

# Traditional Hand Digging Oil Wells in Myanmar

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## Abstract

This paper presents traditional hand digging oil wells in Myanmar and describes the origin and development of oil production in Myanmar. The method of digging wells by hands was used by hereditary owners of oil wells in Yenangyaung oil field. Myanmar traditional digging oil wells by hand can be divided into three sectors: ground preparation work, shallow well digging and deep well digging. Progress in earth oil production, the use of large and small glazed earthen pots and transportation are also presented in this paper. It is found that after the annexation of upper Myanmar in 1886, tradition of digging oil wells by manual Labour gradually disappeared.

**Keywords:** Oil well, digging, workers

## Introduction

Oil production had and still played a major role in the economy of Myanmar. Oil was found since the reign of king Tannet in the Bagan period (AD 905). During the reign of king Anawratha, the oil was used in preservation of palm leaves and lighting. The palm leaves recorded with Pitakas were smeared with oil to prevent from insects. It was also used as medicine and to light lamp. Earth oil remained as an important item imposed on the taxpayers in the Konbaung Period. Starting from 1852 in the reign of king Mindon, the oil wells in Yenangyaung were all confiscated and oil production was systematically managed<sup>1</sup>. The earth oil, teak and precious stones were designated as perquisites of royalty. The oil produced from Twingon and Beme wards of Yenangyaung was carried to Yangon Port in lower Myanmar under the English from which it was sold to the foreign companies<sup>2</sup>. The *Twinyos*<sup>3</sup> and *Twinzas*<sup>4</sup> also enjoyed great benefits from the oil.

Yenangyaung was major oil-producing area of the country since monarchical period; Oil fields were mostly found in Twingon Ward and Beme Ward. The people living in

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<sup>1</sup> U Yo Pe, "Yenangyaung Myo Thinkhapa Sartan", Yangon, Thuria Thadinsarteik, 1939, p.8 (Henceforth: Yo Pe, 1913)

<sup>2</sup> U Khin Maung Gyi, '*Myanmar Yenana Thamaing*' (Memories of the Oil Production in Myanmar), Yangon, Sarpaybeikman Press, 1980, p.21 (Henceforth: Khin Maung Gyi, 1980)

<sup>3</sup> Lords of oil wells)

<sup>4</sup> Owners of oil wells

this area earned their living by oil production. The petroleum is said to be originated from the accumulations of organic remains on the seafloor in the past millions of years ago<sup>5</sup>. Several oil wells were dug by hand or by lever mechanism and by drilling. Oil wells dug by hand in the Yenangyaung Oil Field were called hand dug wells. The method of digging wells by hand was used by hereditary owners of oil wells. The hereditary oil well owners had the right by royal grant to work oil wells<sup>6</sup>. At first they dug oil wells by hand around oil seepages and drew the oil out. They obtained crude oil up to 50 gallons per day. In the late 18th century, fairly deep oil wells were dug for oil production.

Oil workers managed to dig wells down to 200 feet in depth. It is said that the oil well belonging to *Twinsayo* Daw May was about 400 feet deep<sup>7</sup>. In the early days of oil production by hand, there were two kinds of hand dug wells. They were shallow wells which were a few feet deep and deep wells which were over 100 feet in depth.

In ancient Myanmar, the Schlumberger method of gun perforation was unknown to the ancient oil workers. But they could tell the striking of oil by observing rock types, fossil content, and change in hollow sound of the well. They could tell the striking of oil by making use of the sense of taste with tongue<sup>8</sup>.

Myanma's traditional digging of oil wells by hand can be divided into three sectors. They were: -

- (1) Ground preparation work,
- (2) Shallow well digging, and
- (3) Deep well digging.

