NOTES

ON

SIAMESE TIMBER

SUITABLE FOR BUILDING PURPOSES

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PREFACE.

Siam owes its richness of woody plants to the beneficial influence of moisture and high temperature. In Europe and the Northern part of Asia the forests may be named after certain kinds of trees growing socially to-gether in large groups or forming extensive forests for many miles. Though this fact can be met with also in Siam, the most forests consist of hundreds of species, the names of which are almost impossible to be kept in ones memory. I have counted in the museum at Bangkok not less than 600 specimens of wood, half of which differ in kind.

In the present work I am indeavouring to furnish some information regarding Siamese timber. I have quoted from and referred to the following authorities :—

W. Roxburgh : Flora Indica.

J. S. Gamble : A Manual on Indian Timbers.

Chow Phya Montri : Specimens of trees growing in the forests of the Siracha Co. (p.p. 35-62).

Statistic of Import and Export by H. M. Customs.

The descriptions are partly derived from the above works and partly from my own research.

To obtain the vernacular names of the different trees many of which are different in another part of the country, I secured the aid of reliable natives, whose information is more or less regarded as authentic.

The remarks on durability were made after carefull investigation. The weights and coefficients of transverse strength I found out in taking the average of several results obtained in experimenting with wood specimens.

It was not my intention to have ventured so far into the Botanical part, as this requires many years of quiet study, but merely to assist all interested in the building trade to whom a certain knowledge of the most important timbers for building purposes is essential.

RUDOLPH GÖTTE.

CONTENTS.

MAI SAK (Teak tree, *Tectona grandis.*) The teak tree is a tree of the order Verbenaceae. It is a beautiful tree and cannot be mistaken from any of a thousand others in the forests of Siam. The teak tree can attain a height of 40 - 60 m. and a circumference of more than 4 m. when the conditions for its growth are favourable.

The numerous white flowers are in great terminal and cross-armed panicles and have 5 -6 cleft corolla. The germ is round, hairy, four celled with one ovulum in each cell attached to the axis. The corky drupes are about the size of a hazelnut. The flowers may be used medicinally to cure retention of urine.

The leaves are opposite-petioled 25-30 cm long and covered with rough points. They are used to dye yellow or purple silk and cotton, for plates, packing, rough umbrellas and as a thatch for temporary huts.

The bark is thin, ash-coloured and scaly, with numerous spreading branches. The wood is moderately hard, of a light brown colour and sometimes tinged with yellow, which makes it resemble coarse mahogany. The annual rings are marked by one or more lines of regularly

arranged pores. The medullary rays are moderately broad, giving a conspicuous handsome silver green of elongated plates. The wood has an agreeable smell in a dry state, being scented with an oil which is perceptible to the touch. Further, Teak contains silicic and tannic acids, which properties are to a great extent the cause of its durability as they do not corrode iron and prevent rot. The pith is large and quadrangular. The specific gravity is 0.7-0.85. Other good qualities which make this wood so valuable are its nonliability to swell and its absence of knots. The wood being also soft, strong and comparatively light, it can easily be worked and is considered as the best wood for building purposes. It polishes well. In durability it even exceeds the oak.

Teak trees grow up to 800 m. in elevation into groups and thus form forests by themselves, that is to say in the so-called teak forests they preponderate over other trees and plants. These forests are situated in the dry regions of the Monthon Bayap (Chiengmai) and in some parts of the Pitsnuloke and Nakonsawan to Monthon (Raheng, Kampeng). These regions are hilly and

have numerous waterways by which the timber may be floated out to the Menam river. The trees grow on various soils, doing best on sandstone and metaphoric rocks and also on other tracts but are poor on limestone and laterite. They require good drainage and therefore grow better on hills. In Siam they are rarely met with in flat country.

The Siamese distinguish three kinds of teak, Sak On, Sak Tong, Sak Hin. The first is a soft and inferior teak, of a light colour, grown on unsuitable soil. Sak Tong is a better quality, somewhat heavier and of a dark yellow colour. Sak Hin is the heaviest teak, grown under favourable conditions. The average weight of Sak On is 720 kg. per cbm., Sak Tong 780 kg; Sak Hin 830 kg. per cbm. P=553 for good heavy teak.

Teak may be used for all building purposes, especially for ships and houses, furniture, planks, bridges and carriages. It does not shrink much. It is not heavy enough for Railway sleepers, besides that, an enormous outlay is required on long lines, along which suitable hardwood timber can be obtained; however it is more

economical at the end to use teakwood sleepers on narrow-guage light Railways, especially when it is difficult to obtain hardwood.

The teak forests are now under the control of the Royal Forest Department. After 1896 several Royal Decrees were promulgated providing for the better protection and control of the teak trade. The trees selected are girdled, or in other words, rings are cut through their bark, preventing the sap from rising,and they are left standing to season. After that they can be felled. The selection and girdling is done under the supervision of a Forest Officer, by cutting a ring around the tree about four feet above ground 12 cm. deep and 25 cm. broad. The elephants drag the logs together to suitable places and from there to the next stream where they will be marked with the "hammer-marks" of the owners. The logs are measured and a proper account is kept of the logs drawn together. If the rainy season sets in and the streams are full of water, the logs are dragged into the stream by elephants and they will keep them moving and follow them downwards till they

reach deep water without rapids and here they are made into rafts.

A raft consists of some 150 or more logs, fastened with rattan into several rows. The first, second and last row consist of a smaller number than the intermediate. Guard logs are placed at the side of the rafts. These logs will prevent the raft from breaking up on touching the banks, etc. On the rafts the logs are again numbered and marked with a hammer-mark and a careful account of them is kept. The raftsmen make little huts on the rafts to sleep in at night and a high stand from where a man can be on look-out and give directions to the men on the water who will pull the rafts into the direction of the current by means of long rattan ropes. This is done in the Me Ping river, which is shallow. All rafts have big oars at head and stern to help to steer them. In other rivers no stand is necessary as the water is deep enough and no man could follow the current. The raftsmen are engaged by contract for 2 Ticals per log (from Raheng to Paknampho.) The duty is paid at Paknampoh (See Pikat table for calculation of the Duty on Teak). The Royalty

must be paid in the forests, at the rate of tcs 6 for small logs and tcs 10 for large logs. The large log is one of 2 Pikat and over. After the Duty has been paid the rafts can proceed to Bangkok; generally the raftsmen are changed at Paknampoh. Some 100,000 logs arrive every year at Paknampoh.

At Bangkok the logs are sawn into sundry sizes according to the demand of the European market and the major part of the teak is exported to Europe.

The export of Teak was as follows:—

	Value	Tons
During 1903.	Tcs. 8,276,405	58,140
„ 1904.	„ 10,051,725	77,531
„ 1905.	„ 140,75,329	101,397
„ 1906.	„ 12,800,428	96, 843

The price of teak logs at Bangkok changes according to the market, it is at present at 10-22 pikat (See Standard Table of Pikat Rates.) The chief trade is done by the following firms: the Bombay Burmah Trading Co., Borneo Co., Denny Mott & Dickson, East Asiatic Co., Ltd., Siam Forest Co.

SAPPAN.

MAI FANG.—(Sappan tree, *Caesalpinia Sappan*). is a tree of the natural order Caesalpinieae, a small tree 9 - 12 m. high or a straggling shrub.

Calyx base permanent, border five-parted and deciduous, corol irregular five petalled, the upper one smaller. Filaments woolly. Anthers all ten fertile and open on their sides. Leaves bipinnate, pinnae from ten to twelve pair, leaflets from 10 - 12 pair, somewhat dolabriform. Panicles terminal. Legumes ligneous sub-trapeziform from 3 - 4 seeded. The wood is hard and of a light red colour, the young trees newly split of yellowish brown colour, will however tinge saliva quite red when chewn. Pores are small and the medullary rays are fine, wavy and very numerous. Sappan trees grow near Ratburi, they may be met wild in the Shan States.

In former times when colours were not manufactured by chemical means, this wood was used to obtain colours for dyeing and printing cloth and also to make red ink, varnish, etc. Sappan wood contains a substance

called Brasilin. C_{20} H_{22} O_7. Indian furniture and boxes are made out of it and the Siamese use it for medical purposes. MAI FANG is a very pretty wood and takes polish well. It does not come into question as building timber, as it is hard to obtain good pieces for the sizes required. It must however be named as it is an interesting timber in a commercial sense. It is generally exported in short pieces and branches without bark. Bishop Pallegoix gives the value of the revenue derived from Sappan wood as Ticals 200,000. If this statement is taken as correct, the export of Sappan has gone considerably back. The total value of Sappan wood exported in 1903 was Ticals 36,730.

MAI PAYOONG.— (Rosewood, Blackwood tree *Dalbergia latifolia*) is a tree, of the natural order of Papilionaceae. Leaflets from 3 - 7, subalternate, roundish, emarginate. Panicle axillary, filaments 10, coalesced into one body. Legume, one-seeded. Trunk erect, though rarely straight, often very thick and rising to a very great height. Branches spreading, very numerous, forming a large shady head. Leaves alternate, pinnate with an odd one, from 15–20 cm long, leaflets from 3–7, generally five, alternate, the exterior ones largest, roundish, emarginate, a little waved above, smooth, covered with a little whitish down underneath, generally about 5 cm each way. Petioles, axillary small erect. Flowers small and white. Calyx, hoary, five toothed. Filaments, ten, united into one, open above. Anthers twin singly globular. Germ pedicelled, smooth, stigma simple. Seed of the size of a small French bean. The wood is of a dark purple colour with small black streaks. The sapwood is small and yellow. Payoong wood is very hard. The annual rings are not distinct. The numerous medullary rays are uniform, fine and stout. The tree is

very slow in growing, but may reach after 100 years a height of 20 m. and a diameter of 60 cm. There are about 2--3 rings per cm. radius. The value of P may be taken at 622. The weight is about 900 kg. per cbm. in a perfectly dry state.

After the wood is dry and long exposed to the air it becomes quite black, therefore it is sometimes called blackwood.

The name Rosewood has been wrongly given, probably on account of a striking rose like odour which the wood is said to have when freshly cut. This is a mistake as there is no such odour.

Payoong trees grow in the large forests in the areas of Korat and Pachim provinces. There was formerly a small export of this wood, but since the Korat Railway was opened, considerable quantities have been brought down to Bangkok owing to its being easily transported. There is a large demand for Mai Payoong. It is elaborately carved by the Chinese for furnitures and is even exported to Europe. The price in London is £10 per ton.

The value of the export in 1903 was Ticals 168,154.

