son's assertion that the color of the skin depends on the climate? Evidently not. If they were, we should see the descendants of a white person become black, and vice versa. The acclimated white man does not work in the sun, and he preserves his white skin as a Brahman does. Furthermore, it would require many generations to accomplish the change.—N. Y. Med. Jour.

[FROM KNOWLEDGE.]

WHIP SCORPIONS AND THEIR WAYS.

By R. I. POCKOCK.

ALTHOUGH, as their name implies, the whip scorpions offer a strong superficial resemblance to the true scorpions, they are in reality more nearly allied to the spiders. The most obvious points of likeness between them and the scorpions lie in the fact that the appendages of the second pair have lost their leg-like appearance, and have been transformed into powerful prehensile organs or pincers, and that the abdomen is composed of a series of distinct segments, the posterior of which are narrowed to form a stalk, bearing a many-jointed thread-like tail, which undoubtedly corresponds morphologically to the scorpion's poison sting. But to all intents and purposes the resemblance ceases here; for if we refer to the embryological history and to other structural details, we find striking features of similarity between the whip scorpions and the spiders. In both, for instance, there is a narrow waist separating the thorax and abdomen, and in both the abdomen is provided with but two pairs of breathing sacs, whereas in the scorpions there are four pairs of these organs; and in neither is there a trace of those curious abdominal appendages, the combs, which are so characteristic of scorpions. So, too, in the structure of the nervous and circulatory systems, is the relationship between the whip scorpions and spiders still further established. Nevertheless, the special characters of the former are sufficiently well marked to allow of their being separated as a distinct order from the spiders or Araneæ. This fact was long ago recognized by Latreille, who proposed to include the whip scorpions or Thelyphoridae and the Phrynidæ in his order Pedipalpi. The name "pedipalpi," or palp-footed, was ascribed to these families of Arachnida in allusion to the peculiar formation of the first pair of legs. A glance at the accompanying figure of Hose's whip scorpion (Thelyphonus hosei), from Sarawak, will show that the appendages in question are much longer and thinner than the rest of the legs, and that the tarsus is divided up into a series of small segments and is clawless.

These limbs, in fact, are never used for locomotion, for which, indeed, they are quite unfitted, but take the functional place of the antennæ of an insect, and enable their possessor to learn by touch the nature of the surroundings in which it is placed. There is no doubt that this end is also partially attained in the case of Thelyphonus by the long, pliable, whip-like tail, which is thickly studded with tactile hairs. In the Phrynidæ or tailless Pedipalps, on the other hand, in which this posterior feeler has disappeared, we find the want of it made good by the excessive development of the anterior feelers, which are sometimes as much as eight times the length of the animal's body, the three distal segments of the limb being transformed into a long, many-jointed antenniform lash, which can be projected with equal ease forward, backward or sideways, the two together covering in large specimens an area upward of twenty-four inches in diameter.

The whip scorpions have no poison glands for killing prey, such as are possessed by spiders and scorpions; but they speedily slay insects with the deadly embrace of their pincers, which are armed for the purpose with stout, horny spines.

The adult males are very different from the females in appearance, being smaller and thinner in the body and having the pincers much longer and stouter. The reason, however, of these structural differences in the pincers is not yet understood.

The geographical distribution of these animals is both interesting and puzzling. They range in south-eastern Asia from Japan and the river Amur in the north to South India and Ceylon in the south. Thence in an easterly direction they spread throughout the islands of the Indo and Austro-Malayan Archipelagos, including the Philippines, so far as the Fijis and the New Hebrides, perhaps just touching the north of Queensland on the way. But from the greater part of Asia, the whole of Europe, of Africa, including Madagascar, of Australia, with the above-mentioned exception, and of New Zealand, they are, so far as at present known, entirely absent. In America their distribution closely resembles that of scorpions and other tropical and sub-tropical groups, for they extend from the Southern States (Texas, Florida, etc.), through Mexico and the West Indies, certainly as far as the southern portions of Brazil.

Of the palæontological history of whip scorpions but little is known. A few specimens, however, from the carboniferous beds of Bohemia and Illinois show that, like the scorpions, these animals have existed on the earth with but little change in structure from that remote period until the present time.