In the preliminary ground preparation work, the first to do was the selection of well site. By past experience, they chose the site where peikthinkhat (*Cassia auriculata*), prickly pear (*Euphobia trigona*), zaungyan (*Qsyris aborea*) and htanaung (*Acacia leucophloes*) grew. Such a site was regarded as a place where oil could be struck at depth by persons

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<sup>5</sup> Capatin Thein Kyaw, *Burma Myaysi Myanma Shweyi* (Earth oil of Myanmar, Golden Liquid of Myanmar) Yangon, Daily Gazette Press, 1959. (Henceforth: Thein Kyaw, 1959)

<sup>6</sup> Yenamyay Ba Pe, "Mindon Min Khit Hma Bemepaykhethaw Yenamyay" (Sanctuary Oil Field During the Reign of King Mindon), *Sarpay Loketha Magazine*, No. 29, Yangon, Win Shwe Sin Press, 1983, pp.126-127 (Henceforth: Be Pe, 1983)

<sup>7</sup> Yenamyay Ba Pe, "Yenamyay Myohaung Seiktha Kwanhtauk" (Old Oil Town Seiktha Royal Camp), *Sandar Magazine*, No. 154, Yangon, Sandar Press, January, 1982 (Hence forth: Ba Pe, 1982)

<sup>8</sup> Yenamyay Ba Pe, "Shaykhit Myanmar Yenandug Wells" (Ancient Myanmar's Handdug oil Wells), *Myawady Magazine*, Vol. 30, No.7, Yangon, Myawady Press, 1982, p. 109 (Henceforth : Ba Pe, 1982)

who earned their livelihood on oil well digging<sup>9</sup>. The traditional *Twinza* or *Twinyo*, after selecting a well site, applied to the oil minister for permission to dig oil well. But during the colonial days, they could dig oil wells only after getting a license to dig oil well. Then, the traditional *Twinza* or *Twinyo* gave the oil well site to the foreman of the oil workers. The foreman, after collecting workers, set to work to clear and level the ground. If the chosen site was on a hill side the ground was leveled and a path was built down the slope for running the rope.

The ground preparation work was carried out by four diggers, one well controller, six rope runners and eleven workmen. The essential materials and implements in digging oil well were:-*tantonekhwa taing*<sup>10</sup>,*-tone*<sup>11</sup>, two top- knots<sup>12</sup>,*sikyo*<sup>13</sup>, *cheikkyo*<sup>14</sup>, *toke*<sup>15</sup>, *tarakhan*<sup>16</sup>, *taras*<sup>17</sup>, *myaysatin*, *cha-chin*<sup>18</sup>, *awakyin phaungkan myay-oe*<sup>19</sup>, and *taywir*<sup>20</sup>. Then a fine *thalia* mat was spread over the spot where the well was to be dug. Steamed glutinous rice, fried whole fish, coconut meat, white rice cake, red rice cake, fried dumpling of glutinous rice and jaggery were placed on eleven plates. They were then offered by traditional *Twinsa* together with foreman and oil workers in propitiation to the spirits of seven queens, their brothers, grandpatron, and the spirits of the earth and the trees. In propitiation the following was recited:"

"Benefactor Lord Grandpatron, and seven queens of Nyaung-ok, Nyaungshwe, Sale, Tilin, Kyapin, Popa and Nyaungyan, brothers and eminent Kyay-punnas are all invited to feast the offerings and bless us with foam stretching like a mountain range and liquid spurting up to the sky." <sup>21</sup>

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<sup>9</sup> Thaug Thaug, "Myanma Yoya Yenana Lettwin Tuphaway Lokangan" (Manual digging Myanmar traditional oil drilling), Typescript, 1970, P.14 (Henceforth: Thaug Thaug, 1970)

<sup>10</sup> wooden posts with forked branches

<sup>11</sup> cross-beam

<sup>12</sup> pulley

<sup>13</sup> rope tied to the waist of the well digger in going down

<sup>14</sup> the rope communicating between well controller and well digger

<sup>15</sup> plank placed at the sides of the well to prevent the earth from caving in

<sup>16</sup> longer cross-plank placed at the bottom of plank preventing cave-in,

<sup>17</sup> plank placed on two opposite tatakhan planks

<sup>18</sup> bamboo basket for loading and raising well diggings

<sup>19</sup> glazed earthen pot with narrow opening made in phaungkan village

<sup>20</sup> iron-bar one foot in length, with 2 cubits and one span long handle and 2<sup>1</sup>/<sub>2</sub> viss in weight

<sup>21</sup> Yo Pe, 1913, p.8

The opening of the well was two cubits wide. Two pits were dug at a distance of one cubit from each side of the well and two forked wooden posts were erected at a height of three feet. A long was placed in mortise on the two forked wooden posts. Four forks with two top-knobs were fixed at the centre of the long. In going down the well two ropes—riding rope and hook rope were used<sup>22</sup>. The riding rope was used to tower or raise the well digger and the hook rope was for raising the well diggings to the ground surface and to draw the oil out of the well. In digging oil well, it was systematically prepared starting from opening of the well with the crow bar. The sand dug out from the well was heaped around the well in a circular form. As the diggings were systematically heaped into small mounds, it was a beautiful sight when seen from a distance. By the time the well was about 20 cubits deep, it turned out neatly with a mound-like ground, log holding posts and top-knobs.

