

FANGS OF SERPENTS.

BY C. FEW SEISS.

The venomous serpents are divided into two groups, namely, *Solenoglyphæ*, including the rattlesnakes, vipers, etc., and *Proteroglyphæ*, embracing the cobras, coral or bead snakes (*Elaps*), and venomous water snakes of the East (*Hydrophidæ*). Fortunately, harmless serpents are, throughout the world, by far the most numerous. In the States north of Maryland, there are only two species of poison-fanged serpents (the rattlesnake and copperhead), while the non-venomous number eighteen species.

The fangs of serpents vary in number, shape, and size. In the viper, *Pelias berus*, the only venomous one of the three species of serpents found in Great Britain, the fangs are two in number, and are situated in the superior maxillary bones. There are no other teeth in the maxillæ, but there is a row of small teeth in the palatine bone on each side. The bite of the viper is often extremely painful, but rarely if ever fatal. The viper is not found in the United States. I remember on one occasion, in Maryland, a gentleman conducted me to a wood to show me a "viper" he had a short time before killed, and gravely informed me it was an "extremely poisonous species." It, however, proved to be a harmless hog-nose snake, *Heterodon platyrhinus*.

Fig. 1 shows the head of a viper, with fangs thrown forward in a position to strike.

The fangs of the rattlesnake (*Crotalus*) are also two in number, situated as in the viper. They are curved backward, and hollow, save at the tips, where they are solid, and turned slightly forward. The minute opening through which the venom is ejected is in front, about one twelfth of an inch from the needle-like point. The glands in which the venom is secreted are oval or almond-shaped, two in number, situated one on either side of the upper jaw, behind the eye. Each gland has a duct connecting with the base of its fang. These poison ducts are kept closed by an arrangement of muscular fibers when the fangs are not in use, but at the moment when the snake strikes these ducts are forced open by certain muscles of the head, and the poison shoots through the ducts and out of the openings near the points of the fangs into the wound. When not in use the fangs lie upon the gums in the roof of the mouth, buried in the folds of mucous membrane.

Fig. 3 represents half of the skull of a rattlesnake, viewed from the side, with the fang thrown outward and forward, ready for action.

The deadly machuca, of Nicaragua (*Bothrops atrox*, Wagler), has four great fangs in the upper jaw, two on each side. Fig. 4 is the head of the machuca, two thirds natural size, drawn from a large specimen in the Academy of Natural Sciences, Philadelphia. Fig. 2 is a front view of the head, showing the mucous folds covering the basal portions of the fangs. On the right side of the jaw of the specimen examined, one fang is drawn back against the roof of the mouth, while the other is thrown forward. This seems to show that the fangs are capable of independent motion, but we have no proofs of this fact. It may be they were thus forced apart when the serpent was killed, yet they seem to

lie in a natural and easy position. In view of the serious results which have followed the bite of our *crotalus* and moccasin, armed with only two fangs, how much more deadly must be the machuca, driving venom into four wounds at once!

The beautiful harlequin or bead snakes, *Elapidae*, are provided with two or more nearly permanently erect, grooved fangs in the upper jaw. These are generally small, not greatly curved, and project only slightly below the basal membrane. The poison glands of our Southern species of *Elaps* are small when compared with the above mentioned serpents. They are generally considered harmless snakes.

Salt River, Arizona.