MAI DENG (Ironwood tree, *Xylia dolabriformis.*)

This tree has red flowers in February and March at which time it is nearly destitute of foliage. The bark is then grey and red-brown. Not much sapwood. The heartwood is of a red-brown colour, very hard and cross-grained.

The annual rings are distinct. The pores are of a moderate size and mixed with resin, which makes the wood very durable. The numerous medullary rays are fine and undulating. The wood is very heavy, the average weight is 1020 kg. per cbm. in a perfectly dry state. Specimens have been examined with a weight of 1090 kg. per cbm. P=608. The trees are very often twisted and knotty. the inside unsound. Some Engineers prefer Mai Teng or Mai Maka for posts and bridge timber. It is however a much superior wood if procured from well matured trees and not exposed to the heat of the sun after newly cut or sawn. The higher coefficient of transverse strength is one of the reasons of its being superior. The presence of resinous substances and tannic acid make the wood valuable. The resin is partially soluble in hot water to which it imparts a reddish colour. The Mai Deng

which grows in an open forest on laterite far from streams is superior to that near rivers. It is easily found in mixed forests but it is difficult to extract. The rate of growth is fast, about one ring on a cm. radius.

Mai Deng has been chiefly used in Siam for bridge timber. It is good for tool handles, boat building, sleepers, Telegraph poles and Railway pegs. With the exception of Takien, Mai Deng is easier to saw and can easier be worked than other hardwoods as Maka, Pradoo, Teng, Rang. If once well seasoned, which is however a slow process, it may last almost an indefinite period. An inexperienced eye may mistake Mai Deng from Mai Sahk and Mai Maka on first sight. In Bangkok mills very little is sawn. Formerly there used to be a large export of Mai Deng from Bangkok. Last year some Mai Deng was rafted to Bangkok after having been adzed to sizes required. Rafting Mai Deng (with bamboos) is expensive, therefore the price at Bangkok is high. Much Mai Deng can be found in the Korat provinces.

Calyx five toothed. Corollets one diadelphous

legume. The leaves are conjugate pinnate, leaflets from 2 to 4 pair with a single on each side below the pairs. Stipules lanceolate. Spikes axillary, round, long peduncled, corrollets deciduous. Legumes falcate, ligneous, many seeded.

MAI TENG (*Shorea obtusa*) a tree of the natural order of Dipterocarpeae. Calyx five-leaved, permanent, enlarging into five long wings; Corol five petalled. Germ superior, 3 celled, two seeded, attachment superior. Nut one-seeded. Embryo inverse, without perisperm. This tree has small white flowers of a very agreeable odour, with oval leaves 15-20 cm. long and half as broad. The bark is 3cm. thick, grey with deep longitudinal fissures. Heartwood is very hard, even in grain. It has a brown colour and is pale when newly sawn. The sapwood is small on large trees, it does not last long, the pores are moderate sized, each pore surrounded by a narrow white ring. The medullary rays are numerous and brown, joined by short irregular transverse lines of lighter-coloured tissue. The wood is very durable, is not attacked by insects and stands well all influences of climate, heat and moisture. The Teng trees grow together with Mai Pluang and Mai Rang or form large groups or extensive forests on elevated ground mostly laterite but not beyond 800 m. above sea level. There are enormous tracts of Mai Teng all over

such parts where no streams and rivers run and means of communication are wanting. The trees grow very straight and are admirably suited for building, for Railway sleepers, Telegraph poles, Bridge-timber, Tool-handles and Canoes. Straight trees for Bridge poles 14 m. in length have occasionally been met, but are rare. They can attain a height of 30 m.

Mai Teng is rather hard to saw. If perfectly dry the wood weighs 950 kg. per cbm. P=574.

The resin is white and is used with the oil of the Yang tree for overhauling boats and painting all sorts of vessels, roofs of boats, etc., to prevent leakage. The resin is superior to Mai Rang resin which is generally mixed with the same.

Resin (vernacular "Chan") is collected during the dry season in February and March.

MAI RANG (*Pentacme Siamensis*) is a tree of the Dipterocarpeae. The flowers, which appear in March, are white or red with a fine odour; the bark is somewhat thicker than Mai Teng, and is a little darker but with vertical fissures. It is also more broken and irregular

than that of Mai Teng. The wood resembles Mai Teng in colour, but is cross-grained. The pores are surrounded by narrow white rings and joined by fine wavy concentric lines. The medullary rays are fine and at equal distance. Mai Rang is hard and durable, but if compared with Mai Teng it is a little inferior in quality. It will grow where Teng trees can grow and is used for the same purposes. The wood is rather hard to saw and difficult to smooth with a plane, because it has on the vertical section alternate belts in which the grain changes. The weight is 920 kg. per cbm. P=565

The resin is reddish, it sells well and is collected by the natives, for the same purpose as the Teng resin. It is also sold to Bangkok and exported as gamboge.

Comparison between Mai Teng and Mai Rang.

Both woods are called and generally sold under one name, viz. Mai Tengrang. In reality there is a difference which may be explained by the following:

	TENG	RANG
Leaves	15 - 20 cm. long	20--25 cm long
Bark	1¼ cm. thick with longitudinal fissures.	Thicker with vertical fissures.
Colour of wood,	pale to brown	Similar
Pores	Surrounded by narrow pale rings	Surrounded by narrow white rings and joined by fine, wavy concentric lines.
Medullary rays	Numerous, brown joined by irregular transverse lines of light coloured tissue.	Fine and at equal distance.
Resin	white	Red
Weight	950	920
P	574	565

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MAI PRADOO is the name given to different kinds of Pterocarpi. Four kinds are to be found in Siam. Calyx campanulate, five-toothed. Legume nearly round, leafy margined, varicose one or more celled; cells one-seeded. Flowers pure yellow or white and fragrant, leaves alternate.

The largest trees are some 6 m. in girth. The bark is of an olive grey colour. The wood is very hard, the sapwood is small. The heartwood has a dark-red colour The pores variable, small and large with patches of pale tissue joined by irregular, pale, wavy interrupted bands of varying breadth. The medullary rays are fine, very numerous, uniform and equidistant.

Pterocarpus Dalbergiodes is a large tree. The wood is moderately hard, the sapwood grey and small but very large in young trees, the heartwood bright red, streaked with black and brown. The pores are moderate sized, filled with resin which gives an agreeable scent. The pores are surrounded by pale rings and joined by narrow wavy concentric lines, prominent on a vertical scale. The medullary rays are extremely fine,

very numerous and equidistant; when first cut it is of a bright colour but fades when dry.

The wood is very difficult to saw owing to the amount of resin it contains but it works and polishes well. Pradoo is an excellent wood for pavement of floors and Railway carriages as it does not shrink. Further it may be used for door panels, furnitures and interior decorations. It is very good for bridge timber and sleepers. In America it is largely used for building Pullman cars.

The weight is 880 kg. per cbm. P. = 571. The value of the export of Pradoo in Bangkok during 1903 amounted to Ticals 66,932. It has always been largely exported to China.

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MAI TAKIEN, (*Hopea Odorata*) is a tree of the natural order of Dipterocarpeae. Mai Takien is a handsome and beautiful evergreen tree of the siamese jungle. Calyx five-leaved two of them increasing with the capsule into wings. Corol one petalled, contorted. Filaments ten, inserted on the tube of the corol, alternately two cleft. Anthers fifteen. Germ superior, three celled, two seeded, attachment superior. Capsule one celled, one valved. Seed solitary. Embryo inverse, without perisperm. Leaves ovate-oblong, a hollow gland on the axills of the large veins, alternate, short-petioled.

The largest specimen found is 7 m. in girth and 80 m. high. According to Siamese folklore, very big specimens are inhabited by ghosts who can cause the death of any one felling the tree. This tree has white flowers in March. The seed ripens in May and June. The bark is dark, it has deep, long furrows and is 2½-4cm. thick. The wood is hard of yellowish brown colour but is lighter in tone when newly sawn. The pores are of a moderate size and ringed. The medullary rays are prominent on a radial

section, short and broad, joined by numerous faint transverse lines.

This tree grows mostly along streams all over Siam, especially East of Srimaharacha chiefly in damp forests. The wood is valuable on account of its durability. It is much used for boat building, ships' blocks, capstan bars, carriages and oars. It can be used as bridge timber. It is very elastic and is moderately hard to saw. Some natives are too superstitious to use the wood for house building, they make, however boats out of it, especially hull boats. Fishing boats have been seen which have been 60 years in use. At Ayuthia a delapidated house has been found, the Mai Takien parts of which are not rotten. The royal barges are mostly built of Takien. Some of them are more than hundred years old. The resin can be used for the manufacture of varnish. The Siamese make medicine out of it. The fruits are chewn by them together with betel. An analysis of the heartwood by R. Romanis has given the following result.- Potash 29.64 Soda 0.37, Lime 44.30, Magnesia 18.49, Oxide of iron 2.23, Phosphoric acid 1.97, Sulphuric acid 0.80, Silicic acid 2.20.

The weight is 830 kg. per cbm. in the dry state. Value of P=478.

There is another species of Hopea (vernacular Mai Payawm) also an useful timber very similar to Mai Takien. but somewhat lighter in colour and not much inferior. It is found in the upper districts of Klong Ta Law and Klong Ta Luang, Muang Pitsnuloke and Pichit. It is more difficult to saw than Takien as it is more resinous. The white flowers have an agreeable odour.

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MAI MAKA (probably *Sindora Siamensis*, Laos Ka tä) is a first-class hard wood, when cut fresh, it is of a yellow green colour, later it becomes dark red. The pores are scanty and of a moderate size. The medullary rays are fine and very numerous. The bark is thin. After the wood has been exposed to the sun for a long time it turns quite black. The sapwood is whitish and rots quickly. The wood is extremely difficult to saw and to work.

The largest trees to be found are 2.60 m.in girth and logs or parts which may be cut are 8 m. long. Posts of Maka are said to last a hundred years or more.

Maka wood has been used in Siam for bridge-building below Paknampoh and is considered a first class wood by the Engineer who was in charge of that section. The wood may be recommended for Sleepers.

The weight is 1000 kg. per cbm.P=630 The Siamese consider another species, Maka Yai, a little inferior in quality.