At the marked spot of the well, a square pit was dug. Such well digging was called opening of shallow well. When the square pit was fairly deep, a circular well like ordinary water well was dug at the centre of the square pit. When square pit was fairly deep, a circular well like ordinary water well was dug at the centre of the square pit. When circular well had been dug to a certain depth, the square well was again dug. Digging of circular well in the square well was called kanchaw<sup>23</sup>. The sand dug out from the well were used to be systematically heaped in a circular form around the well. After kanchaw had been done, the walls of the well were lined with planks<sup>24</sup>. As the oil well was square in form, the planking was done on the four sides. After digging the well in a square form to a certain depth, kanchaw digging was done. After kanchaw digging, square digging was done again and the well sides were planked. The planking of the walls was to prevent the earth from caving in.

In planking the walls, *tarakhan* was used first. *Tarakhan* was about one cubit longer than the toke planks. The two ends of *tarakhan* were inserted in the holes dug in the walls. This operation was called fixing *tarakhan*. After fixing *tarakhans tarasi* was placed cross-wise on the *tarakhans*. Then, toke planks were placed one upon the other on the four sides. It took sixteen planks in all to cover the walls on the four sides. The ends of toke

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<sup>22</sup> Albert, L. "The petroleum Wells of Yenangyat," *Journal of the Burma Research Society*, Vol IV, Part ii, 1942, 119–120 (Henceforth: Albert, 1942)

<sup>23</sup>Thein Kyaw, 1959, 99

<sup>24</sup> To prevent the earth from caving in the planks were stacked on the walls of the well Stacking planks one upon the other is called Toke-khat

planks need not to be inserted into the walls like *tarakhans*. The toke planks have notches at the two ends. These notches fitted with the notches of the other toke planks. The notches are to keep the planks in place without moving<sup>25</sup>.

Placing toke planks one upon the other is called *letkamaung khattin* and *mikatboungh khattin*. It means placing one upon the other. After *tokekhat*, the remaining open spaces are also appropriately planked to fill up uncovered places. This was called *taranyuntthat*<sup>26</sup>.

If open places are still left after filling in, these places are also covered with bits of planks. This operation is known as *kyetshaphauk*<sup>27</sup>

Digging to a depth of 20 cubits was not considered to be the sector of shallow well digging. Beyond the depth of 40 to 50 cubits, scorching heat, foul smell or foul vapour was met with. Under such circumstances, the digger dared not go on digging. Then selected worker called *htaukpyan*<sup>28</sup> was hired to continue digger.

Particularly when hand dug well reached a depth of 150 feet, the oil well digger encountered with foul smells of gases, spurting water, cave-ins, and difficulty in breathing due to carbon gases and faced with risk of life<sup>29</sup>. Therefore, a siphon operated by a plunger device was used to supply air to well digger<sup>30</sup>. Thus, an iron helmet fitted with transparent glass in front and raincoat<sup>31</sup> were invented for the well digger to wear. Reflecting mirror was also used to provide light for digging and for seeing the digger from the well top<sup>32</sup>. In digging well by hand, the well controller watched the well digger from the time of his

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<sup>25</sup> Thaug Thaug, 1970, 7

<sup>26</sup> Toke planks are appropriately left to fill up blank places

<sup>27</sup> Bits of toke planks are sharpened and stuck into the remaining open spaces

<sup>28</sup> One who holds his breath and digs well

<sup>29</sup> Ba Pe, 1982, 118

<sup>30</sup> Royal Herald U Toke bought through Kawi Company in Yangon an air pump used in pearl diving and tested successfully in digging oil well. As it was bought from Bombay, it was known as Bonbaing machine

<sup>31</sup> The raincoat was sewn to an airtight iron helmet fitted with glass. The raincoat was provided with loose sleeves and reached to the knees. It was worn starting from the head. The raincoat was air tight. The nose was provided with air pipe for breathing. The water proof khaki coloured raincoat sewn to iron helmet was the wearing designed for deep well digging

