

myths are untrue only if we understand them in their literal significance. They are true if we heed only the spirit of the myth which is an exposition of the truth in its dawn. Light is thrown on this subject in Ribot's book, *Essay on the Creative Imagination*, in which he has devoted much attention to the approximation to truth by speculative imagination. In a chapter of my little book *The Surd of Metaphysics*, entitled "Truth or Mythology," the significance of allegorical formulations with special reference to the terminology in science and also in religious truths has been pointed out, and teaches us to respect the old mythology and pagan superstitions, including the paganism which is still clinging to present-day Christianity, better than we otherwise would be inclined to do.

P. C.

## HOW RUBBER IS MADE.

BY A. M. REESE.

ONE of the principal products of the Malay Peninsula is rubber. Like most people who have never happened to investigate the matter my ideas as to the way in which an automobile tire is extracted from a tree were very hazy; so, with another American, who had charge of a mission school in Singapore, I boarded the Jahore express on the F. M. S. R. R. (F. M. S. meaning Federated

Malay States) and after a run of half an hour arrived at the Bukit Timar rubber estate some ten miles northwest of Singapore.

The Bukit Timar is an up-to-date plantation of more than one hundred thousand trees, and here we saw the whole process, from tree to sheet rubber, as shipped to all parts of the world and sold by the pound. Rubber trees grow to a considerable size, but this being a young plantation most of the trees were not over six or eight inches in diameter. In the middle of the estate was a very attractive bungalow where lived the manager and his wife, a young



HOME OF THE MANAGER OF THE BUKIT TIMAR RUBBER ESTATE NEAR SINGAPORE.

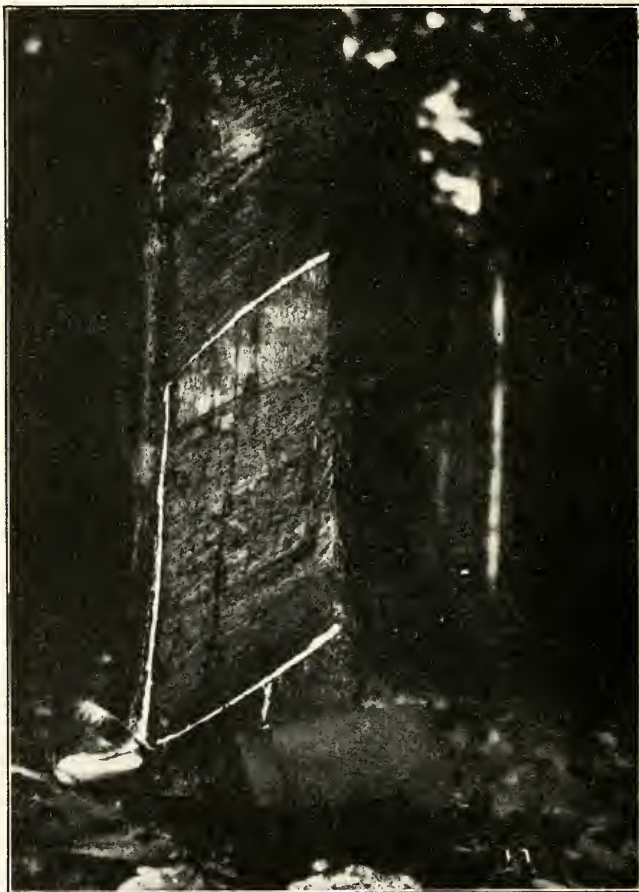
English couple, and the former very courteously showed us about his place and explained the different processes.

"Tapping" begins at daybreak, and all the juice or *latex* is collected before noon. Dozens of native and Chinese men and boys are employed in this process, some of the latter being so small that they can scarcely carry the two buckets of latex on the bamboo stick over the shoulder.

In tapping, a very thin and narrow piece of bark is gouged off, just deep enough to make the tree bleed, but not deep enough to kill it; so that by the time the bark on one side of the tree has been

cut away that on the opposite side has had time to regenerate. The process is thus a perpetual one and the tree lasts indefinitely.

The exact method of tapping varies, but usually it is begun as



**A YOUNG RUBBER TREE SHOWING ONE METHOD OF TAPPING.**

The white lines are the latex running down the grooves into the glass cup at the bottom. Above the two slanting lines is seen the scarred tissue where the bark has been gouged away. When the lower end of the lower line reaches the ground the tree will be tapped on the opposite side. The amount of latex in the cup seems greater than it really is because of the water upon which it floats. The size of the tree may be judged from the kodak case at its foot.

two slanting grooves that converge to form a V. The latex oozes from the freshly cut bark, runs down the converging grooves to their point of union, and is caught in a small glass cup or other

vessel suspended under a tiny spout at the apex of the V. The method of tapping shown in the photograph is different from this somewhat, though the principle is the same. The latex that oozes from the grooves is a pure white, sticky fluid resembling milk; about a tablespoonful is obtained each day from each tree.

By the time each man has tapped or gouged all of the trees assigned to him (perhaps two or three hundred) the first-tapped trees have bled all they will for that day, so that collecting is begun at once. In each cup is a little water to prevent the latex from coagulating and sticking to the bottom.



