stated in books. The soldiers of some ’species are, however, dimorphic to the extent that larger and smaller forms occur in the same nest without intermediates. In other cases soldiers of simply variable size exist. The soldier is blind and wingless, though in a few soldiers minute wing-rudiments can be detected. As in the worker, the development of the sex organs is arrested, but both sexes are represented. The function of the soldiers is probably, as stated by Haviland, defence. The mandibulate soldiers use their heads as blocks to stop gaps in the nests, and employ terrifying but somewhat theatrical devices, making threatening motions and producing noises by movements of the head and thorax. The nasute soldiers emit a fluid from the tip of the rostrum, and dab it upon their enemies with some skill. Soldiers are present in all species of termites except the South American genus *Anoplotermes.* It is a remarkable fact that in the group *Calotermitides* soldiers exist although there are no workers, but in this case the function of the soldier seems to be very much that of a worker. Grassi says that in *Calotermes flavicollis* all the individuals of a community work for the common welfare. Moreover, in the *Calotermitides* no very great development of the heads or mandibles occurs.

(3) *Adult or Winged Termite.—*Such of the young as do not become workers or soldiers grow and develop after the fashion usual in exopterygote insects. Moults take place, the wing-pads gradually increase in size, eyes appear, and finally pigmentation takes place, and the winged insect is perfected at the last moult (fig. 3). In prosperous colonies these winged insects are produced in large numbers and emerge at intervals as swarms. Tney have extremely feeble powers of flight, and apparently scarcely any other capability. They are a favourite food of a large number of animals,

including even man. They have well- developed eyes and ocelli, and differ from all the other forms by their greater pigmentation. The function of these adults is to diffuse the species, and. to favour crossing outside the family circle. . Attainment of this second end is, in some cases, favoured by the fact that the whole of the indi­viduals constituting a swarm consist of one sex only. This extraordinary fact is attested by Grassi, but has not yet received the attention it merits. If a termite colony be compared with a tree or plant, the winged forms, it is clear, functionally correspond to the flowers and seeds of the tree; indeed, Fritz Müller and Grassi go further, and conclude that the modes of diffusion and repro­duction of termites are analogous to the modes of plants of con­tinuing the species by means of cleistogamic as well as ordinary flowers. The force of this comparison will be better appreciated after the reader has made himself acquainted with the facts con­nected with the neoteinic forms of termites.

(4) *King and Queen.—*As a rule each community includes only a single pair of individuals apt for reproduction ; these are the royal pair, or king and queen (fig. 4). They are adult termites that have shed the wings they formerly possessed. The queen usually undergoes an extraordinary increase in the size of the abdomen, which may be distended to many hundred times its original capacity (fig. 4, A). In many species the king and queen are confined in a royal cell, out of which they cannot move, though the workers, owing to their smaller size, can get in and out to tend them. In other cases the queen only is so imprisoned, the king being able to leave the cell. In still other cases neither king nor queen is effectually imprisoned. Much discrepancy of opinion exists as to the invariable presence of a king in each nest; this., however, is explained by Haviland’s observation that the king is active and timid, and when a nest is opened seeks safety by running away and concealing himself, so that he is sometimes only discovered when the very last fragment of the nest is brought under scrutiny. Another point on which extremely diverse opinions are expressed is the copula of the sexes. It is usually stated that the swarming of termites is analogous to that of bees and ants, in which groups of insects the conjunction of the sexes takes place at this period, and at this period only. In the termites the reverse is the case. The swarming is not at all a nuptial flight ; indeed, at that time the sexes are not apt for reproduction. Copulation only takes place after a pair have cast their wings and have established them­selves together. It is repeated at intervals, and is thus quite dis­similar from the corresponding phenomenon in Hymenoptera. The male has no intromittent organs, so that copula during flight is impossible. Grassi has. actually witnessed the act in subsequent life. Haviland is of opinion that in some cases the male fertilizes the eggs without connexion with the female.

(5) *Neoteinic and Substitution Forms.—*When a colony of termites is deprived of king and queen it can replace them by forms specially prepared. These substitution forms are of two kinds—*(a)* nor­mal adult individuals, and *(b)* neoteinic forms. The latter may be described as unnatural kings and queens possessing reproductive powers, though the wings have never been developed and some other parts of the body have not taken on the fully adult state. Haviland removed the royal pairs from nests of *Termes malayanus,* and after three or four months again examined the nests: in three out of the five cases substitution pairs exactly resembling the original ones, with well-formed wing-stumps, were present; in the other two cases he failed to find the royal cell, and believes that the loss had not been repaired. In other species the bereavement is made good by means of neoteinic instead of normal individuals, and in certain species neoteinic forms are abundantly found. In the case of substitution forms there is usually more than one pair present in a colony, and sometimes numerous pairs exist. Grassi says that in Sicily the colonies of *Termes lucifugus* are kept up entirely by neoteinic kings and queens; in other words, the swarms are nearly or quite useless. The neoteinic forms are compared to cleistogamous flowers; and this curious case is parallel with that of a species of plant whose reproduction should be accomplished entirely by its cleistogamous flowers, though at the same time it produced perfect flowers in abundance. The con­dition recorded by Grassi is probably extremely ex­ceptional. Fritz Müller found once a colony in which a true king was act­ing as consort to a con­siderable number of neo- tei.nic queens, no true queen being present.

In order to understand the curious phenomena pre­sented by the castes and variety of forms of a single species of termite, it is necessary to become ac­quainted with their food habits, which are very peculiar and may be described as communistic. Termites have the habit of eating their cast skins and even their dead companions, and in fact their system of keeping the nest clean seems to be that of eating the refuse of their own bodies till it no longer contains any digestible matter. This cannibalism is the more remarkable, as they will not eat other termites. The most curious part of their dietary is their complex system of feeding from the matters contained in the alimentary systems of their fellows.. When a termite wishes food it strokes the body of another individual with its antennae, and the specimen thus caressed exudes from the posterior or from the anterior part of the body a drop of matter, which is eaten by the hungry one. The matter exuded from the posterior part of the body appears to be very different from that yielded by the mouth, so that there are at least two kinds of this excretory food. The proctodaeal food (that which comes from the posterior part of the body) is in great favour with adult termites, but so far as is known it is not used for feeding the newly born young, which are believed to be fed on matter elaborated in the bodies of the adult workers and communicated by their mouths. Subsequently the young take also proctodaeal food, and triturated vegetable matter.

*Origin of the Castes.—*When termites are hatched from the eggs none of the remarkable differences that are manifested in the individuals in subsequent life can be detected. The sexes are in termites extremely similar in external characters. When the young are hatched they all appear nearly exactly alike, though on careful examination the sexes can be distinguished.