Our knowledge of the habits of the Thelyphoridae has been greatly increased during the last few years by observations made of different species living in America and in the East Indies.

Mr. E. W. Oates, who has perhaps collected more of these animals than any other man living, tells us that in Burma they live under timber and stones, or at the roots of trees under accumulated dead leaves and rubbish, lying concealed during the daytime and creeping about at night only. They certainly require moisture, but must have well drained soil. Prof. Wood-Mason, however, goes a step further than this and affirms that he found them only during the heaviest rains, when the soil and surrounding vegetation were saturated with water. He noticed, too, that they soon die when removed from their humid haunts, and from this circumstance it was inferred that air laden with moisture is necessary for respiration. We are told, on the contrary, by Mr. Schwarz, that in Florida a species is found in dry, sandy localities, and if we are to allow credence to these somewhat irreconcilable statements, it would seem that the American and the Indian species differ considerably in constitution.

Like many animals which have a reputation for scarcity, whip scorpions seem abundant enough, if the observer knows where to look for them. Mr. Oates says that upon one occasion, while visiting Double Island, which lies off the coast of British Burma, he and a friend secured no less than three hundred and sixty specimens during a three hours' search.

All the known species appear to be nocturnal, spending the day in hiding beneath stones, logs of wood, etc. But there is no doubt that some species dig for themselves holes in the ground, which are used as permanent places of abode. Mr. Pergande, of Washington, who kept in captivity a specimen of the North American species, *T. giganteus*, put it into a jar, the bottom of which was covered to a depth of about ten inches with sand. The animal, after first making a tour of exploration, began to dig a burrow. Choosing a place where there was a slight hollow, it started scraping the sand together from a particular spot with one of its great pincers. It then used both of these organs for the same purpose, and dragging the sand backward some distance from the spot, proceeded to smoothen and level down the heap. The object of this action probably being to prevent an accumulation of sand near the mouth of the burrow. The animal repeated this operation until it had dug out a tunnel from two to three inches deep, the inner end being about an inch and a half below the surface. The completion of the burrow, however, took several days, the operator seeming to require many rests between whiles.

When on the prowl the animal moved about the jar very cautiously and slowly, with its great pincers outstretched in readiness to grab anything edible that it might come across. The first pair of legs, or feelers, being kept in constant and active motion, touching all objects within reach.

Upon perceiving the presence of a cockroach, the Thelyphonus either stopped or moved scarcely perceptibly, but not being active enough to catch so agile an insect by speed of foot, it adopted a cunning device to

HOSE'S WHIP SCORPION (THELYPHONUS HOSEI).

gain its end. Waiting near the cockroach with extended nippers, it stretched out its long front pair of legs, and by cautiously tapping the insect on the further side gradually induced it to advance within reach of its pincers; then, suddenly grasping it with these organs and crushing it to death in their strong embrace, it carried away the victim to be devoured at leisure in its burrow.

The late Dr. Marx also kept in captivity a specimen of this species, which was supposed to be only a few days old when captured. It started to dig a home for itself in the sand within twenty-four hours of its being put into a glass jar. The burrow was luckily made close to the glass wall of the jar, so that the animal was kept constantly under observation. It devoured on an average one or two small cockroaches per week, but did not appear to drink any of the water with which it was supplied. In this respect it resembled scorpions, which never seem to require water. For about three months during the coldest part of the year this animal closed up the aperture of its burrow and stayed in the deepest part, which had been enlarged for the purpose. But during this period of quiescence, it did not lapse into a lethargic or dormant state, as is usual with hibernating animals, but stood quietly in its retreat, sensitive to the slightest disturbance. In their natural surroundings, however, these animals do not always bury themselves in the winter, for during a spell of cold weather in Florida, Mr. Schwarz found them under logs, apparently in as active a condition as in the summer.

At the breeding season, Dr. Strubell tells us, the female of Thelyphonus caudatus, which is common in Java, buries herself a foot or more deep in the ground and there lays her eggs, which she subsequently carries about attached to the lower surface of her abdomen. The young when first hatched much resemble the parent, and during growth undergo a series of moults like spiders, scorpions and in fact all Arthropoda. But the process of growth seems to be

a slow one. According to Dr. Marx, his young specimens above referred to grew less than an inch in two years.

