

the plant is used by the natives of Silhet to smear over the inside of baskets constructed of split rattan, which are thus rendered water-tight. Old trees yield a richer juice than young ones. The milk is extracted by incisions made across the bark down to the wood, at the distance of about a foot from each other, all round the trunk or branch, up to the top of the tree, and the higher the more abundant is the fluid said to be. After one operation the tree requires a fortnight's rest, when it may be again repeated. When the juice is exposed to the air it separates spontaneously into a firm elastic substance and a fetid whey-coloured liquid. Fifty ounces of pure milky juice taken from the trees in August yielded exactly 15½ ounces of clean washed caoutchouc. This substance is of the finest quality, and may be obtained in large quantities. The *Ficus elastica* may often be seen in the hothouses of this country.

The use of caoutchouc with which we are most familiar is that of removing the marks of lead pencil from paper, and its most common name is Indian rubber. It is not much more than a century since it was introduced into Europe, and the manner of its production was at first unknown. In 1735 some members of the French Academy of Science visited South America, when they found it was the thickened juice of a Brazilian tree, and in the following year an account of its preparation was given to the Academy. The best time for obtaining the greatest quantity of caoutchouc is in the rainy season, when the trees being pierced, a thick juice, having neither taste nor smell, exudes, which, on its first appearance is of a yellowish white colour, and afterwards becomes darker by exposure to the atmosphere, and also becomes solidified. Several coatings of caoutchouc being successively applied to the exterior surface of clay models of bottles, they are dried over fires, in the course of which each stratum of caoutchouc becomes blackened by the smoke. The lines usually visible on the exterior of a bottle of Indian rubber are traced with a blunt tool. After being exposed to the drying effect of fire for a sufficient length of time, the clay is crushed and shaken out of the bottles, which are then ready for exportation. The Indians had long been in the habit of making boots of caoutchouc, which were perfectly waterproof, and the inhabitants of Quito were accustomed to employ it in the manufacture of cloth. Caoutchouc gives a soft and beautiful light, and before the demand in Europe became so great the South Americans were in the habit of employing it in flambeaux. One of these an inch and a half in diameter, and two feet long, would burn during twelve hours. The caoutchouc obtained from India is prepared in a different manner from that which is followed in South America, being, when imported, in a solid flat state, and not blackened.

The chemical properties and affinities of caoutchouc, which adapt it for a great variety of purposes, must be treated in connection with its uses as a substance of growing importance in the manufacture of an increasing variety of articles.

PEARLS.

The enormous value attached in ancient times to some extraordinary pearls seems to be almost fabulous; much of this must of course be attributed to the caprice which will pay any price however excessive, for whatever is unique in its kind, the possession of which may be an object of competition; and the manufacture of artificial pearls had not then lowered the price of the real jewel. But though no longer so extravagantly valued, the pearl must always be a favourite; its delicate and silvery lustre, in the words of an admirer, "relieves the eye after

gazing at the brilliancy of the diamond, as the soft brightness of the moon after the dazzling fire of the sun."

The finest pearls are found in the neighbourhood of India, and the Hindus poetically ascribe their production to drops of dew which fall into the shells of the fish in which they are formed. A Brahman told Mr. Le Beck that the fish rises to the surface of the sea in the month of May, to catch the drops in his shell, and that he thus received the germ of a pearl, which is then impregnated by the heat of the sun.

Pliny had probably received some version of this Indian idea, and, as usual, he improved the story by the addition of something of his own. He says, "The pearls vary according to the quality of the dew by which they are formed; if that be clear, they are also clear; if turbid, they are turbid; if the weather be cloudy when the precious drop is received into the shell, the pearl will be pale-coloured; if the shell has received a full supply the pearl will be large; but lightning may cause it to close too suddenly, and then the pearl will be very small; when it thunders during the reception of the drop, the pearl thence resulting will be a mere hollow shell of no consistency."

Agurello, an Italian writer of the fifteenth century, has introduced the idea in a Latin poem in these words:

"Cum se summo pandunt in marmore conchas
Ut genitalis eas anni stimulaverit hora
Implenturque levi conceptu roris hiantes,
Et gravidæ certo mox edunt tempore fetus,
Ætheriusque illis fit candens unio partus."

("When the shells open on the surface of the deep, excited by the genial season, they are filled by the light fertilizing dew; thence in due time they bring forth their young, and the brilliant pearl is the ethereal produce.")

The truth is much less poetical than the fiction. The pearl is generally admitted to be a sort of disease, a morbid concretion produced in the body of several species of molluscous fishes. How it begins is not precisely known; probably a grain of sand, or other minute substance may have found its way into the shell; and there produced irritation; the efforts of nature, if unable to expel the cause of uneasiness, would be excited to render it less injurious by covering it with layers of calcareous matter, and thus the pearl might be formed. That it is injurious to the animal appears from the observation of pearl-fishers, that the smooth shells rarely, if ever, contain pearls, while the distorted shell is seldom or never without one.

Pearls are found in Asia, Europe, and America. The Romans procured them from Britain almost two thousand years ago, though not of excellent quality; and in modern times, considerable quantities have been furnished from Scotland. It is stated that the rivers of Perthshire supplied the London market with pearls to the amount of 10,000*l.* annually for several years, about the middle of the last century. In Russia they are produced in the province of Novgorod, Tver, and Pskov, and until the year 1776 they were considered imperial property wherever they were found. Several rivers of Saxony, Bavaria, Bohemia, and Silesia, afford pearls, and it has been remarked that in several cases the production extends to a small part only of their course. Thus, the little river Elster, which rises in the Erzgebirge of Saxony, on the borders of Bohemia, contains many pearl shells from its source to the town of Elsterberg, a distance of fifteen miles; beyond this none are to be met with; the cessation is with much probability attributed to the confluence of the river Triblerbach, which in its course turns several large mill-wheels used in mining operations. This supposition is corroborated by the fact that Triblerbach itself produced pearls previous to the erection of the machines upon it.