Chapter-V

OIL
The discovery of both tea and coal, the details of which have been discussed in earlier chapters, were the result of conscious efforts on the part of the British. Oil, on the other hand, was an accidental discovery. About thirty years before Colonel Drake drilled the world's first oil well at Pennsylvania in 1859, men were exploring Assam for coal. In the process, these explorers, mainly army officers, found oil in addition to coal.

EARLY DISCOVERIES

The earliest recorded notice of oil in Assam is by Lieutenant Wilcox of the 46th Regiment Native Infantry. He observed a seam of coal in the bed of the Buridihing at Supkong near which petroleum rose to the surface. He also mentioned that the neighbouring jungles were full of an odour of petroleum. In 1828, C.A. Bruce also referred to petroleum while prospecting for coal in the Suffrai Valley. Major White discovered several springs of petroleum at Nampong close to his camp on the Namrup River in 1837. Lieutenant H. Bigge and Dr. Griffith, while exploring the banks of the Namrup River for coal, also came across petroleum springs in the area. Around the same time Captain Jenkins observed several small springs of petroleum near the coal outcrops at Borhat. The oil flowed into the pools in the water course, and "four or five seers were collected in a few minutes," by Jenkins' servants.

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3 ibid., p 5.
In a letter to Jenkins written in 1845 Captain P.S. Hannay, Commandant of the 40th Regiment Infantry, described his search for petroleum in the neighbourhood of Jaipur. He reported that he had come across some specimens of "earthy and indurated sandy asphalt", along with ordinary oil, at a place called Nahar Pung near the mouth of the Namchik River. The specimens were later identified as being composed of earth and sandstone impregnated with petroleum. Hannay wrote:

At Namchik Pathar, near the mouth of the river, the petroleum exudes from the banks, and a bed of very fine coking coal runs across the bed of the Namchik. The hills are also intersected by revines; in one spot an extensive basin or hollow is formed which contains muddy pools in a constant state of activity, throwing out with more or less force, white mud mixed with petroleum. This is indeed a strange looking place and I am told by the Singphos that at time there is an internal noise as of distant thunder, when it bursts forth suddenly with a loud report, and then for a time subsides.

Acting on these reports, an Australian speculator, Wagentrieber, applied for "leases and monopolistic rights over the tract of land between Bappapoong and Namchik" in the Lakhimpur district to ascertain the quality and commercial value of the springs. The Board of Revenue thereupon asked Jenkins, the commissioner of Assam to furnish all the particulars. Jenkins reported the existence of three springs at Makum, Bappapoong and Namchik. He, however, pointed out that Bappapoong was used by the Government as a trap for capturing elephants while Namchik, being located three days journey away from the frontier outpost, was insecure. Makum could be

leased out without any objection. The estimated output at this spring was between twenty and thirty seers of oil per annum. The local inhabitants supplied the same to the Europeans who used it as a preservative against white ants. Therefore, on the recommendations of Jenkins, the Board of Revenue granted a lease to Wagentrieber "to operate the petroleum springs at Makum" for a term of three years. However, there is no record of the experiments of Wagentrieber and presumably the venture failed.

In 1865, H.B. Medlicott, a Government geologist, observed some petroleum springs near Makum. The copious discharge of gas and non-discharge of water being both favourable symptoms, Medlicott recommended that experimental borings should be sunk there to practically test the value of the oil accumulations. In a later survey, Mallet found oil oozing out from the coal rocks at Hukanjuri near Tezpur. At Telpung, on the Dikhow, he saw oil coming out to the surface at frequent intervals from the massive sandstone rocks. Again, at Babu Barpung, on the northern part of the Tipam range, he found a layer of earthy bitumen evidently resulting from the saturation of oil.

