vision is discovered by it being noticed that the child is slow in learning to read, or that it is a bad speller. Partial deafness closely simulates failure of attention. Whether interference with the breathing, dependent upon some naso-pharyngeal disease, causes the appearance of feeble-mindedness, or not, seems to me doubtful. It is so maintained, however, by some authorities. General diseases require little comment. But stress must be laid on the condition of over-fatigue, into which many children are pushed by the excessive work they are forced to do. It is by no means a rare experience with me for mothers to bring children, between the ages of eight and twelve or fourteen, to be examined because the school teacher has reported slow progress and backwardness. Examination shows the children to be of good intelligence, and not very much under a normal standard of health. But there is a general appearance about them of fatigue; in sitting, they do not hold themselves erect; in standing, they attempt to help support the weight of the body by leaning against the wall or by laying the hands on the desk or table. Inquiry as to daily routine shows that the children are doing very much more work than they should, and that their hours of unregulated and untrammelled play are too short. The following is the routine which a child of fourteen was expected to follow in a large girl's school in New York. Rising at 6:15 A.M., she was kept constantly busy with school duties until 10:30. A recess of fifteen minutes was followed by more recitations and study till the half-hour dinner at 12. Play was allowed immediately after dinner, for an hour, then followed practising, sewing, recitations, study, religious exercises until 6:30, with a recess of only fifteen minutes. After supper the only free time was from 7:30 to 8:15 when bedtime came. Thus, of the whole twenty-four hours, only one, and that one directly after the heartiest meal, was given over to uninterrupted play. Is it remarkable, under such circumstances, that a child gives irrelevant answers to questions, that he cannot remember well, that his lessons are imperfectly learned, that he is irritable and fretful?

PROGNOSIS.—The prognosis of idiocy concerns life and intellectual prospects. In a large number of the congenital or early developed cases death occurs in the first few months or years of life. These patients are particularly subject to such diseases as diarrhœa and pneumonia. From all points of view the defective and feeble-minded are poorly equipped for the struggle for existence and die prematurely. Most idiots who survive infancy, die before twenty, few live to be over forty. Occasionally, however, cases are met with that live to old age. The prognosis as to life must, with few exceptions, be made to depend upon the degree of malnutrition which may be present; generally the latter is directly proportionate to the degree of mental defect.

The prognosis as regards the intellectual condition has reference solely to the question of improvement. There is no such thing as a cure in arrested mental development. If the child is not teachable, even improvement is out of the question, except possibly in cretinism. If, on the other hand, the child can be taught, much can be attained by modern pedagogical methods. The statistics contained in the twenty-seventh annual report of the Royal Albert Asylum at Lancaster, England, showed, with regard to the after-career of pupils discharged on completion of their seven years' training, that ten per cent. were or had been earning wages; that five per cent. were remuneratively employed at home; and that three and one-half per cent. additional were capable of earning wages. Such favorable results can be expected in a small proportion of cases only. In the others we have to be satisfied if the patient learns to talk, to acquire a knowledge of some simple kind of handiwork and habits of cleanliness, to show respect for authority, and to exercise some measure of self-restraint. The prognosis varies also with the degree of original defect and with the age at which training is begun. The latter should not be delayed beyond the third or fourth year, and should be begun earlier if possible.

TREATMENT.—The treatment of idiocy is medical, surgical, and pedagogical.

The medical treatment is not different from the medical treatment of children generally. The physician is, however, more largely thrown on his own resources. Statements from the patients are either not forthcoming or are unreliable; and the absence or diminution of the pain sense cuts out the diagnostic symptom of pain.

Surgical procedures, directed toward relief of the mental state, are rarely if ever justifiable. Tapping the lateral ventricles in hydrocephalus, and trephining in microcephalics, on the theory of premature ossification of the skull, are tried from time to time. But it is a matter of considerable doubt if these procedures do any real good.

