in the strata overlying the Trenton limestone in these portions of the State from those overlying the same formation in the main gas and oil-producing areas. In the latter areas the Niagara limestone of the Upper Silurian age and the Hudson River limestone and Utica shales of the Lower Silurian, are the only formations to be pierced by the drill between the drift or surface and the oil and gas-bearing Trenton. In the central-southern and western portions, especially the latter, a number of formations which are wholly absent in the main gas and oil field, intervene between the surface and the top of the Niagara limestone. The drillers employed during the gas and oil excitement of 1887 to 1895 to sink the bores in these regions were, for the most part, from the gas fields. Their knowledge of geology was small, and in many instances, after passing through a shale which resembled the Utica, and which they doubtless thought was that formation, they called the underlying rock "Trenton limestone," and soon abandoned the bore as barren. The shales which they had pierced may have been any one of a half dozen carboniferous shales, or, what is more likely, the black Genesee shale, no one of which occurs in the main gas field.

Again, strong flowing veins of salt water were struck in a number of the bores, and the local companies, whose members were paying for the drilling, became alarmed at the extra cost necessary to case off such water, and often abandoned the bore before reaching Trenton. In a number of instances in the southwestern counties, the Corniferous limestone, which in places, as Loogootee, Terre Haute, etc., is oil and gas-bearing, was not even reached, though it lies 900 to 1,200 feet above the Trenton. Wherever a bore was thus abandoned without reaching Trenton, all the money spent was wholly wasted, there being neither negative nor positive results. Moreover, much territory was condemned as nonproductive without being given a fair test.

The foregoing statements are not made because I believe that gas or oil in paying quantities will eventually be found in the Trenton limestone of southern and western Indiana, for I have no reasons for such belief. Neither have I reasons for believing the contrary. If the earlier bores had of a certainty reached Trenton and proven barren, then negative evidence would have been available. The one fact which I do wish to impress upon the citizens of the regions mentioned is that much of their territory has not been properly tested. Another and more important reason for the statement is to induce companies who sink future bores to see to it that nothing stops the drilling before Trenton limestone is reached, or, rather,

before that formation has been pierced at least 75 feet. Beyond that depth there is little possibility of finding either gas or oil. A contracting driller of experience can easily and without great expense case off any salt water which may give him trouble. An accurate record of the thickness of each formation passed through, together with a small vial of the drillings of each, will aid much in determining the horizon which the drill is piercing at any depth, and such record and samples should always be kept.

THE MAIN INDIANA OIL FIELD IN 1901.

No great strikes were made in the main Indiana oil field in 1901, and new developments increased the area of that field but little. It extends from the Ohio-Indiana State line westward to Marion, Grant County, and from Warren, Huntington County, south to Hartford City, Blackford County. The greatest length of the field is about 48 miles and its extreme width about 20 miles. There are, however, a large number of sections within the area thus bounded which have, as yet, not been fully tested. A map showing the exact area tested up to January 1, 1901, with details of the new developments from January 1, 1897, to that date, was published in the last (1900) report of this department. The details which follow relate, for the most part, to bores sunk during 1901 on the sections denoted as untested on the map mentioned. The number of barrels of oil produced in the main field in 1901 was 5,307,579, or 92.7 per cent. of the total product of Indiana Trenton limestone oil.

DEVELOPMENTS IN ADAMS COUNTY IN 1901.—In Adams County the year started out with the drilling in of two or three good wells on the Studebaker and Tumbleson leases, Section 31, Blue Creek Township. One of these flowed at the rate of 300 barrels daily for a short time, but dropped to 150 when put to pumping, and to 75 in about two weeks. Several others almost as large were put down during the year in that section, while a number of bores on the same leases struck less porous Trenton, and yielded only 10 to 25 barrels in the beginning. Section 30, adjoining the pool on the north, produced one or two small wells and one fair one during the year.

On Section 36, Monroe Township, just west of the rich pool in Blue Creek, two small producers, and one bore with an initial output of 150 barrels, were completed. Two test bores were sunk about two miles northwest, in the same township, in the hopes of opening up a new field in that direction. One of these, on the Habegger lease, Section 34, was a small producer, starting at four barrels. The

other, on the Shug lease, Section 21, was dry. A dry hole had been previously sunk on the Buffenberger farm, Section 25, so that the results were negative, and further drilling was stopped.

In Jefferson Township, Section 6 produced a few light wells. The only other new developments in this township were in Section 30, just north of the New Corydon pool, where a bore on the Collins farm, starting at 150 barrels, was completed in November. A test bore on the Hauser lease, Section 33, came in dry.

In Wabash Township bores on Sections 3, 13, 21, 25 and 26, shown as untested on the map of last year's report, resulted in dry holes; one bore alone, on Section 25, being a small producer. In the same township Section 20 produced some fair wells, while Section 32, previously untested, yielded a number of good ones. The west half of Section 33, adjoining, proved fair territory, as did also a portion of Section 36.

This was the sum total of new developments in Adams County during the year. Altogether 175 bores were sunk in the county, as against 120 in 1900. Of these, 157 were productive, the average initial output being 29.5 barrels, as against 25.6 in the previous year, a very good showing indeed. The percentage of dry holes was slightly increased; being 10.2 in 1901 and 9.8 in 1900.

