experimentally of late years that the venom has no effect upon the individual itself, nor yet upon a member of the same species. Scorpions, however, are extraordinarily susceptible to heat, and succumb very rapidly when exposed either to the warmth of a fire or to that of the tropical sun. Moreover, when they feel the heat beating upon them they brandish their tails and strike right and left as if to drive off or destroy the unseen enemy; and there can be no döubt that the belief above alluded to is traceable primarily to observation of the sequence of events just described, the final event being the death of the animal, not, however, from a self-inflicted wound but from the heat which provoked the behaviour suggestive of suicidal purpose. It may be that under such circumstances a random stroke has now and again wounded the animal itself; but a wound so inflicted would be accidental, not intentional, and at most would contribute in a small measure to the creature’s death. Scorpions are very easily rendered innocu­ous by scraping off the sharp point of the sting; and specimens, which are handled with impunity by Arabs and Der­vishes to impress the uninitiated with their super­human attributes, have generally been treated in this way. At the same time it has been shown that insensibility to the pain of the sting and immunity to the ill effects can be acquired by any one who has the courage to

permit himself to be repeatedly stung.

Like many poisonous animals, scorpions are for the most part rendered conspicuous by distinctive coloration of jet-black or black and yellow; and many of them are gifted with stridulating organs, developed in various parts of the body which are functionally comparable to the rattles of rattlesnakes, porcupines and other noxious animals. In habits scorpions are cryptozoic and nocturnal, spending the daytime concealed under stones or fallen tree trunks or in burrows, and only venturing out after sunset in search of food. Amongst the burrowing kinds are the large African species belonging to the genera *Pandinus* and *Opis- thophthalmus* and to the eastern genus *Palamnaeus.* The yellow scorpions of the genus *Buthus,* which are common in Egypt and the Sahara, lurk on the watch for prey in shallow depressions which they excavate with their legs in the sand.

Unlike the majority of Arachnida, scorpions are viviparous. The young are bom two at a time, and the brood, which consists of a dozen or more individuals, is carried about on its mother’s back until the young are large and strong enough to shift for themselves. The young in a general way resemble their parents and undergo no metamorphosis with growth, which is accom­panied by periodical casting of the entire integument. Moulting is effected by means of a split in the integument which takes place just below the edge of the carapace all round, exactly as in king- crabs, spiders and Pedipalpi. Through the split the young scorpion gradually makes its way, leaving the old integument behind.

Scorpions are of great antiquity. In coal deposits of the Carboniferous Period their remains are not uncommonly found,

and no essential structural difference has been discovered be­tween these fossils and existing forms—a fact proving that the group has existed without material structural modification for untold thousands of years. These Carboniferous scorpions, how- ever, were preceded by others, now occurring in marine Silurian deposits, which evidently lived in the sea and exhibit some anatomical differences marking them off as a group distinct from their Carboniferous and recent descendants and attesting affinity with the still earlier marine Arachnida referred to the group Gigantostraca. Their legs were short, thick, tapering, and ended in a single strong claw, and were well adapted, it seems, like the legs of shore-crabs, for maintaining a secure hold upon rocks or seaweed against the wash of waves. The method of breathing of these ancient types is not certainly known; but probably respiration was effected by means of gills attached to the ventral plates of the body. At all events no trace of respiratory stigmata has been detected even in well-preserved material. These Silurian scorpions, of which the best-known genus is *Palaeophonus,* were of small size, only 1 in. or 2 in. in length.

At the present time scorpions are almost universally distributed south of about the 40th or 45th parallels of north latitude; and their geographical distribution shows in many particulars a close and interesting correspondence with that of the mammalia, their entire absence from New Zealand being not the least interesting point of agreement. The facts of their dis­tribution are in keeping with the hypothesis that the order originated in the northern hemisphere and migrated southwards into the southern continent at various epochs, their absence from the countries to the north of the above-mentioned latitudes being due, no doubt, to the comparatively recent glaciation of those areas. When they reached Africa, Madagascar was part of that continent; but their arrival in Australia was subsequent to the separation of New Zealand from the Austro-Malayan area to the north of it. Moreover, the occurrence of closely related forms in Australia and South America on the one hand, and in tropical Africa and the northern parts of South America on the other, suggests very forcibly that South America was at an early date connected with Australia by a transpacific bridge and with Africa by a more northern transatlantic tract of land.

In conformity with their wide dispersal, scorpions have become adapted to diverse conditions of existence, some thriving in tropical forests, others on open plains, others in sandy deserts, and a few even at high altitudes where the ground is covered with snow throughout the winter. In the tropics they aestivate at times of drought; and in the Alps they pass the cold months of the year in a state of hibernation. (R. I. P.)

SCORPION-FLY, the popular name given to insects of the family *Panorpidae,* deriving the name from the fact that in the typical genus, *Panorpa,* the last two or three segments of the abdomen are narrow and can be flexed over the back like a scorpion’s tail. The scorpion-flies are remarkable for the elongation of the oral region of the head into a prominent beak. The larva is grub-like, beset with spines and generally furnished with eight pairs of abdominal pro-legs in addition to the legs on the thorax, which are short. They live in the soil or in rotten wood and are carnivorous. The species of the genus *Bittacus* are superficially strikingly similar to the *Tipulidae* or “ daddy-long- legs”; while those referred to, *Boreus,* are anomalous in being apterous and like small grasshoppers. They have usually been included in the order Neuroptera, but it is now generally considered that they should form a distinct order, which is termed Panorpata or Mecaptera.

SCORZONERA *(Scorzonera hispanica),* a hardy perennial, native to central and southern Europe, and cultivated in gardens as a vegetable for its fleshy cylindrical roots, which resemble those of salsafy except in being black outside. They should be treated in every respect like salsafy. The genus is a member of the natural order Compositae, and nearly allied to *Tragopogon,* to which salsafy belongs.

SCOT, MICHAEL (? 1175-1232), Scottish mathematician and astrologer. The dates of his birth and death are quite uncertain, the most probable being those here given. The efforts of Sir