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Mai Pluang (*Dipterocarpus tuberculatus*) is a very large tree aud grows straight. The characteristics are Calyx one- leaved, permanent, two of the five divisions of its border large and growing with the pericarp on two very long, scariose wings. Corol five-petalled, germ superior, three celled, cells two seeded, attachment inferior, Nut ovate one celled, and one seeded. Embryo inverse, no perisperm. The body of the calyx of D. tuberculatus is spherical with knobs under its five fissures on the outside. The leaves are about 5 cm. long. The bark is thick and grey. The wood is of a red brown colour. The pores are large and round, filled with resin, the medullary rays are prominent and moderately broad with a number of fine rays between each pair of broad ones. Immense tracts of Pluang forests exist in Siam, but the wood being brittle is inferior than the other hardwoods described in this work. The wood is good for planks aud interior parts of permanent buildings but should not be used for bridge building. It is mentioned because it could be mistaken for Mai Teng, at first sight. The weight is 830 kg. per cbm.P=518.

MAI YANG.—(*Dipterocarpus turbinatus*) is an evergreen magnificent tree, 50-60 m. high. The characteristics of the Dipterocarpi are described in the foregoing account of the Mai Pluang and refer also to the Mai Yang Characteristics of the Mai Yang are further: Spikes axillary, drooping, leaves ovate oblong, glossy and ribbed. Body of the calyx without wings, or angles. Anthers thirty, bristle- pointed.

These trees grow along river banks and are conspicuous in large groups between mixed jungle, ascending to a height of 1,000 m. above sea level. The heartwood is rough and of a red brown colour, the sapwood white. Medullary rays are of 2 kinds, broad and fine, a large number of the latter between each pair of the former, prominent and shining on a radial section. The wood is used by the natives for long dug-out canoes (rua chala) and for house building, but does not resist the attacks of white ants. The average weight is 750 kg. per cbm. in a dry state. P=527.

The moderately hard wood is very resinous and floats well in a dry state. Long posts for the staging in

erecting iron bridges may be obtained by taking Mai Yang. Planks from this wood are superior to planks from softwood trees such as Tabek and Mai Kwao. It is also an excellent firewood. The natives along the Korat line supplied it as firewood till an order from the Government stopped it. For cremation pyres of Royal personages, posts of Mai Yang have been used for generations and no trouble has been spared to bring these giant logs down to Bangkok.

The resinous oil may be taken out of the tree about 20 times a year, after it has reached a certain size, about 1.60 in girth. At an age of about 30 years, a hole is cut into the stem 1 m.-1.50 m. above ground and and a fire is kept burning with dried leaves in that hole. After 3 days the oil starts running into it and it is then taken away to be refined and sold. The price of a kerosine oil tin of good wood-oil is locally 1.50-2.50 tcs. 20-30 tins give 150-200 lbs. of oil capable of making 2,000-3,000 torches (Burma Forest Report 1881-1882). 80-90 torches in bundles of 10 pieces cost locally only 1 tical.

MAI KWAO. *(Nauclea cordifolia)*, a very useful soft-wood tree. The flowers are aggregate, on a globular receptacle, axillary from 1-3 corollets funnel shaped. Germs inferior, two-celled, cells many-seeded; attachment interior. Capsules two-celled. Seeds many, imbricated, and winged. Embryo invert, and furnished with a perisperm. Leaves opposite, round cordate, downy underneath. Segments of the calyx clavate; seeds membrane-winged, not imbricated.

The bark is rough of a grey colour, 1½ cm. thick. This tree has no heartwood, the softwood itself is yellow and moderately hard. The annual rings are indistinct, the medullary rays very fine and short. The pores are fine and small.

The wood is liable to crack if exposed to heat and it shrinks considerably, it is easy to saw and much used as it lasts long in the shade, when exposed to moisture it rots. It should be well seasoned before use and painted in time. The tree grows on good ground above high flood level, trees above an altitude of 800 m. are rare. Mai Kwao is rafted down in great quantities. Besides planks

it may be used for furniture and boxes. If polished the wood has a fine appearance. It can be worked and turned well. It weighs only 680 kg. per cbm. P=459.

MAI TABEK. (*Lagerstroemia flos reginae*) is one of the the most useful and very common trees of Siam.

Calyx six-toothed. Petals six, inserted by claws, and curled. Germ from 3-6 celled; cells many-seeded, attachment central. Capsule superior, from 3-6 celled, from 3-6 valved. Seeds several winged. Embryo, with centripetal radical and little or no perisperm.

The bark is very thin showing white spots along the whole stem. It can be peeled off easily. In August and September the tree has lilac flowers.

The wood is light red to yellow, has small and large pores the large ones are joined by narrow and wavy concentric bands of larger woodcells which contain the smaller pores, prominent on a vertical scale, the medullary rays are indistinct, the annual rings show an average of 36 per cm. radius, they are marked by a ring of large pores. The average weight is 680 kg. per cbm. P.=450.

Tabek grows generally in groups in soft wood or mixed forests, but forms under good conditions extensive forests without allowing too many other genera to grow amongst them. It can easily be extracted and floated, is

therefore cheap and in considerable demand.

Excellent planks may be sawn from Mai Tabek, even for permanent buildings, but it does not stand moisture or the extreme heat of the sun and is liable to attacks by insects. If used for permanent work it should be seasoned and painted in time. Then it will last 20 years or longer provided that some attention is paid to the attacks of insects. Unless the wood is perfectly dry the amount of shrinkage will be considerable. It seasons well.

Tabek logs are being rafted down to Bangkok in large quantities, much is sawn in native sawing sheds along the Menam. Extensive forests are on the east coast, in the district of Saraburi, along the MePing. As fuel it can hardly be surpassed. Thousands of these trees along the Korat Railway have been felled and split into firewood. It is easy to split, has a high heating quality and leaves little ash when burnt.

Tabek is, amongst some other woods, very suitable to replace the so-called "Singapore wood." There is still an import of foreign woods into Siam, chiefly Singa-

pore wood. Tabek is much superior to Singapore wood. If it can be obtained cheap enough, the preference should be given to Tabek.

There are still other species of this genus, Tabek Lueat and Tabek Pluey, both timbers are useful and fairly uniform in structure and quality.

MAI NGIU. (Cottonwood tree (*Bombax malabaricum*) Leaves digitate, leaflets cuspidate, Calyx simple, from 3-5-toothed, corol five-petalled. Stamina numerous in two series of fascicles. Capsule five celled, five valved. Seeds woolly.

The flowers are big, inside dark red and outside pink. The 5 celled drupes are big and woody. The bark is grey and covered with sharp conical prickles, with corky base. When old these prickles disappear. The leaves are long-petioled.

The wood is white when fresh cut, turning dark on exposure, it is very light, soft and perishable. It has no annual rings. Pores very scanty, very large, often oval or divided into compartments. Medullary rays fine to broad, numerous, not prominent.

In order to avoid the wood turning dark the log should be sawn up fresh and the planks dried separately. Cheap planks can be sawn out of it. If they are painted in time they may last several years.

Under water it lasts fairly long. It may be used in making boxes for packing and planks for temporary

buildings otherwise it is of no use. The rate of growth is fast, about 3 annual rings on 2 cm. radius.

The seeds are surrounded by cotton which is good for filling pillows and mattresses. Gum is obtained from the tree. The weight is about 400 kg. per cbm. in a dry state. P=360.

The trees are very straight about 30 m. high, they grow under all conditions, however they prefer grassy plains. The may be seen along the river banks between Paknampoh and Utaradit.

SCIENTIFIC NAMES OF SOME SIAMESE TREES.

Artocarpus integrifolia Roxb.	Kanun
Bombax malabaricum D. C.	Ngiu
Caesalpinia sappan Linn.	Fang
Dalbergia latifolia Roxb.	Payung
Dipterocarpus turbinatus Dyer.	Yang
Ficus glomerata Willd.	Madua
Ficus religiosa Willd.	Ton Poh
Gmelina arborea Roxb.	Takien noo
Hopea odorata Roxb.	Takien
Lagerstroemia flos reginae Retz.	Tabek
Mallotus philippinensis Muell. Arg.	Mohkman
Mangifera sylvatica Roxb.	Mamuang Pha
Michelia Champaca Willd.	Champa
Nauclea cordifolia Roxb.	Kwao
Pentacme Siamensis Kurz.	Rang
Psidium guava Raddi.	Farang
Pterocarpus Indicus Willd.	Pradoo
Shorea obtusa Wall.	Teng
Sterculia villosa Roxb.	Paw
Tamarindicus Indica Linn.	Makahm
Tectona grandis Linn.	Sak
Xylia dolabriformis Benth.	Deng
Ziziphus jujuba Willd.	Putsa

ENUMERATION OF TIMBER TREES

GROWING IN THE SIRACHA COMPANY'S FORESTS, SIRACHA.

1. MAI TAKIEN TONG, TAKIEN HIN. ไม้ตะเคียน ทอง ตะเคียน หิน Largest size 35 kam, greatest suitable length 25 wah. Takien Hin of light yellow colour, Takien Tong dark yellow, flowers white. This tree can attain an age of many hundred years. The Government has permitted (to the Siracha Co.) to cut trees above 3 kam. Useful for boards and boatbuilding. It is very good for furniture. Excellent for building.

2. MAI PAYAWM ไม้พยอม Largest size 30 kam, greatest useful length 8 wah, of yellow colour, flowers white and fragrant. It is used for many purposes and is considered by the Siamese as good timber.

3. MAI YANG.— ไม้ยาง Largest size 35 kam, greatest useful length 15 wah, the wood is softer than Takien, colour light red, flowers white, timber very lasting if protected from the influences of heat and moisture. The government has permitted to cut trees above 8 kam, and collects a tax twice as much as from other woods. This tree gives the wood oil; only trees from which no more wood oil can be obtained may be cut. The wood is good for internal work, but should be well seasoned.

4. MAI KRABAK.— ไม้กระบาก Largest size 35 kam, greatest useful length 15 wah, a timber of white colour, flowers white.

The value of timber increases the older it is. The Siamese use it for housebuilding. Fishing boats from Mai Krabak are said to exist which are twenty years old. It is good for internal work.

5. MAI YAI BOO. ไม้ ยาย บู่ Largest size 20 kam greatest length 10 wah, timber of white colour, flowers white, wood scented, timber used by the natives for flooring and furniture.

6. MAI PRADOO LAY or PRADOO DENG CHIN ไม้ประดู่ลาย หรือ แดง จีน Largest size 16 kam, greatest useful length 5 wah, hardwood red, very hard of very red colour, flowers white fragrant. Hardwood and over 2 kam is an object of trade. Big timber fetches high prices.

7. MAI PRADOO SOM, ไม้ประดู่ส้ม Largest size 30 kam, greatest useful length 10 wah, hardwood very hard of red colour, flowers white not quite as good as the preceeding, is also exported to China, can be exposed to rain and the sun over 100 years.

