

(1) Number of Pages 8
(2) Date of repair 9.2.66
(3) Initials of the Referencer Mez

MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Rev DEPARTMENT

G.O. No.
B.P. No.

79

Press
Mis.

Dated

12.6.1873

196

.

Not to be folded or roughly handled

GOVERNMENT OF INDIA.
DEPARTMENT
OF
AGRICULTURE, REVENUE, AND COMMERCE.

MEMORANDUM ON THE METALS AND MINERALS OF UPPER BURMAH.
BY CAPTAIN G. A. STROVER, POLITICAL AGENT, MANDALAY.

The Chief Commissioner having called for a report upon certain mineral products of this country, it has occurred to me that as many years have elapsed since any concise information has been given upon the subject of metals and minerals generally, and as our knowledge regarding these products has been greatly extended of late in consequence of increased intercourse between the British and Burmese Governments and the subjects of each nation, it will not be out of place, and of some interest, to give a brief sketch of the resources of Upper Burmah as regards the same.

GOLD.

It has been generally supposed that Upper Burmah is not rich in itself as regards this metal, but there would seem to be good grounds for supposing that it exists very extensively. In former years the gold used in the country was imported from China to the extent of some 4 or 500 viss annually, but the imports have considerably decreased since the commencement of the Mahomedan rebellion in Yunan, and now do not exceed 200 viss per annum, the deficiency being imported from Rangoon. It is an article that is greatly used in the decorative art, and appears to be generally plentiful.

In the Mogoung district there would seem to be a gold field that, if properly worked, would prove very productive. Some years ago, a Mr. Golding, of Australian experience, contracted with the King to work one square mile of this field for a sum of Rs. 25,000 annually, for 10 years, but unfortunately the district proved to be malarious and Mr. Golding succumbed to fever; he, however, pronounced the fields to be equal to any in Australia, if not better. I am not aware that he succeeded in procuring much gold. Since then no attempt has been made on the part of the Burmese Government to work the mines.

To the north-east of Mandalay, in the Shan States, there is another field of gold. My information tends to show that here again, with energy and enterprise, considerable quantities of gold could be extracted, and the mines prove very productive; but the locality at present is malarious, and but little gold is procured.

At Thayet-pein-yua, near the Myit-Nyay, on the road to Pyoungshoo, to the south-east of Mandalay, the gold quartz is found in abundance, the reefs cropping up from the ground, and there is reason to believe that very valuable gold mines are in existence, and could be worked and developed with little trouble. A Shan lately procured from here a piece of quartz 3½ lbs in weight that produced exactly 2½ ticals of gold.

In the Yaw district, to the south-west of Mandalay, gold is obtained in fair quantities in the alluvial deposits; it exists at Sagaing, Kannee, Sein-joo, and is also obtained from the Kyren-ween river, and, indeed, it is procurable from the sands of most of the streams between Mandalay and Mogoung. The natural conclusion from this profusion of gold in the rivers and streams of Upper Burma is that it exists in large quantities *in situ* somewhere, and, as I have explained, this is the case, and doubtless there are more deposits that have not been discovered.

SILVER

Is found in many localities in the Shan States to the east of the Irrawaddy river, but the most prolific mines are those situated at Bawyne, Kyonktah and Toung-byne, near Theebaw, to the north-east of Mandalay. It is mixed with lead, and is in fact a rich argentiferous galena. One mine, the Kampanee, will yield as much as 40 ticals of silver and 25 viss of lead from one basket of the ore, while the poorest mine gives 4 ticals of silver and 30 viss of lead. Other mines exist, such as the Baudween, Baudweengyee and Sagaing. The metal is also found in other towns unmingled with lead. The supply of silver obtained hitherto has been sufficient for the requirements of the country in conjunction with the imports from Yunnan.

COPPER

This metal is found in the Shan States, but is not worked. It is also found at Kolen-myo and Sagaing; at Bawyne and Kolen-myo the malachite appears to be of a rich description. The copper resources of the Shan States do not appear to have been ever utilized to any extent, and the deposits, which seem to be abundant, remain as nature placed them. The Sagaing mines were worked in former times by Chinese, but many years have elapsed now since they were abandoned. The surface ore is not promising. Most of the copper used in Upper Burma is imported from China. It is plentiful in the Province of Yunnan.