From the above discoveries, the intimate connection of the Assam petroleum with the coal bearing areas was obvious. In all the cases, the oil was either on or close to the coal bearing strata. In fact, in those

7 A.S.R., Revenue, July 1854, Prog. No.18.
9 Ibid.
early days, with the exception of the Janji coalfields, petroleum had been found in every coalfield from Namrup to Disai. In 1874 F.R. Mallet observed: 10

In the majority of the cases the springs are near the outcrop of one or more seams of coal... . There is reason to believe that very moderate heat such as would be afforded by the natural temperature of the ground near the surface, and the chemical action involved in the process, is sufficient for the production of petroleum under certain conditions.

In 1865, Goodenough, of Mckillop Stewart and Company, Calcutta, decided to act upon Medlicott's recommendations. Accordingly he applied for a lease of the petroleum springs for twenty years. Although the Board of Revenue did not normally favour the granting of such long term leases, Cecil Beadon, the Lieutenant Governor of Bengal, felt that the application should not be turned down unless the Government itself was prepared to undertake the operations. The local authorities were therefore, authorised to give Goodenough a rent free lease of the petroleum spring in the neighbourhood of Makum for a period of twenty years. He was, however, forbidden to interfere with the catching of elephants by the Government in the neighbourhood. 11 Goodenough immediately started a systematic programme of drilling. 12

His first attempt, a hand-dug well which went down to 102 feet at Naharpung, about thirty miles from present Digboi, led to a dry well. He then brought in a Mather and Platt steam-boring engine to drill his second well.

11 A.S.R., Revenue, File 68 of 1878.
The hole reached a depth of 195 feet, but with the exception of some amount of gas, the attempt proved unsuccessful. However, on 26th March 1867, he struck oil at Makum south of the Dihing River near Margherita, a place named in honour of the Queen of Italy. The oil was found at a depth of 118 feet. This was the first successful mechanically drilled oil well in Asia. About 300 gallons of oil were collected from this well. Between 1866 and 1869, eight other shallow wells were drilled in this locality. One or two of these produced oil in appreciable quantities, but the others produced oil and water intermittently in spurts.

Notwithstanding these encouraging results Goodenough was not successful in establishing a petroleum industry in Assam. The main cause of his failure appears to have been the transportation difficulties which raised the freight cost and the subsequent price of the oil at Calcutta to a figure at which it could not compete with oil from Rangoon or America. Therefore, Goodenough handed over his petroleum rights to a private company, The Assam Mineral Oil Company. This company also met with the same fate because of transportation difficulties.

In January 1878 an application was made by M/s Balmer Lawrie and Company, Calcutta, for the exclusive right of raising, manufacturing and selling petroleum and

13 As a tribute to the Italian Engineer, Chevalier Roberto Paganini, who founded the settlement.
15 ibid.
mineral products in the area around Jaipur for a period of ninety-nine years. The Company offered to pay a royalty of one rupee on every hundred gallons of refined oil. The Chief Commissioner, Stuart Bayley considered such an extensive monopoly neither necessary nor expedient. However, in view of the initial cost of investment and the transportation problems involved, the Government of India decided to give the Company the exclusive rights of working the springs at Naharpung and Makum for a term not exceeding fifty years. The lease was subject to a rental of Rs.50 per square mile which was to merge in the royalty paid for crude and refined oil. The Company was also advised to take precautions against any conflict with M/s Shaw Finlayson Company who had acquired coal extraction rights in the area. 17

In 1879, S.E. Peal, a planter, sailed up the Dihing River to the Nongyang Lake on the Burmese Frontier. He reported the existence of petroleum springs at Margherita and in the vicinity of Jaipur. He further stated that he had evidence to believe that kerosine was being extracted from these oil springs, 18 although he was not in a position to indicate an approximate date for the same. However he was of the opinion that this could have been the outcome of the famous distillation experiments of 1865 by Dr. James Young. 19

In the meanwhile, the Rangoon Oil Company was formed in Burma to refine oil produced from hand-dug

17 A.S.R., Revenue, File No.68 of 1878.
18 S.N. Visvanath, A Hundred years of oil, P8.
19 Ibid.
wells located near the Irrawady River. In Assam, however, lack of transportation facilities was the main impediment in the development of the oil resources. An improved means of communication was, therefore, urgently felt.