In December the holdings of the Superior Oil Company, whose headquarters were at Geneva, Adams County, were sold to a New York company. The sale was one of the largest in recent years, consisting of 5,000 acres of leases in Adams, Jay and Wells counties, including the noted Blue Creek pool, northeast of Geneva. On these leases were 152 producing wells, with a total daily output of 400 barrels. The price paid was \$300,000.

DEVELOPMENTS IN JAY COUNTY IN 1901.—The developments in Jay County during the year were few and far between. It was thought for a time that new territory would be opened up in Pike Township, about five miles south of Portland, as three wells were completed in June on the Ware and Lush leases, Section 9, which started off at 15 barrels each. One or two bores had been previously sunk in this vicinity which showed a fair quantity of oil, but not enough to justify extensive operations. Three dry holes, located on Sections 8, 9 and 17, followed the small producers in October, while a fourth, on the Creamer farm, in Section 30, stopped drilling for the year.

In Wabash Township, near New Corydon, a well whose initial production was 100 barrels, was completed in April on the Martin lease, Section 4. This resulted in a number of bores being sunk on

other portions of that section and on the north half of Section 5. Of these, three came in dry and three others were five to ten-barrel producers. This territory adjoins Sections 31 and 32, Jefferson Township, Adams County, where a number of good wells have been completed.

Bores sunk on untested territory in Bear Creek Township produced a dry hole on Section 3 and a five-barrel well on the Hardy lease, Section 19.

In Jackson Township a dry hole and a gas well were completed on Section 25, while Section 26, to the west, yielded three or four fair producing oil wells and two dry holes.

All other bores in the county were on known productive territory, though a number of them came in dry or as small producers. During the year only 70 bores were sunk in Jay County, as against 105 in 1900. Twenty of the 70 were dry. The average initial output of the 50 producers was 17.6 barrels, a decrease of 4.8 barrels from the average initial production of 1900.

DEVELOPMENTS IN WELLS COUNTY IN 1901.—This county, which, in the past, has been the banner oil-producing county of the State, still led in total output, but in the number of new wells sunk, became second to Grant. But little new territory was opened up within its bounds, but on territory already tested a large number of bores were sunk, the operators believing that they could afford to drill for small wells, owing to the lessened chances of failure. In this they showed a wise and conservative policy and at the same time maintained the production of the county.

In the eastern part of Nottingham Township, the limits of the known productive area was extended half a mile or so northward by the bringing in of a good well on the Berie farm, southwest quarter of Section 8 (13 east). In this region the average record of the bores is about as follows:

	<i>Feet.</i>
Drive pipe	70
Casing	310
Top of Trenton.....	980

In the same township several good wells were drilled in Section 14, along the eastern boundary of productive territory; also on the Schooly lease, Section 9. The southeast quarter of this section furnished a dry hole, as did also the Risser lease, Section 16, the Burger lease, Section 15, and the Slavey farm, Section 35.

In Chester Township, the limits of productive territory were extended a mile north to the Liberty Township line, a number of fair

producing wells having been sunk on Sections 3 and 4. With them, however, were several dry holes, so that the new area is none of the best. Some of the best producers of the year in Wells County were brought in on the Maddox lease in Section 34 and on Section 33, adjoining.

The bores sunk in Jackson Township were numerous, and for the most part quite productive, the best one being on the J. J. Good farm, northwest quarter of Section 20. This township is now a close rival to Nottingham for production, and may even exceed the latter. The only new territory opened up was on the Terral lease, Section 7, and the Logue lease, northwest quarter of Section 6, where fair producers were drilled.

In Liberty Township a few small producers were bored on the Huffman and other leases in Section 30, a half mile or more north of the known limits.

The total number of bores drilled in Wells County during the year was 470, as against 579 in 1900. Of these, 40 were dry, an increase in percentage of 2.1. The average initial production fell from 19 barrels in 1900 to 17.2 barrels in 1901.

DEVELOPMENTS IN BLACKFORD COUNTY IN 1901.—The new developments in this county during the year have proven that a large portion of the untested territory shown on last year's map as lying between Hartford City and tested territory in Washington and Harrison townships, is productive.

In Harrison Township, on the west half of Section 31, four fair wells were completed on the Woodward, Walker and Stallsmith farms. The record of the bore on the last named farm, northwest quarter of the southwest quarter of Section 31 (24 N., 11 E.), was as follows:

	<i>Feet.</i>
Drive pipe	197
Casing	321
Top of Trenton.....	958
Total depth	1,058

In Washington Township, Sections 34, 35 and 36 have become fairly productive, a number of wells starting out at 25 to 60 barrels. One dry hole was bored on the Sipe lease, southwest quarter of Section 34; another on the Bugh farm, northwest quarter of Section 25, and a third on the E. Flower farm, Section 29, which had a tendency to stop further operations in those sections. On the southwest quarter of Section 6, one or two small producing wells were also sunk. The remaining bores in this township were on known productive territory. Sections 8 and 17 yielded the largest number of good

producers. One of these, on the J. Byrd lease, in Section 17, created quite an excitement last February by being reported in the newspapers as a 3,000-barrel gusher. It was a large salt water well, and never produced over 225 barrels of oil daily. In ten days the yield was down to 65 barrels. It was but one-half mile from the Dale well, which, in 1898, started at 350 barrels.

