Cimex lectularius, bedbug. Known in different localities as chinches, chintzes, redcoats, mahogany flats, etc. It has infested human habitations since the dawn of history and is distributed over practically the whole world even into northern regions. The body is very thin and flat, oval in outline, the head sunken in the prothorax, the margins of which are finely ciliate. The antennæ

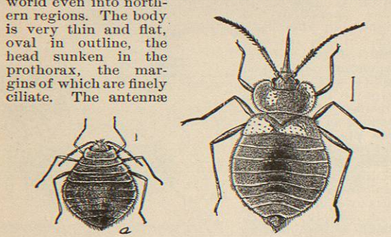

FIG. 2866.—*Cimex lectularius*. *a*, Young. Both enlarged. (From Riley, United States Dep. Ag.)

are slender, the three distal joints about equal in length and covered with fine hairs. The wing pads are very small and never known to become fully developed. The color is light yellowish to dark reddish-brown, depending on age and the contents of the body. It has a very characteristic odor similar to that of the chinch bug and many of the other species of this order. The odor would seem to be of no advantage to the bug under present conditions, and may be looked upon as a survival. The habits are nocturnal, the insect sucking the blood of man at night, and secreting itself during the day-time in cracks of furniture or walls. Its bite is in some degree poisonous, affecting some persons much more seriously than others, but is apparently due to irritation of puncture or simply the juices of the mouth, as no poison glands have been detected. Individuals hibernate or, where warm enough and conditions favor, reproduction may proceed throughout most of the year, but is most

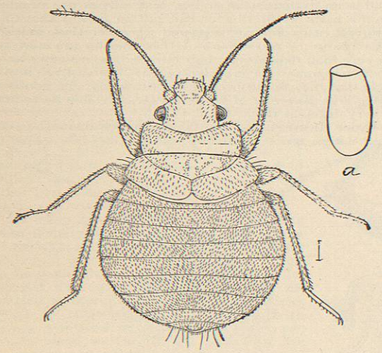

FIG. 2867.—*Acanthia inodora*. Female. *a*, Outline of egg enlarged. (Author's illustration, Bull. United States Dep. Ag.)

rapid in warm weather. A period of seven to ten weeks or more is occupied from egg to adult, but varies greatly depending on temperature and food. They may survive long periods without food, but development is retarded.

Irritation of the bites may in extreme cases require the attention of the physician, but ordinarily effort should be directed toward prevention. In well-kept homes the extermination is a matter of persistent use of well-known household measures, but in hospitals, asylums, prisons, and other institutions where large numbers of people of varied habits and history are brought together the problem may become more serious. In extreme cases fumigation of rooms or of whole buildings may be the quickest way to secure relief. An effective plan is to clear the room or rooms of all objects that would be tarnished or bleached by the process and then burn brimstone in a small dish set within a larger one so as to avoid possible fire from overflow of the burning material. Close all openings even down to the keyhole and leave the room for several hours after which it may be opened and thoroughly aired. Recent experiments have shown that Hydrocyanic acid gas can be used with best of results for these and other "vermin" in prisons and other buildings and in railway coaches or sleeping cars, where it is possible to vacate the structure and close it tight enough to confine the fumes.

Acanthia inodora Duges, "Coruco" or Mexican chicken bug. This species has been described as infesting poultry in Mexico and New Mexico and is also stated to be a very serious pest in houses. According to information recorded by Townsend it used "to swarm in military posts to such an extent that the soldiers were ordered out and formed in two lines, one with brooms to sweep the corucos en masse up against an adobe wall where the other line stood ready with trowels and mud and plastered them into the wall alive."

There are other species of this genus which sometimes cause alarm by their abundance where swallows or bats congregate from the supposition that they are in this manner introduced into houses.

A. hirundinis Jenyns swarms in enormous numbers in the nests of the barn swallow, and may scatter over the building, but so far as known never enters houses or preys upon other than the swallows.

A. pipistrelli Jenyns preys upon the bat and swarms in places where these animals secrete themselves during the day.

A. columbarius Jenyns is recorded as infesting dovecotes in Europe, but has not been recorded so far as I know for America.

Sub-order *Parasita*. These are strictly parasitic insects, being confined to their hosts constantly and deriving all their nourishment from them. They are wingless, and the mouth parts consist of a tubular suctorial organ. There are two divisions of the group, the one including the forms which have a three-jointed beak and which are parasitic exclusively on bats, and which may be disregarded here, the other including our common lice mention of which follows.