<sup>32</sup> In setting up a reflecting mirror was placed on the side where the shadow was cast. The mirror reflected sunlight to a small mirror at the bottom of the well. Sometimes a plate of tin plate from a new kerosene can be used instead of a mirror at the bottom. But for the wells located in gully or on lowlying places, mirror could not used to give light to well digger at sunrise and sunset

<sup>29</sup> Thaug Thaug, 1970, 9

descent from the mouth of the well. He was in fact the benefactor of the well digger. The well digger intending to descend a well had to fix his mind only on one thing. If his attention was distracted to other social problems, it is said that he experienced scorching heat if he thought of fire or felt cold numbing his body if he thought of water<sup>33</sup>. If a well digger was possessed by a well<sup>34</sup>, he could no longer work in a well. He had to be promptly up to the ground surface.

When possessed, well digger had been quickly pulled up to the ground surface, he was usually brought to consciousness by fanning or pouring water upon him<sup>35</sup>. The well controller was of great importance for the well digger to descend the well in good condition.

When the well digger was ready to descend, the well controller ordered the rope runners to hold the rope firmly. This order was called swetaung. When the well controller ordered "lite", the well digger brought the two legs together which were spread apart on the sides of the well. He rode on the rope which was slowly lowered<sup>36</sup>

The controller and well digger communicated by pulling and shaking the riding rope and hook rope. One sharp pull of hook rope was the signal for raising the basket containing well diggings. Two sharp pulls on the hook rope signaled to change the toke plank. In case the well digger wanted to halt before reaching the bottom, he shook the hook rope<sup>37</sup>.

If something happened while excavating, the digger pulled the riding rope around his waist. The controller dropped another rope to the digger. Then, both riding rope and spare rope were pulled up. Therefore, the well digger had to dig the well but he had to inspect the condition of the toke planks as well. He had to attend to the maintenance of the well. While excavating the oil well, the digger used to encounter with hard slabs of rock. In such cases, a heavy plumb-bob<sup>38</sup> with a nose-ring was dropped onto the stone slab to break it<sup>39</sup>. Then the plumb-bob was picked up by a man descending the well. Sometimes, it was met with difficulty in picking up because of petroleum gases.

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<sup>33</sup>Thaung Thaung, 1970, 9

<sup>34</sup> It is said that a well digger is possessed when he became delirious after breathing in petroleum gases

<sup>35</sup> Thein Kyaw, 1959, 102

<sup>36</sup> It is the order to lower the riding rope for the well digger to descend

<sup>37</sup>Thaung Thaung, 1970, 9

<sup>38</sup> Cheincha is the dropping of a ball of iron shaped like a papaya fruit. It was provided with a nose-ring for tying a rope

<sup>39</sup> Albert, 1942, 119-120

The oil well diggers could foretell the striking of oil by studying the rock types, mineral and fossil contents of the excavated rocks, change in the hollow sound of the well and the odors exuded by the well<sup>40</sup>. Then the well digger had to be quickly pulled up to the ground surface<sup>41</sup>. Thus "*khapan* oil"<sup>42</sup> used to be obtained between depths of 120 and 150 feet. Between depths ranging from 187 feet 5 inches to 225 feet, good quality crude oil used to be obtained in large amount<sup>43</sup>. On striking oil<sup>44</sup> the foreman of the workers immediately reported the good news to the *Twinza* or *Twinyo* who owned the well<sup>45</sup>. On such occasion, the traditional oil well owner *Twinza* or *Twinyo* used to give silk *longyis* to the well diggers, shirt, turban and necklace to the well controller and silk scarfs to the female rope runners as rewards.

In excavation of oil well, when a depth over 100 feet was reached an air pump was kept in readiness. A lean-to was built and oil storage pits *khatkyins* were dug near the oil well. Supplies of sand and water were kept in readiness. Large glazed earthenware pots with holding capacity of a hundred viss or 150 viss were used to hold crude oil. Later, both large and small tanks made of corrugated iron sheets were used in the place of glassed earthen pots. Oil from the *khatkyins* was bucketed and poured into glozed earthen pots or iron tanks<sup>46</sup>.

