

**Iron Metallurgy in Manipur with Reference To
the Ancient Iron Smelting Sites at Kakching: An
Archaeological and Empirical Approach**

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Abstract

Iron (Fe) is a metal found abundantly in the earth's crust and is considered one of the most important metals for the growth and development of human civilizations. Iron smelting is the technological process of extracting iron from its ores. Regarding the origin of the art of iron smelting in the world, most of the historians point towards Asia Minor (Anatolia and the Caucasus) in the region of Armenia, where the Hittites performed the iron-making processes around 1700 BCE. Manipur is one of the eight states of North East India, which was also an ancient kingdom with a long recorded history of its own. The growth and advancement of iron use and its metallurgy in the region is a very important area of research for the reconstruction of a precise history of technology in Manipur. This is when an iron-smelting community called the Kakchings comes to light. Historically, they are known for their expertise in the art of iron smelting. It is also suggested that they supplied iron to the kings of Manipur as a yearly tribute. This paper focuses on the introduction of iron use and its metallurgy in the ancient kingdom of Manipur, based on archaeological and literary sources. The significance of iron smelting sites found in and around Kakching is also analyzed for a better understanding of the development of iron metallurgy in Manipur.

Key words: *Iron, Iron smelting, Iron metallurgy, Kakchings, Khamlangba.*

Introduction:

Iron is the most abundant metal found on earth (by mass). It is considered as one of the most important metal for the social and economic development of the human society. The ancient civilizations experienced a big jump in technological advancement and economic growth within a short period of time by using iron tools and weapons for household, agriculture and war purposes. Historically, the use and production of iron have come a long way. V. Tripathi expressed “*Iron as a metal undertook a long journey from one of the most expensive metals (four times more expensive than gold) to the cheapest one, from the costume apparel of mobility to the tools of the craftsman and the farmer*” (Tripathi, 2001:26). The earliest known iron artefacts are the nine small beads which are dated to circa 3200 BCE, found in the burials of Gerzeh, Egypt, by G. A. Wainwright (Weeks, 1968:31). Based on their

7.5% nickel content, they are found to be made of meteoritic iron shaped by hammering into beads and strung into ornaments with gold, lapis lazuli, carnelian, etc. (Thilo *et al*, 2013). Similar was the case with the blade discovered from the royal tomb in Ur (Kroeber, 1948:725). It is generally accepted that the type of iron first used by humans was of meteoritic origin. Meteoritic-iron is different from terrestrial-iron which is rust-resistant due to its high nickel content. It was used in making decorative ornaments and expensive weaponry crafts in ancient times. Iron metallurgy is equally important as the iron itself. It is the process of producing iron from its ores and using it to make different types of tools and weapons for both domestic and social uses. The process requires a set of technological skills and knowledge. V. Tripathi has rightly stated that “*The innovations in metallurgy led to its (iron) adaptation on a much larger scale than ever before*” (Tripathi, 2001:26). The topic of the origin of iron and ferrous metal metallurgy is still in debate. But according to the archaeological findings, Hittites in Anatolia appear to have produced iron from their ores between 1500 and 1200 BCE (Weeks, 1968:32). Historians like Weeks, N. R. Banerjee, and D. P. Agrawal suggested that iron metallurgy originated in Anatolia and was spread to other parts of the world after the fall of the Hittites in 1180 BCE. This theory of the single origin of iron metallurgy is strongly argued by other scholars like Dilip, K. Chakrabarti, Jane Waldbaum, John Newton Friend, and Vinay Tripathi with a different theory of multiple origins of the technique (Tripathy 2001).

India is well known for its crafts in the field of iron metallurgy. Damascus steel also known as Woodz steel, which is considered as a valuable metal in antiquity, first appeared in India. The Iron Pillar of Mehrauli, Delhi, which is also known as the *Rustless Wonder*, has been a worldwide sensation for a long time. And it is also reported that during the revolt of 1857, the British found it very hard to destroy the Indian blades seized from the Indian armies (Tripathi, 2001:25). According to earlier researchers like Gordon and Wheeler, the beginning of ironworking in India may be traced back to 700–600 BCE. But with the introduction of radiocarbon dating in association with archaeological evidence of the Painted Grey Ware culture, it had been pushed back to the second millennium BCE (Tiwari, 2014:536), which is generally accepted among the majority of scholars.