Pediculidæ. Rostrum very short, unjointed but surmounted by a circle of hooks; eyes reduced; antennæ three- to five-jointed; thorax with segments not sharply separated; legs thick; tarsi with a single strong claw usually fitting against a spur of the tibia; abdomen usually nine-jointed. The egg "nits" are attached to the hair of the host, and the young have the same form as the adults and like them cling closely to the host animal.

FIG. 2868.—Mouth parts of Louse (*Pediculus vestimenti*). *a*, *a*, The summit of the head with four bristles on each side; *b*, *b*, the chitinous band; *c*, the hind part of the lower lip; *d*, *d*, the foremost protruding part of the lower lip (the haustellum); *e*, *e*, the hooks turned outward; *f*, the inner tube of suction slightly bent and twisted; the two pairs of jaws are perceived on the outside as thin lines. (After Packard.)

The species are, so far as known, very closely restricted to one species of animal or at most to a few closely related species in the same genus, a fact which indicates a very perfect adaptation to a particular host and which may mean some particular adaptation of the mouth parts of each to the thickness or texture of the skin of its special host. The mouth parts in all cases must be capable of considerable extension, and the mechanism for probing into the skin so that the capillaries may be reached is quite complex. The fleshy rostrum is surmounted by a circlet of hooks which as the organ is extruded embed themselves in the skin and thus furnish a firm grasp whereby the tubular suctorial organ consisting of four delicate bristles may be gradually forced through the outer skin and down to the capillaries. This tube terminates, in *vestimenti* at least, in a delicate set of lobes which are supposed to act as tactile organs in feeling the way through the dermal cells. When the blood-vessels are reached a current is maintained by the pulsations of the pumping stomach. The injury which results from these infestations is the annoyance and irritation of their presence, and *phthiriasis* as a specific disease, meaning anything more than infestation or "lousiness," has been shown to be a misnomer. The ancient accounts of frightful and fatal consequences due to the presence of these parasites must be exaggerations or the lice have been charged with being the cause of diseases due to some other agent. Since none of the species affecting lower animals is known to be transmissible to man we may omit them from the discussion of particular species.

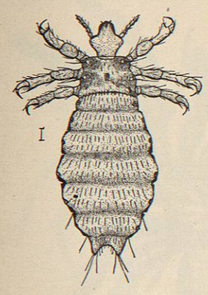

FIG. 2869.—*Pediculus capitis*. (Original.)

Pediculus capitis Degeer, head louse. Whitish with faint markings on the dorsum of thorax and abdomen and usually, in adults, distinct dark markings on the margins of the abdominal segments. The last segment of the abdomen is bilobed. This species has been recognized under one name or another during all historic time and its ancestry doubtless runs back to primitive man. While most commonly found on children it may multiply in unkept hair of adults as well, but it seldom occurs elsewhere on the body than amongst the fine hair of the head. The eggs or "nits" are white and glued to the hair at some distance from the roots and are in most cases placed more abundantly behind the ears. When numerous they form quite conspicuous objects and serve as a good diagnostic feature. The newly hatched lice resemble the adults except in size, and in being less distinctly marked, and the proportions of the body vary slightly, the abdomen being smaller in proportion to the head and thorax.

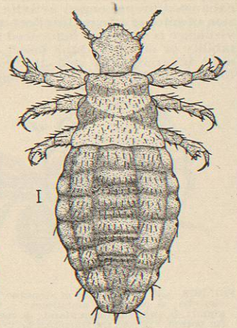

FIG. 2870.—*Pediculus vestimenti*. (Original.)

Murray has shown that the different races of man harbor different varieties of this species of louse, the difference in the varieties being particularly in color and in the form of the claws. In color they differ from the nearly white infesting the Caucasian to the black infesting the African. The claws differ somewhat in proportions, and Murray thinks these differences constant.

Most cases will respond promptly to cleanly habits, but aggravated cases in asylums or poor-houses may require more heroic methods and the mercurial preparations are probably as effective as any.

