ELEPHANTS AS SAWMILL HANDS.

THE displays of trained animals, broken for show purposes, cannot offer the slightest comparison in interest to the trained elephant exhibition one sees in the city of Moulmein, British Burmah. The most absorbingly entertaining feature of the novel sight is the paradoxically industrious character which the work of those huge Indian pachyderms assumes. It hardly seems possible that the work of a sawmill, usually done by human hands, could be accomplished through the medium of the elephant's trunk and the elephant's sagacity; nevertheless it is a fact that the Irawadi steamship company uses some forty to fifty elephants in the operation of its sawmills at Moulmein, and the teakwood so largely entering into the construction of ships is here made ready for the artisan.

A gentleman lately returned from a tour of the east gives an interesting account of the manner in which the mills are operated. The logs are chopped in the interior and floated several hundred miles down the Salwin river to the mill, which is situated on the banks of the stream at Moulmein. Here the logs are formed into a boom, and henceforth the work of transporting is done by the elephants.

The boom is very similar to those we see in Canadian lumbering districts, but instead of the sight of men, brightly garbed in red and blue, running from log to log and moving them with long steel-pointed poles, we see great, ponderous elephants wading and swimming among the teak logs and pushing them toward the shore. The logs are not sawed directly from the water, but are first seasoned, and the elephants not only bring the logs from the water to the land, but also stack them in huge piles, convey them to the mill, saw them, and afterward pile the lumber. Of course, each elephant performs only such certain parts of the work for which he has been trained, and the entire herd is divided into companies of from two to eight. One division of the pachyderms does the work in the water, another company carries the logs to the drying or seasoning stacks, others pile them, another class convey the dry logs to the mill, where some of the elephants do the work of sawing, still others pile the saw lumber, and another herd carries hay and prepares the food for this great industrial combination of brute strength and intelligence.

But the most wonderful, interesting, novel and almost incredible feature of the entire combination is the sight of two monstrously large male elephants that actually act in the capacity of bosses or overseers of the work. These move from place to place among the working elephants, spurring them on, pushing, driving, and frequently chastising a lazy or recalcitrant member of force.

Very few men are needed to direct the elephants in their work. From six to eight of the animals usually work in the water. These wade or swim, according to the depth of the water, to the log boom, and loosening several logs at a time, tow them to the shore at a certain point. Each of the company of elephants that convey the logs from this point to the drying place has a chain attached to his neck and reaching to the ground. At the bottom of the chain is a loop through which the log is run. A man directs the movements of the elephants in placing the log within the coil of the chain. The elephant picks up another log by his trunk and in this manner drags two at a time to the seasoning stacks. About eight elephants are employed in this capacity. The work of piling the logs to dry is done by two female elephants. Each winds her trunk about the log near the end, and together they raise it in a horizontal position and place it on the stack.

After the logs have dried sufficiently they are ready for the mill. Two female elephants take the dry logs from the piles and deliver them to a herd similar in training to those that work between the water and the seasoning stacks. These convey the logs to a track over which a small car runs to the mill. Only one log at a time is placed on this car. As soon as a log is in position on the car an elephant trained for this particular part of the work pushes the car to the mill. Arrived at the mill the log is pushed from the car to a carrier that passes beneath the buzz saw. As soon as the log is thus transferred to the carrier the elephant operating the car returns for another log, while another huge beast, trained to do the sawing, operates the carrier and pushes the log against the saw. But the interesting part of the work does not end here, for as the log is being sawed into the desired boards and timbers, another elephant receives the completed material, piling the slabs on one side and the more valuable product on the other. But two men are required to oversee and direct the elephants in sawing the logs.

Another detachment of the herd is used in carrying the lumber from the mill to the yards and sheds. For this purpose very long trucks with the low front and back wheels close to each other are used. There are elephants trained for loading trucks to the sheds. In the lumber yards are the "pilers" or elephants that take the lumber from the trucks and place it in piles for further seasoning.

As stated before, there is one detachment of this strange army of laborers which does the "kitchen work" for the hotel de elephant, or whatever the feeding place of these big fellows may be called. Some may be seen carrying for the stables, but by far the most interesting sight is the preparation of the food. This is composed of grass, bran and molasses, and is mixed in a large vat. While some are carrying these different components of this highly delectable elephantine boarding house hash, others are engaged in mixing it with pestles which they dexterously manipulate with their trunks. The narrator observed one of the elephants suddenly stop in his work with the pestle and refuse to wield his mixing stick any further. One of the two big boss elephants was called to the scene, and, picking up the recalcitrant's pestle beat him with it over the back and hips until he returned to his work.

Only about ten men are employed in directing the work of the entire herd of elephants. Those who have seen this novel mill at Moulmein in operation all agree in giving it the credit of being the greatest exhibition of trained animals in the world, and say that Hagenbeck's, and, in fact, all other trained animal shows, are simply nowhere near "in line" with it. The mill hands, or more properly speaking, the mill trunks of this institution, have never yet gone out on a strike.