THE ASSAM RAILWAYS AND TRADING COMPANY

John Berry White, a Civil Surgeon, Upper Assam, was intimately connected with the development of the Assam Oil field. He had been an active shareholder of the Assam Mineral Oil Company and had followed the progress of oil discoveries with enthusiasm. Sir Boverton Redwood, a petroleum expert, had said that Dr. White's scientific and practical knowledge of this subject, coupled with his long experience, has been of the greatest service in connection with petroleum work. Berry White realised that the most urgent requirement of Assam was an improvement in her transport and communication system. It was generally agreed that neither the large coal deposits nor the oil wells would be of any value unless cheap means of transport in the Brahmaputra Valley could be provided. Although the idea of forming a railway company had originated in 1877, negotiations continued till 1879 when Dr. White invited applications in London for shares in the proposed Assam Railways Company. The main object of the company was the construction of a railway line from the steamer ghat in Dibrugarh to the 51st Mile on the Sadiya Road, together with three branch lines extending to the coal and oil

areas. Owing to poor public response, the scheme collapsed. This disappointment, however, was shortlived. On 30th July 1881, the Assam Railways and Trading Company was incorporated.21 Eventually, this Company played a Yeoman's role in the exploitation and development of the resources of the province.

COMMERCIAL PRODUCTION OF OIL

In 1882 a concession was acquired by the Assam Railways and Trading Company covering the petroleum rights over thirty square miles at Makum, south of the Dihing. It also included the area which Goodenough had earlier worked. The lease was for a period of twenty-five years with the option of renewal for another 25 years. The Company was to pay a royalty of four annas per hundred gallons of crude oil and one rupee per hundred gallons of refined oil, for the first five years. Thereafter they were required to pay 5% of the market value of the crude oil and 20% of the refined oil. Operations were to commence latest by October 1884. The Company had the right to surrender the lease at any time, but a transfer of the same had to be sanctioned by the Government of India.22 The Company selected a site south of the Buridihing. However, after having invested a substantial amount of capital, it was found that the wells in the area were dry. In the meanwhile, as the Company's Engineers were constructing the railway line from Dibrigarh to Margherita, they noticed oil seepages near present Digboi. The generally accepted view is that an elephant, that they were using for pulling timber,

21 See Chapter VI for details.

made the discovery by bringing oil on its feet. In March 1888, the company applied to the Government for a licence to extract petroleum in an area of about six miles near Digboi. The application was turned down by the Revenue Department as the land applied for was situated in a newly constituted reserve forest. The Chief Commissioner, at the same time, promised that no concession would be given to anyone else for two years in the above region. The Department added that if the area already held by the Company south of the Dihing should turn out to be worthless, they would then be prepared to consider an application for a lease elsewhere. Permission, however, was granted for "examining the plot indicated by the company by borings or otherwise," it being of course understood that no trees can be cut or anything else done in the forest without the previous authorisation of the forest officials.

In spite of this unsatisfactory reply the company continued its quest for oil informing the Government in June 1888 that in addition to the borings on the south side of the Dihing River, arrangements were being made to start borings at Digboi, near Borbhil station, about nine miles north of the river. The company submitted a memorandum to the Viceroy, Lord Dufferin, asking that "all the terms and conditions of the lease or deed of the concession to be granted by Government may be forthwith

23 Salam Irene ascribes the accidental discovery of oil in this area to an enterprising Marwari businessman, Saligram Rai Chunni Lal Bahadur. (Now known as Bakliwal in Manipur). He is said to have operated a railway line from Dibrugarh to Sadiya and expanded into other enterprises such as tea plantations, coal mines and timber mills. According to this view, it was Bakliwal who had first observed that the elephants transporting timber in Assam had traces of oil on their feet. Salam Irene, "The Marwaris and the Economy of Manipur, Proceedings of NEIHA 1990, p 257.