Pediculus vestimenti Leach, the body louse. Like the preceding species this insect is whitish, but it has in maturity more definite markings which give it a grayish-white appearance and gained for it the name "gray-back." It is slightly larger, the head scarcely as protruding in front; the end of the abdomen not so markedly lobed or almost entire. Like the preceding species it has been a familiar object though not always recognized as a separate species. It is more common where opportunities for good sanitation are wanting, as in armies, prisons, or other places where many people are brought together under conditions that prevent due regard to cleanliness. It is said to occur on the body, most frequently on the nape of the neck, but secretes itself in the clothing when not actually engaged in sucking blood. The long slender sucking tube, by means of which it reaches the blood, is shown fully extended in Fig. 2868. The eggs are deposited in the folds of the clothing, and, according to the estimates of Leeuwenhoek, an adult female may have a progeny of five thousand in eight weeks, an estimate

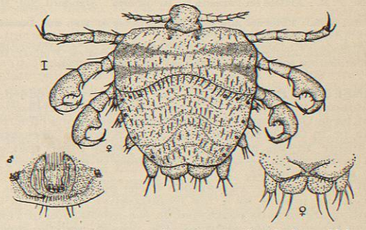

FIG. 2871.—*Phthirius inguinalis*. Female; dorsal view. Male; tip of abdomen. (Original.)

which he believed might be increased in the heat of summer. There is abundant basis in this estimate for all the rational accounts of excessive numbers of this parasite in certain cases. A ready means of destroying the pest is thoroughly to heat the infested clothing by boiling or by heating in an oven up to the point where both eggs and lice will be destroyed, which is considerably less than what would scorch the clothing. Fumigation may also be used.

Under the name *Pediculus tabescentium* Alt described the form which he considered as the cause of *phthiriasis*, but later writers have referred his observation and description to aggravated cases of *vestimenti*.

Phthirius inguinalis Leach. This species is very distinct from the other species occurring on man, the body being nearly as wide as long, and the spreading legs, which extend laterally far beyond the borders of the body, give it a decidedly crab-like appearance. This has given it the name of "crab-louse." It confines itself particularly to the coarse hair of the body, especially the pubic region, but may occur also on the coarse hairs of the arm pits, in the beard, and is said also to cling to the eyebrows. It is of a whitish color, with dusky patches on the thorax, the legs slightly tinged with reddish and the

claw having this color more pronounced. On the borders of the abdomen there are a number of prominent lobes, and the spiracles are so arranged that three lie transversely each side at the base of the abdomen. In the female there are prominent lobes with stiff bristles meeting on the ventral side near the tip. It is nearly one-tenth of an inch (2.5 mm.) in length.

Its attacks are said to be more severe than those of the other species, and the young, by burrowing under the epidermis cause an intolerable itching. The eggs, as with other species of lice, are attached to the hairs.

Infection may come from occupying quarters previously used by an infested person, but no person of cleanly habits is likely to be long troubled with them. For severe cases use of mercurial applications may be recommended.

Herbert Osborn.

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INSECTS, POISONOUS.—As generally classified, a poisonous insect may be almost any of the *Arthropoda* that have the property of producing poisonous effects in man or in the higher animals; and it seems necessary, therefore, in this article, to refer to some forms that are not in the strict zoological sense insects or members of the group *Hexapoda*.

We may preface a discussion of the particular forms of poisonous insects by a few comparative statements regarding the organs concerned in the production of venomous material, the nature of the poison, and the means by which it is injected into the system of the victim. In all cases in which there is a true injection of venom or poisonous principle there is a development of glands concerned in the secretion, and these glands may be variously located, depending on whether the wound is caused by the mouth parts or by a sting. The mandibles of the spider and the solpugid, and of certain varieties of ants, as also the piercing mouth parts of the bug and mosquito (modified mandibles), are the organs of injection; and, as might be supposed, the glands connected with these organs are specialized salivary glands which have taken on the function of secreting a venomous fluid. The sting of the bee or wasp is a modified ovipositor, while the sting of the scorpion appears to be an independent structure possessing a venomous function only. In both these cases the glands are probably specialized dermal glands which, traced back, may be found homologous with the coxal glands of general distribution in more primitive groups. The venomous secretion, in most cases in which it has been investigated, is of a formic acid, or similar nature. Its effect is corrosive, and the symptoms usually noted are rapid swelling and inflammation; often numbness or partial paralysis occurs; while in more extreme cases a general effect on the nervous system extending to the nerve centres is produced. The distinctly paralyzing effect on the nerve centres is especially the work of certain wasps which sting their prey in order to render it helpless and inactive, while its life is spared that the body may serve as a lasting food supply for the young hatched from eggs deposited at the