Oil from the glazed earthen pots was transferred to smaller glazed earthen pots which were then transported to load on boats at the river port by means of bullock-carts or porters. There used to be over seventy to nearly eighty large country boats awaiting at the river port to be loaded up with oil. Such a country boat had the capacity to carry over 60 tons of crude oil<sup>47</sup>.

Thus, Myanmar oil production was connected with pottery, carting and boating production<sup>48</sup>. With progress in earth oil production, the use of large and small glazed earthen pots, boats and carts was also increasing.

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<sup>40</sup> Ba Pe, 1982, 28

<sup>41</sup>Thein Kyaw, 1959, 104

<sup>42</sup>Oil spurting from the wall girdle of the well

<sup>43</sup>Thein Kyaw, 1959, 103

<sup>44</sup> Striking of oil is obtaining of crude oil in large amount in excavation of an oil well

<sup>45</sup>Ba Pe, 1982, 109

<sup>46</sup> Khatkyins are pits where crude oil drawn from the oil well was stored

<sup>47</sup> Thaug Thaug, 1970,11

<sup>48</sup> *Myanmar minmya Lethtet Sethmu Lethmu Lokengan Thamaing* (History of Industries during the Reign of Myanmar Kings), Ministry of Industry No.1 March, 1988, p. 40

With the introduction of air pump in excavation of oil wells, there were increases in the number of oil workers and the rates of daily wages. Therefore, a gang of oil workers comprised of one air-pump in-charge four oil well diggers, one well controller, six rope runners, and six air-pump workers the total number of workers being eighteen.

The daily wages were five *kyats* for the air-pump in-charge four *kyats* each for oil well diggers (total sixteen *kyats*), two *kyats* for oil well controller, one *kyat* each for the six rope runners (total six *kyats*) and one *kyat* each for six air pump workers (total six *kyats*)<sup>49</sup>.

In those days, the earnings were sufficient for food, clothing and shelter for the oil workers. As the oil well owners used to solve the problems on occasions of joy and grief, there was no dissatisfaction between oil well owners and oil workers. Crude oil or earth oil production began with acquiring of a working permit from a *Myaytaing thugyi*. In those days, earth oil was collected from natural oil seepages on the ground surface. During the Konbaung Period, there was not commercial production from oil seepages. Oil was collected from shallow pits scooped out by hand around oil seepages. There was progress in the production of earth oil from shallow wells yielding 10 to 50 gallons per day.

To the inquiry made by a British envoy comprising a British Geologist, T. Oldham, Captain Renny and Captain Yule, *Twinzas*, oil diggers, porters and cartmen answered that there was no certainty in digging oil wells. Hard rock was found at about a depth of 10 cubits, clay at about 20 cubits, pebbly rock at a depth of about 30 cubits and clay at a depth of about 40 cubits. Yellow clay was sometimes found when it strikes oil. If fortunate, there could be oil seepage at depths ranging from 180 to 190 cubits. Sometimes, there was no oil at all and such well was abandoned despite the cost of digging. In most cases, the oil wells which were 250 to 260 cubits used to yield oil well yielded 150, 200, 300, 400 gallons a day<sup>50</sup>.

The crude oil was transported by large boats and rafts to Lower Myanmar in glazed earthen pots. By that time, lower Myanmar was under the British rule. Then, the foreign merchants in Yangon exported the crude oil to England and America. In England, the crude oil was refined to produce candle wax, engine oil, lubricant and kerosene. In America, Yangon, oil was used in cleaning weapons<sup>51</sup>. Myanmar used the crude in painting the wooden buildings such as houses, monasteries, *Zayats* and *Tazaungs* and also boats for

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<sup>49</sup>The owner of bombaing or air-pump who organized oil well diggers, well contract basis

<sup>50</sup> Dr Than Tun, *Nehle Yazawin* (Peripatetic History), Vol. II, Yangon, Nantha Press, 1969, 154

<sup>51</sup>Ba Pe, 1982, 13

lasting longer. The oil production in Myanmar expanded from domestic use of materials to transportation and trading<sup>52</sup>.