8. MAI PRADOO SEN, ไม้ประดู่เสน Largest size 30 kam, greatest useful length 10 wah, hardwood hard, darker than Pradoo Som. This wood is much valued by the Chinese. For the last 2 kinds the government collects taxes twice as high than from ordinary trees.

9. PRADOO NAM, ไม้ประดู่น้ำ Largest size 30 kam, greatest useful length 10 wah, hardwood hard

colour red streaked with black. This timber is used by the natives for housebuilding and attains a great age.

10. MAI DENGROAT, ไม้แดงรอด Largest size 30 kam, greatest useful length 10 wah, heartwood hard, of dark red colour, white fragrant flowers, may be used for houseposts.

11. MAI PRADOO CHING CHAN, ไม้ประดู่ชิงชัน Largest size 30 kam, greatest useful length 10 wah, heartwood extremely hard, colour dark red and streaked black, flowers white, it is useful for toolhandles.

12. MAI GET, ไม้เกด Largest size 15 kam, greatest useful length 6 wah, wood very hard of red colour, streaked with yellow, flowers white. Fruits are sweet and can be eaten. The wood is fairly good but rare, it is used for posts, sugar presses and furniture. At Siracha the posts of a rice shed are said to be more than 80 years old.

13. MAI RAK ไม้รัก Largest size 4 kam, greatest useful length 2 wah, colour red like blood, flowers white, it is good for furniture.

14. MAI KLENG ไม้เขลง Largest size 16 kam, greatest useful length 8 wah, wood very hard, of pink colour, flowers white, fruits can be eaten, toolhandles are made of the wood, also it is exported to China where the rudders of lorchas are made of it.

15. MAI GANGRAO, ไม้ กันเกรา Largest size 12 kam, greatest useful length 9 wah, wood very hard of yellowish colour, flowers fragrant, may be used for houseposts.

16. MAI KOHNSMAW ไม้ โคนสมอ Largest size 10 kam, greatest useful length 5 wah, heartwood hard, of light green colour, flowers yellow, the wood may be used for houseposts.

17. MAI PANCHAM ไม้ พันจำ Largest size 15 kam, greatest useful length 6 wah, heartwood hard of yellow colour streaked with black, flowers white and fragrant, the wood may be used for houseposts; it is good for building.

18. MAI MAHAT ไม้ มะหาด Largest size 8 kam, greatest useful length 9 wah, heartwood hard, of dark yellow colour, flowers white, fruits can be eaten, the wood may be used for houseposts.

19. MAI MAKALING มะค่าดึง Largest size 16 kam, greatest useful length 4 wah, heartwood hard, colour yellow streaked with green, flowers blue, wood excellent for internal and outside fittings.

20. MAI GATIT ไม้ กะทิด Largest size 13 kam, greatest useful length 5 wah, heartwood hard, colour light yellow streaked green, flowers white, the wood is excellent and can be used for house building.

21. MAI KAESAI ไม้ แคทราย Largest size 14 kam, greatest useful length 4 wah, heartwood very

hard, colour light yellow streaked green, flowers white, wood very heavy. It may be used for posts but should be used for works of secondary importance, as the quality is still doubtful.

22. MAI MAKA MONG ไม้มะค่าโมง Largest size 16 kam, greatest useful length 3 wah, wood hard of yellow colour, flowers blue, used for houseposts.

23. MAI MAKLUA ไม้มะเกลือ Ebony. Largest size 7 kam, greatest useful length 5 wah, very hard, colour ink black, flowers blue, fruits used for deying cloth black. The wood is used in Siam for handles or weapons etc., it is largely exported to Europe. The government has imposed an export tax of 1 tical per picul.

24. MAI DAMDONG ไม้ดำดง Largest size 6 kam, greatest useful length 5 wah, heartwood as hard as Ebony, of black colour, flowers yellow it is used in Siam for furniture and boxes and is largely exported.

25. MAI SMAESAN ไม้แสมสาร Largest size 5 kam, greatest useful length 3 wah, heartwood very hard, of black colour streaked white, flowers yellow. It is used in Siam for wooden nails in boat building. It is an expensive wood

26. MAI KAPI KAO KWAI ไม้กะพี้เขาควาย Largest size 5 kam, greatest useful length 3 wah, heartwood hard of black colour streaked white, flowers blue. The wood is used for furniture, toolhandles and boxes.

27. MAI MAMUANG PAH, ไม้ มะม่วงป่า Largest size 15 kam, greatest useful length 7 wah, heart- wood hard, of black colour streaked red, flowers white, fragrant, fruits can be eaten. This wood is used for boxes.

28. MAI CHAMOT ไม้ ชะมด Largest size 3 kam, greatest useful length 3 kam, heartwood hard, wood black and white streaked, flowers blue, fruits can be eaten, it is used for walking sticks and fancy boxes.

29. MAI PAWADAM ไม้ พะวาดำ Largest size 16 kam, greatest useful length 10 wah, heartwood hard of yellow colour, beautifully streaked black and red, it may be used for posts, planks and furniture. The flowers are yellow.

30. MAI PAWAKAO ไม้ พะวาขาว Largest size 15 kam, greatest useful length 10 wah, heartwood hard, of white colour, flowers white, fruits eatable ; the wood may be used for planks and posts.

31. MAI KANUN BAN ไม้ ขนุนบ้าน Largest size 10 kam, greatest useful length 4 wah, wood hard of yellow colour, yellow flowers, fruits can be eaten. The wood is used for deying priests garments.

32. MAI INTANIN ไม้ อินทนิน Largest size 16 kam, greatest useful length 6 wah, heartwood hard of yellowish red colour, flowers pink. It is an excellent wood, good for building and can be exposed to heat and moisture.

33. MAI POO CHAO ไม้ปู่เจ้า Largest size 15 kam, greatest useful length 10 wah, heartwood hard, of yellow colour, flowers white, may be used for planks in flooring.

34. MAI TANHOK ไม้ตันหก Largest size 15 kam, greatest useful length 6 wah, heartwood soft like teak, colour light yellow, flowers white, it is a good timber and can be exposed to heat and moisture.

35. MAI PUTYIPUN ไม้พุทยี่บุ่น Largest size 6 kam, greatest useful length 2 wah, wood hard of white colour, it is exported to Japan.

36. MAI MAKAHM ไม้มะขาม Largest size 20 kam, greatest useful length 3 wah, colour black and white, flowers yellow, fruits can be eaten. The wood is good for inside fittings in houses, but is difficult to work.

37. MAI SISIET ไม้สีเสียด Largest size 12 kam, greatest useful length 9 wah, heartwood hard, it is a good wood for building, and is used for flooring, boat building and furniture, the bark is eaten with betel. The flowers are white.

38. MAI PAYUNG ไม้พยุง Largest size 25 kam, greatest useful length 5 wah, the colour of the wood is red, flowers white, it is very durable and can be highly recommended.

39. MAI MANAO PAH ไม้ มะนาว ป่า Largest size 4 kam, greatest useful length 3 wah, has no heartwood, wood light yellow, flowers white. The size of the wood is too small to come in question for building.

40. MAI GAEO ไม้ แก้ว Largest size 4 kam, greatest useful length 2 wah, wood yellow and hard. It is a beautiful wood and is used for fancy boxes.

41. MAI MA PAEN ไม้ มะแพน Largest size 15 kam. Greatest useful length 5 wah, wood hard of red colour, flowers red, it may be used for internal work.

42. MAI LUEANG ไม้ เหลือง Largest size 3 kam, greatest useful length 3 wah, flowers yellow, the wood is used for dyeing yarn and silk ; the price is locally 6 tcs. per picul.

43. MAI YANG DENG ไม้ ยางแดง Largest size 30 kam, greatest useful length 12 wah, colour red, flowers red. The wood has a resinous oil, it may be used in building for internal work.

44. MAI CHAN ไม้ ชัน Largest size 30 kam, greatest useful length 13 wah, wood is red, it is used for boat building; flowers are white.

45. MAI BUNNAK ไม้ บุนนาก Largest size 10 kam, greatest useful length 5 wah, has no heartwood, wood red, white fragrant flowers, good for internal fittings.

46. MAI CHOOMPRAEK ไม้ชุมแพรก Largest size 20 kam, greatest useful length 10 wah, heartwood hard of red colour, it is a wood of doubtful quality. The flowers are white.

47. MAI OYCHANG ไม้อ้อยช้าง Largest size 15 kam, greatest suitable length 5 wah, heartwood hard, colour bright red, it is not good for permanent work.

48. MAI KANG KAO ไม้ค้างคาว Largest size 4 kam, greatest length 3 wah, no heartwood, wood red, it is elastic, but is not good for building; the flowers are pink, fruits are eatable.

49. MAI SANMAN ไม้สารมัน Largest size 15 kam, greatest useful length 6 wah, heartwood hard, the flowers are white, the fruits eatable ; the wood can be recommended for internal parts.

50. MAI SONG GRADONG ไม้สองกระดอง Largest size 5 kam, greatest useful length 6 wah. The wood is of black colour streaked white, it is not a building timber, the small heartwood is good for walking sticks. The flowers are white.

51. MAI MASANG ไม้มะทราง Largest size 20 kam, greatest useful length 7 wah, heartwood hard, wood light red, fruits eatable, it is a good wood, the posts of the pier at Bangplasoi are more than 60 years old, the wood is not attacked by boreworms.

52. MAI MAGLAM TA CHANG ไม้ มะกล่ำ ตาช้าง Largest size 20 kam, greatest useful length 6 wah, heartwood hard of a light red colour, flowers light yellow, fruits eatable, it may be used for internal fittings.

53. MAI HIENG ไม้ เหียง Largest size 25 kam, greatest useful length 6 wah, heartwood hard of a light red colour, it is a good timber and is not attacked by boreworms. The flowers are white.

54. MAI MOHKMAN ไม้ โมกมัน Largest size 4 kam, greatest useful length 2 wah, wood soft, yellow mixed with other colours. It is too small and useless for building, it is however elastic and therefore good for small oars.

55. MAI TAEO ไม้ แต้ว Largest size 20 kam, greatest useful length 6 wah, heartwood hard of light yellow colour, flowers white. It is good for internal fittings.

56. MAI SAMRONG ไม้ สำโรง Largest size 30 kam, greatest useful length 10 wah, wood soft of bright red colour, flowers red, fruits can be eaten, oil for the hair is made from the wood; it can be used for internal fittings.

