

XIX.—*Observations respecting various Insects which at different times have afforded Food to Man. By the Rev. F. W. HOPE, F.R.S. &c.*

[Read 4th December, 1837.]

I THINK it necessary to state at the commencement of this paper, that I confine my inquiries at present solely to insects, passing by the *Crustacea*.* It will, no doubt, after an investigation be generally admitted, that insects in very early days were eaten as an article of food; as it may however be doubted by some individuals, it will be better to clear up this point before we enter more minutely into the main object of our inquiry.

Perhaps the earliest account we have of edible insects is that which is mentioned by Moses, the Jewish lawgiver, where insects are noticed in the catalogue of animals permitted for food, (vide Lev. xi. 21, 22), "These ye may eat, the locust after his kind, and the bald locust after his kind, and the beetle after his kind, and the grasshopper after his kind." Without attempting at present fully to explain this passage, which has afforded ample matter for discussion to the commentator as well as the naturalist, I merely remark in alluding to it, first, that at the time the above passage was written, it may fairly be inferred that locusts had long been eaten as food; and secondly, that in defining the different kinds, the object might be partly to deter the Jews from eating other *insects*, which experience had proved to be injurious, while the locusts, which were a wholesome food, might be eaten with impunity, and therefore were they more especially recommended to notice. The next authority I have to advance in support of insects eaten as food, is that of Herodotus, the father of history. Speaking of the Nasamones he states, they regaled on locusts. The translation of the passage is as follows: "They hunt for locusts, which having dried in the sun, they reduce to powder and eat, mingled with milk." vid. Herod. Melpomene, chap. 72.

Diodorus Siculus also mentions a race of Ethiopians who were so fond of eating this food, that they were called acridophagi, or locust eaters (vid. lib. 24, ch. 3). Instead of bringing forward at present a cloud of witnesses of ancient as well as modern

* An account of the different edible species of *Crustacea* may at some future period be added to the present, should such a memoir be thought worthy the attention of the Society.

writers in attesting the well-authenticated fact of locusts eaten as food, I shall merely insert in tables at the end of this paper the names of different nations and people mentioned as feeding on such diet, and cite the several authors who have recorded them.

Before investigating the genera and species which have severally ministered to the wants of the wild African and Australian bushman, or to the luxurious Roman or more modern Epicurean, it may here be stated, that almost all the insects alluded to live on vegetable matter; some on the outer bark, a greater portion on the saccharine alburnum, the pith and inner coatings of trees, while a great number of others thrive on leaves, twigs, and the delicate fibrous roots buried beneath the soil. It appears then from the above brief statement, that insects live on cleanly diet, and consequently afford us more wholesome food than some of the animals that are usually served at our tables. It is not my intention here to recommend insectal food to nations living in northern climates, although I am aware that there are naturalists who have done so; the supply in summer accidentally might be abundant, but in winter certainly always must be scanty and precarious. I see no reason, however, why in the warm and well wooded regions of the world they should not be eaten, as the supply there is generally abundant. The New Hollander, or even the European settler in those parts, may derive much benefit by adopting the larvæ of insects as food, for the very worms regaled on, if left to themselves, in time might multiply so as to endanger the crops of future years, entailing ruin on the grower, and perhaps famine on the settlement. In case of scarcity in our own country, and certainly in milder regions of the world where famine has been known to spread over the land, insectal food may be adopted. It is probable that want and hunger may have been the original cause of introducing to notice several of the insects which have been taken as food, although I am unable at present to adduce any particular instance to substantiate the fact. Insectal food, which I here recommend in case of necessity, will certainly not be so revolting to man as the animal gelatine of pulverised old bones, or even as insipid as sawdust bread, recommended by the French in similar emergencies.

To proceed, however, it is time to investigate the species of insects which have been eaten at different times. I shall commence with the *Coleoptera*, and run through the remaining orders, explaining, as far as is possible, the genera and species to which they may belong.

Scarabæus sacer, Linn.