The object of pedagogical measures is to increase the acuity of the senses, to teach coördinated use of the muscles, to instil good habits and eradicate bad ones, to teach the use of language, to inculcate ideas of form, number, length, weight, surface solids, and, finally, to apply these results to still higher education. The sense of touch is educated by surfaces of varying degrees of smoothness, by soft and hard objects, by stringing beads, by buttoning specially made buttons, etc. The eye is educated by yarns of different colors, by blocks, cubes and balls of different colors and sizes, by various mechanical games, etc. Gongs, bells, music, singing, etc., help to educate the ear. By the improvement in the acuity of these senses, there naturally results an increase in attention and a better coördination of movement. Walking is taught by increasing the strength of the legs by massage and passive movements, and then by various mechanical devices. By analogous means, the hands are accustomed to coördinated movements. The key to teaching habits of cleanliness of the person, etc., is to be found in the watchfulness and assiduity of the nurse, and, above all, in the absolute *regularity* with which the various procedures are carried out. Certain bad habits must be grappled with. Constant watchfulness is the only cure for masturbation, which is a very difficult symptom to overcome. It is sometimes necessary to tie the patients at night. Sucking the fingers and biting the nails are cured by the application of a solution of aloes or other disagreeable substance.

Speech is taught by the oral method, or by constant and regular exercise in speaking correctly. Manual training and industrial training follow naturally after simpler things have been learned. (See Plate C.)

Further into the details of the pedagogical methods currently used in idiocy it is impossible to enter here. It is the province of the psychologist and educator, rather than of the physician. But in closing it may be said that the earlier such treatment is begun the better, and that better results are generally obtained in good institutions, either public or private, than at home.

The writer desires to express his obligations for the illustrations which accompany this article to Dr. Walter E. Fernald, Superintendent of the Massachusetts School for Feeble-minded Children. *Pearce Bailey.*

INSECT FLOWERS.—*Pyrethri Flores. Insect Powder.* The half-expanded flower heads of *Pyrethrum cinerariæfolium* Trev. (*White* or *Dalmatian Insect Powder*) and of *Chrysanthemum roseum* Weber and *C. carneum* Weber, both called *C. coccineum* Willd. in the *Index Kewensis*, (*Blue, Caucasian* or *Persian Insect Powder*), all of the family *Compositæ*. The Dalmatian species is greatly superior. All are native and very extensively cultivated perennial herbs of western Asia. The heads bear a close resemblance to those of the common daisy, the rays being white in the Dalmatian, blue in the Persian. Insect flowers reach the hands of the consumers entirely in the form of the yellowish or gray powders, and it is then extremely difficult to determine their purity or quality, which varies most widely. The quality is claimed to be best when the heads are just beginning to expand, but their collection at this time is not economical. It decreases progressively with their maturity, but the use of

the mature or old flowers, being extremely difficult of detection, is obviously profitable, and constitutes the chief form of sophistication. Enormous quantities of the stems, which possess a very slight activity, are also ground with the flowers. Their presence is readily detected in the powder by the appearance of large whitish, glistening particles, chiefly of the fibres, and less readily by the greener color which they impart. The powder should have a clear greenish-yellow, but not a bright-yellow color, the latter indicating curcuma, fustic, chrome yellow, or other coloring addition. It has a tea-like odor and an aromatic and bitterish taste. Its ethereal liquid extract, in the proportion of five parts of the filtered liquid to one of the powder used, should be of a handsome yellow, and on evaporation should yield a soft extract equalling 3.75 to 5.5 per cent. of the weight of the powder. Upon incineration, the powder should yield not more than 6.5 per cent. of ash, nearly all soluble in hydrochloric acid. These tests will determine the presence of nearly all of the very numerous adulterants which have been employed. Others are detected by the use of the microscope, but this requires considerable experience. A powder from flowers which have become too old exhibits characteristic seed tissues and yields considerable fat, of which there is but a trace in the young flowers. The powder is more active in proportion to its fineness.

No analysis of the constituents of insect powder yet made is conclusive as to the identity of the toxic agent. There are (1) volatile oil ranging up to 0.5 per cent., most abundant in the youngest flowers; (2) four to seven per cent. of resin, about two-thirds of it alcohol-soluble, the rest ether-soluble; (3) fat, from a trace in the youngest flowers to a considerable amount after the seed has formed. With these are ordinary plant principles. An alkaloid, a glucoside, and a volatile acid have been indefinitely reported. It is a curious fact that the toxic properties are imparted alike to alcohol or hot or cold water, or to the atmosphere by burning. The death of insects by contact with the fine powder is only partly mechanical, for Jelliffe has shown that while the stem powder is thus fatal to some, it does not affect others, which, however, are promptly killed by contact with the powder of the flowers. Insect powder does not affect the insect's eggs.

