

Natural History.

THE FOX KUSU IN THE BERLIN AQUARIUM.

The whole group of animals of the order of Marsupialia derive their names, as is well known, from a pouch situated in the lower part of the abdomen, a broad fold of skin, which is of the greatest importance for the existence and subsistence of the young of these animals.

The pouched animals are born naked, blind, deaf, and with stumpy legs, and are so helpless that it is impossible even with the greatest care, to bring up the little creature artificially.

It was a puzzle for a long time how the young were placed in the pouch, but it has been found that the mother takes the little ones up with her mouth, as a cat does her kittens, and places them in the protecting covering. In this pouch are the nipples, which the little imperfect animal would not be able to find, if the mother did not immediately press them to it.

The little animal remains in the pouch for several months developing and finally reaches out its head to look around the world.

Many weeks pass before it ventures to forsake its warm well furnished little house. Finally it takes the great step, and moves about for the first time in the open air, but at the least noise it returns in haste to its mother's pouch, from which it again looks forth when the imaginary danger is past.

The fox kusu (*Phalangista vulpina*) is a climbing pouched animal, and resembles the squirrel. The length of the body is 60 centimeters, of the tail, 40 centimeters. The color of the upper side is brownish gray, with markings of pale red: the under side is yellow, the back and tail black. The tail is used for grasping and holding firmly to objects, and appears to be an indispensable organ.

It climbs and leaps like the squirrel, but the squirrel far surpasses it in intelligence. Like most of the representatives of this order, the fox kusu shows a certain want of mental capacity; this is evident in its motions and in its capture by day. If it is pursued it soon gives up the flight and hangs with its tail to a branch, from which it may be easily taken. It has been ascertained that the continual gaze of the hunter wearies the animal and in a measure blinds and bewilders it, so that it finally falls down helpless.

The fox kusu inhabits Australia and Tasmania, lives in the forests, and leads a nocturnal life. Its nourishment consists mainly of vegetables, but it likes eggs and young birds.

It is much hunted by the natives for its flesh, which is repulsive to others. The skin is of some value, and is sometimes seen in the market.

The kusu of the Berlin Aquarium was soon tamed, is always peaceable and gentle; but it is difficult to decide whether its amiability does not proceed from stupidity.

FILIGREE JEWEL CASKET.

We give an engraving of an exquisite filigree jewelry box of silver from the celebrated Gruenes Gewoelbe, in Dresden. In this repository many beautiful and valuable objects are stored. Our engraving represents this fine piece of silver work so well that it is unnecessary to enter into a detailed description of it.

TABLE, AFTER SHERATON.

Ingenuously contrived dressing and other tables were among the specialties constructed by Thomas Sheraton. While light of structure, they were generally strong, and such articles, made of Spanish mahogany, are still occasionally met with in a good state of preservation, which latter is partly due to the admirable workmanship that characterized all Sheraton's productions, and partly to the well-seasoned timber he employed. We illustrate below a table which has been adapted from one of his designs, and which we take from the columns of the *Furniture Gazette* of London. In giving sketches like these, our object is not to induce our readers to slavishly imitate them, but rather to enable cabinet-makers and designers to turn them to account in evolving new shapes and forms. Such examples, moreover, help to make modern craftsmen familiar with the distinguishing characteristics of the eighteenth-century styles.

The first saw-mill was erected in the Island of Madeira in 1420; and the next at Breslau, in Austria, in 1432.

Miscellaneous.

COVERED PULLEYS FOR BELTING.

In driving machinery which makes a great number of revolutions per minute it is often necessary to have comparatively small pulleys, and as for very high speeds the belt should be as light and thin as possible, some means of getting greater adhesion between the belt and pulley are required. To draw the belt very tight will not answer, as that means both straining the belt and putting a great pressure on the bearings next to the pulleys. To use a tightening pulley to increase the "arc of contact" is an awkward and troublesome expedient, as most who try it will find, even at low speed of belt, and one that causes friction and frequently destroys the belt. One of the best means of increasing the friction is to cover the iron pulley with some substance which will cause a greater friction between the surfaces of the belt and pulley. Wooden pulleys are sometimes used, but as they are apt to split, or get out of truth, they are not so reliable.

A very good plan is to make an endless band of rubber belting, and draw it tightly over the pulley; the friction between it and the pulley being round the whole circle of the pulley, will always be greater than can well be got between the driving belt and the new face of pulley made by the rubber.

Another plan, and one often much more convenient, is to cover the pulley with leather. A good way to do this is to bore a number of holes around the circumference of the pulley, and drive hard wood wedges into these, then tack on any old belting or strips of leather of nearly uniform thickness. Having done this, put the pulley in a lathe and turn up the leather face carefully but with a rough surface, and then cement or glue on another coating of new leather all in one piece; if possible, the joint had better be scarfed, and wooden pins may be driven through the leather, so as to fasten the whole together. This method has been successfully done even with large pulleys. In one instance, where a belt 22 inches wide was running on a pulley about 40 inches diameter and required a lightening pulley to prevent it from slipping and had frequently broken, the pulley was covered with leather in the manner described with the result that the tightening pulley was dispensed with, and a new belt gave no further trouble, and drove the machinery without any appreciable slip. The original belt had only been in use a few months, but was found quite brittle from overstraining, and broke short off across its whole width, the elasticity apparently being all exhausted.

It may appear a little troublesome to cover the pulleys, but once well done it is a permanent job and makes a great improvement in the wear and tear of the belt.—*Canadian Manufacturer.*

NEW WATER MOTOR.

A new apparatus for measuring the consumption of water has been introduced that appears to have the merit of simplicity and cheapness. It consists of two cast-iron cylinders, placed together at the bottom, and inclined from each other at an angle of about twenty degrees. They are supported on a pivot, and on this they are free to rock from side to side, as the weight of the water in one or the other causes it to move. These cylinders are connected with each other at the bottom, and are partly filled with quicksilver. There are also inlets and outlets for the water, controlled by the oscillation of the cylinders, which serves to move a registering device that marks the quantity of water that passes through the apparatus. The water, on entering one cylinder, drives out the quicksilver and it passes over the other cylinder. Here the weight of the quicksilver serves to rock or upset the cylinder, and its movement on the pivot opens the outlet port and closes the inlet port. At the same time, a second inlet port is opened and the water flows into the second cylinder, driving out the quicksilver. The same operation follows in the first cylinder, and thus the continuous passage of the water is secured, while the oscillation of the cylinders controls the registering apparatus.—*The Century.*

From the Syriac translation of the Bible we find that Pumps were invented by Otesibus of Alexandria, 224 B. C. and were wholly or partially made of cast brass or bronze.