IRON

Iron abounds in the Shan States, and the district of Pagan, to the south of Mandalay, is noted for it. A manufactory exists on a rough and ready scale in this district at Pohpah Toung, but the outturn is inconsiderable. To the west of Sagaing, for miles up the Irrawaddy river, the ore abounds—a rich hematite. His Majesty is now procuring iron works from England, and will before long have a large foundry, with all the requisite machinery, erected and at work at Sagaing. The surface hematite alone will feed it for years to come, if worked.

Two mining engineers are now awaiting the arrival of the works, and expect to proceed to Sagaing soon to commence operations.

LEAD

Is found in abundance in the Shan States, and is extracted from galena. Considerable quantities of this metal could be obtained if such was desired. At present moderate supplies are procured, sufficient for the requirements of the land. It is also imported from Yunnan.

(3)

TIN

This metal exists in the Shan States to the south-east of Mandalay, but the mines have never been worked. The tin consumed in the country now is all imported.

PLATINUM

Is said to exist in the Shan States, and it seems probable that it does exist, but I have no reliable information on this point.

GRAPHITE

Is found to the east of Nat-taik in large quantities on a low range of hills near the village Nyoke-toke. It is not utilized.

COAL

This mineral is known to exist at Thingadaw, about 70 miles above Mandalay, on the western bank of the Irrawaddy; at Shuaygoo below Bhamo; at Meimbaloung in the Shan States east of Mandalay; to the south-west of Mandalay in the Yaw district, at Yaignaw, east of Nat-taik. It is found at Pagan and Shimpagah, and it is probable that it exists near Meuhla and Yeynangyoung. At Thingadaw the coal has been extracted, but it is of an inferior description, and more resembles lignite than the true mineral coal. An attempt was lately made here to ascertain the productiveness of the coal beds. It is nearly certain that plenty of coal exists in the locality, and a few more borings would probably prove this. The coal bed in the Shan States at Meimbaloung contains the true mineral coal, and consequently a valuable coal. It has been inspected by an experienced mining engineer, and highly approved of as equal to the best English coal. There is little doubt that the beds are extensive, but unfortunately the distance in land is great, and no easy means are available for transporting the coal to the low lands; indeed, the only method at present is by floating it down mountain streams and rapids on rafts, which entails considerable risk and loss of coal. European skill and enterprise would soon make a safe route of one description or another if really required by the Government; it remains at present, with neighbouring wealth, where nature placed it, awaiting development in times to come.

JADE AND AMBER

The quality and extent of these mines above Mogoung is well known. They are both extensive and capable of development.

SULPHUR

This substance is not found in mass or in its native state in Upper Burma, *sui generis*, but is found in efflorescent salts, and is manufactured from metallic sulphurets. The following is a list of localities where it is made, and the yearly average outturn:—

Mooda Myo, N.	...	...	3,000	Viss.
Tsein-goon, E. S. E.	...	...	2,000	"
Kyook-hoo, S. E.	...	...	3,000	"
Bawyne, Shan States, S. E.	...	...	6,000	"
Dybayen Myo, N. W.	...	...	4,000	"
Pagan Myo, west bank of the Irrawaddy	...	...	4,000	"
Toungthoo Einlay, E. S. E.	...	...	4,000	"
From the Bhamo District	...	...	2,000	"

TOTAL VISS YEARLY ... 28,000

At Toungthoo Einlay, to the south-east of Mandalay, sulphur is manufactured by the Toungthoo Shans, who sell their outturn to the King; at all the other places the mines are worked by His Majesty.

The Bawyne works have been increased during the past month by four extra furnaces, which will give about 5,000 viss more per annum. The sulphur ore appears to abound in the Shan States; in fact, at Bawyne, Kyonktah, Dybayen,

Pagan and Toungthoo Einlay, the supply seems to be unlimited. It is found in the tertiary blue clay from 12 to 30 feet below the surface, which is an alluvial deposit of the old red sandstone; it is embedded in the clay, and consists of very hard metallic pyrites of some size.