On the question of how it was started in India, two primary theories have been developed. The first one suggests that the knowledge of the iron working process was diffused from the Hittites of Anatolia and was brought to India by the Aryans after the fall of the Hittite empire. This theory was supported earlier by scholars like Wheeler, Gordon, M.N. Banerji, Roy, N.R. Banerjee, Neogi, etc. (Tripathi, 2012:4). But scholars like Chakrabarti, V. Tripathi, and Rakesh Tiwari, strongly challenged the theory on the basis of archaeological and metallurgical facts and data. This group of scholars propounds the second theory which indicates the indigenous origin of iron metallurgy in India. Chakrabarti said “*In any case, there is no reason to relate the origin of iron in India to any process of dispersal from a fixed centre of origin in Anatolia*” (Chakrabarti, 1972:183). Rakesh Tiwari also stated that ironworking in India developed independently (Tiwari, 2012:543). V. Tripathi had also done extensive work on the emergence of iron technology in India. She said that, “*Archaeological evidence on iron technology*

at its earliest level has been examined in divergent cultural zones that existed in different ecological settings. Each of these cultural units was almost independent of each other, having few common traits."(Tripathi, 2012:37). She then deduced "*a detailed evaluation of the literary, archaeological, and metallurgical data on iron technology in ancient India is suggestive of its independent beginning in the subcontinent.*" (Ibid: 36). However, in both cases, northeast India had not been touched.

Regarding the history of iron metallurgy in North East India, there is the same question of whether the knowledge of iron smelting is of indigenous origin or was it brought to the region from other places. It is a fact that very few works have been done focusing on the history of iron metallurgy in North East India. The area deserves more attention from scholars and researchers. Two scholars, Pawel Prokop and Ireneusz from Poland, had done extensive work on the history of iron smelting in the Khasi Hills, Meghalaya (North East). They collected charcoal samples from the different layers of iron slag and sandy colluvial deposits at the Nongkrem and Raitkteng sites in the Khasi hills. The dates of the samples were determined through radiocarbon dating method. The sample from the Nongkrem site was dated to 2040±80 years BP (Pawel and Ireneusz, 2013:766). Pawel claimed it as "*the earliest studied iron smelting site in the Khasi Hills and consequently, in the whole of NE India*" (Ibid). But the given date is quite late as compared to the evidences found from other parts of India. The metallurgical tradition was also found to be accompanied with the erection of megalithic memorial monuments, which is similar to other megalithic sites in India that are frequently associated with the Copper-Bronze or Iron Age. Regarding the origin of the knowledge, Pawel wrote "*The relative isolation of the Khasi people, who inhabited a highly elevated plateau, is evidence of the indigenous origin of manufacturing technology. On the other hand, given their trade contacts with the surrounding lowlands, one cannot exclude the possibility of the diffusion of iron production knowledge from the west.*" (Ibid: 767).

Iron metallurgy in Manipur:

Manipur is one of the eight states of North East India, sharing the international border with Myanmar in the west. In spite of being quite an isolated place because of its geographical location and terrain, like other ancient kingdoms, Manipur has its own history of iron and the development of its industry. It also has a number of significant ancient iron smelting sites which are the clear evidences of the practice of Iron Metallurgy in ancient Manipur.

This study focuses on two main points for the reconstruction of the history iron in Manipur. They are as follows:

1. When did the use of iron start in Manipur?
2. How did the people of Manipur possess the knowledge of iron metallurgy?

In order to determine the answers to these two questions, both relevant literary and archaeological sources are to be examined carefully.

Analysis of the literary evidences:

According to *Poireiton Khunthok*, an ancient Manipuri text, Poireiton came to Manipur with a number of followers and wandered in search of a place for settlement. He brought an iron staff with him (Chandra Singh, 1979:28). It also writes about an incident where he encountered a person while wandering around the kingdom and the person was holding an axe probably made of iron. These are possibly the mention of iron first time in the historical texts of Manipur. From the statements, it may be asserted that Poireiton came from or through a place where the Iron Age had already had developed. According to B. Kulachandra Sharma (Sharma, 2007:36), a Manipuri scholar, the axe held by the random person was made of iron. If it is true, it may be inferred that the Iron Age had also already been developed in Manipur at that point of time. But no information was given on Poireiton's origin and the time of his arrival. However, based on other literary sources, Kulachandra Sharma stated that the arrival of Poireiton in Manipur took place during the reign of Nongda Lairen Pakhangba (*Ibid*: 37). K. Ruhinikumar and O. Ranjit Singh have also have given the opinion that Poireiton arrived in Manipur around the 1st century AD. (Ruhinikumar Sharma and Singh: 2010:159)