The first insect to which I shall direct your attention is the *Scarabæus sacer*, which is frequently eaten at the present day by Egyptian women, in order that they may become prolific, (vid. Dr. Clarke's Travels, vol. iv. ch. 1, p. 9), where it is denominated *Sc. pilularius*, or rolling beetle. The same he mentions is often met with sculptured on the obelisks and other monuments of the country. The above writer observes, but I know not on what authority, that this beetle served as food for the Ibis, and its remains are sometimes met with in the earthenware repositories of the embalmed birds which are found at Saccara and Thebes. Lane, in his account of the modern Egyptians, corroborates the testimony of Dr. Clarke. He states, "that the Egyptian women generally make use of perfumes, such as musk and civet, &c. and often of cosmetics, and of several preparations which they eat and drink, with the view of acquiring what they call a proper degree of plumpness. One of the preparations is extremely disgusting, being chiefly composed of *mashed beetles*." In a note appended to the above passage (vid. vol. i. p. 237), Lane argues, that these insects were eaten by the Jews (see Levit. xi. 21, 22), "Of these ye may eat, the beetle after his kind; but we cannot suppose that they derived this custom from the Egyptians, who regarded the beetle as sacred." In our translation of the Bible, the Hebrew word *chargol* is rendered beetle, which ought to have been rendered locust, vid. Bochart in loc. In another passage, in a note, the same author states, "Some women add another ingredient, but for a particular purpose, which is to make them fat; they broil and mash up a number of beetles in the butter, and then add honey," &c.

Lepidiota, Kirby.

Lep. Hypoleuca, Wiedemann. Wiedemann mentions that he found on the waron tree, in the Island of Java, *Melolontha Hypoleuca* in great abundance. This species is as common there as *Mel. vulgaris* is in Europe. He adds, the inhabitants of the mountains collect them as an article of food. Vid. Westermann and Wiedemann in Germar's Magazine, vol. iv. 419.

Rhisotrogus Pini.

The inhabitants of Moldavia and Wallachia are mentioned in some authors as eating the larvæ and perfect insects of *Rhisotro-*

gus Pini: the author's name I have unfortunately omitted to transcribe.

Anophlognathus viridiæneus.

Mr. William Sharpe Mac Leay has stated, in the "Horæ Entomologicæ," that he is inclined to think that the larvæ of *Anophlognathidæ* are the grubs which the New Hollanders use as an article of food;* in corroboration of this opinion, I can add the testimony of an individual who resided some years back in different parts of Australia, who assured me that the white grubs† which are eaten turned into golden beetles, and pointed them out in the box of insects which he had to dispose of. The species alluded to was *Anophlognathus viridiæneus*, and there can be little doubt that the white grubs of various other species are often mistaken for them and eaten. Should this opinion be further substantiated, and the food prove palatable and wholesome, the settler, from policy, should patronize as food these dainties which are so highly prized by the wild Australian, and thereby secure the crops of future years by feeding on the insects capable of destroying them; and certainly no reason can be adduced why the grubs of New Holland may not rival in delicacy the palm-worm of the Eastern world, or the cossus of Europe, which the Roman epicure, in the days of Pliny, so highly esteemed.

Oryctes Owariensis.

Another insect which is eaten at the present day is a species of *Oryctes*, named *Owariensis* by Palisot Beauvois. It is eaten by the nations inhabiting Cape Coast, and there can be little doubt that many other species of this genus, as well as of *Xylotrupes*, may be eaten with impunity. It is not improbable that Reaumur was aware of a species of *Oryctes* being eaten by the Africans, since he recommends the larvæ of *Oryctes Nasicornis* of Europe to especial notice. My gallant friend, Captain Downes, a resident some years at Fernando Po, who, although unable to specify the insect, mentions that at Sierra Leone the natives roasted and ate a palm-tree worm. He informs me also, that beetles and their larvæ are eaten on various parts of the western coast of Africa.

* Mr. Cunningham states, "Our wood grub is a long soft thick worm, much relished by the natives, who have a wonderful tact in knowing what part of the tree to dig into for it, when they quickly pull it out, and gobble it up with as much relish as an English epicure would an oyster."

† Vide Two Years in New South Wales, by P. Cunningham, vol. i. p. 329.

Lucanus cervus.

Scopoli records his opinion, that the larva of *Lucanus cervus* was probably the *Cossus* of Pliny, and it seems probable that this opinion was correct.

Tenebrio, Fabricius.

The celebrated Niebhur states in his travels, that the women of Arabia and Turkey make use of a species of *Tenebrio*, which is found amongst the rubbish of their gardens. As plumpness is thought a beauty in the east, the women, in order to obtain this beauty, swallow every morning and every evening three of these *Tenebriones* fried in butter.—Vid. Niebhur's Travels, vol. ii. p. 339. It will perhaps be remarked, that the name of the species is not mentioned. I think it is likely that a *Pimelia* of the present day is intended, and not a *Tenebrio*. As the larvæ of *Tenebrionidæ*, commonly called meal-worms in England, chiefly live on flour, might they not in times of scarcity be resorted to? they abound in bakehouses and granaries, and often in our kitchens live under the hearth-stones. Lane distinctly states that true *Scarabæus* is eaten; probably, therefore, other genera and species are regaled on.