25 Ibid.
considered and definitely decided upon".  

It is at this spot on 19th October 1889 that the Assam Railways and Trading Company first struck oil at a depth of 178 feet. The Borbhil station was then dismantled. Another station was thereafter constructed near the newly discovered well. It was named Digboi, sometimes referred to in old papers and maps as "Digboy". This success ushered in the oil industry of India.

The Well No.1 gave a settled production of about 200 gallons per day for several months. Its production, however, gradually declined. Today, it is preserved as a memorial of those pioneers of the oil industry in India.

In 1892 oil was struck at another well. It was described by Dr. White as follows:  

All arrangements had been made for starting the fourth bore and abandoning number three just before oil struck. Mr. Slack, had practically abandoned it when his brother thought he would bore a few inches deeper and had scarcely been at work half an hour when he struck the crust of the reservoir and oil rushed up forty feet high and nearly engulfed them.

Following these successes, systematic drilling was undertaken. By 1894 eleven oil yielding wells had been successfully drilled by the company. In the expectation of continued success, a small refinery was erected at Margherita where oil from Digboi was sent by rails for almost six years. In the meanwhile, work on the Makum oil

\[\text{26 ibid.}\]

\[\text{27 ibid., p 46.}\]
concession was stopped. In a letter to the Government, the General Manager of the Assam Railways and Trading Company wrote: 28

On account of the Company having spent very large sums of money on this concession without meeting with any result to justify the expenditure, my Board in London have now instructed me to stop all further boring operations on this concession, and move the staff and tools to the Digboi concession.

In 1893 negotiations with the Government regarding the boundary of the company's area at Digboi and the terms of lease were completed. A syndicate, known as the Assam Oil Syndicate, was granted a similar lease covering an area adjacent to that of the Assam Railways and Trading Company. 29 In the meanwhile, M/s Balmer Lawrie and Company had abandoned their project and had become the agent of the Assam Oil Syndicate. 30

The Assam Oil syndicate had invested a considerable sum of money in its operations. Owing to its success in obtaining a sufficient quantity of crude oil, the company felt justified in the erection of a refinery and plant for making kerosine and other oils. 31 In order to attract future capital, they requested the Government to extend their existing mining lease from twenty five to thirty years. 32 However, on enquiry it was found that the financial position of the syndicate was rather precarious. About one lakh rupees had already been invested and an estimated two and a half lakhs rupees

30 A.S.R., Revenue A, June 1894, Nos.78-236.
31 ibid., Revenue and Agriculture, Feb. 1895, Prog. No.150.
32 ibid., letter dated 22 Sept., 1894.
would be further required to work the oil wells at Nahor Pung and Bapu Pung satisfactorily. At a meeting of the syndicate in Calcutta, a large number of the shareholders expressed their reservations regarding the proposed venture. They felt that there was no justification in sinking more money in "what must still be looked on as a speculation." They were, however, willing to take deferred shares for their capital in any other company that could be raised for further developing the property. The Government acknowledged that "a bonafide attempt had been made to work the concession."

In the meanwhile, although drilling for oil by the Assam Railways and Trading Company continued to be successful, it was both expensive and time consuming. Better results could be expected only with improved methods and induction of more capital. After long deliberations the Directors of the Company came to the conclusion that profitable development of the oilfields could be best secured by a separate organisation. With this end in view, the Assam Railways and Trading Company promoted another company in 1899, known as the Assam Oil Company. Accordingly, all the rights and privileges in respect of both the Digboi and Makum oil concessions were transferred to the new company. The Assam Oil syndicate also transferred its rights to the Assam Oil Company.

The new company established its headquarters at Digboi. Lord Ribblesdale, Chairman of the Assam Railways

33 ibid., letter dated 22 Sept. 1894.
34 ibid.
35 ibid.
36 ibid., letter No.1693, dt. 12 Dec. 1894.
and Trading Company, was selected as its first Chairman. In 1901 the Digboi Refinery with a production capacity of 500 barrels or 20,000 gallons a day, was commissioned. This refinery supplemented the earlier one at Margherita. In 1902 the first lot of kerosine from this refinery appeared in the market. On the occasion, General Manager of the Assam Oil Company wrote: 38

The Kerosine department has now started in all its branches. Both the refrigerating and sweating departments for the wax are ready to start, as soon as we have sufficient wax oil from the stills to enable a start in these departments to be made. There is still a good deal of work to be done to complete the new Refinery......but a start has been made, and that is the main thing.

