THE FLYING GURNARDS.

BY CHARLES F. HOLDER.

When one approaches the Strait of Florida, and even before, against the Gulf Stream, he begins to see the clear blue water dotted with the green weed called gulf weed, the growth which, in the great vortex to the east and south, forms the so-called Sargasso Sea. The writer has seen patches of this weed covering acres of the Gulf near the Florida keys, the vast masses forming homes for many strange and interesting animals ranging from fishes down to barnacles, nearly all so singularly colored as to resemble almost perfectly the weed itself.

The *sargassum* is often broken up into leads, rivers, and streams, as it were, and in which will be found many interesting fishes which seem to seek protection here. Among them is a flying gurnard of great interest and beauty, shown in the accompanying photograph from life.

The fishes are veritable knights of the fin; are armored cap-a-pie, the head covered by a bony cap from which several spines turn backward. The side or pectoral fins are large and winglike, the rays connected by webs presenting an extraordinary surface, and seemingly having all the attributes of a wing. They are beautifully colored as well, and a marked contrast to the ordinary flying fish, which is usually a pure silver below and green or blue above; but the flying gurnard is a resplendent creature ablaze with tint and color.

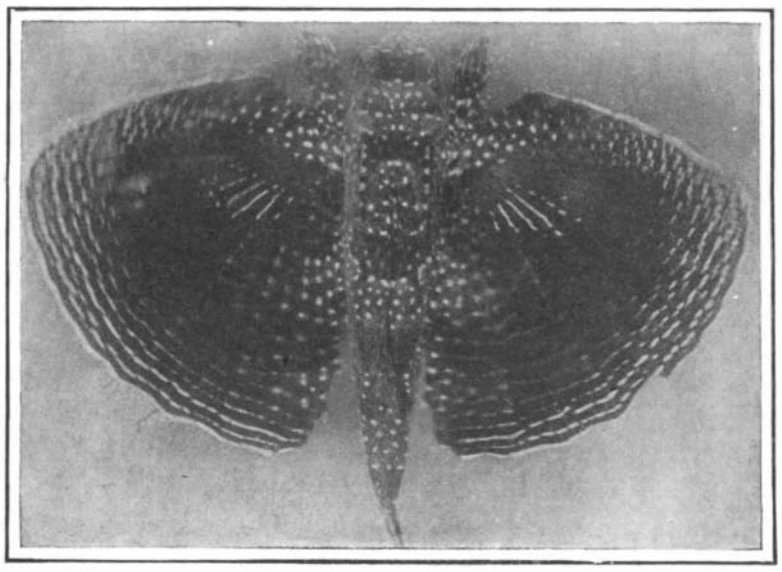
The adult gurnard is about twelve inches long, and I have more than once dodged it as it came flying along the surface. There is a marked variation in color. I have seen them in a vestment of deepest blue; again a crimson, or a combination of both. The wings are often olive green in color, but I have seen them a deep scintillating blue, and often they are green splashed with spots of vivid blue, almost iridescent. The tail is sometimes tinted a pale violet. Such a radiant creature, flashing like a gem in the blazing sunlight, not one, but a dozen, or twenty dashing over the surface, appeals to observers in different ways. The layman who has never seen them before admires the brilliant display, the fish appearing like some dazzling insect as it dashes through the air; and in nine cases out of ten the observer will be willing to take affidavit that the fish is flying, as the fins or wings appear to flutter; but the fact is that the flying gurnard is an animated aeroplane. It dashes out of the water at full speed, spreads its wings and soars, not flies, the rush through the air causing the weblike wings to flutter, giving the impression that the animal is moving by the beating of its wings.

The gurnard, at least so far as my observation goes, cannot fly as far as the California g fish, which covers an eighth of a mile with ease, yet I have seen a gurnard sail out of sight, have seen it pass over a boat four or five feet from the water, and the fish is often blown aboard vessels, in several instances men being knocked down by it. In one instance known to me, a schooner was plying between some of the keys of the outer reef, but one man being on deck. The men below noticed that the vessel was up in the wind, and ran on deck to find their companion senseless from a wound between the eyes; a gurnard near by on the deck was the explanation. The head of the fish is a most formidable weapon of offense as a projectile, being as hard as a stone, and reaching backward from it are four long, sharp spines, which have all the appearance of barbs to this living arrow. The head is blunt, rising almost directly from the mouth, altogether giving the gurnard a pugnacious appearance.