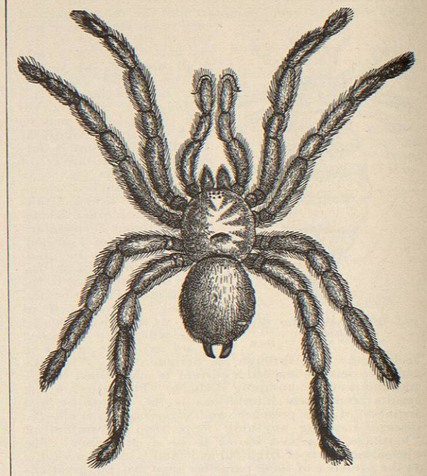

FIG. 2872.—Bird Spider (*Mygale hentzii*). (From *American Entomologist.*)

time these hapless victims are captured and put in "cold storage." In the scorpion the venom affects the blood corpuscles. The effects of insect bites or stings vary greatly with the susceptibility of the victim and with the condition of the poisonous insect at the time the poison is injected. Evidently the secretion of the gland may be exhausted by prolonged activity, so that after a succession of bites or stings the effect may be slight; while the virulence is doubtless influenced also by the state of irritability or activity of the insect. Since the poison is almost invariably an acid, the general antidote is some form of alkaline base, as magnesia or lime and their carbonates, ammonia, etc.; particular antidotes are recommended further on, however, in a number of special cases.

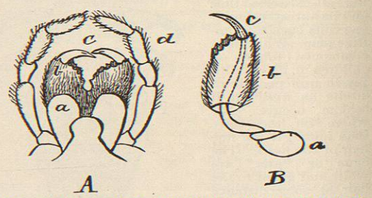

FIG. 2873.—*A*, Mouth Parts of Genuine Tarantula (*Tarantula fasciventris*); *a*, palpi; *b*, mandibles; *c*, fang. *B*, Fang and poison-gland; *a*, twisted poison gland; *b*, mandibles; *c*, fang with outlet for poison. (From the Gartenlaube.)

Among the group of spiders, scorpions, etc., known as *Arachnida*—distinguished by the presence of two body

regions, four pairs of legs, a number of simple eyes, but no compound eyes or antennæ—there are certain poisonous species that shall first receive attention.

Araneidæ, Spiders. Body of two regions, the abdomen connected by a slender pedicel; mandibles two-jointed, the outer forming a claw or fang folding against the inner. A poison gland located in the basal joint opens through a duct at or near the tip of the fang. Of this variety, the bird spiders or American "tarantulas" are the most formidable in appearance, some of them reaching a great size, being strong enough to capture small birds. Some of the tropical species occasionally reach Northern cities by being transported in banana bunches, and they cause considerable interest, if not some terror, when brought to light. Their bite is quite painful, though not necessarily dangerous, being often of such a nature as to need attention. Of native species we have two: one the *Mygale hentzii*, illustrated in the figure, which occurs throughout the Southern and Eastern part of the country; the other the *Mygale rileyi* Marx, which occurs on the Pacific coast. The bite of these two species is not very serious, though in the case of children or susceptible adults the effects may be rather alarming. The true tarantula belongs to a family called the wolf spiders, *Lycosidæ*, the European *Tarentula fasciventris* being the species popularly credited with causing all sorts of afflictions, and especially the affliction known as tarantismus or tarantula dance.

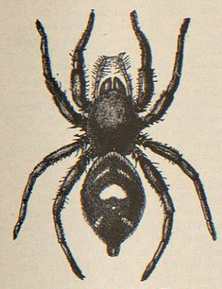

FIG. 2874.—Wolf Spider (*Phydippus tripunctatus*). (After Riley.)

Of the same family is the "malmagnatte" *Latrodectus malmignatus*, inhabiting Italy, Corsica, and the Antilles. It is recorded to have appeared in great numbers in Spain on different occasions, causing much terror on account of its poisonous bite. The *Latrodectus mactans* is charged with numerous serious bites in this country, some with a fatal termination. The records are for the most part wanting in specific details, and Dr. Howard has shown that a large part of such records may be due to other causes, and especially to the bites of Piratine bugs to be mentioned later. Still another wolf spider, the *Phydippus tripunctatus* L., has been stated by Riley to produce

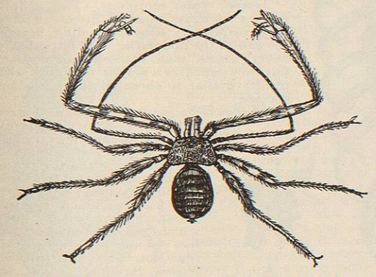

FIG. 2875.—*Phrynus lunatus*. (After Brockhaus.)

a serious bite, and he records in the first edition of this HANDBOOK an instance observed by Dr. Otto Lugger which would seem sufficiently exact in details to require credence.