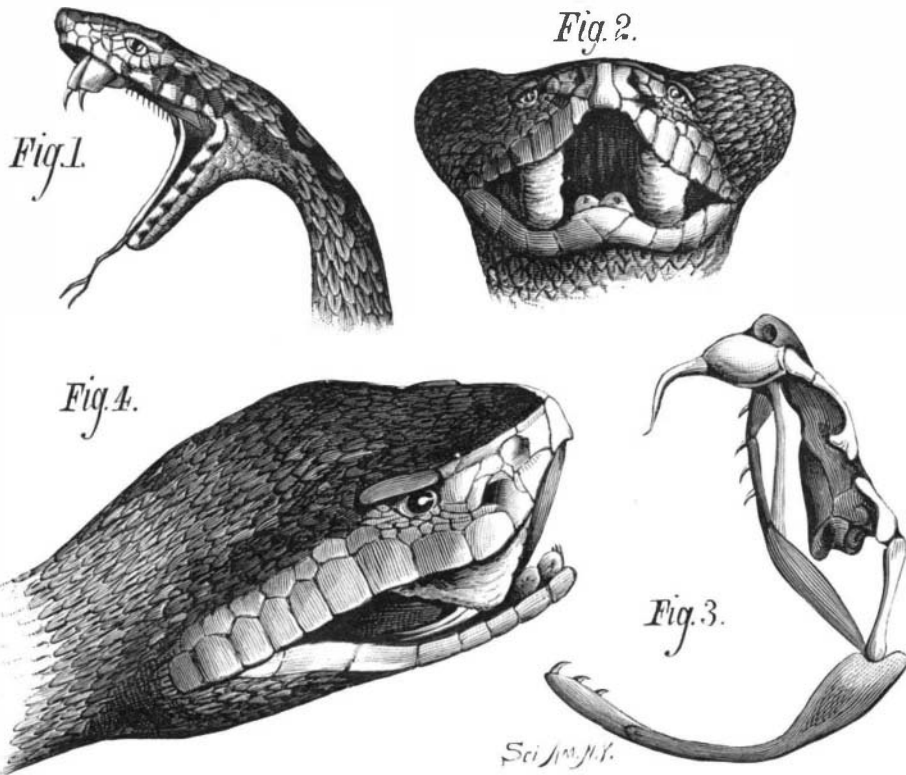
It was long supposed that the brackishness of Salt river, Arizona, was caused by the stream running over a bed of salt somewhere along its course. Its waters are pure and fresh from where it heads in the White Mountains to within 50 miles of where it empties into the Gila. Fifty miles

lasting from a few seconds to an hour, and reaching down from the under surface of a cloud to, or nearly to, the surface of the earth or sea. In the center of this whirlwind appears a slender column of water or of dense vapor, probably hollow, and the air whirling around it is sometimes an ascending, but more generally a descending current. The cloud bursts of Eastern Nevada, which have at times caused much damage, are of the latter type. Certain portions of the globe are peculiarly subject to waterspouts, which thus, like cyclones, have somewhat of a local character. Our engraving, for which we are indebted to the London *Graphic*, represents the British ship Boxer surrounded by waterspouts during a recent cruise on the west coast of Africa, when unusual facilities for studying the character of such phenomena were offered.

Progress of the Electric Light.

The Cleveland (Ohio) *Herald* lately witnessed a trial of the electric light at the establishment of the Union Steel Screw Company, in that city. The apparatus used has been constructed for the illumination of a large carpet mill in Philadelphia. It consists of a Brush dynamo-electric machine of 12,000 candle power, arranged to give four separate currents, each running an electric lamp of 3,000 candle power. Two of the lamps were placed on the third floor and two on the fourth floor of the immense building, and when the engine was started up the machine started at the same time, and, without the slightest manual interference, the lamps flashed out their light in all its magnificence. The effect was most brilliant. The rooms were flooded with a pure white light like the light of the sun, and it streamed out at all the windows, illuminating houses and streets for a long distance in every direction. The light was very uniform and steady, free from the flickering that used to be an accompaniment of electric light, and, considering the enormous illuminating power, the light was unexpectedly soft and endurable to the eyes. An opportunity was afforded to test the character and whiteness of the light. Worsteds, scarfs, afghans, etc., of brilliant shades, were hanging against the wall at one side of the room, and it was noticed that the colors were brought out as clearly as by the full light of the sun. Estimates were made as to the amount that the light furnished by this apparatus would cost, if used by the Screw Company as it was used on this occasion, and it was ascertained that the total cost of the whole light from the four lamps, including the items of consumption of carbon in the lamps, interest on the investment, and wear and tear, would not exceed thirty cents an hour. The light produced was photometrically equal to 800 gas burners, burning five feet of gas per hour each. This amount of gas would cost \$8 per hour.

PEAT PRODUCTS.—The ultimate elements of peat are essentially those of wood and coal, viz., carbon, hydrogen, oxygen, and nitrogen. If, therefore, peat be distilled, the resulting products are the same; and in this way peat has been made to yield ammonia, acetic acid, pyroxylic spirit, tar, naphtha, oils, and paraffin—all of great value in the arts.