In rowing my boat through the *sargassum* at times these beautiful fishes would be seen rising all about; sometimes landing in the blue lanes, again dropping upon the mass of weed to struggle laboriously off into their native element, disturbing various stolid fishes known as *Antennarius*, often found lying prone, so simulating the weed that it was impossible to distinguish them from it.

In parts of the Barbados these fishes are highly esteemed, just as the sculpin, which is scorned in New England, is considered one of the best of edible fishes in California. The natives down in the Caribbean Sea round up the flying gurnards of that region in great seines and take them by thousands. The sight is often of great interest, as when a school is found, and it is surrounded by the big net, the fliers go into the air by hundreds, presenting a most animated picture; the blacks shouting and laughing, and dodging the hard-headed fishes, which dash over the nets, sometimes hitting the natives. The net is either hauled upon the beach, or upon the various boats, which are filled to the brim with gorgeous fishes.

Moseley, the naturalist of the "Challenger," tells an interesting story regarding his experiences with this fish. He was fishing for some larger game when he had a strike, and a flying gurnard dashed into the air, firmly hooked, to the amazement of the angler who, doubtless, never before played a fish in the air.



FLYING GURNARD.

Light spots are blue; dark areas are olive green.

The flying gurnards, at least those observed by me, are surface fishes, preferring to live where they can leap into the air and soar away from their enemies. It is somewhat singular that inventors who are experimenting with airships do not study the flying fish, which is an ideal model, the most perfect soaring machine ever seen or likely to be seen. The pose of the flying fish in "soaring" is never pictured properly in books. Engravings usually show them parallel to the water, but they stand in their relation to the water at an angle of about forty-five degrees, the tail hanging down. When the speed is great the angle is more acute, and *vice versa*. If an airship could be built on the plan of the flying fish, it would be an instantaneous success.

LATRODECTUS—THE POISONOUS SPIDER.

BY ALEXANDER PETRUNKEVITCH, PH.D., HONORARY CURATOR FOR ARACHNIDA AT THE AMERICAN MUSEUM OF NATURAL HISTORY.

All spiders have a pair of poison glands situated in the cephalothorax, and opening by means of a narrow duct near the tip of each fang. (Fig. 1.) Nothing, however, could be more erroneous than to suppose that all spiders are poisonous to man. On the contrary, with the exception of the large *Tarantulæ* (*Theraphosidæ*) there is only one genus all the species of which are extremely poisonous. The name of this genus is *Latrodectus*, and it has its representatives in all warm countries. The bite of the *Latrodectus tredecimguttatus*, or the so-called "Malmignatta," has always been dreaded by the population of Italy, and it is probable that the fable of the tarantella dance is based on observations of the convulsions following the bite of this spider, which have been embroidered upon by the vivid southern imagination. *Latrodectus mactans* is one of the commonest neotropical species, but it is found as far north as New Hampshire and to the south as far as Patagonia. The female is only one-third to one-half of an inch long, of a uniform shiny black color. The ventrum is just as black, but there is always a bright red spot on the abdomen, by which the species may be at once recognized. (Fig. 2.) The male is much smaller and harmless, since it cannot bite through the human skin. The spider makes its loose web under stones, is of sluggish nature and of nocturnal habits.

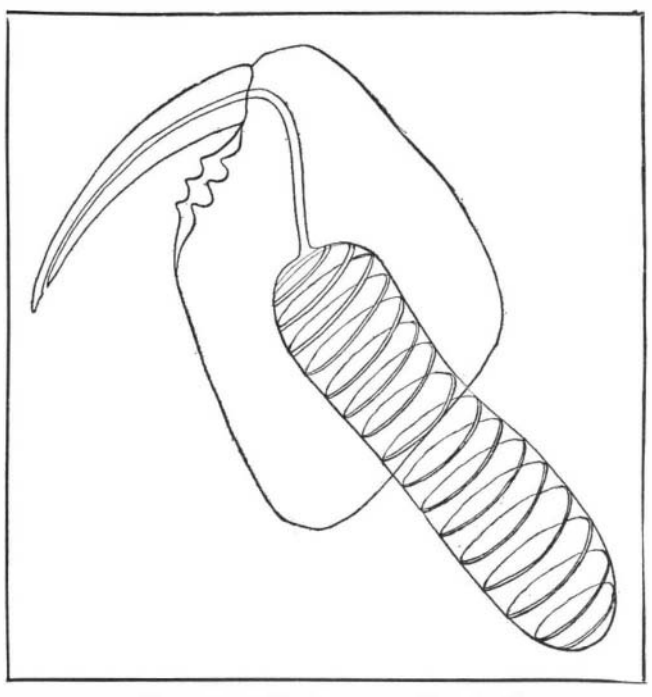


Fig. 1.—Fang of the Latrodectus, showing poison duct.