Licking Township was the seat of most of the drilling in Blackford County during the year, 114 bores having been drilled in and about the edge of the Hartford City field. Of these, 36, or 31 per cent., were dry holes. The average initial output of the 78 productive wells was 28.4 barrels. One of the best wells finished in the new territory was on the Maddox lease, northeast quarter of Section 14, which started out in September at 250 barrels, and averaged 125 barrels the first week. Four other good wells were drilled in on this quarter section within an area of 60 acres. Four or five dry holes were sunk in the same section on the edges of this small pool. Two or three fair producers were also completed in the north half of Section 12. The south half of Sections 1 and 2 and the west half of Section 3 developed into good territory. On Section 4 dry holes were drilled on the northeast and southwest quarters. Three non-producers were also finished on Section 9, which had the effect of condemning the entire section. The majority of the bores in this township were sunk on Sections 3, 10 and 16.

During the year 258 bores were drilled in Blackford County, as against 202 in 1900. Of these, 47, or 18.2 per cent., were dry. The average initial output of the productive wells was 20.9 barrels, a little more than double what it was in 1900, when more extensive wild-cattling was the rule.

DEVELOPMENTS IN HUNTINGTON COUNTY IN 1901.—There was much less doing in Huntington County during the year than in 1900, the total number of bores sunk for oil having been but 75, as against 147 the previous year. The only really new territory opened up was Section 36, in Wayne Township, where several fair wells were sunk on the White and Spaulding leases.

All of Section 31, in Jefferson Township, has come within productive limits, a number of good wells having been completed on this area. One of these on the George Scearce farm was an old gas well, which, when cleaned out and put to pumping without being shot, started off at 30 barrels. There are many such wells near the limits of former gas territory which have been abandoned for some time. They were never sunk sufficiently deep into Trenton to properly test the oil-bearing qualities of that rock. If cleaned out, drilled 30 to

50 feet deeper and shot, the most of them would probably yield oil in paying quantities.

Of the 75 bores sunk in Huntington County in 1901, but six, or 8 per cent., were dry holes. The average initial production was 24.7 barrels, as against 30.8 barrels the previous year.

DEVELOPMENTS IN GRANT COUNTY IN 1901.—To Grant County belongs the greater part of the new developments in Indiana territory during the year, as well as the largest number of bores sunk in any county, there being 578 drilled in, of which 80 were dry or gas-producing. While the larger number of wells were sunk in Center and Franklin townships, near Marion, the ones with the best average initial output were in the Van Buren Township field, which has slowly grown into one of the best, if not the best, producing territories in the State.

In this (Van Buren) township much of the territory marked as untested on the map of last year's report has been drilled, and, for the most part, proven productive. The northeast quarter of Section 10 produced several good wells, as did the south half of 19, the southwest quarter of 20 and the east half of 21. These were within known productive limits, but untested. All of Sections 25 to 30, in the next to the southern tier, produced fair to good wells, with the exception of Section 26, on which one dry hole and one 10-barrel well alone were drilled. The Pully lease in the northwest quarter of 29 and the Luggar farm in the south half of 30 were especially promising. On the south line of the township tests were drilled on Sections 32 to 34, 31 being as yet untested, and 36 having several dry holes and gas wells. The Rowland lease, northwest quarter of Section 32, produced one small well. On the Lease farms, west half of 33, four bores were sunk, one of which produced gas, the others, 5, 60 and 75 barrels initial output. A 45-barrel producer was also drilled on the Moriarty farm in the south half of the section. The southeast quarter Section 34 did better, as a test on the T. B. Doyle farm yielded a 100-barrel well.

In April, F. M. Johnson, one of the leading operators in the Van Buren field, sold his holdings, consisting of 1,000 acres of leases and 53 producing wells, for \$65,000. The leases were on some of the best prospective lands in the township.

Monroe Township, just south of Van Buren, is, as yet, largely gas-producing. Previous to 1901 only the northwest quarters of Sections 15 and 18 and the south half of 25 had yielded oil, and that only in small quantities. During the year 20 additional bores were sunk in the township. Some of the most productive of these were on

the Joshua Strange farm, northeast quarter of Section 15, one of which started at 100 barrels. Twelve bores were drilled on this lease of 160 acres, but one of which was dry. An average section of these was about as follows:

	<i>Feet.</i>
Drive pipe	238
Casing	390
Top of Trenton.....	993
Total depth	1,060

The two pay streaks were found at 1,021 and 1,035 to 1,050 feet. Some of the wells yield quite a quantity of gas. This is used for fuel on the lease and also supplies in part the citizens of Arcana, a nearby town.

The Hultz lease, on the southeast quarter of Section 15, had also two good wells sunk upon it. Several additional bores put down on different parts of Section 18 were light producers, while one on the Carter lease, southeast quarter, was dry. A test bore on the northeast quarter of Section 10 yielded gas and salt water. Another on the northwest quarter of 11 was a small producer, as was also one on the southwest quarter of Section 20. There is little doubt but that most of this township will become productive of oil as soon as the gas supply is sufficiently exhausted.

In Washington Township, west of Van Buren, almost all of Section 1 became good productive territory during the year. The Creviston lease, in the northeast quarter, had a half dozen or more good producers to its credit, and fair wells were drilled on each of the other quarter sections. The east half of Section 12, to the south, had two bores finished, which started at 90 and 120 barrels.

On the northwest quarter of Section 27 a bore on the Turner farm came in as a big salt water well, but, after pumping about six weeks, began to yield oil in paying quantities. Just north of Marion, in the west half of Section 31, two light producers were finished on the Vandermeter farms. The limits in the remaining portion of the township remained about the same as shown on last year's map.