57. MAI SMAW TIN RAENG ไม้ สมอ ดิน แร้ง Largest size 15 kam, greatest suitable length 5 wah, heartwood hard of black colour streaked with green, flowers blue. It may be good for internal fittings only.

58. MAI RACHAPRUK PAH ไม้ ราชพฤกษ์ป่า Largest size 10 kam, greatest suitable length 5 wah, heartwood

hard of dark black colour, used in Siam fer houseposts and flooring, pink flowers.

59. MAI RACHAPRUK ไม้ราชพฤกษ Largest size 10 kam, greatest useful length 7 wah, heartwood hard, colour black, used for posts and flooring, flowers yellow, fruits can be eaten.

60. MAI MANGUA ไม้มะงั่ว Largest size 5 kam, greatest useful length 4 kam, no heartwood, no building timber, wood used to make combs, gunshafts; flowers white, fruits can be eaten.

61. MAI CHIENG PRAH·NANG AE ไม้เฉียงพร้านางแอ Largest size 15 kam, greatest useful length 7 wah, heartwood hard, of yellow and red colour, beautifully marked, used internally for planks and walls, flowers white.

62. MAI KANUN PAH ไม้ขนุนป่า Largest size 20 kam, greatest useful length 10 wah, heartwood hard of yellow colour, no building timber, good for furniture; flowers yellow.

63. MAI KRABOK ไม้กระบก Largest size 20 kam, greatest suitable length 7 wah, little heartwood, wood of white colour, good to burn charcoal, flowers blue; fruits can be eaten.

64. MAI TABEK ไม้ตะแบก 2 kinds, one streaked yellow, and one not streaked. Largest size 25 kam, greatest

suitable length 8 wah, wood white, flowers lilac. Very good timber for flooring and walls if protected from moisture.

65. MAI GRACHO ไม้กระเชาะ Largest size 16 kam, greatest suitable length 7 wah, no heartwood, wood of yellow colour, good for internal fittings, flowers blue.

66. MAI KWAO ไม้เคว่า Largest size 15 kam, greatest suitable length 6 wah, no heartwood, yellow colour, flowers white, good for internal fittings. Much shrinkage.

67. MAI PAYAYAH ไม้พยายา Largest size 4 kam, greatest suitable length 3 wah, no heartwood, wood hard of light yellow colour, no building timber, good for boxes, flowers white.

68. MAI KRADOHN ไม้กระโดน Largest size 10 kam, greatest useful length 3 wah, heartwood hard dark red, no building timber, flowers white.

69. MAI PRIK ไม้ปริก Largest size 6 kam, greatest useful length 2 wah, softwood of yellow colour, suitable only for furniture and gunshafts. Flowers white.

70. MAI KACHIEN ไม้กะเจียน Largest size 10 kam, greatest useful length 10 wah, softwood of yellow colour, yellow and fragrant flowers, excellent planks for flooring, walling and internal fittings.

71. MAI POTALE ไม้โพทะเล Largest size 4 kam, greatest suitable length 2 wah, heartwood hard of black colour streaked red. Pink flowers. The wood is good

for toolhandles, but too small to be used in building.

72. MAI GATANGHAN ไม้ กะทังหัน Largest size 10 kam, greatest useful length 10 wah, heartwood hard of red colour, flowers white. The wood is good for high posts and masts.

73. MAI SADAO ไม้ ตะเดา Largest size 12 kam, greatest useful length 6 wah, heartwood hard of dark black colour, flowers white and fragrant. The wood can be used for permanent work and can be exposed to sun and moisture.

74. MAI KRADUK GAI ไม้ กะดูกไก่ Largest size 6 kam, greatest useful length 3 wah, softwood of white colour, flowers white. This wood may be used for internal fittings only.

75. MAI MOHKLUEANG ไม้ โมกเหลือง Largest size 3 kam, greatest useful length 6 wah, softwood of yellow colour, flowers yellow; not used in building.

76. MAI TABOON ไม้ ตะบูน Largest size 10 kam, greatest useful length 3 wah, heartwood hard of red colour, flowers white ; not used in building.

77. MAI MAPLAP ไม้ มะพลับ Largest size 4 kam, greatest useful length 10 wah, softwood of white colour, flowers blue, fruits eatable. The wood is used for fishing stakes.

78. MAI MAKAHM KRAY ไม้ มะขาม กราย Largest size 10 kam, greatest useful length, 10 wah, softwood of yellowish white colour. The wood lasts fairly long in water, but is useless for building.

79. MAI SMET DENG ไม้ เส็มดแดง Largest size 10 kam, greatest useful length 3 wah, heartwood hard, colour red, flowers white, fruits eatable. Timber not used for building.

80. MAI WAH YAI หว้า ใหญ่ Largest size 15 kam, greatest useful length 6 wah, no heartwood, softwood compact, colour light yellow, flowers white, fruits can be eaten, the wood may be used for internal parts of buildings if seasoned and painted in time.

81. MAI KANGKO ไม้ คัง โค Largest size 4 kam, greatest suitable length 3 wah, softwood of light yellow colour, flowers white, fruits can be eaten. Very elastic, but too small to be used for building.

82. MAI TASUEA ไม้ ตา เสือ Largest size 15 kam, greatest useful length 4 wah, heartwood of red colour, flowers white, may be used for outside fittings, if seasoned and painted in time.

83. MAI MOONTRI ไม้ มูนทรี Largest size 15 kam, greatest useful length 7 wah, softwood of red colour, may be used for planks inside.

84. MAI CHAMUANG ไม้ ชะมวง Largest size 10 kam, greatest useful length 10 wah, softwood of white colour, flowers white, fruits eatable, may be used for outside fittings if painted in time.

85. MAI LUEAT KWAI ไม้ เลือด ควาย Largest size 10 kam, greatest useful length 6 wah, no heartwood, softwood compact, flowers white. The wood may be

used with care, it has an oily substance like blood.

86. MAI KLAI ไม้กลาย Largest size 10 kam, greatest useful length 10 wah, no heartwood, softwood yellow and compact, the wood cannot be recommended.

87. MAI KOLAEN ไม้คอแลน Largest size 10 kam, greatest useful length 6 wah, compact softwood of white colour, flowers white, fruits eatable. The wood may be used also for outside parts if seasoned and painted in time.

88. MAI PLONG ไม้พลอง Largest size 5 kam, greatest useful length 3 wah, compact softwood of white colour, too small to be used for building. Flowers white, fruits eatable.

89. MAI KAMTCHAT ไม้กำจัด Largest size 15 kam, greatest useful length 10 wah, softwood of white colour, should not be used for building.

90. MAI KAWK KLUEAN ไม้กอกเกลือน Largest size 15 kam, greatest useful length 6 wah, heartwood soft of red colour, flowers white and fragrant, fruits eatable ; timber may be used for planks.

91. MAI LAMDUAN ไม้ลำดวน Largest size 4 kam, greatest useful length 2 wah, softwood of white colour flowers white and fragrant, fruits can be eaten. The wood does not come into question for building owing to its small size.

92. MAI LALAWK ไม้ ละ ลอก Largest size 15 kam, greatest length 5 wah, softwood of yellow colour, flowers white. The wood may be used for planks and walling not exposed to rain.

93. MAI GONG GANG ไม้ โกง กาง Largest size 15 kam, greatest useful length 5 wah, softwood of white colour, flowers white. The timber may be used for planks and inside fittings.

94. MAI POOTSA TALE ไม้ พุด ซา ทะ เล Largest size 3 kam, greatest useful length 2 ½ wah, heartwood of red colour, flowers white, fruits can be eaten. Timber cannot be used in building.

95. MAI SAMPAO ไม้ สำ เภา Largest size 4 kam, greatest useful length 3 wah, softwood of white colour, flowers white ; the timber is lasting in the shade and in water, but cannot be alternately exposed to sun and moisture.

96. MAI MOHK KAO ไม้ โมก ขาว Largest size 3 kam, greatest useful length 7 wah, softwood of white colour, flowers white, useless for building.

97. MAI ROY RIN ไม้ ร้อย รัน Largest size 5 kam, greatest useful length 3 wah, softwood of white colour, flowers white. Not used in building.

98. MAI MAPRANG PAH ไม้ มะ ปราง ป่า Largest size 5 kam, greatest useful length 4 wah, softwood of red

colour streaked white, fruits eatable. Wood good for planks which are not to be exposed to heat and moisture.

99. MAI LAM YAI PAH ไม้ ลำ ใย ป่า Largest size 15 kam, greatest useful length 6 wah, heartwood hard of dark red colour, used in building, lasting in shade. Flowers white, fruits can be eaten.

100. MAI MAFAI PAH ไม้ มะไฟ ป่า Largest size 6 kam, greatest length 4 wah, softwood of white colour, flowers white. Not to be used in building.

101. MAI PUNG TALE ไม้ พง ทะเล Largest size 15 kam, greatest useful length 9 wah, heartwood of red colour, flowers red, fruits eatable. The timber is used for planks in shade and inside fittings.

102. MAI CHAN IN ไม้ จันอิน Largest size 8 kam, greatest useful length 5 wah, heartwood hard of pink colour, flowers yellow and fragrant, fruits eatable; timber good for inside fittings.

103. MAI KATAWN PAH ไม้ กะ ท่อน ป่า Largest size 20 kam, greatest useful length 7 wah, softwood of white colour, flowers white, fruits eatable. The wood is suitable for planks in flooring and walling protected from moisture.

104. MAI KÆSENG ไม้ แค แสง Largest size 15 kam, greatest useful length, 7 wah, no heartwood, wood soft of yellow colour flowers white. Very good for planks and

inside fittings.

105. MAI HAMCHANG ไม้ หำ ช้าง Largest size 15 kam, greatest useful length 8 wah, softwood of white colour, flowers white. The wood is good and lasting when used for inside fittings.

106. MAI PLŒNG YAI ไม้ เพลิง ใหญ่ Largest size 16 kam, greatest useful length 3 wah, softwood of yellow colour, flowers white. The wood is not used for building.

107. MAI PLŒNG NOI ไม้ เพลิง น้อย Largest size 5 kam, greatest useful length 3 wah, very soft wood of yellow colour, flowers white no building timber.

108. MAI SMAW PIPEHK ไม้ ส้มอ พิเภก Largest size 15 kam, greatest useful length 10 wah, heartwood of white colour, flowers white, fruits eatable. The wood may be used for planks in shade.

109. MAI CHLOOT TON ไม้ ชลูด ต้น Largest size 10 kam, greatest useful length 5 wah, softwood of white colour, flowers yellow. May be used for planks and inside fittings.