Pedipalpi.—The scorpion spiders combine the characteristics of the spider and of the true scorpion; they differ from the latter particularly in the absence of an elongated abdomen, with or without a tail but without a sting, the poisonous secretion, when present, being discharged through a fang like that of the spider. The bite of some of the species is serious, but is usually exaggerated in importance. In the genus *Phrynus* there are a number of species occurring in the Southwestern part of the United States, the group being confined to the warmer parts of the globe. In *Thelyphonus*, which has an elongated whip-like appendage to the more elongate abdomen, are the whip scorpions, which, though very formidable in appearance, have, it is claimed, no serious power of biting or poisonous effect on human beings.

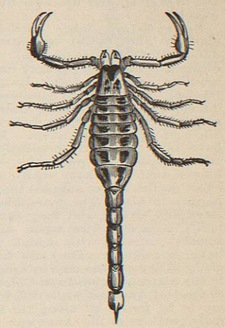

FIG. 2876.—Scorpion (*Buthus carolinus*.) (From *American Entomologist.*)

Scorpionidæ.—The scorpions are a very well-marked group of animals, being recognized at once by the large chelate palpi and the slender-jointed post-abdomen with its prominent up-turned sting at the tip. Two large ocelli are placed near together in the middle of the cephalothorax, and smaller lateral ocelli are arranged along the anterior margin. They are familiar objects in all tropical countries, and have always had a reputation for being dangerously poisonous, but in many cases their venomous nature has been greatly exaggerated. None of the species produces fatal or even very serious results, except it be upon very susceptible individuals. The sting is perforated at the tip, and the milky poisonous secretion is forced from the gland contained in the large bulbous telson or terminal segment of the abdomen. It is stated that the poison of the scorpion acts upon the red blood corpuscles, paralyzing them and causing them to become agglutinated, and thus to clog the capillaries and smaller blood-vessels. The symptoms are faintness, numbness, fever, tumors on the tongue, and dimness of vision. Ammonia alleviates the pain quickly, and ipe-

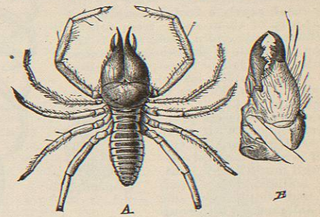

FIG. 2877.—*Dataames striatus* Putn. *B*, Side view of head of female. (After Putnam.)

cacuanha may be administered to overcome the faintness. The common species in the Southern States is *Buthus carolinus*, but a number of species occur further to the southwest and become more numerous in Mexico and Central America. Old-World species are also numerous.

Solifugæ (Galeodidæ). Bodies elongate and thorax separated; the abdomen distinctly segmented. The mandibles are large and scissor-like, and the maxillary palpi leg-like. Respiration by tracheæ, and not by pulmonary sacs. These are very peculiar animals, with quite marked differences from any of the other groups of Arachnida. While they have been popularly credited with extreme poisonous properties, it is not known that they have really any serious effect on the larger animals that they may happen to bite. The mandibles are very large and strong, and they can certainly inflict a severe bite upon any of the smaller animals with which they may have to contend. They are found especially in dry regions, and in America occur in the plateau region from Colorado down to Central America, while different species are to be found all along the higher and drier portions of the American continent. In the Old World the desert or plain regions of Southern Asia and Russia are their haunts.

Myriopoda, centipedes and millipedes. Bodies long, with segments of nearly uniform size and no differentiation of thorax and abdomen. One pair of antennæ, three pairs of palpi, no compound eyes but a cluster of simple eyes. The *Diplopoda* or millipedes have cylindrical bodies and very numerous legs. The species are not poisonous.

Chilopoda. Body flattened, one pair of legs to each segment; antennæ long and many-jointed; mouth organs strong; poison glands opening in second postcephalic pair of appendages, which are strong and resemble mandibles. The centipedes, *Scolopendra*, are the most familiar species in this group, and have received much notice on account of their venomous bite, which, however, is seldom of a very serious character. Some of the species reach nearly a foot in length, but the majority of them range from four to six inches. *Scolopendra castaniceps* is the common centipede of the Southern States. It reaches a length of about six inches, and is of a yellowish-brown color with green borders to the segments.