Prionus coriarius, Linn.

The larvæ of this insect, with those of *Lucanus cervus*, were eaten by the Romans under the name of *Cossus* (vid. Amoreux, p. 154), and if it is allowable to add other species which were probably confounded under the same name, I should mention *Hamaticherus heros*, *Lamia textor*, and *Morimus tristis*, all inhabiting southern Europe, and tolerably abundant in Italy at the present day.

Stenodontes Damicornis, Linn.

The larvæ of this beetle are eaten in Surinam, in America, and in the West Indies, both by white and black people. It is considered an exquisite relish, and is called by the natives the Macauco, or Macokko beetle. Linnæus, in his Mantissa Plantarum, published in 1771, gives us a short list of insects, where, under the name of the above species, he adds the following remark:—"Habitat in Jamaica, larvæ in obsoniis sapidæ."

Montac Beetle.

This is the larvæ of one of the *Prionidæ*; it is eaten at the Mauritius when dressed, and is named the Montac grub; the whites as well as the negroes eat it greedily. Vid. St. Pierre's Voyage.

Macrodonia cervicornis, Linn.

Linnæus, writing on this insect, states: "Habitat in America, ligno Bombacis larvæ quæ exemptæ edulis in deliciis."

Omacantha gigas, Fab.

According to Smeathman this insect, when roasted, forms an article of food in Africa.

Lamia rubus?

The larvæ of *Lamia rubus*? Fab. are eaten in the island of Ceylon, and I have heard also, that the Burmese are partial to these beetle grubs, probably a closely allied species of *Lamia*. One species I have seen, it appeared longer than *rubus*, but it was in too mutilated a state to speak with certainty. It may here be added, that under the name of *rubus* there are several species of *Lamia* confounded together.

Lamia 8-maculata.

The above insect is reported to be eaten in India. Is this the destructive insect named *Carian* by Heyne, which he states is not so prejudicial to the cocoa-nut trees in the Mysore as it is on the coast? Before concluding with the *Longicornes* it may be mentioned, that many others of the *Prionidæ*, and *Lamiidæ* and *Cerambycidæ*, are probably eaten, and, from the account of various travellers, beetle grubs appear to be rich and delicate eating.

Calandra Chinensis?

The historian Ælian mentions the circumstance of an Indian king treating some of his Grecian guests with the larvæ of an insect instead of fruit. This probably was a grub of a species of *Calandra*, and not unlikely that of *Cal. Chinensis*, which is widely spread over a large portion of the Asiatic continent. It is abundant in China, on the Tanasserim Coast; at Calcutta, Ceylon, and also in the Concan.

Calandra palmarum.

This insect is also a species of palm-worm, but certainly distinct from that of India. It is called in the West Indies, where it abounds, *Grugru*. According to Madame Merian they are roasted

by the natives, and are esteemed, when properly cooked, rich and delicate eating. Linnæus also, in a remark relating to this species, adds, "*Larvæ assatæ in deliciis habentur.*"—Vid. Linn. System. Nat. p. 606.

In terminating the Coleopteral order it may be here stated that there can be little doubt that various other species of grubs of the genus *Calandra* are eaten by different nations in the widely separated regions of the globe.

ORTHOPTERA.

1. *Locusta migratoria*, Linn.

Locusts, as I have before stated, were eaten in the early stages of the world, and it is only by critical commentators that this point seems to have been disputed.

The well authenticated fact of various nations eating locusts as food, determines a question concerning which commentators on the Bible have long disputed, namely, whether the *Acrides* of John the Baptist were locusts according to the literal sense of the word, or whether ἀκριδες was a term given to the pods of a species of cassia. The first, in my humble opinion, is the only correct interpretation of the word. The hypercritic argues that locusts are an unnatural food, forgetting that they were allowed to be eaten by Moses, the Jewish lawgiver. Now, if they were eaten in early days, and are eaten at present by people frequenting the very same desert which John the Baptist inhabited, what reason have we to think that they were ever abandoned in his time? None whatever! Locusts will still continue to be eaten, and critics still endeavour to refine, but all their acumen and learning will never convert an insect to a fruit.

The first species I allude to is the *Locusta migratoria*, commonly eaten in the Crimea: it is often the precursor of *Loc. Tatarica*. Under the name of migratory locust, there are undoubtedly several species confounded. The trivial name of *migratoria* is characteristic of many of the species, and has probably been the cause of the confusion. Occasionally they visit various parts of Europe, and sometimes England, migrating chiefly from the Crimea.