The moulting is effected as in scorpions and spiders, by the splitting of the skin along the sides of the cephalothorax, beneath the carapace. Mr. Oates tells us that the sexes grow up exactly alike until the final moult. But the male emerges from his last skin a very different looking animal, with longer and stronger nippers and thinner body.

Like many other harmless animals, the whip scorpions have been accredited with the possession of poison glands, and in America there are even stories to the effect that horses have been known to die from the effects of their sting. They may, however, be handled with perfect impunity, and dissection fails to reveal the existence of poison glands. They have, nevertheless, a remarkable means of defense in a pair of stink glands which open upon the last segment of the body at the root of the tail. These glands discharge a liquid, the odor of which is said to resemble acetic acid or aromatic vinegar, and is so powerful, Mr. Oates tells us, that it has frequently betrayed to him the whereabouts of the animal, and, according to Latreille, has earned for these creatures the title vinaigriers from the French settlers in Martinique.

There cannot be much doubt that the pungency of this fluid renders the whip scorpions distasteful to such enemies as insects and birds that would otherwise prey upon them. But upon an occasion when some drops of it were by chance discharged into Mr. Oates' eye, no harmful results ensued.

Another curious organ possessed by most genera of this family may be here mentioned. This is the pair of clear yellow spots found on the last segment of the abdomen. The function of these is at present unknown, but it has been suggested by Dr. Hansen that they may be luminous organs like those to be seen on the firefly. But so far as is at present known, this supposition has no foundation in fact.

ALABASTER.

By RICHARD BEYNON.

ALABASTER does not hold a very high place in popular taste at the present day. It is admittedly a delicate and pretty stone; but that is all. Time was, however, when its translucent beauties were universally admired, and the "whitish stone," as the Arabic albatrator denominates it, was keenly sought after. The alabaster so highly prized by the ancient inhabitants of the Nile Valley does not seem to have been a true alabaster at all, but rather a species of stalagmitic limestone, beautifully clouded and prettily banded, and now generally known as Oriental alabaster, or onyx marble. Alabaster boxes or bottles were considered the most fitting receptacles for the costliest of Eastern drugs and perfumed ointments. In fact, the term alabastra came to be applied to any valuable vessel in which the rarer perfumes were contained.

Among the Romans alabaster was as highly esteemed as among the Egyptians. They looked upon the chaste purity of the white variety as peculiarly fitting it to contain the ashes of the dead, and hence the fact that the cinerary urns were so largely constructed out of this material. But the Romans were specially favored in the matter of alabaster. In the province of Pisa are deposits of the mineral, which were doubtless being worked upward of four thousand years ago.

The true alabaster, the hydrated gypsum, or sulphate of lime, is found in large quantities nowhere outside the province of Pisa. Of so-called alabasters there are legion. They occur in the Tyrol, in Saxony, in Derbyshire and many other places; but most of them, like the Oriental alabaster, are a form of carbonate of lime. Even where the alabaster is alabaster, it is frequently so poor in quality and so lacking in beauty and fineness of texture that it is subjected to the base process of being ground to a powder to make the well-known plaster of Paris. But the Pisan alabasters are simply incomparable. All possess a marvelous softness of texture, and some can even be scratched with the finger nail. But the rarest and most expensive of all alabasters is a yellow one found at Volterra. This city has been famous for its alabaster from time immemorial.

Four thousand years ago its alabaster quarries, if they can be so described, were in full swing, and they have probably been worked continuously ever since. The Palazzo Pubblico of this ancient Etruscan city contains a museum rich in priceless antiquities, among which cinerary urns of alabaster play a prominent part. In the days of the Etruscan league, when Volterra was a city of much importance, with a population numbering one hundred and twenty thousand, its walls, forty feet high and thirteen feet thick, inclosed a space four and a half miles in circumference. Beyond the crumbling ruins of this mighty barrier lie the alabaster caverns. Quarries they cannot be called, for the mineral is not extricated in the open, but dug out of caves, the entrance to which is often by way of a long and winding passage. No shafts are sunk from the outer air, so that the ventilation is none of the best, and the atmosphere is hot and stifling, as may be readily understood when it is stated that some of the caves are reached by subterranean passages a mile in length. This necessitates the quarrymen working in short shifts of two hours, and no underground workman is allowed to labor more than six hours per day. In spite of this, however, alabaster getting is held to be healthy work, the white, impalpable dust which each worker must inhale in large quantities being considered antidotal to the diseases common to the district. Be that as it may, the alabaster workers are certainly as healthy and long lived as their comrades who labor in the open.