Although this substance is somewhat irritating, its tincture sometimes even causing vesication of the skin, yet its medicinal action is of no importance, and its one use is for the destruction of insect vermin. Here it has the great advantage over nearly all similar agents of being non-poisonous. It not only destroys such domestic pests as roaches, flies, bedbugs, and fleas, but is very useful as applied to insect-infected plants, either in the house or in the field. For the latter purposes it is best sprayed in the form of a decoction. Mosquitoes may be destroyed in a closed room by slowly burning a half-ounce or an ounce of the powder. *Henry H. Rusby.*

INSECTS, PARASITIC.—The group of insects as formerly understood included four sub-classes: the *Malacopoda*, consisting of a few worm-like forms; the *Myriopoda*, centipedes and millipedes; the *Arachnida*, spiders, mites, and ticks; and the *Hexapoda*, or six-footed winged division. While these groups all agree in having jointed bodies with jointed appendages and breathing by means of tracheæ, there is so much divergence in other respects that they are now separated into distinct classes and the *Arachnida* especially considered as widely different.

The INSECTA proper, or HEXAPODA, are bilaterally symmetrical animals having jointed bodies with jointed appendages, the body consisting of three distinct regions, the head, thorax, and abdomen, the former of which bears jointed antennæ and variously modified mouth parts; the thorax (consisting of three segments, pro-, meso-, and meta-) bears on each segment a pair of legs and on the meso- and metathorax each a pair of wings. Respiration is provided for by means of tracheal tubes which ramify throughout the tissues, carrying air to all parts of the body. Exceptional forms, especially among the parasitic species, occur in which the wings may be aborted or entirely wanting or in which different organs may be more or less aborted. It rarely happens, however, that these reductions go so far, but that the insect structure may be recognized at least during some brief period in the life history of the species.

Of the sixteen to nineteen orders which are recognized by different authors, but four include groups which are parasitic on man or the domestic animals with which he is most closely associated. These orders are the *Diptera* or two-winged flies, mosquitoes, etc.; the *Siphonaptera* and fleas; the *Hemiptera* or bugs, lice, etc., and the *Mallophaga* or bird-lice.

Of the other orders there are quite a number that may have an incidental importance, as the stinging *Hymenoptera* to be mentioned under *Insects, Poisonous;* the beetles, *Coleoptera*, some of which produce vesicating properties and others which at times cause trouble by getting into eyes or ears, and the *Lepidoptera*, many of which have larvæ that have nettling properties. To give mere mention to all of these phases would outrun the limits of this article, and our further attention therefore will be directed to such orders as include parasitic, or at least, semiparasitic, habits and affect the human species.

Diptera.—Two-winged insects, flies, mosquitoes, gnats, etc. Mouth parts fitted for piercing or sucking; a pair of mesothoracic wings and a pair of modified structures, halteres, or balancers, occupying the position of the metathoracic wings. Many of the members of this order affect man, but in such manner that it is often difficult to decide just where they should be placed. The mosquito, for instance, sucks the blood of man and might be counted semiparasitic, but its bite is poisonous and so it may properly be included under the section of poisonous insects, where discussion of its habits in this connection is given. It has further a most important relation as the medium for transmission of certain diseases, and this pathological relation is covered in an article on *Mosquito in Relation to Human Pathology*, by Professor Ward. The gad-flies or horse-flies seem on the whole to be better treated in connection with the poisonous insects and are so placed. Some other forms cause extreme annoyance by getting into the eyes, nostrils, and ears, causing intense irritation and sometimes requiring medical attention. The Hippelates flies, described by Dr. Schwarz from occurrences in Florida, are among the worst of these, and aside from the great annoyance and suffering may induce severe inflammation, and moreover are a menace as possible carriers of diseases of the eye or disorders of the skin.