Khamlangba Khunkumlon is another Manipuri text that deals with the history of Khamlangba and his settlement. He is a local deity of Kakching, and also referred to as the god of iron smelting and its associated works (Sharma:*Opcit*: 38). J. Shakespear, who was a British Political Agent of Manipur (1905-8) also remarked about the iron deposits, "*All these deposits are under the protection of an Umang Lai, i.e., forest god, named Khumlangba, who has to be propitiated before the iron can be worked*" (Shakespear, 1910:349). The text mentioned about his settlement at Uripok (Manipur) from where he went to Takhel (presently Tripura) in search of iron ores. This assertion suggests that the knowledge of iron smelting from its ores had already been there in Manipur during that time. Unfortunately, the time of the event was not given in the text. So, for finding the period of Khamlangba and his ventures, another Manipuri text called *Sagol Kangjei* is needed to be referred. It mentioned about a mega event organized by Nongda Lairen Pakhangba, in which a Sagolkangjeimatch (recognized as polo) was played and Khamlangba was one of the players who was praised for his performance (Saratchandra, 2016:14). Therefore, it has suggested that Khamlangba was a contemporary of Nongda Lairen Pakhangba.

Meitei Ningthourol, an ancient Manipuri text, also reported that Khuyoi Tompok, whose reign started from 154 AD to 263 AD, found lumps of iron while excavating the ground at Kakching (Bormani, 1918: 9) which became the first indication of the availability of iron ore in Manipur. According to O. Ranjit Singh and Englangbam Nixon Singh, Khuyoi Tompok's reign is regarded as the age of technological advancement (O. Ranjit Singh, 2013:9).

Meitrabakki Yot Thanggi Chak (The Iron Age of Manipur) written by B. Kulachandra Sharma is an elaborate work on the history of iron in Manipur. After the examination of a number of relevant sources, he assumed that the iron age in Manipur started from around 2100-2050 years ago, which

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means the 1st Century BCE (Sharma, 2007:47). He also made another significant claim that the chronological sequence of the metal ages of Manipur was completely different to the conventional metal age sequence of other parts of the world.

Conventional Metal age sequence:

1. Copper age 7000-6000 years ago
2. Bronze age- 6000-3700 years ago and
3. Iron age 3700 years ago

Metal age sequence of Manipur as claimed by Kulachandra Sharma:

1. Iron Age-1970-1200 years ago
2. Copper age- 1200-900 years ago and
3. Bronze age 900-200years ago (Sharma, 2007:30)

On the part of the British colonial records and accounts, a note penned by J. Shakespear (Political agent of Manipur, 1905-08 and 1909-14) titled as, "*Notes on the iron workers of Manipur and the annual festival in honour of their special diety, Khumlangba*", is found to be quite useful in tracing the history of iron metallurgy in Manipur. It stated about the origin of the Kakching people (an iron smelting community), as well as the processes and requirements of iron smelting by this group of people.

The analysis of the literary sources has revealed that the earliest references given to the association of the Manipuri people with iron fall in or around Nongda Lairen Pakhangba's reign. He was the founder of the Ningthouja dynasty of Manipur. According to various other sources, it is conventionally accepted that he came to power in 33 CE which is the 1st Century AD (Sanajaoba, 2005:40).

Analysis of archaeological data:

Archaeological research, which is the backbone of historical fact findings, seems to have reached Manipur late. Very few archaeological studies on the history of iron have been done in the region. Some important data on the findings of the archaeological surveys conducted by the State Archaeology Department, Manipur, at different sites of the state (Sharma, 2007:41-43) are given below:

Sites	Findings
Mongjam (Imphal- West District)	A small Iron knife, grayish loam fan deposit overlain the light yellowish brown fissure clays deposit probably of late Holocene, plain and decorated potsherds.
Nongpok Keithelmanbi (Senapati District)	Iron slag, large number of potsherds.

Panjaopallumching, (Kakching District)	Iron implements like a barbed harpoon, a barbed arrowhead and a sword were found along with some cultural remains of human burial
Moirang (Bishnupur District)	Faintly painted pots, a wooden coffin of about 12ft. long and some other remains were found. The cultural remains were found to be similar with that of Panjaopallum Kakching.