CHEAP POWER FOR MANUFACTURERS.

IN a suggestive article on "The Economics of Electric Power," which appears in Cassier's Magazine for March, Mr. H. L. Lufkin, a prominent electrical engineer, draws a very striking picture of what has more recently been accomplished in the way of applying electric motors to the driving of machinery of all kinds. So much has been said and written in a general way of the convenience and economy of applying electricity to the driving of shop tools that specific facts and figures, derived from actual experience, are most welcome additions to the literature of the subject, and every power user must, therefore, needs appreciate the valuable reference data given in the article. One of the advantages of using electric motors is found in the fact that they may be connected to the machinery to be operated almost directly, without the intervention of long lines of shafting, whose friction losses alone often represent an appreciable item of expense. Referring to this feature, Mr. Lufkin says:

The apparent losses in shafting had always been vaguely estimated until the advent of the electric motor, by which, with the aid of an ampere indicator, these losses are readily and accurately determined. As a result of a test in some thirty shops of varied descriptions, made in 1890, it was discovered that 68 per cent. of the average power applied in these shops was consumed in the shafting. Some data recently very kindly furnished to the writer by one of the large electric companies, which, by the way, is furnishing current for operating about four or five thousand horse-power in electric motors, cover seventy-one shops. The totals of these shops showed that 121,524 watts represented the average total energy supplied, and that 84,700 watts were consumed in the shafting, etc., being 69 2-3 per cent, of the average power, thus approximately checking the tests of 1890. These friction losses in shafting in the mills and factories before referred to have been partially eliminated by means of grouping tools in sets and otherwise driven by electric motors, so that entire sets might be completely shut down when not actually in use without interfering with the remainder of the shops, and long lines of transmitting shafting and belting between floors or from building to building have thus been dispensed with.

An interesting example of the economy derived from this grouping of tools is found in a factory now being equipped with an electrical transmission system. A preliminary experiment in this factory showed that the saving in fuel alone will certainly exceed 50 per cent. and possibly 60 per cent. In one recent instance a card indicating fifty-nine horse-power, was taken from an engine driving a large machine shop, a blacksmith shop with pneumatic hammer, blowers, etc., a pattern shop and numerous special tools on three floors of a building about seventy-five feet square. This card was taken with all tools idle, thus showing friction only. The same tools were rearranged and grouped into several sets driven by electric motors, and under the conditions the average indicator card from the engine driving the dynamos which furnish the power for these same tools is about twenty-five horse-power, covering friction, power for the tools and all.

The convenience and flexibility of an electrical power transmission system are frequently commented on by present users, from the fact that single tools or small groups of tools may be efficiently operated in isolated locations, or locations at considerable distances from the main power plant. The great saving derived in an electrical system owing to the intermittent use of tools, was long since taken advantage of by the builders of traveling cranes, and to-day probably ninety-nine out of every hundred traveling cranes installed are operated entirely by electric power, an independent motor being used for each of the several functions of the crane. Many foundries now work their jib cranes with directly geared motors, taking current, in many instances, from the same dynamo which lights the shops.

THE SHADDOCK TREE.

AMONG the interesting trees of the South is the "shaddock," or "grape fruit" tree. Its name "shaddock" is due to the fact that it was introduced from its native clime, the Malayan and Polynesian islands, to the western tropics by Captain Shaddock, many years ago. From this fact the larger, coarser varieties, which are never imported, take their name. They are also called by the native islanders "forbidden fruit" or pomelos. The trees grow a height of thirty or forty feet and are very beautiful. The leaves resemble the leaves of an orange tree are glossy, dark green and very downy upon the under sides and upon the young shoots. The shaddock is considered the "black sheep of the melon family." It grows singly and often attains a weight of fifteen pounds, while the grape fruit known in this country grows in clusters. The outside of all varieties is pale yellow, according to the kind. The rind and the divisions are extremely bitter. Of late years it has been widely cultivated in Florida, for as its medicinal properties become known the demand for the fruit increases.

AMMONIA AN ENEMY TO WOOD.

THE injurious effect of ammonia upon paint and varnish have been so frequently referred to that few are unaware of the loss that is sure to occur if painted surfaces are exposed to its fumes, but it is not so well known that this enemy to paint is also an enemy to wood, particularly when in a green state. Its worse effects are shown upon oak and hickory, but it operates against other hard woods. If any of our hard timbers are piled up to season near a stable or other place where they are brought in contact with the fumes of ammonia, it will ruin the timber by rendering the fiber brittle and destroying its elasticity. The discoloring of oak is often due to the presence of ammonia. To protect the timber from this enemy it must be well covered, and so piled while seasoning that a good current of air can circulate freely among the piles and between the respective pieces.