2. *Locusta Tatarica*, Linn.

This insect is eaten commonly in the Crimea. When these animals arrive in swarms, the whole vegetable produce disappears. Nothing escapes them, from the leaves of the forest to the herbs

of the plain; fields, vineyards, gardens and pastures, every thing is laid waste; sometimes the only appearance left on the naked soil is a revolting heat caused by their putrifying bodies, the stench of which too often produces a devastating pestilence.

3. *The Muken, or Red Locust.*

I am in doubt what name to attribute to this species. The Egyptians and Arabians esteem it as the fattest and most delicate of the locusts.—Vid. Niebhur. At Bassorah, the Arabs call this locust, which they are extremely partial to, *Muken*; when fat and full of eggs it is esteemed a very strengthening food for men; the male *Muken* is lean, and therefore is not much eaten.

4. *The Light Locust.*

Another species eaten by the Arabians is called the light locust: it appears to be unknown to our European entomologists; this, when it arrives, is lean, and after it has lived well for a time is called the *Fat Locust*.

5. *The Dubbe Locust.*

This species is by no means in request in Arabia, and is scarcely deemed esculent, because it tends to produce diarrhœa. Roesel tells us, that eating locusts is unwholesome, and produces winged dog lice, or dog flies. This opinion, however, is disputed, and is now not credited by travellers.

6. *Locusta gregaria*, (Forskal, Gerrard,) or *Red Skipper*.

This insect is considered as one of the most destructive to vegetation, and is most probably the *Acridium* of the ancients. An interesting account relating to this species will be found in Blaquiere's Travels. It is probably also the locust described by Belzoni, who says they devour every thing. The natives eat them fried; they are about two inches in length, and are generally of a yellow or gold colour, but there are some red, and some green.—Vid. Belzoni. Colour is no criterion of species with respect to this locust, and probably the remark will apply to others. When young it is green; as it grows it assumes a yellow hue, and lastly becomes brown and red. There is an indifferent drawing of one of the above insects in James Grey Jackson's Travels in Morocco. Vid. third edition (1816), p. 102.

7. *Locusta Cernensis*, Hope.

This species, which is apparently undescribed, is eaten by the natives of Madagascar, and preferred by them to their finest fish. Their method of dressing them is to strip off their legs and wings and fry them in oil. I have given it the name of *L. Cernensis*, derived from the ancient name of that island, which I prefer to *Madagascariensis*, used by French writers.

8. *Locusta devastator*, Lichtenstein.

This destructive insect is mentioned by Lichtenstein as devastating Southern Africa. They are greedily devoured by the Bosjesmans or Wood Hottentots, who, not content with catching them by handfuls, dig long and deep trenches, and capture them by thousands. Adamson mentions, moreover, in his voyage that various tribes of Africa eat locusts.—Vid. p. 161.

9. *Locusta pupa*, Linn.

I have somewhere read (Rosenmüller?) that this species is eaten occasionally, but do not recollect the reference.

10. *Locusta cristata*, Linn.

Linnaeus, in his "Systema Naturæ," under the name of *Locusta cristata*, mentions in a note that this species is eaten by the Arabs, "Hic Arabicus esculentus est."

There are different methods of preparing locusts. The Arabs throw them on the fire, and when sufficiently fried, they pluck off the legs and head, and eat the remainder. Some dry them in ovens, and others grind them to powder in handmills, or pound them in stone mortars; the powder is then mixed with water, and made into a cake, and baked as common bread. Others, again, boil and eat them with salt. The taste is compared to shrimps, and by Rosenmüller they are reported to be nearly the same in flavour as the smoked *Agaric* eaten in Holstein. Another authority for their peculiar flavour is "Joseph de S. Ange, de Toulouse, dans son Gazoph. Pers. sous le titre *Locusta*, raconte qu'en Arabie tout le monde (tutti quanti), pauvres et riches, mangent les sauterelles avec beaucoup de l'appetit, et qu'en effet elles sont bonnes (e che veramente sono buono), et ont le gout d'ecrevisses. D'autres disent qu'elles ont plutot le gout de hareng frais."—Vid. Scheuchzer, vol. ii. p. 111.

11. *Locusta viridissima.*

This species has occasionally been eaten. It is seldom found in great numbers, and is reported not to possess the flavour belonging to the migratorial species.

12. *Locusta Mahrattarum.*

When a cloud of locusts visit the Mahratta country, the common people salt and eat them; probably they have long been accustomed to such food; as it is evidently distinct from any African species, I suggest the name of *Locusta Mahrattarum*.