However, no record of carbon dating or any kind of scientific dating of the remains can be found except for the 12ft long coffin from the Moirang site. The coffin was carbon dated and was assigned to 1170 A.D (State Archaeology of Manipur, 1987: 9). The data also indicate that the cultural remains of the Panjaopallum and Moirang sites were found to be similar, which means that the iron remains of Panjaopallum were possibly of the same period. It may be pointed out that 1170 AD is a very late date as compared to the literary evidences of the iron. In the light of this, it appears to be insignificant in tracing the origin of iron use in the region.

The data also shows that the cultural remains from Nongpok Keithelmanbi are similar to those found in Mongjam. Since there are no records on the scientific dating of the remains of these two sites, no concrete facts regarding the subject can be extracted. Therefore, the available facts from the data are found to be less useful for the concerned objective.

For a deeper understanding of the history of iron and its metallurgy in Manipur, evidences of iron smelting at Kakching needs to be closely examined.

Iron Smelting at Kakching:

Kakching is a small town situated along National Highway No. 102 and is 45 kilometers away on the south from Imphal, the state capital of Manipur. It is home to a community of Loi people who are famous for their iron smelting tradition and is located roughly 70 kilometers away from Indo-Myanmar borders. It is more like a cultural identity for this group of people. The knowledge and skills required for making iron have been passed down from generations to generations. They are also considered to be the last iron smelters of the Manipur. There are a number of theories and arguments from different scholars and historians regarding the origin of the knowledge of iron smelting possessed by this group of people. It is believed that they migrated from place to place in search of iron ores before settling at the present location. Their ethnic history is also found to be very much associated with the history of Khamlangba (the god of iron smelting), who is still worshiped by the people as their local deity.

The importance of studying the history of iron smelting at this particular region is that it will not only help in understanding the history of iron and its metallurgy in Manipur but will also help in the reconstruction of the history of iron in the North East India.

According to some literary works and accounts from the local elders, there were a number of sites in and around the Kakching area where iron was smelted.

They are given below:

- a) Panjaopallumching,
- b) Tumu-ching,
- c) Yotshungbam Pareng, and
- d) Kereching (As mentioned by Kshetri Bira)

It is generally believed that the people of Kakching brought the knowledge of the iron smelting in that area. J. Shakespear has also expressed that, “*The people claim that their ancestors came from Cachar; whence their most important clan's name, Meyanglangbam, Meyang denoting a foreigner from Cachar. The story runs that the ancestors of the Meyanglangbam and Khettrimayum clan were one day walking near Thobal, and noticed some earth thrown out of a bamboo rat's burrow, which resembled that in which iron was found in Cachar; so they gathered it and on their way home they met the Raja, who asked what they were carrying, and, being told, ordered them to experiment and report the result. Eventually the community, numbering then only five or six households, was settled near the spot where the ore was found, and subsequently moved to their present /locations, where the deposits of ore are more extensive*” (Shakespear: *opcit*:349). According to this, the introduction of iron smelting in the area automatically falls on the time when the iron smelting community settled there for the first time. And according to ‘*Meitrabakki Puwarida Kakching*’ by Mayanglambam Gourachandra, the Kakching people is said to have migrated from the Thoubal area, which is about 25 kms away on north from the present location in the year 1740, during the reign of Maharaj Gambhir Singh (Mayanglambam, 2002: 5). On the other hand, this concept is contradicted by the findings of the surveys recently done by M. R. Sheikh and his team. Charcoal samples were collected in the survey from one of the iron smelting sites at the outskirt of Kakching, locally called Tumu Ching, situated at about 5 Kms. to the South-West from the central Market of the Kakching town. The age of the samples was determined with the Thermo luminescence dating method and was found to be 1600±80 years old i.e. 4th–5th century A.D. (Sheikh, *et al* 2023). It appears to be much earlier than the first settlement of the people at the region as mentioned.

Another important piece of relevant information from the book *Meitei Ningthourol* is about the incident when Khuyoi Tompok found lumps of iron while digging the earth at Kakching (Bormani, 1918: 9). This information has suggested that the people knew about the occurrence of iron ore in the Kakching area during the reign of Khuyoi Tompok (154 AD to 263 AD), which is also much earlier in date than the said settlement of the Kakching people.

Contrary to general belief, these facts seem to have shown that iron smelting activities had already been carried out at the Tumu-Ching prior to the presence of Kakching people in the area. And this new development raises an entirely new question concerning who smelted iron for the first time in that specific area and where they came from.