The Marion field proper includes developments in Center, Franklin and Mill Creek townships. It was here that the most extensive work was done in Indiana in 1901, and the largest area of new territory opened up. At the beginning of the year there were developments only in four sections southwest of Marion in Center and Mill Creek townships. About 20 wells, with a total output of 200 barrels daily, were in operation. During the year 177 bores were sunk in Center Township, 78 in Franklin and 32 in Mill Creek. Of these,

41 in Center, 9 in Franklin and 13 in Mill Creek were dry or yielded gas only. The remaining 224 produced oil in paying quantities. At the close of the year the Marion field proper contained about 230 productive wells, the total output of which was close to 2,000 barrels daily.

Taking up Center Township in detail, by sections, we find that the Hays lease, southwest quarter of Section 2, produced a number of fair wells. The best of these was No. 7, a record of its bore being as follows:

	<i>Feet.</i>
Drive pipe.....	180
Casing	425
Top of Trenton.....	960
Total depth	1,061

Three pay streaks were found, the first one at 25 feet producing gas, the second at 40 feet oil, and the third at 60 feet oil. The well made 2,100 barrels the first 30 days. The southeast of Section 3 also developed two or three light wells, the initial output being 12 to 25 barrels each. A bore with similar results was also sunk on the Brinker lease, on Section 4.

In the next tier of sections, south, No. 7, lying just east of Marion and partially within the city limits had a large number of bores sunk upon it, most of which were on town lots or small tracts. Three of the best producers were on the northwest quarter on the Barley and Spencer tract of eight acres. Their No. 1 well, finished in June, made 200 barrels the first 24 hours, and 2,200 the first 30 days. By December 1st the product had fallen to 30 barrels daily. The record of this bore was as follows:

	<i>Feet.</i>
Drive pipe.....	190
Casing	410
Top of Trenton.....	910
Total depth	1,000

Gas was struck in the first pay streak at 935 feet, and gas and oil in the second at 965 feet, the thickness of this pay being 35 feet. About 1,200 barrels of salt water are pumped each day with the oil. Wells Nos. 2 and 3 were lighter, making about 20 barrels each at the end of 30 days. On Section 8, one gas well and several light oil wells were completed. Section 9 produced gas alone, as did the northwest quarter of 10. The southeast quarter of 10 and all of 11 came in as light producing territory. Section 12 remained untested.

Section 13 produced two or three light oil wells, one gas well and one dry hole. On the northwest quarter of Section 14 several good bores were sunk, one of which flowed 50 barrels natural for several days. The remainder of the section was poor, yielding two gas wells and a dry hole. No. 1, on the Voris lease, near the center of 15, three miles east of Marion, started at 85 barrels and produced 1,600 barrels in 30 days. The record of its bore was:

	<i>Feet.</i>
Drive pipe	190
Casing	410
Top of Trenton.....	910
Total depth	1,000

The first oil was found 35 feet in and the second at 60 feet. Two other bores on the southwest quarter of the same section were light producers. On Section 16 one good well, a number of light ones, and one dry hole were drilled north and west of last year's productive area. Seventeen and 18 are mostly divided into town lots and small tracts. On these a number of productive wells, starting at 15 to 50 barrels, were drilled, and a few better ones at 75 or thereabouts.

Section 19, south of Marion, produced a dry hole on the Knight lease, northwest quarter, and two good wells on the Miller farm. On the Marion Brick Company's land, Section 20, four producers starting at 20 to 90 barrels and one dry hole were bored. Another dry hole was finished on the Henderson lease, and two or three light producers on the Kiger land. East of 21, which was developed in 1900, Section 22 yielded a water well; 23, two big gas wells, while 24 had a mixture of gas wells, light oil wells and water wells. These last three sections will doubtless produce a quantity of oil after the gas pressure has been sufficiently reduced.

In Mill Creek Township 40 per cent. of the bores sunk during the year were either dry holes or gas wells. The Ayres and Hiatt leases, on the north halves of Sections 28 and 29, produced a number of fair wells and two dry holes. A good well was bored on the D. E. Harris farm, Section 5, west of Jonesboro, and a small one on the Overman lease, same section. Bores in Sections 4 and 26 yielded gas only.

The operations in Franklin Township, west and southwest of Marion, were wholly new. They were started by the Marion Fruit Jar Company, which, about April 1st, cleaned out, drilled deeper and shot an old gas well on the Sohn farm, in Section 13, a mile and more west of any producing territory. It started off at 70 barrels, and, as a result, a number of rigs were immediately erected on that and adjoining leases. The No. 2 Sohn, finished about May 1st, showed

a large pressure of gas, and pumped 100 barrels of oil. By June 1st five wells were completed, which yielded an average of 40 barrels each, besides several others which produced only gas or salt water. Bores on Sections 24 and 26, to the south and southwest of 13, came in dry and stopped development in that direction. The greater part of Sections 1, 2, 11 and 12, north and northwest, proved productive, the best well bored in the township being on the Isaac Smithson lease, Section 13. A record of it showed:

	<i>Feet.</i>
Drive pipe	140
Casing	390
Top of Trenton.....	920
Total depth	1,035

The first pay streak was found 40 feet in. This and most other wells in this township were bored 100 to 130 feet into Trenton. The well yielded 200 barrels the first day and 2,300 barrels the first 15 days. It was finished July 4th, and on December 1st was still producing 40 barrels daily. Besides the bores on the sections named, a few light producing wells were sunk on Section 14 and one or two on Sections 3 and 4.