The mode of extracting the sulphur is very simple. The sketch below illustrates it:—



Common chatty-shaped vessels are made on the spot from the soft blue clay in which the ore is found. The larger vessel is filled with broken ore, and placed on a fire, a clay retort being fitted to the top, and communicating with the smaller vessel. The sulphur is thus sublimed and condensed as shown, after which the retort is broken and a hollow tube of flower of sulphur extracted therefrom which is superior to that condensed in the vessel. Iron pyrites do not appear to be utilized in the manufacture of sulphur, and it is doubtful whether the Burmese could utilize them. These pyrites are to be found in abundance in parts of Upper Burmah and the Shan States. The imports from Yunnan are also considerable every year.

It is manufactured in Yunnan, and in the "Shit-Pyee-Doung," or eight Shan States to the north-east of Bhamo, at present under the rule of the Chinese, or tantamount to the same. European sulphur can be purchased in the bazars at the rate of Rs. 3 per viss.

SALTPETRE

Is manufactured at the following places in Upper Burmah:—

- | | |
|----------------------|-------------------------------------|
| 1. Toungthoo Einlay. | 13. Salem-myo. |
| 2. Ameerapoor. | 14. Yoon-doo. |
| 3. Shimpagah. | 15. Myo-tha. |
| 4. Ong-ben-lay. | 16. Tsit-kine. |
| 5. Leen-gine. | 17. Aloon. |
| 6. Sameet-koon. | 18. Tee-ber-Yeen. |
| 7. Pyogan. | 19. Myay-Yeen. |
| 8. Aug-gyeen. | 20. Shin-bin-oon-Eni. |
| 9. Samoon-gyee. | 21. Yua-shit-gyee. |
| 10. Oo-yun-galay. | 22. Enidyne Yua (Kyouksay, S. E.) |
| 11. Shuaybo. | 23. East of Pagan (Yoongdaw Toung). |
| 12. Satoong-ma. | |

The yearly average outturn is about 40,000 viss. The manufacture is not prohibited as with sulphur, and considerable quantities are used in the preparation of fireworks.

The manufactures at Toungthoo Einlay, Eidyne, Kyouksay, Yoongdaw Toung, and Sameet-koon can produce very largely if required.

At Toungthoo Einlay the Toungthoo Shans in former times used to make from 20 to 25,000 viss of saltpetre per annum, but emigration to British territory has considerably reduced this.

The price of saltpetre is Rs. 50 per 100 viss. Many parts of Upper Burmah are well suited for its manufacture, the ground being well supplied with nitre.

RUBIES, SAPPHIRES, GARNETS, &c.

These are found in abundance at Mogouk, Kyat-pyeen, to the north-east of Mandalay near Momeit. The ruby ground extends over a large area of hilly country. The gem sand is found from 3 to 15 feet below the surface soil, and the beds are then followed up. The method of working is primitive and rough, the consequence being that large rubies are seldom extracted intact.

Some years ago, a Mr. Bredamajee, a German Mineralogist, was located at these mines for the purpose of developing them, but, after a short stay, he got into trouble with the people, and was dismissed.

He declared that, with careful working, rubies as large as pigeons' eggs could be extracted, and that the mines were very rich. At Mogoung also ruby mines exist, and very fair rubies have been found. The Sagyeen or marble hills, a short distance to the north of Mandalay, contain the gems as well, but they are of too light a colour to be valuable. They are, however, mixed with other rubies and disposed of.

SALT

Extensive salt fields exist at Shimpagah, a short distance above Mandalay, on the western bank of the Irrawaddy river. It is also obtained at other places in Upper Burmah on a small scale. Large quantities can be manufactured at Shimpagah, but imported salt is fast taking its place in the market. The hill people, though, appreciate to a certain extent the Shimpagah salt and mix it with European salt.

PETROLEUM

This mineral oil is found at Yeynangyoung and Pagan, but information regarding it is so complete that it is hardly necessary to allude to it further. I will, however, make a few brief remarks.