Looking from that angle, the association of the people from Myanmar with the iron metallurgy at Tamu-Ching has been expressed in various sources. It is already said that the charcoal samples found in Tumu Ching were found to be 1600 ± 80 years old. One interesting fact about the name 'Tumu Ching' or 'Tumu Hill' is that it is similar to the name of a town called 'Tamu' in Sagaing Region in north-west Myanmar near the Indo-Border, locally known to the people of Manipur as 'Tumu'.

M. R. Sheikh also wrote about a conversation he had with the watchman of that area. When asked about how the hill was covered with such slag, the watchman replied, "*The place has remained covered with such slag, which they called Yotthi, since time immemorial. The hillock was known as Tumuching simply because the people from Tumu now in Myanmar crossed the series of mountain ranges in search of iron ores and settled there to undergo the work of iron smelting*" (Sheikh, 2023). Sheikh has also conducted a comparative study on the traditional iron works in Manipur and Bagan District of Myanmar and found that the shiny glassy matrix that formed the iron slag from Kakching is similar to those found attached to the lumps of bricks that formed the furnaces of Bagan in Myanmar. After performing different tests like Thermo luminescence analysis (TL), X-ray fluorescence analysis (XRF), X-ray diffraction analysis (XRD) and other tests, it also is said that the phosphorous content in the iron slag of Tumu Ching (Kakching) was found to be higher compared to the conventional iron produced in other parts of India (Sheikh, 2013:124). These assertions in connection with Sheikh's archaeological findings has signified that people from Tamu (Myanmar), which is on the eastern side of Manipur, came to this particular area and performed iron smelting there during the 4th or 5th century AD, much earlier than the settlement of the Kakching community in the area (Year 1740, as stated by Gourachandra Sharma). This theory also fits in with Kulachandra Sharma's claim of the diffusion of iron use (Cast iron) to Manipur from China through Myanmar. (Sharma, 2007:49). However, it is still a fact that the people of Kakching, who are considered to be an iron-smelting community, had a historical connection with Tripura and Assam regarding their origin and their local deity, Khamlangba (God of iron smelting). Therefore, according to the analysis, when it comes to the question of how the people of Kakching possessed the art of iron smelting, it points towards both eastern (Myanmar) and western (Tripura and Assam) sides of the kingdom. The existence of ancient iron smelting sites other than Tumu-Ching at the region, still imply that there is the possibility of the presence of indigenous or other iron smelting communities in and around Kakching for the same purpose. Therefore, it may be concluded that the area of Kakching might have been an iron smelting hub in the ancient times where people from different directions and places came to the region and smelted iron at different points of time, which is how iron smelting ultimately became a culture for the people living in the area.

Conclusion:

After thoroughly analyzing the information gathered from different sources and connecting the dots in an attempt to understand the historical development of iron use and its metallurgy in Manipur, it is evident that iron, as a metal locally called 'YOT'(iron), was known to the ancient people of Manipur

since or before the reign of Nongda Lairen Pakhangba (33 AD-154 AD). They were also aware of the occurrence of iron ore in the kingdom. The art of iron smelting, which requires a level of technological expertise was found to be practiced as early as the fourth or fifth century AD in a region presently known as Kakching, which is in the southern part of the kingdom. The evidence that people from Myanmar smelted iron at Tumu Ching (Manipur) has indicated the possibility of the diffusion of iron-smelting knowledge from China to Manipur through Myanmar. This finding has created a new area of historical research. However, the historical connection of the iron smelting community of Kakching with Cachar (presently Assam) and Takhel (Presently Tripura) cannot be ruled out. So, it is concluded that people with iron smelting skills came from different directions and places, including those from outside the kingdom, at different periods of ancient Manipur. On the other hand, with the presence of ancient iron smelting sites in Manipur, where archaeological surveys are yet to be done on scientific lines, the possibility of indigenous origin of iron smelting in Manipur still exists. However, the sources available for the reconstruction of a more precise history of iron in Manipur are still very limited. More archaeological surveys are needed to be conducted at the remaining iron smelting sites of Kakching and Mongjam areas, followed by comparative studies of the findings with those from other parts of India (especially the north-eastern states) and Myanmar. A study on the ethnic history of the people of Kakching is also needed in order to trace the origin of the art of iron smelting possessed by the people of Manipur.

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