Meer Hassan Ali tells us, that the Mussulmauns in India eat locusts. Speaking of a cloud of them, he proceeds as follows: "The main body of the army of locusts must have occupied thirty minutes in passing over my head, but my attention was too deeply engrossed to afford me time to consult my watch; stragglers there were many, separated from the flight by noises made by the servants and people to deter them from settling, some were caught and were converted into currie for a Mussulmaun's meal. They say it is no common delicacy, and is ranked among the allowed animal food."—Vid. Meer Hassan Ali's History of the Mussulmauns, p. 165.

As I have heard Englishmen who have been in the East Indies state that the natives of India do not eat locusts, I quote another authority which speaks on the point generally without alluding to any particular species. Paxton gives us the following passage: "Many nations in the East, as the Indians in the Bushee Islands, the Tonquinese, and the inhabitants of Madagascar, make no scruple to eat locusts, of which they have innumerable swarms, and prefer them to their finest fish."—Vol. i. p. 327.

The next authority I quote of people eating locusts is Ludolphus; in his History of Ethiopia we find the following quaint passage: "The Habessines for sometime support themselves by feeding on locusts, which they greedely eit, as well to satisfie their hunger as in revenge, for it is a very sweet and wholesom sort of dyet, by means of which a certain Portuguez garrison in India, that was ready to yield for want of provision, held out till it was relieved another way; and therefore it is not to be doubted but that St. John the Baptist fed upon these locusts in the wilderness."—Vid. chap. 13, p. 67.

13. *Locusta Persarum*, Morier.

Morier informs us of a flight of locusts which visited Persia.

They were not, he says, of a predatory kind, and differed from the red locust which destroys vegetation; they were three inches long, the body and head were of a bright yellow. The Plain of Bushire was covered by the poorer inhabitants, men, women, and children, who came out to gather locusts, which they eat; they dry and salt them, and afterwards sell them in the bazaars as the food of the lowest peasantry: when boiled the yellow ones turn red; they eat like stale and decayed shrimps.

Forbes states in his *Oriental Memoirs*, "It is well known that locusts there are an article of food in Persia and Arabia at the present day; they are fried until their wings and legs fall off, and in that state are sold in the markets, and eaten with rice and dates, sometimes flavoured with salt and spices."—Vol. i. p. 82.

As to the modern Arabs, they eat locusts when fresh, and esteem them, when salted, a great delicacy; the flavour is similar to that of fried herrings, but more delicious.*—Vid. Horneman's *Travels in Fez*.

It would indeed be easy to multiply modern authorities respecting locustal food; one more authority shall suffice, from which it will appear that the Arabs make a sort of locust bread. Madden, in his interesting travels, tells us, "The Arabs make a sort of bread of locusts; they dry them and grind them to powder, then mix this powder with water, forming them into round cakes, which serve for bread."—Vid. vol. ii. pp. 31 and 218.

* Burkhardt more particularly details the method of dressing locusts in Arabia. "All the Bedouins of Arabia and the inhabitants of the towns of Nedjd and Hadjaz are accustomed to eat locusts. I have seen," he says, "at Medina and Tayf, locust shops, where these animals were sold by measure. In Egypt and Nubia they are only eaten by the poorest beggars. The Arabs, in preparing locusts as an article of food, throw them alive into boiling water with which a good deal of salt has been mixed, after a few minutes they are taken out and dried in the sun. The head, feet and wings are then torn off, the bodies are cleansed from the salt, and perfectly dried; after which process, whole sacks are filled with them by the Bedouins. They are sometimes eaten broiled in butter, and they often contribute materials for a breakfast, when spread over unleavened bread mixed with butter."—Vid. Burkhardt's *Notes on the Bedouins and Wahatays*, vol. ii. p. 91.

Salt also, in his voyage to Abyssinia, p. 172, writes as follows: "During our stay in this quarter a large flight of locusts came over to one of the islands, and in a few days destroyed nearly half the vegetation upon it, not sparing even the bitter leaves of the rack tree. These locusts are called Jarad in Yemen and Anne in Dankali, and are commonly used as food by the wandering tribes of both these nations, who, after boiling them, separate the heads from the bodies, and devour the latter in the same manner as Europeans eat shrimps and prawns."—Vid. Salt's *Voyage to Abyssinia*, p. 172.

14. *Locusta Onos*, Pallas.