The alabaster is found in nodules or detached blocks embedded in clay or limestone, and great care has to be taken in extricating these so as not to reduce the size of the piece.

The freshly wrought alabaster is either exported or disposed of to the carvers or sculptors, or to the proprietors of fine art galleries who engage sculptors to carve statuary, flowers, etc. Many carvers, however, prefer to work for their own hand and buy their alabaster direct from the owners of the mines, trusting to sell their finished work to customers direct, or failing this, to the middlemen who own the galleries,

Much of the raw material, however, is not worked up at Volterra, but is sent to Florence, Leghorn or Pisa, where there is a better chance of obtaining patrons.

At first sight it seems difficult to account for the declining character of the alabaster industry. But one cause which has operated in this direction is the poor taste displayed by the carvers and sculptors of alabaster articles. The artistic instincts of both English and Americans have of late years undergone a very material refining process, and what years ago might have been dubbed elegant and pretty would, according to our better lights, be considered as a grave offense against the canons of correct taste. Everyone is familiar with the wonderfully carved alabaster flowers or fruit, or florid vases which our sea-going friends insist we shall religiously preserve under a glass case as a treasured possession. These are bad enough in all conscience; but what can be said of alabaster models of steamships carefully and elaborately carved in full detail, even to the propeller, the whole supported upon pediments of alabaster as a ship rests upon the blocks when in graving dock? For our American friends there are statues of Liberty, Brooklyn suspension bridges, New York hotels with real windows of colored glass, through which the light of diminutive candles may shine.

All these, it must be admitted, are most faithfully executed, but of artistic feeling there is little or none. Italian carvers, too, seem to think that nothing is so pretty and effective as an alabaster picture frame!

The English climate, too, is all against alabaster. To a certain extent the substance is soluble in water, and the humidity of our atmosphere soon creates a roughness of surface, which has a powerful affinity for dust and grime. A leaning tower of Pisa in alabaster may be wonderfully pretty, but to preserve the beautiful translucency it is necessary to incase it, and the English nation has now been educated above the once omnipresent glass shade. Clearly, the alabaster industry is at present under a cloud, which shows little evidence of lifting. It may, however, alter for the better when the artistic taste of the Italian carvers improves, and they set themselves to reproduce in miniature the truly beautiful works of art with which their land abounds.—Knowledge.

GREAT DIAMONDS.

Most of the great diamonds of the world have about them an atmosphere of romantic tradition. Objects of such rarity and value have attracted the avarice and ambition of Eastern rulers through centuries, and it has been truly said that almost every one of the great diamonds now the pride of royal treasuries, or of rare collections in Europe, has a history full of strife, contest, rivalry and war. It is not only their enormous money value and the pride of possession which have made them objects of the most violent contention, but also the superstition investing them with all manner of fancied powers, which they are reputed to confer on their possessor. About all the great diamonds of the East there hangs this cloud of mingled history and tradition, often hard to distinguish, and rendering the real record almost unattainable.

The celebrated traveler, Tavernier, visited the East in 1670 and there saw and described many most remarkable jewels belonging to the famous Aurungzebe, then on the throne of the Mogul Empire at Delhi. The subsequent history of these stones is obscure. In 1739 the Persian conqueror Nadir Shah overran much of India, and carried back with him booty and plunder estimated at seven hundred millions of dollars, among which were many of these jewels. After his death his treasures were dispersed, and it has been impossible to trace them. The finest crown jewels of Europe are in many cases a part of this scattered plunder of the Orient.