In Pleasant Township, farther north, two bores were sunk in Section 36, one of which, on the Vandermeter lease, started at 15 barrels daily; the other, on the Faukbonner farm, was dry. One on the Matter farm, Section 23, yielded gas only. Another on the Campbell farm, Section 4, eight miles northwest of Marion, produced salt water and a light showing of oil, while still another, in Section 34, came in dry. This showed that this township is practically outside the limits of productive territory. It may in places yield a few good wells, but they will be in isolated pools rather than in the field proper.

Of the total number of bores sunk in Grant County in 1901, 14.1 per cent. were classed as dry holes or gas producers. This was quite an increase over the previous year, when but 5.4 per cent. were dry. The average initial output of the producing wells fell off but little, being 21.6 barrels, as against 22.5 in 1900.

ISOLATED AREAS OUTSIDE THE MAIN FIELD.

DEVELOPMENTS IN THE ALEXANDRIA FIELD IN 1901.—While the number of bores in the Alexandria field during the year were nearly double what they were in 1900, the results were far less satisfactory. The average initial output decreased from 39 to 21.7 barrels. Most

of the wells were light producers, but few starting in at over 50 barrels. In the latter part of the year so many dry holes and small wells were completed that the operators lost hope, and the number of bores decreased greatly. However, one or two good strikes will start up brisk operations again.

In Richland Township, south of Alexandria, 10 bores were sunk, only four of which yielded oil. One of these, on the Meisner lease, Section 6, near the operations of last year, started at 75 barrels. A second bore, same lease, yielded water only.

The best well in the township was on the Fuller farm, same section. This had an initial output of 100 barrels. A dry hole was bored on the Jones farm, in Section 7.

In Monroe Township 94 bores were sunk, 39 of which were dry. Two of these, on Section 3, resulted in a 40-barrel well and a dry hole. One, in Section 4, produced salt water only. In Section 7 one bore on the D. Bowers lease started at 100 barrels, while several others on this and adjoining leases were small producers. A third bore, sunk by J. E. Lippencott, on the Heritage lease, near his big producer of the year before, produced gas alone, while two on the Edwards tract were dry holes. The Painter lease, on Section 8, produced two of the best wells of the year, their initial output being 75 and 150 barrels. The Kelly lease, same section, produced two dry holes and one light well, while on the Moreland farm a dry hole was bored. This shows the spotted nature of the territory.

On Section 9 a bore on the Wischart farm started at only 10 barrels. The J. M. Hughes farm, on 10, had one well which yielded 150 barrels the first day, and another which started at 90 barrels. Most of the bores on Section 17 were light; one on the N. Carver farm, where, in 1897, the first big strike in the Alexandria field was made, producing salt water only. The Bowers and Watson leases on Section 19 produced some good wells; the Gilchrist farm some light ones; while a test on the Boyd farm came in dry. On Section 20, east of Alexandria, the S. H. Buck farm, on which a good test bore was sunk late in 1900, yielded two dry holes and two light wells. Several other bores on the same section were light or dry. Two dry holes were bored on the Innis and Nicson farms, in Section 23, while the Baxter farm, in Section 29, had a dry hole and two or three fair wells to its credit.

It will thus be seen that little, if any, new territory was opened up, the one section in Richland and 10 in Monroe at present producing all the oil in the Alexandria field. The total production of the field in barrels by months is given in the annexed table:

PRODUCTION OF THE ALEXANDRIA, INDIANA, OIL FIELD BY MONTHS FOR THE YEAR 1901.

January	6,909
February	5,994
March	5,459
April	11,643
May	16,510
June	21,929
July	24,811
August	23,321
September	19,759
October	21,086
November	17,825
December	14,230
Total	189,476

THE PERU FIELD IN 1901.—No new territory was opened up, either in Peru, or in Erie Township, three miles east of the old field. In the former field but two bores, one starting at 40 barrels and the other at five, were drilled, while many of the old wells were abandoned. In the Erie Township field five bores were sunk, three of which were dry, the others being small producers. A lack of fuel for operating was one of the main reasons why the developments fell off so greatly from the year before, when 49 bores were sunk in the two pools. At the Kellar's Station or Rich Valley pool, in the edge of Wabash County, a few miles east of the Erie Township field, but three bores were drilled in 1901. Two of these were very light wells, the other dry.

The output in barrels of the Peru and Rich Valley pools by months for the year was as follows:

PRODUCTION OF THE PERU AND RICH VALLEY OIL POOLS BY MONTHS FOR THE YEAR 1901.

January	13,526
February	14,928
March	18,004
April	16,423
May	18,619
June	14,362
July	13,419
August	12,850
September	9,892
October	11,811
November	9,636
December	9,518
Total	162,988

This was a decrease of 74,300 barrels, or 31.3 per cent., from the production of 1900.

DEVELOPMENTS IN WABASH COUNTY IN 1901.—Besides the three bores sunk in the Rich Valley pool, Noble Township, Wabash County, mentioned above in connection with the Peru field, two bores were sunk near Lafontaine, Liberty Township, about 12 miles north of Marion, Grant County, and one near Treaty, in the same township, four miles farther north. The latter developed a large flow of salt water and a good showing of oil.

One of the Lafontaine wells, on the Sparks farm, Section 25, made a fair showing of oil and a large amount of gas. The other, on the Green farm, same section, started at five barrels of oil and a large output of salt water. A well on the Logan farm, Section 35, Liberty Township, was also gas-producing. While some oil doubtless exists beneath the southern third of Wabash County, the chances are that it is in isolated pools and will be hard to locate.