The celebrated traveller Pallas, in the fourth volume of his *Voyages*, in the Appendix, informs us that *Gryllus Onos* is eaten by the Mongols and other Indians, "Mongolia insectum, Sinensibus edule."—Vid. p. 678. The description of the species is more fully detailed in his *Spicilegium Zoolog. fascicul. 9*, p. 17, where there is an exact figure, vid. table 2, fig. 1.

15. *Acheta Smeathmanni*.

From the information furnished to Mr. Drury by Mr. Smeathman, we learn that the children in Africa are, at the proper season, very busily employed digging out of the ground the females, when full of eggs, of a species exactly resembling *Acheta membranacea* of Drury, on which they make an agreeable repast, roasting generally the whole animal, but eating only the eggs, which are contained in a bag—they resemble part of the roe of the fish—deeming it very delicate food.—Vid. Westwood's Edition of Drury's *Exotic Insects*, vol. ii. p. 91.

A species closely allied to the above ravaged the Burmese territories, and was eaten, I understand, by the people there, after roasting them.

Before concluding my observations on locustal food, I think I may here be allowed to suggest some methods calculated to counteract and mitigate the injurious effects they too often occasion. First then, the legislative powers in the countries where the locusts abound, should recommend them generally as an article of food; more effectual means, however, would be to employ the people and children in hunting for their nests and eggs, which they might in a great degree destroy; when the young make their appearance, they may be employed again, and if the insects prove too abundant for them, the police and military of the district should be called in to aid in the work of their destruction. On the arrival of overwhelming swarms, when famine is likely to be caused by their devastation, I would recommend a *levée-en-masse* of the population to sally forth and collect them by thousands: as many as may be required for food may be prepared for future use, the rest should be buried in deep trenches. To attain this end, a poll tax of a bushel of locusts (or any other measure deemed advisable), might be required from each inmate of a house, and thus, by considerably reducing their numbers, future famine and pestilence (too often the sad effects of their visitations), might in some

instances undoubtedly be prevented. In alluding at present more particularly to one country, namely, the Crimea, I think that some good might there be effected; the descriptions relating to the sufferings of those people by the desolating armies of locusts are harrowing to read, and must excite the attention of the philanthropist as well as of the naturalist.

That unfortunate country almost annually suffers from this dreadful scourge, which devastates their lands; and when we consider it is not merely the yearly crops of corn and pasturage, but all that can be denominated vegetation, which is annihilated,—that it is not the whole crops of one year's growth only, but that of several succeeding years rendered comparatively unproductive by their attacks,—I cannot but repeat again the above recommendation of a levée-en-masse, and I am sure it will not be deemed preposterous when the result must prove decidedly beneficial.

HEMIPTERA.

1. *Tettigonia Antiquorum.*

Tettigonia, *Tettigometra*, *Tettix*, and *Cicada*. Under these several names in the different stages which this insect passes through, we learn that it was eaten by the Greeks; as it is probably unrecognized by moderns, I give it the provisional name of *T. Antiquorum*.

2. *Tettigonia Parthorum.*

According to Pliny, the Parthians regaled on a species of *Tettigonia*; I merely add a specific name to distinguish it from any that possibly were eaten as food in Greece.

3. *Tettigonia Septendecim.*

A species to which the above name is given is eaten by the American Indians at the present day, who pluck off the wings and boil them.

3. *Tettigonia Bennetii*, Hope.

Mr. George Bennett, in his Wanderings in New South Wales, states that the Aborigines used as food the *Tettigonia* or *Frog-hoppers*, which they call *Galang*, first stripping them of their wings; as the species is apparently unnamed, I have added that name, *Bennetii*, in honour of that enterprising traveller.

I now proceed with the remaining orders, first having combated an objection raised against locusts eaten in India. My sole authority was that of Major Moore, mentioned by Messrs. Kirby and Spence, in their *Entomology*; that authority has been questioned. From inquiries made of my friends, Colonel Burke and Major Robinson, officers well acquainted with India, I have since been informed, that it is no unusual custom of the Sepoys to make a locust curry; both the above individuals have at times tasted them, and describe them as little adapted to an European palate. Another authority is a communication received from my friend E. T. Downes, Esq., I give an extract of the letter sent to me: "Respecting your Entomological inquiry, I do not think that natives of any cast eat any insect save the locust, which they make into a curry. The Kunjars and no caste Hindoos eat the flesh of the gosamp, and a lizzard called the *Sanne*, but I have never heard of them eating any insect besides the locust." From the same authority I also state, that in 1833, at Allahabad, an immense flight of locusts fell at that station; they were collected by the natives and eaten as curry when they wanted them: they were collected in earthen vessels, in which they were kept ready for use.