Œstridæ or bot-flies comprise a well-marked family distinguished by heavy body, generally hairy, and with small eyes at the sides of the head. The antennæ are sunken into deep pits on the front; the mouth parts are rudimentary, and no food is taken in the adult stage.

The larvæ, which are the parasitic stage, are fleshy grubs and occur in different regions of the body of the host, such as the alimentary canal (horse bot), the nasal passages (sheep bot), the subcutaneous tissue (*Hypoderma* of cattle and, accidentally, in man, and the *Dermatobia* in man). Eggs are deposited on the body or attached to the hairs of the host to be, and newly hatched young reach the cavities they infest by various routes for the different species. While no species is to be regarded as strictly a human parasite, the occurrence of bots in man is of sufficient frequency to require mention here and consideration of the conditions under which they may infest the human species or become subjects for the practitioner.

Instances of the occurrence of the ox warble, *Hypoderma bovis*, and *H. lineata* in man have been recorded in both Europe and America. The former is the common species in Europe and its occurrence in man is noted as fairly common in Norway. The latter, which is the species occurring in America, has but few recorded instances, one of the best authenticated being that mentioned by Dr. John Hamilton (*Ent. News*, iv., p. 219). Their presence will be recognized from the swollen ulcers at different points under the skin, and there is a strong

tendency for them to migrate from place to place, though in the case reported by Dr. Hamilton, which ended fatally, the location was in an ulcer at the root of the tongue.

Œstrus hominis L. = *Dermatobia noxialis* Goudot. This, the species which has been termed the bot-fly of man, is of frequent occurrence in tropical America where it is a pest to cattle, as well as to dogs, monkeys, and other mammals; its occurrence on man being occasional, perhaps accidental, as a result of deposition of eggs on the bodies of persons exposed, as when bathing, or the exposed parts of the bodies of natives.

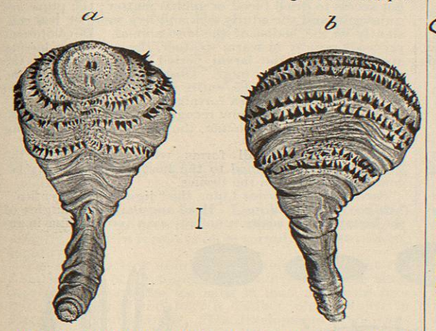

FIG. 2853.—*Dermatobia noxialis*. Larva. *a*, Ventral aspect and appearance of cephalic and caudal extremities, also the three rows of spines, single below and the point where the double rows end: *b*, dorsal view shows that the three rows of spines single below are double above. Greatly enlarged. (From *Insect Life.*)

The insect has a variety of names in different countries: *Ver macaque* in Cayenne and Mexico, *Ura* in Brazil (Para), *Torcel* in Costa Rica, and *Gusano peludo* or *Muche* in New Granada.

The larvæ are very characteristic in shape as shown in the figure, the head end being broad and the terminal segments much attenuated.

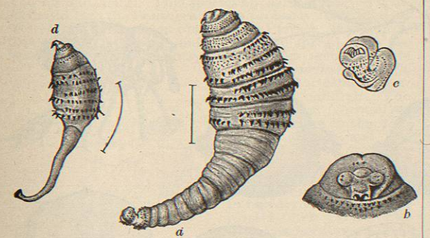

FIG. 2854.—*Dermatobia*. *a*, Brauer's figure of a larva and *d* Coquerel's figure of one probably identical with *noxialis*, differences due to maturity or to amount of contraction at time of preservation; *b*, cephalic extremity; *d*, caudal extremity of *a* enlarged; lines show actual length. (From *Insect Life.*)

If undisturbed they complete their growth in the subcutaneous tissue, and then issue to enter the ground and pass the remaining stages of development, issuing later as adult flies. In man they are probably as a rule extracted before they acquire maturity, since they could scarcely escape notice, and even crude surgery is sufficient for their extraction.