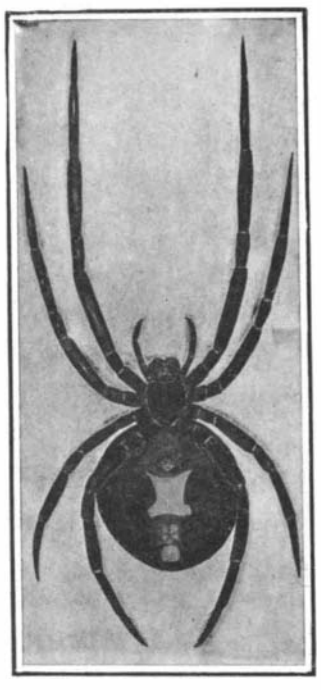


Fig. 2.—Female Latrodectus, identified by red spot on ventrum.

LATRODECTUS—THE POISONOUS SPIDER.

For a long time nothing definite was known about the poison of *Latrodectus*, but grewsome stories of the sufferings caused by the bite were told, and occasionally authentic cases of sickness and even death were recorded in the old and new world. In 1901 Prof. R. Kobert of Rostock published his research on the subject. His method consisted in extracting the poison by means of a salt solution, and injecting it into the blood system of an animal. In this way he found that the extract from a single spider would suffice to kill a thousand cats.

In 1899 an expedition under the auspices of the Russian Department of Agriculture started for the South Russian steppes, and spent several years in the study of the *Latrodectus Karakurt*. Mr. Rossikov, who was at the head of the expedition, gives a detailed account of the results of their investigations (printed in 1904). He also describes the effect of the bite on one of the members of the expedition, a Kirgiz interpreter. Like other species of *Latrodectus*, *Karakurt* does not show much inclination to attack, and prefers to run away. After a month of unsuccessful attempts to induce the spider to bite him, Mr. Sczerbina, a member of the expedition, came to the conclusion that the spider is harmless, and decided to take photographs to prove his assertion. Six spiders were placed on the denuded breast of a man, while Mr. Sczerbina proceeded with the photographing. In the midst of this occupation one of the spiders ran down the arm of the interpreter, and bit him a little above the hand articulation. A moment later terrible pain began to spread from the arm through the entire body of the victim. No swelling of the arm ensued, but inside of five minutes the pain became intolerable. The patient was trembling all over his body, the eyes were dull, the face had an expression of terror. Half an hour later convulsions and cramps set in accompanied by vomiting, oppressed respiration, and cold sweat. At times the patient became unconscious, and again cried out with pain. The doctor arrived one hour after the accident. The cramps continued for nearly six hours. Only on the evening of the following day was the patient strong enough to be removed to a hospital. Three weeks later he was dismissed apparently well, but still suffering from extreme weakness and constant cold perspiration on the forehead and breast.

Other experiments have been made since then by different investigators. They all show that the poison of *Latrodectus* acts as a hæmolysine, i. e., destroys the red blood corpuscles and coagulates the fibrin. Unlike the poison of bees, wasps, scorpions, and tarantulas, it has no local effect, but affects rapidly the whole organism. This extreme rapidity (all symptoms are in full swing in less than five minutes) precludes in the opinion of some medical authorities any other but symptomatic treatment. It was, however, found that the injection of hypochlorite of lime—$CaOCl_2$—has a very beneficial effect, and sometimes saves the lives of camels, which otherwise succumb not seldom to the poison of the spider. Still more recently Mr. Sczerbina has produced an antitoxic serum from the blood of camels, which when injected not later than twenty hours after the bite greatly relieves the pain, and promises to be of very great use. That a good remedy is necessary is shown by the fact given by Rossikov, that in 1905, 1,000 persons were bitten in south Russia, ten per cent of whom, or 100 persons, died. In 1896 394 persons were bitten in one district of the Russian Central Asiatic possessions, and 11 of them died. In the same locality during the same year 738 camels were bitten, resulting in 276 deaths, and 192 horses with 39 deaths.