LEPIDOPTERA.

1. *Larvæ of Papilionidæ.*

In this order I am able to add little additional matter, except that which may be gathered from the mine of information, the invaluable "*Introduction to Entomology.*" Sparrman mentions, that the caterpillars of some of the *Papilionidæ* are eaten by the Bosjemans. Lander also, in the records of Clapperton's last expedition to Africa, in speaking of the food of the Yaribeans, mentions Elio, a celebrated fat eunuch, who held some of the highest offices of state under a black majesty. "He came to me," says Lander, "paunch and all, and boasted that he could procure any delicacy he might want, for he had only to hint his wishes, when a bowl of dogs' or asses' flesh, a *dish of fried caterpillars*, or a *saucepan of ants or locusts* was smoking before him in a moment." In another page of the same work it is stated, "As with the ancient Romans, *caterpillars* are in very high estimation among the people of Yariba.—Vide vol. ii. pp. 201, 205.

2. *Sphinx Larvæ.*

According to Sir George Staunton, the Chinese eat the larvæ of a *Sphinx*; the species, I believe, still remains unknown.

3. *Cossus ligniperda*.

Two celebrated naturalists, Ray and Linnæus, suppose the caterpillar of *Cossus ligniperda*, to be the identical *Cossus* which, in Pliny's time, delighted the Roman epicures.

4. *Bombyx mori*.

The Chinese, when they have unwound the cocoons of the celebrated silk-worm moth, serve up the chrysalides at table, taking care to retain a sufficient number for propagating the species. Tachsius informs us also, that the *Bombyces* were eaten as food;* while Schröder says, that they were dried or reduced to powder, and administered as medicine, in order to cure vertigo and convulsions, vid. Pharmacop. Medico-Chym. lib. v. p. 883. I add another authority, in corroboration of the above remarks. Mr. Favand, a missionary in China, states, that during his long residence in that country, "he has often seen the *chrysalides* of silk-worms used as food. He has himself partaken of them, and found them at once strengthening and cooling. After having wound the silk off the cocoons, they are dried in the fryingpan, when the envelop will come off, and they appear like yellow masses, resembling the eggs of carp. They are fried in butter, lard, or oil, and moistened with broth. When they have been boiled in this for five minutes, they are stirred well, and crushed with a wooden spoon. The Mandarins and rich people add the yolk of eggs, in the proportion of one yolk to a hundred chrysalides. The poorer people are contented with salt, pepper, and vinegar, or, after stripping them, in cooking them with oil."

5. *Nycterobius MacLeayii*.

The natives of Australia eat the caterpillars of a singular species of moth, which are taken at night while feeding. The name of *Nycterobius* has been given to it by Mr. William Sharpe MacLeay.

6. *Euplœa hamata*.

The Aborigines of Australia congregate together in the months of November, December, and January, in order to collect a species of moth which they call *Bugong*. The bodies of these

* "Non vestimentis modo, sed et aliis, Bombyces inservire usibus, certissimum. Pro cibo nonnullis fuisse Sachseus Gammarol. lib. 1, tradidit, et vivos eos virum quendam sanitatis ergo deglutuisse retulis Borellus, Hist. et Obser. Var. Medico-Phys. Cent. 3."

insects are large, and contain a quantity of oil, resembling in taste a sweet nut; they are sought after as a luscious and fattening food, and from various accounts, these bugong moths appear to be more prized by the Australian than any sort of food whatever.

HYMENOPTERA.

It is reported of the inhabitants of Cumana that, along with other insects, they were accustomed to eat bees. Knox asserts, in his history of Ceylon, that they are also eaten in that island; and from the description of the latter writer, the bees in question probably belonged to the genera *Xylocopa* or *Bombus*. Among the social insects we also find bees and ants, which at times have afforded food and sustenance to man; and the above writer tells us, "When the natives meet with any swarms of bees hanging on trees, they hold torches under them to make them drop, and so catch them and carry them home; they boil and eat them, esteeming them excellent food."—Vid. Knox's Ceylon, 1817.

Apis Mellifica.

Dr. Halley, in the "Miscellanea Curiosa," informs us, that the Moors esteem honey a wholesome breakfast, and he adds, "and the most delicious is that which is in the comb, with the young bees in it, before they come out of their cases, whilst they still look milk white, and resemble (being taken out) gentles such as fishers use; these I have often eat of, but they seemed insipid to my palate, and sometimes I found they gave me the heart-burn." The above author elsewhere speaks also of Moors eating the young bees as an usual custom.—Vid. Philosop. Trans. and Miscell. Curiosa, vol. iii. page 382.