The larvæ are to be separated from the related *cyaniventris* by the minute spines on segments two and three,

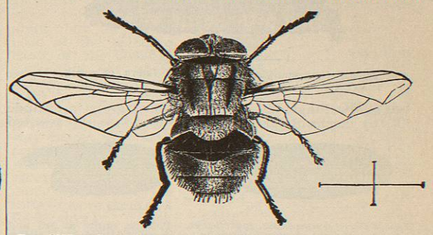

FIG. 2855.—*Compsomyia macellaria*. Adult; wings expanded. Enlarged. (After Francis.)

and the absence of hooks on the posterior borders of segments four to seven.

Dermatobia cyaniventris with similar habits has been separated from *noxialis* by Blanchard, the larva being said to have no fine spines on segments two and three, and a row of strong hooks projecting from the hind border of segments four to seven and sometimes eight.

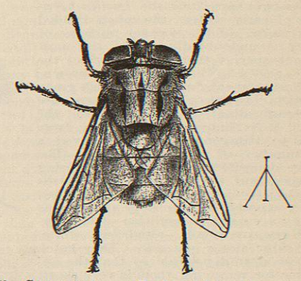

FIG. 2856.—*Compsomyia macellaria*. Adult; wings at rest. Enlarged. (After Francis.)

Muscidæ. Thick-bodied hairy flies, with well-developed mouth parts, either fitted for piercing or, as in the house-fly with soft membranous proboscis, adapted to liquid food. Larvæ, fleshy footless grubs or maggots, living in decaying matter, ordure, etc. The group is a large one, many of which, though not strictly parasitic, may seriously affect man. The common house-fly, for example, aside from being a great annoyance, is undoubtedly

FIG. 2857.—Egg of *Compsomyia macellaria*. Greatly enlarged. (After Francis.)

FIG. 2858.—*Compsomyia macellaria*. Egg mass greatly enlarged. (After Francis.)

a menace to health, since it may readily visit first the fæces of a typhoid patient and then the food of table or camp. Much of the typhoid occurring in the camps during the Spanish-American war is attributed to this means

of transmissal. Patients in hospitals may serve as centres of infection for ophthalmia and other diseases in adjacent dwellings, unless care is taken rigidly to exclude flies by means of close-fitting screens. It is also asserted that they may transmit the eggs of nematode and cestode worms. A number of the species which ordinarily deposit their eggs in decaying organic matter may on occasion deposit them in wounds and cause very serious results. The flesh-fly (*Sarcophaga carnaria*), meat-fly (*Calliphora vomitoria*), blue-bottle fly (*Lucilia cæsar*), and others, are injurious in this way.

FIG. 2859.—*Compsomyia macellaria*. Larva enlarged. (After Francis.)

FIG. 2860.—*Compsomyia macellaria*. Puparia, entire at left and broken at right showing where fly has escaped. Enlarged. (After Francis.)

Compsomyia macellaria, the *Lucilia hominivorus* of early writers, the much-dreaded "screw worm" of the warmer portions of America, is undoubtedly one of the most important species that directly affect the human species. The head is red-brown; the thorax and abdomen are bluish-green with metallic reflections, and there are three longitudinal black stripes on the thorax. It is known all the way from Canada to Patagonia and has received a great number of technical names. The eggs are deposited on various decomposing substances, but not rarely in the nostrils of individuals when sleeping, or even when awake if exposed, but probably attracted as a rule by a catarrhal condition of the person. Eggs are small, cylindrical, white, with a ridge along one side. They hatch very soon after deposition so that the opportunity for removing them is very short. The larvæ on hatching work into the surrounding tissue, and the result of their burrowing is to destroy all the tissues of the soft palate, and cases are on record in which the vertebræ and os hyoides and other bones have been completely laid bare, such cases usually terminating fatally.

As many as three hundred maggots have been dislodged from the mouth and nose of an affected individual, and considering the rapid growth of such larvæ, it is not to be wondered at that the tissues are destroyed with great rapidity. Prompt attention is therefore the most essential element in treatment, and irrigation with dilute solutions of phenol, of clove oil, warm water, or careful use of chloral are recommended. Pyrethrum is stated to be a certain remedy in all cases in which the maggots can be reached with it.