DEVELOPMENTS IN THE PARKER-SELMA FIELD IN 1901.—The pools near Parker, Randolph County, and Selma, Delaware County, which may be treated as one, inasmuch as they are but three miles apart, were the seat of quite an amount of drilling during the past year. The first well of the year was opened up inside of the town limits of Selma, a mile or so from the nearest producing wells, and started at 10 barrels. An old gas well, also located near the town, which was cleaned out and shot, yielded 150 barrels of oil the first day. On the J. Meeks farm, east of Parker, several good wells were drilled, the largest of which had an initial output of 225 barrels, and at the end of 10 days was still producing 100 barrels.

In Section 36, Liberty Township, an old gas well on the Thorp farm, when cleaned out, drilled deeper and shot, produced 50 barrels the first day. A test bore on the Williams farm, Section 16, also showed up well, starting at 75 barrels.

In Section 1, Center Township, about three miles northwest of Selma, three light producing wells were drilled on the McGalliard and adjoining farms. They started at five to fifteen barrels each.

In Section 11, Delaware Township, a good strike was made on the Krohn farm, a mile southwest of the town of Albany. Trenton rock was struck at 925 feet and penetrated 50 feet. The bore yielded 60 barrels of oil and a large amount of salt water the first day it was pumped. Two other bores in the same vicinity proved dry.

By the close of the year 35 producing wells had been bored in the Parker-Selma field, while in locating them 22 dry holes and gas wells had been drilled. The average initial output of the producing wells

was 30.1 barrels. In June a pipe line was laid by the Indiana Pipe Line Company from this field to their main station at Montpelier. The total number of barrels piped from the Parker-Selma field by months during the remainder of the year was as follows:

NUMBER OF BARRELS OF OIL PIPED FROM THE PARKER-SELMA OIL FIELD BY MONTHS
FOR THE YEAR 1901.

June	5,055
July	6,085
August	6,985
September	7,188
October	7,672
November	7,743
December	7,715
Total	48,393

DEVELOPMENTS NEAR DELPHI, CARROLL COUNTY IN 1901.—In May a test bore put down one mile southeast of Delphi resulted in a small producing well, and for a time created much excitement, both among the residents of that city and among operators in different parts of the Indiana field. Major Laban Sparks, of Lafayette, had noted for years the escape of gas and oil in small quantities from a well on the banks of Deer Creek, within the limits of Delphi. This well was bored in 1890 for gas or oil to a depth of 912 feet. It developed a strong vein of sulphur water, which is still flowing, and a small quantity of gas, which, when lighted, will yet burn with a steady blaze a foot or so in length. Major Sparks organized a company, leased a large acreage of land and located his first well on the Stansel farm near the Carroll County fair grounds. A record of the bore, when finished, was as follows:

	<i>Feet.</i>
Drive pipe	30
Casing	650
Top of Trenton.....	954
Total depth	960

The casing extended through the Niagara and Hudson River limestones to the top of Utica shale. The Trenton limestone was pierced but six feet, on account of indications of a strong flow of salt water. Oil arose in the well to a depth of 800 feet. When put to pumping, it yielded 50 barrels for a day or two, but soon dropped to 10 barrels. The oil was a dark-colored, ill-smelling lubricating fluid. A sample

of it was submitted to Prof. H. A. Huston, State Chemist, who reported on it as follows:

Lafayette, Indiana, May 31, 1901.

Indiana Oil and Asphaltum Company, Lafayette, Indiana:

Gentlemen—The sample of oil from Delphi, Indiana, submitted by you has been examined and found to have a density of 0.9045, equal to 25.5° Beaume; flash point closed test 252° F.; flash-point, open test 270° F.; fire test, 290° F. Distillation test; 2.2 per cent. by volume is removed below 302° F.; between 302° F. and 572° F. 12.9 per cent. by volume is removed. This is what is considered the illuminating oil fraction, but so little of it comes over before the temperature reaches nearly the upper limit that it is probable that the oil would not be found satisfactory for illuminating purposes, and the quantity of it is hardly great enough to justify the distillation of this oil for producing illuminating oil.

When cool, the oil still flows at 5° F., and comes very near to the specifications made by the C., B. & I. R. R. for the oil called "Black Engine" oil, zero grade, which is used for lubricating car and engine axles during cold weather. The flash point of the oil is too low for the grade of Black Engine oil which they use in warm weather.

Very respectfully,

H. A. HUSTON,
State Chemist.

The well was shut down after a tank or two of oil had been pumped, on account of a lack of shipping facilities. As a result of this strike, six other bores were sunk, two in the immediate vicinity of the first, both of which produced about the same amount of oil. The three are being pumped by one power, and the product stored in tanks. No record of their exact output by months is available. The other four were half a mile or more distant, in different directions, and were dry. The pool struck by the three producing wells is probably of small area and wholly isolated from the main field.

THE BROAD RIPPLE FIELD IN 1901.—Not a bore was sunk in this field during the year. Several of the old wells have not been pumped for some time, while others are pumped only at intervals. The total production fell off nearly one-half from 1900, when it was 30,194 barrels. The amount produced by months in 1901 was as follows:

PRODUCTION OF THE BROAD RIPPLE, INDIANA, OIL FIELD BY MONTHS FOR THE YEAR 1901.

