

A FLYING BATRACHIAN OF MALAISIA.

All the vertebrates have representatives that are endowed with the faculty of flight. This gift has not been refused to the bat any more than to the galeopitheci, or flying lemurs, and in various regions we find squirrels whose skin extends along the sides in wide folds, and forms a large parachute. The flying squirrels (*Pteromys*) are the most remarkable representatives of these aerial rodents, and, among marsupials, the charming *Belidæ*, of the Austro-Malasian region, are not the least graceful of the flying mammals.

It has been the privilege of all who have sailed in tropical waters to see flying fishes describing graceful parabolas over the water, and endeavoring to escape the bill of the bird or the teeth of the bonito. The reptiles have their flying dragons, and the batrachians include the *Rhacophori* among their number.

The celebrated English traveler A. R. Wallace has, in a remarkable work*—a true *vade mecum* for every naturalist visiting Malaisia—embodied the fruit of his researches and observations made during a stay of about eight years in the islands of Malaisia and New Guinea. During one of his trips to the island of Borneo he was enabled to procure one of those batrachians of the curious genus *Rhacophorus*, and he thus describes it:

"One of the most curious and interesting reptiles which I met with in Borneo was a large tree frog, which was brought me by one of the Chinese workmen. He assured me that he had seen it come down, in a slanting direction, from a high tree, as if it flew. On examining it, I found the toes very long and fully webbed to their very extremity, so that when expanded they offered a surface much larger than the body. The fore legs were also bordered by a membrane, and the body was capable of considerable inflation. The back and limbs were of a very deep shining green color, the under surface and the inner toes yellow, while the webs were black, rayed with yellow. The body was about four inches in length, while the webs of each hind foot, when fully expanded, covered a surface of four square inches, and the webs of all the feet together about twelve square inches. As the extremities of the toes have dilated disks for adhesion, showing the creature to be a true tree frog, it is difficult to imagine that this immense membrane of the toes can be for the purpose of swimming only, and the account of the Chinaman, that it flew down from the tree, becomes more credible."

The naturalist Kuhl, who perished in Java, a victim to his devotion to science, assigns the following general characters to these toads, some of the forms of which he groups under the title of *Rhacophorus*:

Interdigital membranes long and extensible, folded longitudinally when the fingers are not extended; head short, tongue wide, and developed lengthwise, narrow in front, and forked, free behind; tympanum apparent; vomerian teeth situated between the wide spaced posterior nares; the skin of the arm forming along the latter a crest-like expansion. While resembling tree toads in their general external characters, the *Rhacophori*, in their internal organization, recall the frogs, among which many naturalists are inclined to class them.

We herewith give a figure of a large species, drawn by Mr. Clement from a specimen in the Museum of Natural History of Paris. This species, which is known as *R. rheinwardti*, has a green back, speckled with black, and an orange-yellow belly, marked with black dots. Blue blotches are found upon the palms of the four limbs, between all the fingers except the first and second. The general form is well shown in the engraving. The eyes are protuberant, and the snout is rounded in front. Although the dorsal skin, as well as that of the upper surface of the limbs, is smooth, the belly is very granular, as is also the lower surface of the thighs; but the breast and throat are smooth. At the extremity of the very large and long fingers are observed spongy disks of considerable size. The hand has one peculiarity: its fingers are provided in the center with a long, tubercular appendage. The general aspect of the *Rhacophori* is like that of the large and beautiful tree toads of the Papua Islands, one species

of which (*Pelodyras cynea*) is remarkable for its splendid azure color. Rheinwardt's *Rhacophorus* inhabits the Sunda Islands.

Exact data are wanting as to the habits of these curious amphibians. It is permissible to believe that, after the manner of tree toads, they dwell in trees and bushes, hunt insects, and, in their gambols, make use of the singular parachutes that nature has given them. In the East Indies and their archipelagoes, and in Madagascar, other forms are met with that have the interdigital membranes more or less developed.—*La Nature*

The Water Cartridge.

The explosive used is a nitrous compound, which has been given the name of gelignite, or gelatine dynamite, which contains 80 per cent of blasting gelatine, 15 per cent of nitrate of potash, and 5 per cent of wood ground into fine powder, and freed from all resinous matter. It is a soft, pulpy substance of the consis-

Fixation of the Gaseous Nitrogen by Arable Soils.