### THREE LATEX GATHERERS.

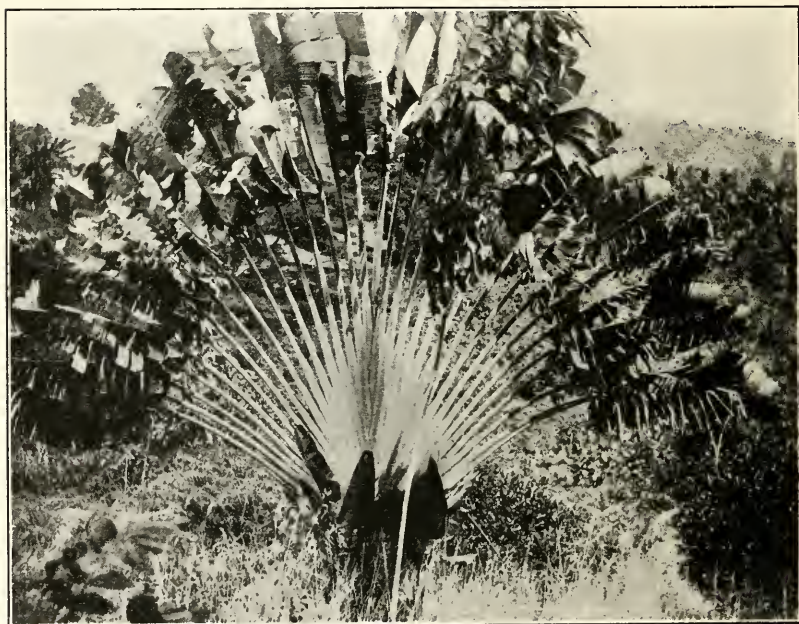
The boy in the middle of the group has the canvass bag over his shoulder in which he carries the scraps of dried rubber from the grooves on the trees.

The first V is cut several feet from the ground, and the amount that is gouged from each side of the V each day is so very thin that it will be months before the apex of the V reaches the ground, by which time the regeneration of the first cuts will be well under way.

After the flow of latex has ceased for the day a narrow strip hardens along each groove, like gum on a cherry tree. These little

strips of rubber, with bits of adherent bark, as well as any drops that may have fallen to the ground, are collected in bags and carried to the factory to be made into sheets of cheap grades of commercial rubber.

After the trees have been tapped the latex is collected in carefully cleaned tin buckets, brought to the factory and strained into huge earthenware tubs. It is then put into enamelware pans about twelve by thirty-six inches in size and three inches deep, and a very weak acid (usually acetic) is stirred into it. In about half an hour the acid coagulates the latex (like rennet in making junket



THE TRAVELER PALM, AN UNUSUAL TYPE OFTEN SEEN IN THE FAR EAST—SINGAPORE AND ELSEWHERE.

from milk) into a soft, pure white mass, about two inches thick and of the area of the pan. This soft mass of rubber is carefully floated out of the pan onto a table, where it is rolled on both sides for a few minutes with a wooden rolling-pin to squeeze out the excess of water and acid. It is then carefully lifted into a large vessel of pure water to harden until the next day.

The next day it is run several times through smooth steel rollers under dropping water, where it is flattened out into sheets of about an inch or less in thickness and of a proportionately greater

area. It is next passed through roughened steel rollers that mark it off into ridges and depressions like a waffle.

These sheets, now tough and elastic, are hung in a closed chamber and smoked until they reach a proper shade of brown, when they are ready for shipment. The smoking process, which is to preserve the rubber, often takes many days, though at the time of our visit the manager of the Bukit Timar estate was experimenting with a method that would complete the smoking in a few hours.

The production of rubber in the Malay Peninsula is of rather recent date and it has increased by leaps and bounds. In the various "booms" that have taken place many fortunes have been made—as witnessed by the palatial residences about Singapore—but many have also been lost, though the witnesses to these are not so evident.

Whether the increased demands for rubber will justify the thousands of young trees that are still being planted, not only on the Malay Peninsula but on Borneo and other islands of the Far East, remains to be seen; but, judging from the opinions of several rubber experts of Singapore, this is quite doubtful.

## HEBREW EDUCATION DURING THE PRE-EXILIC PERIOD.

BY FLETCHER H. SWIFT.

"And Esau was a skillful hunter, a man of the field; and Jacob was a quiet man, dwelling in tents."—Genesis xxv. 27.

"Young men and maidens vied with one another in learning beautiful songs. . . . Shepherds and hunters at their evening rests. . . . sang songs to the accompaniment of the flute."—Herzog, *Encyclopädie*, 2d ed., V. Extracts, pp. 672 ff.

### GENERAL CHARACTERISTICS, SOCIAL AND RELIGIOUS.

IT is impossible to estimate even approximately the duration of the Native or Pre-Exilic Period. From the Conquest to the Exile is something over five centuries, but back of the Conquest stretch unknown unrecorded centuries of nomadism. The Native Period is marked by all those changes, industrial, political, social, moral, religious, intellectual and educational, involved in passing from the life of wandering tribes to that of a people living in walled cities, ruled over by a king, and pursuing as occupations, agricul-