8. *Salpa zonaria* (Pallas).

Both generations have been found in the northern part of the Andaman Sea and the solitary generation was found at station 393, in a mid-water net.

The German deep-sea expedition on the "Valdivia" visited neighbouring waters, passing from Sumatra to the Nicobar Is., and thence to Ceylon in February, 1899. In this region they did not find *C. bakeri*, *S. cylindrica*, *S. confoederata* or *S. multitentaculata*. On the other hand, they obtained *C. pinnata*, *C. affinis*, *C. floridana*, *S. fusiformis aspera*, and *S. amboinensis*.

It appears therefore that much work remains to be done, both in studying the forms that inhabit Indian waters, and in noticing the seasonal occurrence of particular species many of which have an almost world-wide distribution.

T. L. BOMFORD.

INSECTS.

ADAPTATION IN THE HABITS OF A TABANID FLY.—In Miss Ricardo's description of the Tabanid *Haematopota litoralis* from Puri in Orissa (*Ann. Mag. Nat. Hist.* (8), ii, p. 546, 1910) it is stated that the species is common on cactus hedges in the daytime. The case is one of considerable interest from a biological point of view and I have only waited for the publication of the description to give the facts in full. In August, 1910, I found both sexes of the fly abundant on a hedge of Prickly Pear (*Opuntia elatior*, Mill.) running parallel to and some hundred yards distant from the sea. In the heat of the day they sat quietly at the base of the bunches of thorns scattered over the flattened and laterally expanded stems of this cactus, and were easily captured by inserting a small glass tube over them, except when, as was often the case, the position of the thorns rendered this manœuvre impossible. Like other Indian species of the genus, *H. litoralis* is as a rule matutinal and crepuscular in habits, only becoming active in the morning and evening. The other species with which I am acquainted rest on rocks, walls or the bark of trees, on which their mottled wings render them extremely inconspicuous. *H. litoralis* is by no means inconspicuous on the green cactus stems, for its colouration is not markedly different from that of its all es. Its peculiar habits, moreover, expose it to another danger than those which might arise, were it not protected by the thorns, from being conspicuous; for in the high winds that often prevail on the east coast of India flies making their way on the wing to the protection of the thorns are liable to be impaled upon them. This often occurs. Doubtless, however, the advantage gained from the adoption of the habit is greater than its inherent risk, for it would be very difficult for any enemy, except of course a microscopic one, to attack the fly at the base of the thorns. The most interesting feature of the case lies in the fact that the habit must have been adopted recently, for *Opuntia elatior* was only

introduced into India at the beginning of the nineteenth century (see Burkill, *Rec. Bot. Surv. India* IV, No. 6, p. 297; 1911) and there is no plant with similarly arranged thorns indigenous in Orissa. I failed to find a single individual of the fly on walls near the cactus hedge on which it was common, and it was absent even from stems of the (imported) cactus *Cereus* and of an indigenous thorny Euphorbiaceous plant; the bunches of thorns on these plants being arranged in vertical lines on a polygonal stem instead of being scattered on a flattened and expanded one.

N. ANNANDALE.

INDIAN BLOOD-SUCKING MIDGES.—If we restrict the term "midges," as seems legitimate, to the subfamily Culicoidinae or Ceratopogoninae of the family Chironomidae or Tendipedidae, the number of blood-sucking midges for which the habit has been authenticated in India is extremely small, and all that have been proved to exercise it in this country belong to the genus *Culicoides*, Latr., in which the mouth parts are similarly developed in the two sexes. Dr. Kieffer has recently described a considerable number of Indian and Ceylonese representatives of the genus in the *Memoirs* (vol. ii; 1910) and *Records of the Indian Museum* (vols. vi; 1911 and ix; 1913) and in vol. viii of *Spolia Zeylanica* (1912). Of these species only the following are actually known to suck mammalian blood:—

1. *Culicoides molestus*,[1]
2. *Culicoides oxystoma*,[2]
3. *Culicoides himalayae*,[3]
4. *Culicoides peregrinus*.[4]

Of these the first two species were found sucking that of cattle and deer in the Calcutta Zoological Garden in March, 1908.

C. himalayae was originally described from Kurseong (June, 1910) and other specimens have recently been sent to the Museum by Mr. H. Stevens, who took them at Kaliponni on the Nepal-Sikkim frontier at an altitude of about 9000 feet. He refers to them as "blood-sucking flies of a particularly venomous nature."

The type-specimens of *C. peregrinus* were taken at Puri on the coast of Orissa in March. I recently (July, 1913) found the species very abundant in a bungalow near Balugaon in the same district. One individual was killed in the act of biting my wrist, and I had reason to think that many others were attacking my ankles. The irritation was considerable but not lasting and very little swelling followed the bite. Both sexes swarmed at night in the corners of rooms, particularly in the neighbourhood of a lighted lamp; females were much commoner than males.

Mr. F. H. Gravely, to whom I am indebted for the identification, by comparison with the types, of Mr. Stevens' examples of *C. himalayae*, has recorded a curious habit of an undetermined

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[1] Kieffer, *Mem. Ind. Mus.* ii, p. 193, pl. viii, fig. 9.
[2] *Id., ibid.*, p. 193, pl. ix, fig. 1.
[3] *Id., Rec. Ind. Mus.* vi, p. 326.
[4] *Id., Mem. Ind. Mus.* ii, p. 191, pl. viii, fig. 1.