The Assam Railways and Trading Company did not relinquish their interest in oil entirely. They took a large number of shares in the new company and the two Boards were intimately connected. Continuity of interest and management survived for over twenty years. In January 1921 the shares were sold and the Burmah Oil Company were appointed commercial and technical managers of the Assam Oil Company. 39 The oil industry of Assam had thus been launched.

With the passage of time, production increased. Production of kerosine from the Margherita refinery increased from 20,394 units in 1898 to 32,876 units in 1899. The following table shows the sale of petroleum


products for the month of December 1900.

SALE OF PRODUCTS DEC. 1900

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEROSENE OIL</td>
<td>Rs.13,418</td>
</tr>
<tr>
<td>LUBRICATING OIL</td>
<td>Rs. 327</td>
</tr>
<tr>
<td>TIMBER STAINING OIL</td>
<td>Rs. 612</td>
</tr>
<tr>
<td>IRON COATING OIL</td>
<td>Rs. 198</td>
</tr>
<tr>
<td>CANDLES</td>
<td>Rs. 536</td>
</tr>
<tr>
<td>CRUDE OIL</td>
<td>Rs. 3,139</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>Rs. 18,230</strong></td>
</tr>
</tbody>
</table>

With the start of commercial production of oil, the rate of royalty was fixed at 8 annas per 100 gallons of crude oil, as against 10 annas paid by the Burmah Oil Company. This "pioneer concession" was granted in view of the special disadvantages under which the enterprise had to labour in respect of the remoteness of the working areas and the difficulties of communication. In the opinion of the Chief Commissioner, this reduced rate of royalty was not "likely to work to the disadvantage of

41 A.S.R., Revenue A, November 1899, Nos. 47-49.
older and well established oil companies in other parts of India." He observed that it was yet to be proved that Assam Oil could be produced in paying quantities or that the Assam Oil Company would ever be in a position to rival the Burmah Oil Company.  

The output of crude petroleum in 1907 was 31,56,665 gallons valued at annas 9-5p per gallon. After refining, the outturn of kerosine oil was 14,84,726 gallons, of lubricants 3,65,910 gallons, of sundry oils 124,458 gallons and of petrol 48017 gallons. The balance consisted of benzines, the bulk of which was allowed to run waste, as it was heavy and highly inflammable. Moreover, its use was limited as a lubricant for machinery. The kerosine oil, though of a fairly good quality was inferior to the American variety. The petrol, on the other hand, had a great demand in the Calcutta market. In 1907 the outturn of wax was 16,38,649 lbs, the bulk of which was exported to Europe, America and South Africa.

As the output from the oilfield rose, the refining capacity was also stepped up. Consequently, a wider range of products was made available as can be seen from the table below:

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42 ibid.

43 G.N. Gupta, A Survey of the Industries and Resources of Assam and E.Bengal 1907-08, p 86-87.

44 ibid.
<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>METRIC TONNES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PETROL</td>
<td>9,742</td>
<td>12.77</td>
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<tr>
<td>LOTUS KEROSINE</td>
<td>268</td>
<td>0.35</td>
</tr>
<tr>
<td>CHAPHUL KEROSINE</td>
<td>35,095</td>
<td>46.02</td>
</tr>
<tr>
<td>JUTE BATCHING OIL</td>
<td>1,839</td>
<td>2.41</td>
</tr>
<tr>
<td>TEA GARDEN FUEL</td>
<td>786</td>
<td>1.03</td>
</tr>
<tr>
<td>LUBRICATION OILS</td>
<td>234</td>
<td>0.31</td>
</tr>
<tr>
<td>DIESEL OIL</td>
<td>71</td>
<td>0.09</td>
</tr>
<tr>
<td>HMP WAX</td>
<td>3,530</td>
<td>4.63</td>
</tr>
<tr>
<td>RESIDUUM</td>
<td>24,508</td>
<td>32.13</td>
</tr>
<tr>
<td>LOSS</td>
<td>196</td>
<td>0.26</td>
</tr>
<tr>
<td>TOTAL</td>
<td>76,926</td>
<td>100.00</td>
</tr>
</tbody>
</table>