The greatest diamond ever known until two years ago was one described by Tavernier, known as the Great Mogul. Its original weight was 787½ carats, but by the mismanagement of a Venetian lapidary employed by Shah Jehan, from whom his son Aurungzebe inherited it, the stone had been reduced in cutting to 280 carats, a loss of nearly two-thirds. For this blunder, or worse, the lapidary was fined his entire possessions and nearly lost his head. Indian tradition reports it to have been found on the banks of the Kistna River, in Golconda, ages ago, and to have been worn for 5,000 years by Karna, one of the legendary heroes of the Mahabharata. This wonderful diamond has disappeared; it was probably taken to Persia by Nadir Shah, and perhaps has been broken, the recut pieces forming some of the largest diamonds now known.

If the Russian Orloff and the English Koh-i-noor were put together base to base, they would approximate to the size and form of Tavernier's Great Mogul. Each has a flat side, evidently determined by fracture along a cleavage plane. The Orloff diamond weighs 196½ carats. It is cut as a rose, with a flat face below, and is about half the size of a pigeon's egg. This is known to have been brought to Persia by Nadir Shah, and was subsequently bought of an Armenian merchant by Prince Orloff for the Empress Catherine II, of Russia. The price was 450,000 rubles, a pension, and a title of nobility.

The English Koh-i-noor has the most romantic and disputed history of any of the great diamonds. It belonged to the lately deceased Dhuleep Sing, Maharajah of Lahore, and was the greatest treasure of his kingdom. When England took possession of the Punjab, in 1848, the rajah was but a child and was partly persuaded and partly compelled to accept a pension from the Queen and transfer to her the Koh-i-noor. Shortly before his death, in 1839, he visited England to recover the diamond that, he said, had been stolen from him. It was exhibited as one of the great attractions at the first World's Fair, in the Crystal Palace, at London, in 1851. It was then the second largest diamond in Europe—186 carats—but, being somewhat irregular, was recut as a brilliant, and reduced to 102½ carats, with a loss of two-fifths and but little gain in beauty. The name Koh-i-noor, or "mountain of light," was first used by Nadir Shah, on seeing the great Mogul diamond.

Another diamond of the same name, the Persian Koh-i-noor, is one of the great diamonds belonging to the Shah of Persia, who wears them on his left hand and right foot. These are irregularly cut, like all

Indian gems, but their history and details are not known.

Several other large diamonds were seen and described by Tavernier in the course of his Indian travels, but they are not definitely identified now.

The Regent, or Pitt, diamond, weighing 136¼ carats, was long the pride of the crown jewels of France, and until within the past decade the finest large diamond known. It was bought by the Duke of Orleans, then Regent of France, of Pitt, Governor of Fort St. George. Its original weight was 410 carats. According to a pamphlet which Pitt published, to clear himself from the report of having stolen the stone, he purchased it in Golconda of a Hindoo merchant. Pope's famous lines:

"Asleep and naked as the Indian lay,
An honest factor stole the gem away,"

allude to this story. This diamond was stolen from the Garde Meuble in 1792, but was restored in a mysterious manner; its cutting, which occupied two years, cost \$17,500. Napoleon wore it in the pommei of his sword. It is now in the Galerie d'Apollon, in the Louvre, with the two Mazarin diamonds not sold at the French crown jewel sale.

One extraordinary diamond has been yielded by the Borneo mines; this is the Mattam, of 317 carats. It was found in 1760, and belongs to the Rajah of Matam, Borneo. The Dutch governor of Batavia offered for it two men-of-war fully equipped and \$50,000 (\$250,000); but the rajah replied that the fortunes of his family depended upon its retention.

Among other notable or historic diamonds may be mentioned the following:

The Shah, 86 carats, of peculiar oblong form and great purity. It is one of the Russian crown jewels, having been presented by the Shah of Persia to the Czar Alexander I.

The Nassuck, 78½ carats, is a triangular stone with triangular facets. It was among the spoils taken by the Marquis of Hastings in the conquest of the Deccan, became the property of the East India Company, and has passed by sale through various hands to its present owner, the Duke of Westminster, who paid £7,200 (\$36,000) for it at auction.

A diamond of 76½ carats, belonging to a Mr. Dresden, of London, is a Brazilian stone, cut in a drop shape, and of great purity and fire.