January	1,648
February	1,077
March	1,447
April	1,861
May	2,432

June	1,176
July	1,227
August	1,900
September	1,159
October	1,790
November	473
December	848
Total	17,038

CORNIFEROUS ROCK PETROLEUM.

As noted in last year's report, oil is found in the Corniferous rocks of Indiana in three widely separated localities, namely, Terre Haute, Vigo County; Loogootee, Martin County, and near Medarysville, Jasper County. A detailed account of the developments in each of these fields up to January 1, 1901, was given in the report mentioned.

THE TERRE HAUTE POOL IN 1901.—No bores were sunk at Terre Haute during the year. The A. B. McWhinney well, drilled in the fall of 1900, and which showed but little oil when completed, began to yield in May, 1901, and, during the remainder of the year, produced 2,723 barrels, an average of about 12 barrels a day. A second well, sunk in 1899, about 40 rods northeast of the Phoenix well, was closed down most of the year.

The Phoenix well still remains by all odds the best oil well in the State. Finished in 1889, it has since averaged more than 1,000 barrels per month, and the yield seems to increase, the output in 1901 being 15,174 barrels, as against 12,090 in 1900. The total output of the Terre Haute wells by months during the year 1901 was as follows:

PRODUCTION OF CORNIFEROUS ROCK OIL AT TERRE HAUTE, INDIANA, BY MONTHS FOR THE YEAR 1901.

January	1,599
February	1,581
March	1,778
April	1,481
May	1,920
June	1,458
July	1,585
August	1,080
September	1,803
October	1,242
November	1,540
December	1,330
Total	18,397

THE LOOGOOTEE FIELD IN 1901.—Eight bores were sunk in the vicinity of Loogootee during the year. Six of these were in Sections 2, 3, 5, 34 and 35, Barr Township, Daviess County, and yielded gas only. Two in Martin County, on leases already developed, had a total initial output of 15 barrels. The number of barrels shipped from the Loogootee field by months, during the year, was as follows:

SHIPMENTS FROM LOOGOOTEE, INDIANA, OIL FIELD BY MONTHS DURING THE YEAR 1901.

January	755
February	606
March	449
April	563
May	586
June	554
July .....	...
August	569
September	549
October	572
November .....	...
December	701
Total	<u>5,904</u>

STATISTICS OF THE INDIANA PETROLEUM INDUSTRY FOR 1901.

As already mentioned, the output of petroleum from the Trenton Limestone fields of Indiana was greater in 1901 than in any previous year. This was due largely to the small fluctuation in value, and the fair average price received throughout the year. New wells were constantly coming in and all old ones were pumped to their full capacity. When the price of oil falls below 70 cents the operator often becomes disheartened, and stops drilling. Producing wells are also often disconnected. When the price ranges from 70 to 90 cents the operator is making a good profit, and the amount of production, provided the field has not reached its limit, is always advanced.

At the beginning of the year the price of Indiana oil was 82 cents. It continued to advance slowly until March 16th, when it reached a maximum of 89 cents. This price it held until April 1st, when it began slowly to decline, and by the middle of May had dropped to the minimum price of 74 cents. On July 17th it began to rise again, and September 28th reached the maximum of 89 cents once more. This was maintained until December 12th, when another decline began, the price at the close of the year being 80 cents. The average price for the year was 83.4 cents, as against 96.5 in 1900.

The total production of Trenton rock oil in Indiana in 1901 was 5,725,474 barrels, which, at the average price of 83.4 cents, amounted to \$4,775,045. Compared with 1900, this was an increase in production of 812,798 barrels or 16.5 per cent. Owing, however, to the lower average price, the amount received by the producer was but \$34,314, or .72 of one per cent. more than in 1900.

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 eleven years beginning January 1, 1891, and ending December 31, 1901. This does not include the amount used in the field for fuel and other purposes. 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 1902, BY MONTHS.

(Barrels.)

MONTH.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
January	6,171	15,841	111,824	259,000	300,588	365,582	290,746	317,014	297,291	353,451	425,140
February	5,981	18,946	96,025	232,107	230,559	241,743	309,922	272,780	220,440	302,493	384,735
March	5,159	24,794	134,549	282,376	310,303	386,586	341,961	325,301	290,257	364,590	432,922
April	4,973	25,184	146,493	287,330	352,077	395,032	328,779	310,034	325,774	381,804	447,261
May	5,757	31,033	186,939	321,502	397,001	417,963	340,023	311,208	344,831	426,363	482,118
June	5,136	40,888	209,616	333,479	405,569	434,167	369,803	320,477	334,282	446,492	481,807
July	10,809	49,203	221,966	327,349	434,376	422,988	375,249	314,861	329,086	437,087	506,065
August	11,603	56,109	248,353	345,831	420,132	407,238	371,921	332,777	347,621	466,127	523,106
September	16,500	66,034	245,615	319,588	409,169	415,675	362,528	326,264	332,283	418,716	519,087
October	19,029	95,699	252,568	339,421	393,153	394,283	408,179	319,490	326,781	467,521	532,960
November	20,801	129,270	245,607	304,030	373,789	337,331	430,958	200,644	326,802	406,684	510,788
December	21,715	144,067	236,038	337,450	361,436	362,164	423,069	300,457	332,266	441,347	479,485
Total	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

II. PRODUCTION OF TRENTON ROCK PETROLEUM IN INDIANA FROM 1891 TO 1902, WITH VALUE.

	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
Total production (barrels of 42 gallons)	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
Total value at wells of all oils produced, excluding pipeage	\$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
Value per barrel	\$0 40	\$0 37	\$0 45	\$0 48	\$0 64	\$0 63	\$0 43	\$0 59½	\$0 87½	\$0 96½	\$0 83½

*This sum in the table on page 12, Report of this Department for 1899, was 11,000 barrels greater, that being the amount of Corniferous rock petroleum produced at Terre Haute in that year and included in the monthly production of Trenton rock oil.