Order SIPHONAPTERA—wings absent; sides with horny plates; body much compressed; the legs long and stout, the coxæ being remarkably developed; thoracic segments distinct; mouth parts fitted for suction, all the species in the adult stage feeding upon the blood of mammals or birds. Antennæ small, sunken in pits or grooves in the side of the head, of modified shapes, sometimes annulated and in other cases divided into leaf-like plates. Eyes simple or often reduced to mere rudiments or apparently wanting. Tarsi five-jointed.

They undergo complete metamorphosis, the larvæ being slender, worm-like, active creatures, feeding in the litter of dog kennels or other waste material where they may get access to dried blood or animal matter; the pupæ are quiescent, and the adults seek and live more or less constantly on the bodies of the host animal. Development proceeds rapidly in warm weather, the egg stage lasting about six days, the larval period a few days, and the pupa stage a week or more. Observations on some of the species shows that the entire life cycle from egg to adult may be passed in a fortnight.

Three families are now recognized, the *Sarcopsyllidæ*, *Vermipsyllidæ*, and *Pulicidæ*, the first and last including species affecting man.

Sarcopsyllidæ. Small forms with large heads, the gravid females confined to the host animal usually becoming embedded in the tissues.

Sarcopsylla penetrans Linn., the "jigger," "jigger flea," "chigoe," and "chique." Head angular; hind angles of the metathoracic scales rounded; eyes and antennæ in an-

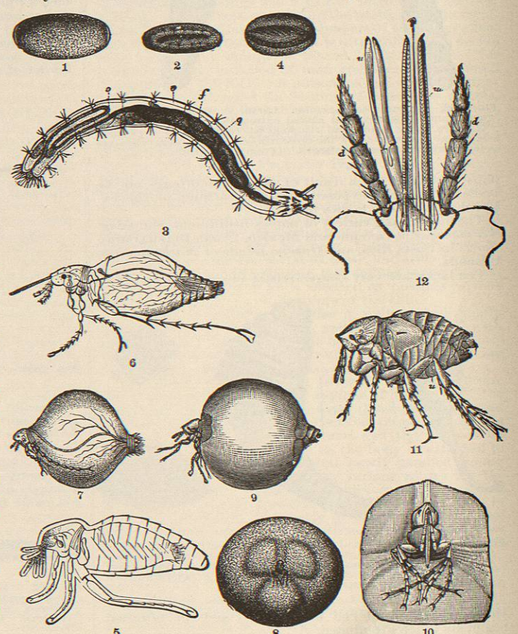

FIG. 2861.—*Sarcopsylla penetrans*. 1, Egg; 2, embryo; 3, larva; 4, cocoon; 5, pupa; 6, fecundated female; 7, the same on the third day from its entrance under the skin of its human host; 8, the same after several days' residence in the skin of its host; 9, fully grown female—magnified four times; 10, head of same still more enlarged; 11, female before entering the skin; 12, mouth parts much enlarged; *m*, mandibles; *d*, maxillary palpi; *u*, labium. (After Karsten and Guyon.)

terior part of head. The males and females are similar and flea-like, but when gorged with eggs the females lose all semblance to their original form.

The species has been noted particularly as a pest of man, but it is a very serious parasite of many other animals also. It appears to have been a native of tropical America, but has been carried to other countries and especially in Africa is said to have spread with astonishing rapidity.

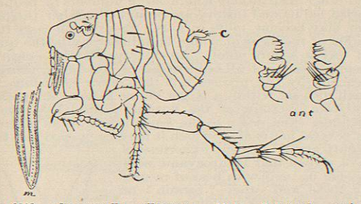

FIG. 2862.—*Sarcopsylla gallinacea*. Male. Enlarged. *ant*, antennæ; *m*, palpi, more enlarged. (From *Insect Life*, drawn by Packard.)

The adults attack animals as in other species, but the females after being impregnated burrow into the skin, especially beneath the toe nails in man, and there produce a swelling and later a distinct ulcer, which in some cases results fatally. The development of the eggs greatly distends the body of the insect so as markedly to change its form, the head and legs appearing as little appendages on a large round body as big as a pea. Each female is said to produce about sixty eggs, which are deposited in a sort of sac, and the young hatch and feed upon the swollen body of their mother until they are full grown, when they escape to the ground. Removal of the parasite is accomplished by the introduction of a sharp knife point, the object being to extract the insect entire as the bursting of its skin and discharge of its contents in the skin are likely to produce distressing sores.