110. MAI MAFAI RAET ไม้ มะ ไฟ แรด Largest size 3 kam, greatest useful length 2 wah, softwood of white colour. This wood does not come into question for building purposes.

111. MAI SATUE ไม้ สะ ตือ Largest size 15 kam, greatest useful length 12 wah, softwood of white colour,

flowers blue, fruits can be eaten the wood is not used for building.

112. MAI SATAW ไม้ สะตอ Largest size 15 kam, greatest useful length 10 wah, heartwood hard of red colour, flowers white, fruits eatable. The wood may be used for temporary work.

113. MAI PRACHAO HA PRAONG ไม้พระเจ้าห้าพระองค์ Largest size 20 kam, greatest useful length 10 wah, softwood of white colour. The wood is not lasting, but may be used for boxes.

114. MAI LAMBIT ไม้ ลำบิด Largest size 5 kam, greatest useful length 7 wah, softwood of white colour, flowers white. Not used for building.

115. MAI KAPONG ไม้ กะพง Largest size 35 kam, greatest length 30 wah, softwood of white colour. The wood is useless for building.

116. MAI CHANUEN ไม้ ชนวน Largest size 15 kam, greatest length 5 wah, heartwood of white colour. The wood cannot be recommended.

117. MAI TIN PET ไม้ ตีนเปด Largest size 30 kam greatest length 10 wah, softwood of white colour, flowers white. It cannot be recommended for building.

118. MAI SAMING KAMRAM ไม้ สะมิง คำราม Largest size 30 kam, greatest length 10 wah, soft wood of white

colour, flowers red. The wood is not used for building.

119. MAI PAWDENG ไม้ ปอ แดง Largest size 15 kam, greatest useful length 6 wah, softwood of white colour, flowers red. The wood is useless for building, but the bark is used for making ropes.

120. MAI PAW POET ไม้ ปอ เบ็ด Largest size 5 kam, greatest length 4 wah, heartwood soft of white colour, flowers yellow. The timber is not used for building. Natives make ropes from the fibres of the bark.

121. MAI PAWFAI ไม้ ปอ ฝ้าย Largest size 5 kam, greatest length 3 wah, softwood very light of white colour, flowers yellow. The bark is used for the manufacture of ropes. The wood is useless.

122. MAI CHUMSENG ไม้ ชุม เส้ง Largest size 3 kam, greatest length 2 wah, softwood of white colour. It is useless for building.

123. MAI KAH TON ไม้ ข่า ต้น Largest size 4 kam, greatest length 3 wah, softwood of white colour, flowers white. The wood cannot be used for building.

124. MAI GAM CHAI ไม้ กำ จาย Largest size 10 kam, greatest length 3 wah, softwood of white colour, flowers white, fruits eatable. The wood cannot be recommended for building.

125. MAI PLAPDONG ไม้ พลับ ดง Largest size 10

kam, greatest length 7 wah, softwood of white colour. It is not used for building.

126. MAI PLAO ไม้ เปล้า Largest size 3 kam, greatest length 3 wah, softwood of white colour, flowers white; the wood is too small and useless for building.

127. MAI MANGAN ไม้ มะงัน Largest size 6 kam, greatest length 2 wah, softwood of white colour, flowers white. The wood does not come in question for building.

128. MAI MAKAWK ไม้ มะกอก Largest size 10 kam, greatest length 6 wah, softwood of white colour, flowers white, fruits eatable. The wood is useless for building.

129. MAI SAI ไม้ ไทร Largest size 10 kam, greatest length 5 wah, softwood of white colour, flowers red. The wood is not used for building purposes.

130. MAI GRANG ไม้ กร่าง Largest size 10 kam, greatest length 6 wah, softwood very light of white colour, flowers yellow. It is not used for building.

131. MAI SATBAN ไม้ สัตบัน Largest size 15 kam, greatest length 8 wah, softwood of white colour, flowers white. The wood cannot be recommended for any purpose.

132. MAI TINNOK ไม้ ตีนนก Largest size 10 kam, greatest length 5 wah, softwood of white colour, flowers white. The wood is not used for building.

133. MAI PIKOON PAH ไม้ พิกุล ป่า Largest size 10 kam, greatest length 10 wah, softwood compact of white colour, flowers white. The wood is not used for building.

134. MAI TONG ไม่ ตง Largest size 5 kam, greatest length 10 wah, no heartwood, softwood hard of white colour. The wood is not used for building.

135. MAI MONG ไม้ โมง Largest size 5 kam, greatest length 10 wah, no heartwood, softwood of yellow colour, flowers white, the juice from the bark is used by native builders for a mixture which is added to lime mortar.

136. MAI MOI MAH ไม้ หมอย หมา Largest size 3 kam, greatest length 3 wah, softwood of white colour, flowers white, fruits eatable. It is too small for building timber.

137. MAI KAI NAO ไม้ ไข่ เน่า Largest size 10 kam, greatest length 3 wah, softwood of green colour, flowers white, fruits can be eaten. The wood is useless for building.

138. MAI SMAW NA ไม้ สมอ นา Largest size 15 kam, greatest length 3 wah, softwood of white colour, flowers white, fruits eatable. It cannot be recommended for building.

139. MAI SMAW DI NGU ไม้สมอดีงู Largest size 15 kam, greatest length 10 wah, no heartwood, softwood compact of light yellow colour, flowers white, fruits can be eaten.

140. MAI HUH KWANG ไม้หูกวาง Largest size 15 kam, greatest length 6 wah, fine shade tree, wood hard of red colour, flowers white, fruits can be eaten. The wood is not used.

141. MAI KOI ไม้ข่อย Largest size 6 kam, greatest length 2 wah, softwood of yellow colour streaked white, flowers white, fruits can be eaten. It is not used for building.

142. MAI CHIK NAH ไม้จิกนา Largest size 15 kam, greatest length 3 wah, wood hard of light red colour, it is not used for building.

143. MAI TIN TAO ไม้ตีนเต่า Largest size 10 kam, greatest length 6 wah, softwood of red colour, flowers white. The wood is not used.

144. MAI TAKONAH ไม้ตะโกนา Largest size 15 kam, greatest length 3 wah, softwood compact of white colour, flowers white, fruits eatable. The wood is not used for building.

145. MAI KRA CHAO ไม้กระเชา Largest size 30 kam, greatest useful length 10 wah, heartwood hard of pink colour, flowers white. The wood is good for planks and internal fittings.

146. MAI KRAPET TON ไม้กระเพ็ดต้น Largest size 15 kam, greatest useful length 10 wah, heartwood hard of light yellow colour, flowers white, fruits can be eaten. The wood is good for planks and internal fittings.

147. MAI MAKAW ไม้มะก่อ Largest size 10 kam, greatest length 6 wah, heartwood hard of light yellow colour, flowers white, fruits eatable. The wood may be used for posts and flooring.

148. MAI KAYAO ไม้กะเย่า Largest size 10 kam, greatest useful length 4 wah, softwood compact of yellowish white colour, flowers white. The wood may be used for posts.

149. MAI MAFUEANG PAH ไม้มะเฟืองป่า Largest size 3 kam, greatest length 3 wah, softwood compact of light yellow colour, flowers white, fruits eatable. It is too small in size to be used in building.

150. MAI PEKAH ไม้เพกา Largest size 3 kam, greatest length 2 wah, softwood of white colour, flowers white, fruits eatable. It is not used for building purposes.

CHOOSING TIMBER AND MEANS OF TRANSPORT.

IN choosing timber for building purposes it is always difficult to find something suitable. This depends in the first instance on the technical conditions which the building in question requires and on the local conditions which influence the price of the timber, namely the distance to the place from where the timber can be procured and the quality of the timber available, further the means of transport, either by rafts or by dragging it out by elephants or buffaloes or conveying it in buffaloe or bullock carts. The technical conditions to be observed are strength, elasticity and weight of the wood. For bridges a very hard timber with a high co-efficient of transverse strength is used; for example Mai Deng, Teng, Rang, Maka.

For temporary building a soft wood such as Mai Yang, Tabek or Kwao is taken, whereas for sleepers good heavy

timber which can be adzed easily should be selected.

The Choosing in Bangkok is not difficult, as Teng Rang, Pradoo and other hard woods cannot always be procured and Teak is applied generally for all permanent work. In the Interior near hills and forests, it is however quite a different matter. In some parts of the Interior where no teak is growing it cannot be bought or is much more expensive than it is in Bangkok. The reason may be found in the fact that teak dealers send their logs direct to Bangkok and take no troubles to meet the small demand for teak in other places. Therefore one has to look for an equal substitute. For all purposes for which teak is used in Bangkok, hardwood timber is chosen which serves its purposes just as well and has the advantage of lower cost.

The transport conditions influence naturally the price of the wood more than everything else. Timber, growing near streams, is easy to transport. Soft woods can be brought together in rafts without much trouble, but in

rafting hardwood arrangements have to be made to prevent the logs from sinking. For this purpose bundles of bamboo, each bundle consisting of from 30 to 50 is firmly tied alongside the timber raft to act as buoys, these bundles are further again securely bound together by cross pieces to prevent the possibility of their parting during transit. The timber is suspended from them by means of rattans. On the thickness and fresh quality of the bamboos depends the carrying capacity of such a raft. In order to transport heavy timber overland for a long distance it is best to use elephants but for smaller timber buffalœs and bullocks may be used to convey it in carts. Should the distance not be too great and large quantities of timber be found, the best means may be a light railway, however, even in this case elephants or buffalœs can hardly be dispensed with to bring the timber to the small line. Bullocks are used chiefly to transport timber in the higher parts, especially in those with little water in the dry season and buffalœs are preferred for this work by the natives in the Menam Valley. The bullocks

work well and are enduring. In transporting wood with buffaloes much patience is required, the animals are really strong but are slow and want to feed and bathe frequently during the day. Their owners look well after them and object to them being used for too hard work.

The following lists will be of a help in choosing suitable timber.

(1). List of timber trees classified according to durability.

(2). An account showing how some timber treated of in the foregoing pages may be used.

(3). A list of weights and co-efficients of transverse strength.

(4). An account showing the difficulties in sawing some timber of different hardness compared with teak.

LIST OF TIMBER TREES

IN ALPHABETICAL ORDER, CLASSIFIED ACCORDING TO DURABILITY. THE NUMBER DENOTES CLASS OF DURABILITY.

Class 1 is most durable. Trees of this class will last at least 10 years under bad conditions. Class 4 is most perishable. Trees of this class will not last 2 years under bad conditions.