The Sancy is a notable historic stone of 53½ carats. It first belonged to the Duke of Burgundy, and was bought by the King of Portugal in 1479, and later from him by the Baron de Sancy, who sent it as a present to his sovereign, Henry III. The servant who bore it was attacked by robbers, and swallowed the diamond, which was found in his body after his death. Its next possessor was James II of England, who sold it to Louis XIV for £25,000 (\$125,000). It disappeared in the plundering of the Tuileries during the French revolution, but after many peregrinations was sold to Prince Paul Demidoff, of Russia.

The Eugénie diamond is a beautiful brilliant of 51 carats purchased by Napoleon III for the Empress Eugénie.

The Pigot diamond, of 44½ carats, was brought from India by Lord Pigot, and finally passed to Ali Pasha, of Egypt, for £30,000 (\$150,000). When Ali was mortally wounded he ordered that the diamond be crushed and his favorite wife strangled. The diamond was crushed, but his wife, Vasilika, was spared.

The Polar Star, 40¼ carats, a remarkably pure and lustrous stone, is, like the Shah and the great Orloff, one of the crown jewels of Russia.

The Pasha of Egypt, 40 carats, is a brilliant octahedron, said to have cost Abraham Pasha £28,000 (\$140,000).

The Cumberland, 32 carats, was bought by the City of London and presented to the Duke of Cumberland. It was afterward claimed by the kingdom of Hanover, and restored by Queen Victoria.

The supposed enormous diamond sent from Brazil to the King of Portugal in 1745 has never been seen by any one who was allowed to examine it or to get near enough to it to give an accurate idea as to what it really is. An illustration which has come to my hand from the London Magazine of December, 1746, gives its form as egg shaped, its weight 1,680 carats, and its value £224,000,000 (\$1,200,000,000). The form represented proves conclusively that it is not a diamond, but a rolled pebble of white topaz or rock crystal, as the diamond, from its extreme hardness, never occurs in a rolled form.

Of colored diamonds the most remarkable are the following:

The Hope diamond, 44½ carats, of a brilliant sapphire blue, one of the most beautiful stones in existence, was in the collection of the late Mr. Hope, of Amsterdam, who valued it at £32,000 (\$160,000), and has lately been sold to an English millionaire, Mr. Joseph Tasker, for £160,000 (\$800,000). The sale was canceled because the purchaser said that he was drunk. The stone is doubtless the same as a blue diamond described by Tavernier, which was afterward sold to the French crown, and disappeared after the robbery of the French crown jewels from the Garde Meuble, in 1793.

The Green diamond, of Dresden, now in the celebrated Green vaults of that city, is a pear shaped stone of 38 carats. It was purchased by Augustus the Strong, and is a remarkably beautiful green diamond.

The Florentine diamond, often called yellow, but really sherry colored, is the largest colored stone, and belongs to the Austrian crown. It weighs 133 carats, and is valued at 1,000,000 florins (\$540,000). Its history is mysterious; it was found on the battlefield of Granson, by a soldier, who sold it for a florin. It finally came to the Duke of Milan, then to Pope Julius II, and by him was presented to the Emperor of Austria.

The finest yellow diamond known, and the largest stone in this country, is the Tiffany diamond of 125½ carats. It is a flawless double brilliant of a rich orange yellow, and is valued at \$100,000. It is an African stone, belonging to Tiffany & Company, of New York, and has never been offered for sale.

The Star of the South is a Brazilian stone of pale yellow, and nearly the same size, 125½ carats. Its original weight was just about double. It has considerable fire and ranks among the finest stones known; it now belongs to the Maharajah of Baroda.

The Red Russian diamond is small (10 carats), but

remarkable for its brilliant red color. It was purchased by the Emperor Paul I for \$75,000 (100,000 rubles) and letters of nobility.

A diamond weighing 457½ carats was brought from the Cape in 1884. It has been cut into a brilliant of 180 carats, the largest in the world, and is valued at £200,000 (\$1,000,000). The finding of this stone is involved in mystery; it was, evidently, surreptitiously taken from one of the mines. The name Victoria was given to it in honor of the Queen, and from 1888 to 1893 it was the finest brilliant known. It is also called the Imperial.—G. F. Kunz, in the New York Sun.

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