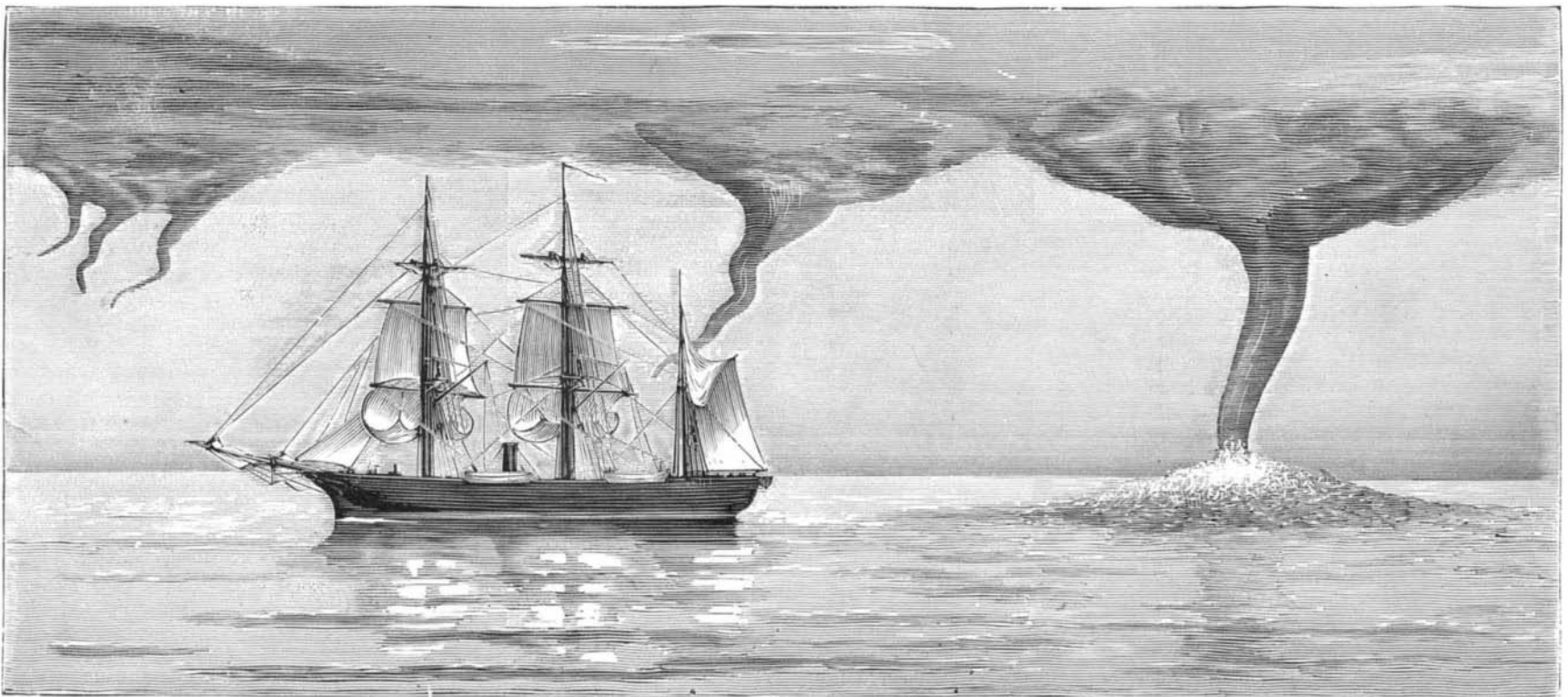


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from its junction with the Gila there comes into it a stream of water that is intensely salt. This stream pours out of the side of a large mountain, and is from 20 to 30 feet deep. It is very rapid, and pours into the Salt river a great volume of water. Here could be easily manufactured sufficient salt to supply the markets of the world. All that would be necessary would be to dig ditches and lead the brine to basins in the nearest deserts. The heat of the sun would make the salt. Were there a railroad near the stream its waters would doubtless soon be turned and led to immense evaporating ponds. It is supposed that the interior of the mountain, out of which the stream flows, is largely composed of rock salt.

WATERSPOUTS.

The theory of the waterspout is still somewhat unsettled, notwithstanding the numerous observations which have been made. Generally it appears as a diminutive whirlwind,



THE BRITISH SHIP BOXER SURROUNDED BY WATERSPOUTS.