According to the author's experiments arable soil continually fixes free atmospheric nitrogen, even without any vegetation properly so-called. This gain cannot be ascribed to atmospheric supplies of nitrogenous compounds, whether gaseous or dissolved in rain water. In the experiments where the rain water flowed away outside after having traversed the soil, the rain removed from the soil, in the shape of nitrates alone, more nitrogen than it had brought in the shape of ammonia and nitric acid taken together. Nevertheless the fixation of nitrogen was more considerable in earth exposed to the rain than in such as was under cover, doubtless by reason of the greater activity of the organisms which fix nitrogen by the circulation of air and water.—*M. Berthelot.*

Chimneys.

For those parts of a chimney which are supported throughout, stone may, under some circumstances, says the *American Architect*, be admissible, but brick is always preferable for the purpose. The abutments of a chimney should be tied into the walls by wrought iron bars of sufficient number and strength, turned up and down at the ends, and built into the jambs for several inches on each side. No part of a flue should be of less thickness than half a brick, or $4\frac{1}{2}$ inches. Where slabs of stone or slate are placed level with a floor before the opening of a chimney, they should invariably be laid in sound mortar, cement, or other incombustible and non-conducting substances, and it should be at a distance of not less than $4\frac{1}{2}$ inches from the joists, flooring, or any other woodwork. A chimney built only up to the roof and stopping at that point is always dangerous. Every chimney in a house should be perfectly distinct and separate from every other chimney, from the hearth to the external opening. Chimneys may safely be built in stacks, but they should on no account have any connection with the stacks. Brickwork around flues should not be less than $4\frac{1}{2}$ inches thick in any part. By the Code Napoleon it was not permitted to build a chimney against the wall of an adjoining house without isolating it by an intermediate wall of sufficient thickness to prevent heat passing to the neighboring premises.

A contributor, writing from Cambridge, Ill., to a local journal, which we copy from the *American Artisan*, gives the following directions for the proper construction of a chimney:

To build a chimney that will draw forever, and not fill up with soot, you must build it large enough—sixteen inches square; use good brick, and clay instead of lime up to the comb; plaster it inside with clay mixed with salt; for chimney tops use the very best of brick, wet them and lay them in cement mortar. The chimney should not be built tight to beams or rafters, as most chimneys settle a little, and if too tight between the beams and rafters, there is where the crack in

your chimneys come and where the most of the fires originate, as the chimneys sometimes get red hot. A chimney built from cellar up is better and less dangerous than one hung on the wall. Don't get your stove-pipe hole too close to the ceiling—eighteen inches from it is near enough.

New Mode of Preparing Oxygen.

Into a suitable generating apparatus introduce two pints of commercial solution of peroxide of hydrogen (3 per cent) and a pound of dilute sulphuric acid (1.5). Into this mixture allow to enter gradually through a safety funnel a solution of 800 grains of potassium permanganate in 28 fluid ounces of water. Oxygen will be rapidly disengaged without application of heat, the yield from the above quantity of materials being five gallons.—*Bulletin de Pharm. de Lyon, Arch. de Pharm.*

If you want knowledge, you must toil for it; if food, you must toil for it; and if pleasure, you must toil for it. Toil is the law. Pleasure comes through toil, and not by self-indulgence and indolence. When one gets to love work, his life is a happy one.—*Ruskin.*



A FLYING BATRACHIAN (RHACOPHORUS RHEINWARDTI).

tence of putty, is white in color, and is made up in bars an inch in diameter. It is made by Nobel's Explosives Company, Glasgow. It produces no fire, and so does away with the danger of igniting explosive gases that may be liberated by the blasting operations. A length of 3 inches contains a quantity equal in explosive power to $\frac{3}{4}$ pound of blasting powder, the average charge used in colliery blasting, and the charges vary in length from 3 to 6 or 7 inches. The cartridge consists of a cylindrical case, 18 inches in length by 2 inches in diameter, and is made of specially prepared water tight paper, in the center of which, held in its place by metal webs or diaphragms, the explosive is placed. A detonator, connected with an electric wire, is stuck into the end of the explosive, the outer case filled with water, and the end tied up round the electric wire, so that none of the water can escape. It is then ready for placing in the bore and ramming. The cartridge, as above described, is now in use at the Wath Main, Birley, Manvers Main, Killamarsh, Mitchell Main, and other collieries in the district, throughout North Staffordshire, at the Altofts colliery, and at many collieries in the north of England.

*The Malay Archipelago. London, 1872.