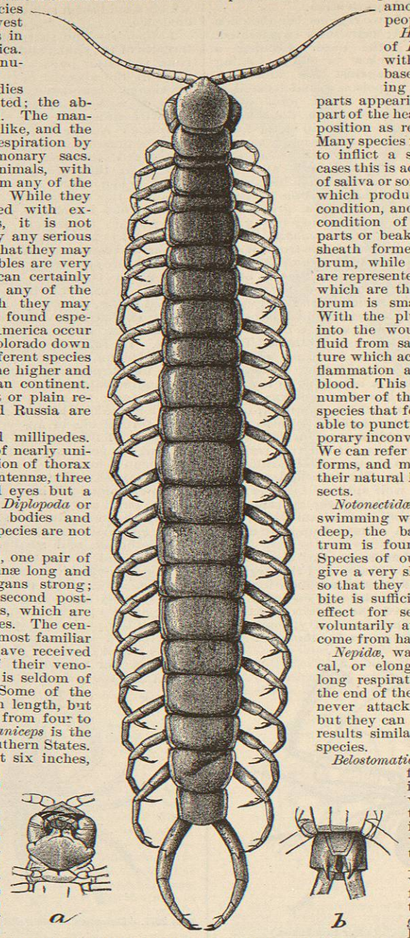

FIG. 2878.—*Scolopendra castaniceps*. *a*, Under side of head, showing fangs; *b*, under side of last segment. (After Wood.)

HEXAPODA.—Insects proper. Arthropods with three pairs of legs, usually two pairs of wings; the body regions well marked into head, thorax, and abdomen. Compound and simple eyes, one pair of antennæ. This group includes an immense number of forms, and authors recognize from sixteen to nineteen orders. But few of these include poisonous forms, though they may have important relation to man in one way or another. In the sub-order Homoptera of the Hemiptera, there are no strictly poisonous forms, but the Cicada, or seventeen-year locust, has been credited with a poisonous bite or sting, and this belief seems to persist among a considerable class of people.

Heteroptera. This sub-order of *Hemiptera* includes the bugs with wings thickened at the base, the apical portion remaining membranous, the mouth parts appearing to rise from the anterior part of the head, which lies in a horizontal position as regards the axis of the body. Many species in this group have the ability to inflict a severe wound, and in some cases this is accompanied with an injection of saliva or some of the fluids of the mouth which produce a more or less inflamed condition, and in some instances a serious condition of the patient. The mouth parts or beak consist of a well-developed sheath formed from the specialized labrum, while the mandibles and maxillæ are represented by slender setæ, the parts which are thrust into the flesh. The labrum is small and scarcely noticeable. With the plunging of the slender setæ into the wound there is a discharge of fluid from salivary glands of an acid nature which acts as a poison, producing inflammation and an accelerated flow of blood. This ability is shared by a large number of the species, even many of the species that feed normally on plants being able to puncture the skin and cause a temporary inconvenience if handled carelessly. We can refer only to the more troublesome forms, and most of these are carnivorous, their natural habit being to prey upon insects.

Notonectidæ, water boatmen. Aquatic, swimming with back downward, body deep, the back boat-shaped. The rostrum is four-jointed, strong, and acute. Species of our common genus *Notonecta* give a very sharp, painful bite if handled so that they can reach the skin, and the bite is sufficiently poisonous to leave an effect for several days. They do not voluntarily attack man, so that injuries come from handling them.

Nepidæ, water scorpions. Flat, elliptical, or elongate aquatic insects with a long respiratory tube extending beyond the end of the abdomen. These probably never attack man without provocation, but they can give a severe puncture with results similar to those of the preceding species.

Belostomatidæ, giant water bugs. Large, flat-bodied brown or gray insects with hind legs fringed with hair for swimming and the fore legs fitted for grasping insects or small fish upon which they prey. We have two very common species, *Belostoma americana* Leidy, which has a groove on the fore femora into which the tibiæ fit, and the *Benacus griseus* Say, of equal or larger size and scarcely distinguishable from the first except for the lack of the groove of the fore femora. Both are destructive to small fishes, and do not bite man except as they may be provoked by handling; and then their bite, though severe, is not dangerous unless extra-

neous matter has been introduced. These insects often appear in great numbers at electric lights during the summer time, and so are likely to attract attention and may be carelessly handled by people unaware of their painful bite.