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INITIAL DIFFICULTIES

The beginning of the twentieth century saw the oil industry in Assam on a firm footing. However, it had taken over half a century to overcome the initial difficulties and the pioneers had to face innumerable problems.

The main impediment was the presence of thick jungles with such dense under growth that even sunlight could not penetrate to the ground. In such areas, therefore, it was only natural that human habitation was almost unknown. A few months prior to the formation of the Assam Railways and Trading Company, J. Edward Wilson had reported that the undeveloped areas to be traversed by the proposed railway were: 46

Covered over literally with forest or jungle about as penetrable as a brick wall. The solitude of the desert may be great, but not as desolate as here: and the absence of all signs of life, when a view of any extent of the country can be had, is sadly oppressive there being scarcely any indigenous speculation.

Added to this was the lack of transport facilities. 47 In reviewing the operations of the Assam Railways and Trading Company a member of the Board wrote: 48

The serious nature of these difficulties will be realised, when we state that it took us six days of hard travelling involving exposure at night in the

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47 See Chapter VI for details.
48 A.S.R., Revenue and Agriculture, Aug.1894, Prog.141.
jungles and on the sand banks in the Dehing River to reach Makum. A few Sepoys maintained, at that time, a precarious existence in Makum Tower as a post of observation over the Naga savages, who were the only inhabitants on the south bank of the Dihing, which even at that very recent date, was not regarded as under British control at all. The Nagas were a terror to the adjacent British territory and punitive expeditions against them were a frequent occurrence. We were aware that there were large coal deposits in the vicinity of the oil wells, but they could be of no value to anyone unless cheap means of transport could be provided.

All supplies, tools and casing for the wells had to be carried from the main settlement by elephant which was undoubtedly a cumbersome and arduous task.

Another very serious problem was the unhealthy working condition in the jungles. Diseases like Malaria, Kala-azar and Cholera were rampant and hundreds of lives were lost. Commenting on this, Hopkinson, Commissioner of Assam wrote that in Assam people were always.

Either falling sick, are actually sick or are convalescing and in which either of the three stages they may be, the work they have to do does suffer greatly. Moreover constant recurrence of disease and weakness, both in mind and body, breaks down hope, energy and enterprise and sets up in the place a desponding careworn mood with despair of everything and finally discontent creeps in everybody and everyone in Assam wishes to get out of it.

Sickness and mortality rates were so high that a survey in 1836 revealed that Assam was surpassed by just a few other places with regard to mortality rates.

When Cholera broke out in 1851, one fourth of the


50 M' Cosh, Topography of Assam, p 88.
population of Gauhati died within a few weeks. Similarly kala-azar and malaria also claimed a large number of lives every year. It was, therefore, not easy to attract capital and labour to these areas.

The recurrent problem of labour aggravated the difficulties of the pioneers. The local Assamese and Bengali labour were prone to disappear during the harvesting season with little certainty of return. Hence the bulk of the labour force had to be brought from other provinces. Like the tea and coal industries, the oil industry was also largely dependent on immigrant labour. The workers were recruited in two ways: directly or through contractors. In either case, recruitment of labour was expensive especially when the high mortality rates were taken into account. The monthly wages of the labourers varied between Rs.8 and Rs.10 for a man and between Rs.7 and Rs.9 for a woman.