There are at present about 150 wells worked at Yeynangyoung; the quantity of oil estimated as deliverable from these wells is 15,000 viss daily, of which 10,000 viss is taken by the contractor who supplies British Burmah, and 5,000 viss by the contractor who supplies Upper Burmah. The total yield of these wells is 6,000,000 viss per annum, or 9,375 tons. There are many abandoned wells, and wells that produce very small quantities of oil. At Pagan there are about 50 wells: they yield daily 1,500 viss of oil, which the earth-oil contractors, at present the Lay-myo-woon and one Moung Tsan-wah, are allowed to purchase. The oil from these wells is obtained in a more liquid state and more resembles naphtha. It is of a brackish nature, and is better suited for lighting purposes than the Yeynangyoung oil. The total supply of earth-oil in Upper Burmah now per annum is 66,00,000 viss or 10,312½ tons.

I have omitted to mention marble and limestone, but both abound.

Upper Burmah with its metals and minerals, its forests, natural resources, productiveness of soil, and from its geographical position, situated as it is close to the teeming population of the Chinese empire, ought to be the richest country in Asia, and Rangoon one of the largest emporiums of trade. The productiveness of the soil, as regards cereals and other crops, is wonderful. The indigo plant, which is prolific in its growth, gives three crops per annum, and the dye would quite equal that of Bengal with careful and proper treatment in its manufacture. Paddy, wheat, cotton, catch, grain, sesamum, sugarcane, tobacco, tea, coffee, each has its own soil in abundance.

Teak and other useful trees abound, and, taking all in all, Upper Burmah would seem to have a grand future in store for it, as civilization advances and old prejudices give way to new and enlightened ideas.

G. A. STROVER, Captain,
Political Agent.

The 22nd January 1873.

A few remarks on India-rubber or caoutchouc may be of some interest.

The estimated number of trees, which are chiefly situated in the Blamo and Mogoang districts, is 400,000. They thrive best in damp, moist soil, and in thick forests, shady and cool. The trees attain to a height of from 50 to 100 cubits, being from 15 to 20 cubits in girth at the base (full-grown trees) and with roots creeping over the ground for some distance. They are fit for tapping when from 6 to 10 years of age, at which time they are from 15 to 20 cubits in height and 3 cubits in girth.

When the time for tapping arrives incisions are made in the trunks of the trees and in the roots above ground. Hollow bamboo cups, about 1½ foot in length, sloped and pointed similar to a prepared pen, are then inserted in the incisions and receive the oozing juice or milk. Three or four hundred of these bamboo receptacles are inserted in each tree. The tapping is continued for about a month, after which time it is discontinued and the wounds allowed to heal. At the expiration of another month the trees have regained strength, and tapping is re-commenced.

In preparing the India-rubber the following crude method is observed.

Water is boiled in large iron pans, and the juice of the tree is thrown in, when it gradually thickens, and subsequently is dried. The India-rubber so obtained is being brought into local use for covering water-buckets, baskets and boxes as a substitute for dammer.

The existence of the India-rubber tree in Upper Burmah does not appear to have been known, or, at any rate, did not attract attention, until somewhat recently, when three Europeans, Messrs. Miller, Marshall and Henri, who were employed at the jade stone mines, were forced to look and search about in the forests for a substance that would effectually repair a diving apparatus that they used in working for jade stone. They found India-rubber and repaired the apparatus. The existence and value of the juice was then brought to the notice of the King, and Mr. Henri is now employed in tapping the trees and preparing the juice. Some 70,000 viss of India-rubber was brought from Mogoang last year. I myself saw 30 or 40 cart-loads of it entering the palace one day. Upper Burmah could produce 2 or 300 tons of this useful substance per annum.

G. A. STROVER, *Captain,*
Political Agent.

P. R. 2
1079
Lodged
12 June 13

June 1873 Sept
No 1660

From
Govt of India Department of
Agri: Revenue & Commerce

Dated 22nd January
Recd 12th June } 1873

Memorandum on the
metals and minerals of Upper
Burmah by Captain L. A.
Strover, Political Agent,
Mandalay

No 79. 12 June 1873

With over

LODGED