FIG. 2879.—Point of Beak of a Hemipteron.

Reduviidæ, pirate bugs. Heads prominent, projecting; antennæ tapering to tip; rostrum curved; wings usually with distinct cells. These are typically predaceous bugs, and nearly all have a poisonous bite. But few of them attack man except when handled or interfered with, but some seem to have acquired a decided taste for human blood. Howard attributes to members of this family many of the supposed spider bites, and the term "kissing bug," which had such an extensive run in the year 1899, was based on the bites of certain of these bugs.

Reduvius (*Opsicoetus*) *personatus* L., cannibal bug; "kissing bug." This species is about three-fourths of an inch long, of a dark brown nearly black color, the head rather small and the body rather trim. It is practically cosmopolitan, doubtless having been introduced into this country from Europe. Its bite is very painful, said to be worse than a bee sting, and the effect may be noticed for several days. The very serious results which have been reported in a few instances must, however, have been due to the introduction of septic matter carried on the beak, as the secretion of poison cannot be credited with such extreme effects. The name "kissing bug" was probably first applied to this form, and it may most properly be credited with the name as it is the most frequent in houses and the only species common in the northern part of the country where some of the first cases were reported under this popular name. The species is credited with preying upon the bedbug, and its attacks on man may be interpreted, if one so chooses, as an indication of a lack of its normal food.

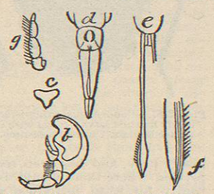

FIG. 2880.—Rostrum of *Notonecta*. *b*, Side view of rostrum; *d*, rostrum from above; *e*, one of the mandibles entire and the base of the other and of the two maxillæ; *f*, extremity of mandible more strongly magnified, with recurved teeth; *c*, labrum; *g*, antenna. (After Westwood.)

FIG. 2881.—*Belostoma americana*. (After Riley.)

Melanolestes picipes, H. S., pirate bug. Black throughout, about 15 mm. long, closely resembles the following except in having the uniform black color. About equally common throughout the Northern United States, and extending south and west, occurring also in Mexico. It does not ordinarily occur in houses, but under logs and stones, where it preys upon various kinds of insects. It bites severely, but only when handled, probably never making an unprovoked attack on man.

Melanolestes abdominalis H. Schf., pirate bug. Distinguished from the preceding by having the abdomen, at least along the border, of a bright red color. It has at times been considered as a variety, but no very satisfactory proof is available. There is very frequently a variation in the wing length or the occurrence of apterous individuals, especially among the females, as shown in the figure. The beak is powerful, and the bite, like that of the preceding species, very painful. The habits are similar, and they will be found in like situations; when caught they should be handled in such manner that they cannot thrust the beak into the flesh.

FIG. 2882.—*Reduvius personatus*. (After Howard, Bull. United States Dept. Ag.)

Rasahus biguttatus Say., "two-spotted Corsair." A large, strong species about three-fourths of an inch (16 mm.) long, black with reddish-brown prothorax, and a large orange-yellow round spot on the membrane of elytra. Distributed over the Southeastern United States, where it is a rather common species. Its bite is very severe, and results in severe

FIG. 2883.—*Melanolestes abdominalis*. Male at left, female at right; apterous form. Beak at left of male. (After Howard, United States Bull. Div. Ent. Dep. Ag.)

cellulitis, the effects of which may continue for several days. No particular fear of serious effects need be entertained unless symptoms of septic poisoning appear.

Rasahus thoracicus Stal. is a very similar species, occurring southwestward and in Mexico.

Conorhinus sanguisugus Le C., blood-sucking cone nose. Considerably flattened, the head more produced and the beak more slender than in the preceding group. The color is mainly a dark gray to blackish, with rather prominent bands on the side of the abdomen; the length is full three-fourths of an inch (16 to 17 mm.). The abdomen is broader than the thorax, and the anterior legs are not so much thickened as in the preceding forms.

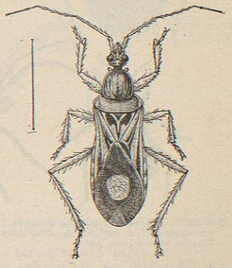

FIG. 2884.—*Rasahus biguttatus*. (After Howard, Bull. United States Dep. Ag. Div. Ent.)