Another serious handicap faced by the pioneer was the absence of appropriate technological skills to extract the oil on a commercial basis. Although oil was detected in several areas in Upper Assam by the middle of the nineteenth century, its commercial exploitation was possible only towards the end of the century when newer technological innovations were introduced into the oil fields of Assam. Till such time, oil extraction was carried out in a rather primitive form.

51 H.K. Barpujari, American Missionaries and North East India, p 58.
In the early years the method of oil extraction was very crude. The first wells were planklined shaft five feet square. Once the shaft was completed, the oil diggers were lowered down the wells on a rope over a pulley. In a 250ft deep well, it took about fifteen seconds to reach the bottom. After about half a minute of frantic digging and loading pots in an atmosphere saturated with gas, the digger was hauled up. He then required half an hour's rest before he sufficiently recovered to go down again. The light by which the digger worked was provided by a mirror at the mouth of the shaft. The arduous nature of the task can thus be easily conceived.

With the passage of the time and improvement in technology, innovations were introduced. Towards the end of the century most of the oil was extracted mechanically. The following mechanical method of oil extraction was initially adopted.

Over each well a huge derrick, about sixty feet high, was constructed. Lengths of steel casing, varying in width from four and a half inches at the bottom to fourteen inches at the top, were inserted into the wells. From the top of the wells, long metal pipes led to huge storage tanks where the crude oil was stored. From there the oil was transferred to boilers.

The crude oil was then subjected to various processes of distillation. The vapour that came off from the first boiler condensed into oil which contained naptha and petrol, and the residue passed by gravitation into a second boiler. The vapour that came off from the second boiler condensed into an impure form of kerosine(a), and the residue was carried to a pot which was gradually heated till it became red hot. The vapour which was given off during this process condensed into a heavy oil containing paraffin wax (b), while the residue baked into a hard coke, which was broken up and removed from the still after it had cooled. The impure kerosine(a) was then mixed with the heavy oil(b) and the product was treated with sulphuric acid and caustic soda and redistilled. The vapour that came off condensed into kerosine oil, which, after being again treated with sulphuric acid and caustic soda, was ready for use, while the residue was heated in a pot till it gave off a heavy oil containing wax. This oil was then passed through huge drums with a refrigerating chamber in the centre, and the cold caused the wax to crystallize, so that the oil and wax left the drums in a sort of buttery mass. This semi solid product was then forced through layer after layer of cloth which collected the wax and allowed the oil to run off. The oil was then treated with sulphuric acid and caustic soda, and redistilled. The first vapour to come off was a light burning oil which was mixed with the impure kerosine(a), the second product
was an intermediate or fuel oil containing paraffin, the third a lubricating oil. The lubricating oil still had too much wax so once more it was passed through the refrigerating drums and layers of cloth, and it was only then, after it had been concentrated to remove the higher oils, that it was fit for use. 54

Thus by the beginning of the twentieth century a sophisticated industry had been set up in Assam. The establishment of this industry, however, failed to have any visible impact on local economy and society. As far as the common Assamese were concerned, it merely symbolised the influx of more Europeans and immigrants from other parts of the country.

The entire capital invested in the oil industry from the very beginning, had been European. As such any profits accruing therefrom were totally drained out from the province. Besides, as the oil industry is highly technical, all the skilled labour was initially imported from the West along with the machinery and tools that were required for the operation of the plants. This meant that the greater portion of the salaries also went to the foreigners. The oil industry by nature, is more capital intensive than labour intensive. The scope for the employment of the local people was therefore minimal. Hence, the province was also deprived of the secondary benefits in the form of wages to the indigenous people. In spite of the existence of the tea and coal industries,

54 Gait and Allen, Assam State Gazetteers 1905, pp 196-97.
it has been seen that Assam continued to remain backward. As such there was practically no local demand for the products of the refineries. For example, even as late as 1905, there was only one motor car in Assam. Consequently, almost all the petrol that was produced, was sent out to Calcutta, while the total quantity of wax was exported to the West. Thus once again the establishment of a modern industry failed to generate any corresponding development whatsoever in the local sector.