The construction of a hand dug well on the Yenangyaung Oil Field was not an easy task. As a Burmese historian has said the method of taking crude oil from the pits was primitive, mainly relying on physical power. After the annexation of upper Myanmar in 1886, the distribution of the oil produced from Yenangyaung oil-field was monopolized by the BOC and other English oil companies. The BOC then used machine in digging oil wells in Yenangyaung oil field. The *Twinyos* and the *Twinzas* who could only shallow hand dug wells could not compete the BOC and other British oil companies in oil production. As a result, the *Twinyos* and *Twinzas* tradition of digging oil wells by manual labour gradually disappeared under the exploitation of the British industrial capitalists.

### Conclusion

In summing up, Myanmar oil production played an important role in the Myanmar's economy. In Yenangyaung Oil Field area, the traditional *Twinyos* and *Twinzas* worked oil wells by hiring manual oil well diggers in digging oil wells employing physical power. The oil production in Myanmar expanded from domestic use of materials to transportation and trading. After the annexation of Myanmar by the British in 1886, the oil production was operated by founding of Burma Oil Company. In digging oil wells, the BOC used machine, and the production of oil was much greater than the hand-dug wells. Therefore, *Twinyos* and *Twinzas* did not enjoy the benefit like the British (BOC).

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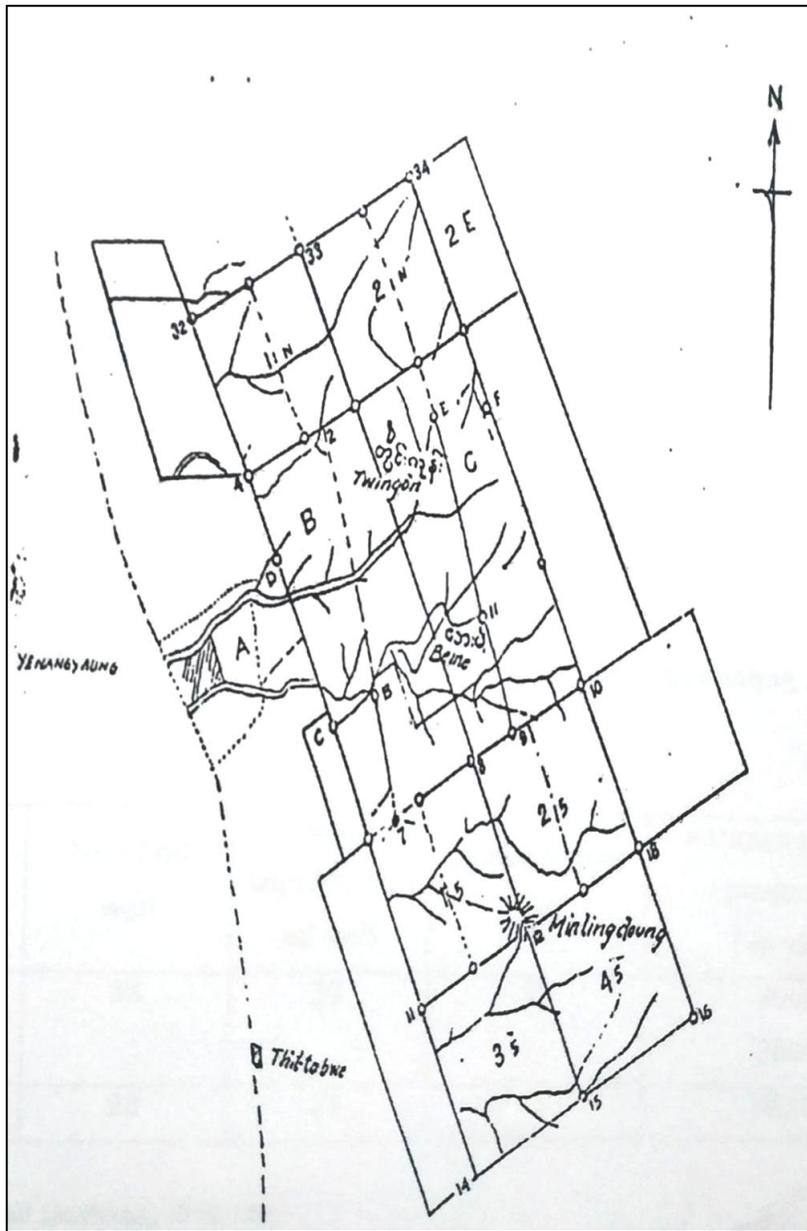
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**Native Well Digger in Diving Dress**



**Burma Oil Company's Oil Exchange**



Source: U Naing (Twinza) Collection