From the above tables it will be seen that the largest production of Trenton limestone oil in any one month was in October, 1901, when 532,960 barrels were produced. The production of the Indiana Trenton rock fields for the eleven years reached the enormous total of 38,475,833 barrels, for which was received \$35,849,735, or an average of \$2,349,976 per year.

By adding to the foregoing table the output of the Corniferous rock oil at Terre Haute and Loogootee, viz., 24,301 barrels, we have a grand total of 5,749,975 barrels of petroleum produced in the State during the year, the total value of which was \$4,795,312.

In the following table there is shown the number of wells put down in the different fields of Indiana for petroleum in each month since June, 1891:

NUMBER OF WELLS COMPLETED IN THE INDIANA OIL FIELDS FROM 1891 TO 1902, BY MONTHS.

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	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	148	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
Total.....													10,357*

*This does not include the wells in the Jasper County field, but includes those at Terre Haute and near Loogootee.

This table shows that 222 more bores were sunk for oil in Indiana in 1901 than in any preceding year. Of the 1,802 bores put down, 1,794 were in the Trenton limestone fields and eight in the Corniferous limestone field in Daviess and Martin counties. The fair average price received for the product throughout the year; the reduction in the cost of iron pipe and other supplies, and the fact that the majority of the bores were put down by old established companies in territory already known to be productive, were the principal causes for this increase of activity in drilling.

From the table it will be learned that up to January 1, 1902, 10,357 bores had been sunk in Indiana for oil. On that date, there were 6,765 producing wells in the State as against 5,492 on January 1, 1901, a gain of 1,273 for the year. By subtracting it will also be learned that since oil was first found in the State, 3,592 bores have proven dry or have been abandoned as nonproductive. The number abandoned in 1901 was 238, or 41 more than in 1900, while the number of dry holes drilled during the year was 291, or 76 more than in 1900. Of the total number of bores drilled in 1901, 16.1 per cent., or 1.1 per cent. more than in 1900, were dry.

The following table gives the

TOTAL NUMBER OF DRY HOLES DRILLED IN THE INDIANA OIL FIELDS
FROM 1891 TO 1902, BY MONTHS.

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1891.....								2	5	4	3	1	15
1892.....	2	6	6	2	3	4	2	3	3	18	6	21	76
1893.....	7	10	10	6	14	6	11	9	5	14	10	9	111
1894.....	19	14	24	14	13	13	9	21	15	14	8	17	181
1895.....	7	4	13	16	22	20	15	23	12	12	9	13	166
1896.....	10	13	6	28	26	20	14	19	4	4	6	8	158
1897.....	8	9	7	12	5	16	11	9	16	11	18	8	130
1898.....	14	4	2	13	9	6	7	10	12	8	13	16	114
1899.....	5	9	14	5	5	7	12	9	12	13	8	4	103
1900.....	11	6	16	20	27	20	32	26	15	21	26	17	237
1901.....	16	10	20	14	32	24	22	27	26	36	44	20	291

In the following table there is shown the

NUMBER OF PRODUCING WELLS, NUMBER OF DRY HOLES, TOTAL BORES AND AVERAGE INITIAL PRODUCTION OF WELLS DRILLED IN EACH OF THE OIL-PRODUCING COUNTIES OF INDIANA IN 1900 AND 1901.

COUNTY.	Producing Wells, 1900.	Producing Wells, 1901.	Dry Holes, 1900.*	Dry Holes, 1901.*	Total Bores, 1900.*	Total Bores, 1901.*	Percentage of Dry Holes, 1900.*	Percentage of Dry Holes, 1901.*	Average Initial Production of Productive Wells, 1900.	Average Initial Production of Productive Wells, 1901.
Adams	120	157	13	18	133	175	9.8	10.2	25.6	29.5
Blackford ...	166	211	36	47	202	258	17.8	18.2	10.4	20.9
Delaware	9	23	4	19	13	42	†1.	45.2	18.4	16
Grant	227	488	13	80	240	568	5.4	14.1	22.5	21.6
Hamilton	3	1	7	.....	10	1	70.	.....	40.	40.
Huntington..	134	69	13	6	147	75	8.8	8.	30.8	24.7
Jay	64	50	41	20	105	70	39.	28.5	22.4	17.6
Madison	18	59	38	45	56	104	68.	43.2	39.	21.7
Marion	6	.....	3	.....	9	.....	33.3	.....	15.8	.....
Miami	45	4	4	3	49	7	8.2	43.	15.4	13.7
Randolph ...	5	13	3	5	8	18	37.5	27.7	8.	44.2
Wabash	2	4	3	2	5	6	60.	33.3	12.5	5.
Wells	542	430	37	40	579	470	6.4	.5	19.	17.2
Daviess .....	.....	.....	10	6	10	6	100.	100.	.....	.....
Martin	3	2	13	.....	16	2	81.2	.....	20.	7.5
Total	1,344	1,511	238	291	1,582	1,802	†a15.	a16.1	a21.4	a21.5

* These columns include bores sunk for oil which yielded gas.

† a = average.