Sarcopsylla gallinacea Westw., hen flea. Head obtusely pointed in front; the antennæ and eyes are in the posterior half of the head; the metathoracic scales angled behind, 1 to 1.5 mm. long. This species appears to have been introduced into the Southern States probably from the Old World, and it has been observed in Florida, Mississippi, Texas, and Oklahoma, and is likely to spread over the warmer part of the country at least. Its main attack is upon domestic fowls, but it is stated to attack man, especially children. The females bury themselves in the skin as in the preceding species and the sores produced are of a similar character. The effects upon young chickens and puppies are said to be very serious and the results often fatal. But little has been ascertained regarding its effects on the human species.

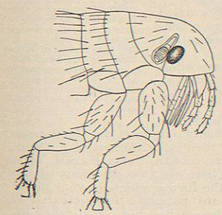

FIG. 2863.—*Pulex irritans*. Head and pronotum, showing form and absence of combs. (Author's illustration, Bull. United States Dep. Ag.)

Pulicidæ. Labial palpi three- to five-jointed. The abdomen of the female does not become especially swollen with the development of the eggs.

Pulex irritans L., the house flea, is recognized by the absence of combs of spines on the border of the head and pronotum, and the length of the hypopharynx and mandibles which reach more than half-way on the fore coxæ, the single row of bristles on the abdominal segments, the large male claspers, and the dark reddish or piceous color. It has a very wide distribution over the world, and has been a familiar if not welcome guest in dwellings from remote antiquity. Their attacks for blood sucking are made more particularly at night, but they have none of the secretive habit of the bedbug, depending on their agility and enormous leaps to escape from capture. Eggs are deposited in out-of-the-way places, in cracks and under carpets where the young may secure a supply of organic matter of various sorts to serve them as a food supply. Each female is supposed to deposit from eight to twelve eggs, which are whitish ovoid, less than a millimetre in length, and which hatch in the course of from four to six days in summer and which reach the pupa stage in about eleven days, from which they issue as adults in about twelve days later. The full life cycle may therefore be completed in the course of a month in summer and six weeks in winter. Preventive measures must be directed against the harbors for the development of the young, cleanliness in regard to the places where the eggs might hatch and the young develop being more effective than attention to other points, though the use of pyrethrum may be resorted to to destroy the adults.

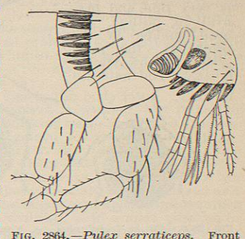

FIG. 2864.—*Pulex serraticeps*. Front part of body showing combs on head and pronotum, enlarged. (Author's illustration, Bull. United States Dep. Ag.)

Pulex serraticeps Gerv., the dog flea, recognized by the distinct comb of spines on the lower border of the head and on the hind border of the pronotum as shown in the figure, is in this country a more frequent pest in houses than the *irritans*. Its normal hosts are the dog and cat, but it seems thoroughly at home on the human species and is an extremely annoying pest. Eggs are attached to the hairs of the dog or cat, but so loosely that they drop off easily and are scattered wherever these animals may chance to rest. Both of these species are more annoying than dangerous, their bites seldom causing more than temporary inconvenience; but it is easily conceivable that they might become the carriers of the germs of infectious disease or of septic matter, and thereby assume a very different rôle.

Order HEMIPTERA—insects with suctorial mouth parts; four wings, unless aborted or rudimentary, the upper or front pair being thickened at their bases. The young hatch in the form of the adults.

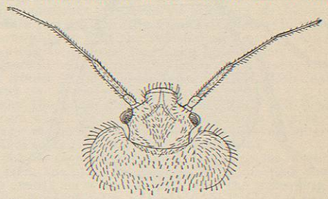

FIG. 2865.—*Cimex lectularius*. Head and prothorax much enlarged. (Author's illustration, Bull. United States Dep. Ag.)

Cimicidæ, wings aborted or if present with simple membrane; the parasitic or semiparasitic bedbug having mere rudiments of wings.