Bunnak	...	3	Dam Dong	...	1
			Deng	...	1
Chaht	...	2	Dengroat	...	2
Chalieng	...	4	Durian	...	4
Chamot	...	2			
Chamuang	...	3	Fang	...	1
Chan	...	3			
Chan In	...	3	Gamchai	...	4
Chanuen	...	4	Gammapruck	...	2
Chayapruek	...	2	Gangrao	...	2
Chet Kon Praruang		4	Ganglueang	...	3
Chieng Prah Nang Ae		3	Gatanghan	...	2
Chik (Siamese)		4	Gatit (Tatit)	...	1
Chik (Laos)=Teng		1	Geo	...	2
Chin Chan	...	1	Get	...	2
Chloot Ton	...	3	Glay	...	3
Choompraek	...	3	Gongang	...	3
Chumseng	...	4	Goom	...	4

Gop	...	3
Grang	...	3
Gracho	...	3
Haen	...	3
Hamchang	...	3
Hieng	...	2
Hom	...	1
Huh Kwang	...	4
Intanin	...	2
Kabao	...	3
Kabek=Tabek	...	3
Kabien	...	2
Kachien	...	3
Kae bahn	...	4
Kae nang	...	3
Kae sai	...	3
Kae seng	...	3
Kah Ton	...	4
Kainao	...	4
Kampi	...	2
Kamtchat	...	4
Kanan	...	3
Kang	...	3
Kangkao	...	3
Kangko	...	3
Kanun	...	3
Kanun pah	...	3
Kao lam Dong	...	4
Kapangha	...	1
Kapong	...	4
Kapi	...	4
Kapi Kao Kwai	...	2
Katawn	...	3
Katae	...	1
Katoom	...	3
Katoom luang	...	3
Kawk kluen	...	3
Kayao	...	2
Kee lek	...	2
Klai	...	4
Klang	...	2
Kleng	...	1
Klohng kwai	...	4
Kolaen	...	3
Koon	...	2
Kohn smaw	...	2
Koy	...	3
Kraat	...	2
Krabak	...	3
Krabok	...	3
Krachao	...	3
Kradohn	...	3
Kradukgai	...	2
Krai	...	3
KrapetTon	...	3

Kwao	...	3	Makaling	...	1
			Makatae	...	1
Lalawk	...	3	Makaw	...	3
Lambit	...	3	Makawk	...	4
Lamduan	...	3	Makayai	...	2
Lamyai	...	2	Makluea	...	1
Lien	...	2	Man	...	3
Lieng	...	1	Mangua	...	3
Liengman	...	1	Manao pah	...	2
Linchi	...	2	Mamuang ban	...	2
Lueat kwai	...	3	Mamuang pah	...	2
Lueang	...	3	Mapaen	...	2
			Mapawp	...	4
Madan	...	4	Mapet	...	2
Madua Chumpon	...	2	Maplob	...	3
Madua Plong	...	4	Maplap	...	2
Mafai	...	4	Maprang	...	3
Mafaw	...	3	Maput	...	4
Mafit	...	3	Masang	...	1
Mafueang	...	3	Matoom	...	3
Magawk	...	4	Moimah	...	4
Maglam Tah Chang		3	Mohklueang	...	3
Mahat	...	2	Mohkkao	...	3
Mahuat	...	3	Mohkman	...	3
Makahm	...	2	Mong	...	4
Makahm gray	...	4	Moontri	...	3
Makahm pom	...	2			
Makahm tet	...	3	Ngiu	...	4
Maka mong	...	2	Noonsi	...	3

Pancham	...	2	Royrin	...	4
Pawadam	...	3			
Pawakao	...	3	Sadao	...	2
Paw deng	...	4	Sahk	...	1
Paw poet	...	4	Sai	...	4
Paw Fai	...	4	Sak	...	1
Payawm	...	2	Sakae	...	4
Payayah	...	3	Sakam	...	2
Payoong	...	1	Salao	...	3
Pekah	...	4	Salieng	...	4
Pi koon	...	4	Saming kam ram		4
Plao	...	4	Sampao	...	3
Plong	...	4	Samrong	...	3
Plap dong	...	4	San	...	3
Plong	...	4	San man	...	2
Ploeng	...	4	Sanuan	...	4
Pluang	...	2	Sataw	...	3
Po Tale	...	4	Satawn	...	1
Poo chao	...	3	Sat ban	...	4
Pootyipun	...	2	Satue	...	3
Pootsah	...	3	Sawong hin	...	1
Pra chao ha praong		4	Sawong on	...	2
Pradoo	...	1	Si fan dang	...	4
Promachat (Tong)		3	Sisiet	...	2
Pung tale	...	3	Smae	...	3
			Smae san	...	1
Rachapruek pah	...	3	Smae tale	...	4
Rak	...	2	Smaw	...	4
Rang	...	1	Smaw di ngoo	...	4

Smaw pipehk	...	4
Smaw tinraeng	...	3
Smetdeng	...	3
Somhit	...	4
Son	...	2
Song kradong	...	3
Sueak (laos) = Yok Fah		2
Tabek=Kabek	...	3
Taboon	...	3
Taeo	...	3
Takien	...	1
Takien noo	...	2
Takonah	...	4
Takraw	...	3
Takuh	...	3
Tang lang	...	4
Tanhok	...	2
Tapoo	...	2
Tapta	...	4
Tasuea	...	2
Tat	...	3
Tawn	...	2
Teng	...	1
Teng nam	...	3
Tengrang=Teng or Rang		1
Tinnok	...	4
Tinpet	...	4
Tin tao	...	4
Tong	...	3
Ton hok	...	2
Wha yai	...	2
Yai Boo	...	3
Yang	...	3
Yang deng	...	2
Yohm	...	3
Yok fah	...	2

LIST SHOWING TIMBER SUITABLE FOR VARIOUS BUILDING PURPOSES.

	Teak.	Tong Rang.	Deng.	Pradoo.	Takien.	Maka.	Payoong.	Kabik.	Kwao.	Intanin.	Lieng	Sawong.	Payawm.
Railway Sleepers ...	–	*	*	*	*	*	–	–	–	*	*	*	*
Bridge Timber ...	*	*	*	*	*	*	–	–	–	–	–	–	–
Telegraph Poles ...	*	*	*	*	*	*	–	–	–	*	–	–	–
Houseposts, for flooring and walls ...	*	*	*	*	*	–	–	–	–	*	*	–	–
Planks exposed to sun and moisture..	*	*	*	*	–	–	–	–	–	*	–	–	–
Planks exposed to moisture ...	*	*	*	*	*	–	–	–	–	*	–	–	–
Planks not exposed ...	*	*	*	*	*	–	–	*	*	*	–	–	–
Boats ...	*	–	*	–	*	–	–	–	–	–	–	–	*
Window and Door frames ...	*	*	*	*	*	*	*	–	–	–	–	–	–

NOTE.—The timber in the column corresponding with an asteric may be recommended.

For other timber refer to the list of woods arranged on pages 63–67 in alphabetical order according to their durability.

Hardwood timber should not be sawn into planks unless it is properly seasoned, as it is liable to crack. Planks of softwood trees will not crack but should not be used before they are perfectly dry as the amount of shrinkage is considerable.

WEIGHTS & COEFFICIENTS OF TRANSVERSE STRENGTH.

	WEIGHT per cbm. in perfectly dry state.	P.
Sappan	1030	1065
Payoong ...	900	622
Deng	1020	608
Maka	1000	630
Teng	950	574
Pradoo	900	571
Teak (Sak) ...	770	553
Rang	920	565
Takien	830	478
Pluang	830	518
Yang	750	527
Kwao	680	459
Tabek	680	450
Ngiu	400	360

For other timber see List of Timber trees arranged in alphabetical order and classified according to durability.

The coefficients of transverse strength are calculated from the formula :

$$P = \frac{W \times L}{B \times D^2}$$

W = Weight in kg when placed on a bar which will cause it to break.

L = Length of bar in cm.

B and D = breadth and depth in cm.

HAND-SAWING WORK.

The timber treated on the foregoing pages being of different hardness it is evident that one kind is easier to saw than another. Teak is easy to saw. If 9 Tcs. per Yok is a fair price to pay for one Yok (= 16 qm.) of teak to sawyers much more must be paid for Mai Maka and Pradoo.

The following prices may be paid to sawyers for sawing planks by hand.

Maka	18	Ticals	per Yok
Pradoo	15	„	„
Teng	15	„	„
Payawm	14	„	„
Rang	13	„	„
Deng	13	„	„
Takien	12	„	„
Kabek	11	„	„
Kwao	10	„	„
Teak	9	„	„

For scantlings and big timber 2 tcs. in addition to the above prices may be paid.

The above prices have been paid at Pichit, at Bangkok they are 2 tcs. per Yok higher.

VALUE OF TIMBER EXPORTED.

	1902.	1903.	1904.	1905.	1906.
Teak	6,726,633	8,276,405	10,051,725	14,075,329	12,800,428
Rosewood	513,713	168,154	294,216	332,583	114,403
Pradoo		66,932			54,585
Agilla		68,961			41,659
Ebony		19,334			26,588
Sappan		36,730			36,330
		360,111			273,565

Value of Timber Sawn or Unsawn Imported.

	Ticals.
1903	562,343
1904	689,678
1905	680,573
1906	725,124

From the above figures it can be seen that the Import of Timber from Singapore is increasing. Very likely the quantities required in future years will increase considerably more and it is believed that the demand must be supplied from other countries as it seems that it cannot be done yet in Siam. The forests of Siam are much better than at the Southern end of the Peninsula.

The cost of transport from the forest to Bangkok is rather too high to allow a big profit to speculators. At present the Sriracha Co. supplies soft wood timber at low rates which is sawn at the Company's Saw Mill at Sriracha on the East coast. There are also suitable forests in other parts of Siam where it will pay to start Saw Mills for scantlings and planks for sale in Bangkok.

The prices for Singapore wood are sure to go up much higher within the next few years: Then is the time when competition with Singapore timber will set in with success and will cause the import to become less again.

PRICES OF TIMBER.

A. At Bangkok.

Teak logs—	12-22 pikat according quality and market rate.
„ sawn,—	Assorted according measurements on timber list and delivered by suppliers Tcs. 3.12 - 4.25 per cbf.
„ scantlings,—	Mixed supplied to R. R. D. Tcs. 120-145 per ton.
„ boards,—	Tcs. 140 - 160 per ton, delivered.
Tabek logs,—	7-9 kam, 8 m long average per log 15 Tcs.
Banglam wood,—	Planks and scantlings of Mai Yang sold at Wang Na, Tcs. 1.50 per cbf. delivered.
Siracha wood,—	Yai Boo, Tcs. 1.00 - 1.25 per cbf. Krabak, „ 1.13 - 1.38 „ „ Yang, „ 1.13 - 1.50 „ „ different hard-woods 1.20-2.00 per cbf. delivered to buyers.
Intanin wood,—	Sawn at the West coast by the East Asiatic Co., sold at Wat Phya Krai per cbf. Tc. 1.-1.50.

Singapore wood,—Planks m. 5.00 × .01 × 0.17 per 100 Tcs. 20-26.

„ m. 5.00 × .02 × 0.17 per 100 Tcs. 56-70.

The market price varies according to quality and demand.

Posts of hardwood, adzed posts are sold at about Tcs. 2.— per running meter.

B. At Sawyard Nong Nam Koon, Korat Line.

Prices charged to railway construction

Hard-wood sawn, For buildings per cbm. Tcs. 75.—

„ „ For bridges „ „ „ 60.—

Posts of hard-wood, Per r. m. „ 0.60.

C. At Petriu.

Teak delivered to R. R. D. per cbm, Tcs. 120.—

Yang „ „ „ „ „ 50.—

Teng „ „ „ „ „ 70.—

D. At Pichit & Pitsanuloke.

Planks of softwood, 1″ tcs. 20.— $1\frac{1}{2}$″ tcs. 25 per yok.

PRICES OF FIREWOOD.

1.)	BLOCK FIREWOOD	per ton	Tcs.	3.—
2.)	LAUNCH FIREWOOD at Pichit	„ 1,000	„	9.—
	at Pitsanuloke	„ 1,000	„	10.—
	at Paknampo	„ 1,000	„	15.—
3.)	ENGINE FIREWOOD delivered to the railway line	per cbm.		2.— / 2.12 / 2.25
	at Lopburi, white		Tcs.	2.—
	„ „ red		„	2.50
	on Pitsanuloke line		„	2.—
	on Petchaburi line red		„	2.87
	on „ „ white		„	1.50
	to Paknam Rwy. p. cbm.		„	7.50
4.)	KILN FIREWOOD at Ban Dara 5-6 m. long	per 1,000	„	40.—
5.)	ROUND FIREWOOD 1 m long stacked in jungle	per cbm.	„	0.75
6.)	Mai Smae at Bangkok	per 100	„	7.50 / 13.—
7.)	Mai Gongkang „ „	per 100	„	25.—

CALCULATING PRICES OF TEAK.

In Siam the teak dealers have adopted a basis of calculation, the so-called Pikat Standard. The Pikat is not a cubic measure nor a measurement in length. The Pikat is an individual value assigned to logs and graduating according to the length and girth of the log. The Pikat Standard places a comparative higher price - a sort of a premium-upon long logs of timber. Therefore, the price per cubic measure of a long log is higher than of a short one. In order to find the value of a log the appended table headed "Standard Pikat Rates" may be used. The current Pikat rates may be multiplied by the figure on the table corresponding to the wah and kam to the log.

EXAMPLE :—*(a.)* A bargain has been made of 1 log 5 wah and 6 kam, at 13 pikat ; in the Pikat list the value 3 Tcs. is found in the column corresponding to 5 wah and 6 kams. This is the price at 1 pikat at 13 pikat $3 \times 13 = 39$ Tcs.

(b.) A contractor offers to drag with his elephants a number of logs from a certain place in the forest to the stream at 3 pikat. There are :

10	logs	3	Wah	10	Kam.
20	„	5	„	8	„
40	„	6	„	6	„

SOLUTION :—Find the rate of one Pikat.

3	Wah	10	Kam	=	5	Tcs.	10	Logs	= 50 Tcs.
5	„	8	„	=	6	„	20	„	= 120 „
6	„	6	„	=	4	„	40	„	= 160 „
								Price	330 Tcs.

$330 \times 3 = 990$ Tcs. price at 3 pikat, the value of his work.

STANDARD PIKAT RATES.

	Length in Wahs						
	3	4	5	6	7	8	9
	Tcs.	Tcs.	Tcs.	Tcs.	Tcs.	Tcs.	Tcs.
5	.50	1	1.50	2	4	6	8
6	1	2	3	4	6	8	10
7	2	3	4	6	8	10	12
8	3	4	6	8	12	14	16
9	4	6	8	10	16	20	22
10	5	8	10	12	20	24	26
11	6	10	12	16	24	28	32
12	7	12	16	20	28	32	38
13	8	14	20	24	32	36	44
14	10	16	24	28	36	42	50
15	12	20	28	32	40	—	—
16	14	24	32	36	44	—	—
17	16	28	36	40	48	—	—
18	18	32	40	44	52	—	—

Note.—One Kam. = 21 cm. of the circumference.

TARIFF FOR DUTY ON TEAK.

LENGTH IN WAH.

(A WAH CONTAINING 2 m.)

Kam	3	4	5	6	7	8	9
5	.375	.50	.75	1.	1.25	1.350	2.50
6	.50	.75	1.	1.25	1.375	2.50	3.50
7	1.	1.375	2.	2.625	3.125	4.375	5.125
8	1.375	2.	2.625	3.625	4.375	5.125	5.150
9	2.	2.625	3.625	4.375	5.50	6.75	7.375
10	2.625	3.50	4.375	5.50	6.75	7.375	8.75
11	3.50	4.	4.75	6.25	8.	9.75	10.125
12	4.	4.75	6.375	8.	9.50	10.125	11.25
13	5.25	5.625	7.625	8.75	10.375	12.	13.50
14	5.625	7.625	8.75	10.375	12.	13.	16.
15	6.75	8.75	10.375	12.	14.375	16.	17.375

DUTY RATES ON OTHER WOOD.

LENGTH IN WAH.

Kam.	3	4	5
5	0.15	0.25	0.40
6	0.25	0.40	0.60
7	0.40	0.65	0.90
8	0.65	0.90	1.15
9	0.90	1.15	1.50
10	1.15	1.50	2.—
11	1.50	2.00	2.40
12	2.00	2.40	3.15

DUTY RATES ON LONG TIMBER OTHER THAN TEAK.

	5	6	7	8	9	10	11	12
6	0.50	0.65	1.15	1.50	2.00	2.25	3.25	4
7	0.65	0.90	1.50	2.00	2.40	3.15	4.00	4.75
8	0.90	1.25	2.00	2.65	3.15	4.00	4.75	6.00
9	1.25	1.75	2.40	3.16	4.00	4.75	6.00	7.40

Hull boats 9 % ad valorem, 3 % above these rates if hull is made of Mai Takien, Deng, Payawm or Sissiet.

MEASURING TIMBER.

Amongst the Siamese and the Chinese sawn wood is measured by the Yok. A Yok is a square measure 16 wah long by one Sok equivalent to 16 qm.

4 Kabiet	—	1 niew.
25 Niew	—	1 Sok or 50 cm.
4 Sok	—	1 Wah or 2 m.

In measuring the length 3/4th Sok of the remainder are counted a full Sok. The price per Yok varies according to the thickness of the planks, viz.—there are Yoks of four Kabiet, two niew, etc.

Logs are measured by the Wah and Kam. 3/4th Sok of the remainder equals a full wah. A lesser portion than this is in the favour of the buyer.

1 Kam=21 cm. of the circumference.

To find the Cubic Contents of a Log, calculate the Square area of the log in the middle according to the formula:

r^2 3.1416 (radius squared and multiplied by 3.1416) and multiply this by the length of the log.

Or G = 1/4th girth of a tree in the middle.
g = 1/4th „ „ „ on one end,
g^1 = 1/4th „ „ „ on the other end.
L = Length of Log.
c = Cubic contents of Log: $C = L\left(\frac{G+g+g^1)^2}{3}\right.$

An allowance must be made for the bark.

To find the diameter of a log, measure the girth in the middle and multiply by 3.1416.

CONTENTS IN CBM.

Kan.	Periphery in Cm.	Diameter in Cm.	Area in qm.	Length in Wahl.						
				3	4	5	6	7	8	9
5	105	33	0.088	0.528	0,704	0.880	1.056	1.232	1.408	1.584
6	126	40	0.126	0.756	1.008	1.260	1.512	1.764	2.016	2.268
7	147	47	0.171	1.026	1.368	1.710	2.052	2.394	2.736	3.078
8	168	53	0.225	1.350	1.800	2.250	2.700	3.150	3.600	4.050
9	189	60	0.282	1.692	2.256	2.820	3.384	3.948	4.512	5.076
10	210	68	0.350	2.100	2.800	3.500	4.200	4.900	5.600	6.300
11	231	74	0.426	2.556	3.408	4.260	5.112	5.964	6.816	7.668
12	251	80	0.501	3.006	4.008	5.010	6.012	7.014	8.016	9.018
13	272	87	0.591	3.546	4.728	5.910	7.092	8.274	9.456	10.638
14	293	93	0.685	4.110	5.480	6.850	8.220	9.590	10.960	12.330
15	314	100	0.785	4.710	6.280	7.850	9.420	10.990	12.560	14.130
16	335	107	0.891	3.546	7.128	8.910	10.692	12.474	14.256	16.038

CUBICMETER RATE IN TCS.

Per Pikat.

Kam.	Periphery in Cm.	Diameter in Cm.	Area in qm.	Length in Wahs.						
				3	4	5	6	7	8	9
5	105	33	0.088	0.95	1.42	1.70	1.89	3.25	4.26	5.07
6	126	40	0.126	1.32	1.98	2.38	2.65	3.40	3.97	4.41
7	147	47	0.171	1.95	2.19	2.34	2,92	3.34	3.66	3.90
8	168	53	0.225	2.22	2.22	2.67	2.96	3.81	3.89	3.95
9	189	60	0.282	2,36	2.66	2.84	2.95	4.05	4.43	4.33
10	210	68	0.350	2.38	2.76	2.86	2.85	4.09	4.28	4.13
11	231	74	0.426	2.35	2.94	2.82	3.14	4.02	4.11	4.17
12	251	80	0.501	2.33	2.99	3.19	3.33	4.00	3.99	4.21
13	272	87	0.591	2 25	2.96	3.38	3.38	3.87	3.81	4.13
14	293	93	0.685	2.43	2.92	3.50	3.40	3.75	3.83	4.05
15	314	100	0.785	2.55	3.18	3.56	3.39	3.64	3.82	4.24
16	335	107	0.891	2.62	3.37	3.59	3.37	3.53	3.65	4.37