Ants.

Pinto makes mention of a sect of people who were accustomed to eat ants of various kinds. Piso gives us the names of two species inhabiting South America, which are in great request there, and the latter authority is corroborated by the celebrated Humboldt. Mr. Consett, in his Travels in Sweden, asserts, that in that country, "ants are distilled along with rye, in order to give a flavour to the spirits in use among the people, and there can be little doubt that formic acid is likely to be found far less injurious than the vitriolic acid, with which the gin of this country is so copiously adulterated." Another authority is Caldcleugh,

who, in his travels, states, that at St. Paul's, in the Brazils, there is a species of large ant, which when fried, forms a food by no means contemptible in the eyes of the inhabitants. Richard Lander, in speaking of the food of the Yaribeans, mentions that they eat *black ants** just as they are able to fly. "They are stewed," he says, "and eaten with yams and *tuah*, and are consumed by all ranks with the most astonishing avidity."—Vid. Lander's Records of Clapperton's Last Voyage, page 205.

By Callaway it is stated, "Swarms of ants are abundant in Ceylon. The Sepoys attract them by burning a torch, which, scorching their wings, they drop to the ground. After picking them up and frying them with rice, the mess is divided and sent round to their friends as a delicacy."†

NEUROPTERA.

The present order affords us little additional matter, and is confined entirely to the genus *Termes*, commonly known under the name of the white ants. They yield, however, an ample supply of food to various nations.

1. *Termes fatale*.

Lichtenstein informs us, that the *Termes fatale* is a very favourite food of the Bosjesmans or Wood Hottentots; and he particularly mentions their eggs, which are in very great repute.

2. *The Indian White Ant*.

In the East Indies, according to Smeathman, the natives eat the white ants, raw as well as boiled. They take them in great quantities, mixing them with flour into a sort of paste, which they sell to the poor at a reasonable rate. The Mahrattahs are reported to be extremely partial to them. Forbes, in his *Oriental Memoirs*, supports the authority of Smeathman. "He states that the white ant is about the size of a small grain of rice, has a white body, appearing like a maggot, and a very strong red head armed with a powerful forceps. It has four short legs. They are an article of food among some of the low caste in Mysore, and the Carnatic.—Vid. vol. i. page 232. Buchanan informs us

* Lieutenant H. Sayers (lately returned from Africa) informs me, that amongst many other delicate viands particularly prized by the natives in the vicinity of Sierra Leone, black ants are sought for and eaten with avidity.

† Vid. Callaway's *Oriental Collections*, 1834, p. 61.

also, that one common article of food among the Chensu Carira of India, is the white ant, commonly called *Termes*.

3. *Smeathman's Ant.*

Smeathman also tells us, that several African tribes eat white ants, roasted, boiled, and raw ; and then adds his opinion, derived from personal observation, that the individuals living on them soon get into good condition, from feasting on this nutritious food.

4. *Termes arborum.*

Before concluding my remarks on the order *Neuroptera*, it may here be mentioned, that not only the insects themselves, but part of their domiciles, are sometimes taken, not as food, but as medicine. Koster informs us, that portions of the nest of the *Copim* (of a species named *Termes arborum*) is taken in the state of a solution in South America, in agueish disorders.—Vid. Koster's Travels, vol. ii. page 50. May we not here take a hint from the South American, and as we have not the *Termes*, why not try and ascertain if portions of the nests of our British ants are efficacious in checking the same complaint? It is worthy of remark, that the grand specific for ague is bark and sulphuric acid, in short, quinine. Whence, I ask, originated this specific? probably it originated in the very country which gives us the Peruvian bark. What then is quinine? it is a remedy attempted to be assimilated to that of *Copim*. The next question that arises is, what is *Copim*? as far as is known, it appears to be an extract of wood acted upon by termitic acid. What is quinine? nothing more than bark acted on by sulphuric acid, and made more efficacious by that acid. I throw out these remarks purposely to promote inquiry, and I take the present opportunity of stating, that *Copim* appears to me to contain the concentrated virtues of the tree on which the insects feed ; and I have little doubt, that insects may eventually afford us medicines more powerful than those of trees and plants, and certainly less deleterious than those derived from minerals.

DIPTERA.

In Pinto's Voyage there is a notice of a sect of people who used flies as an article of food. Scopoli, in his "Entomologia," mentions the larvæ of *Musca putris* as a dainty. The jumping maggots frequently met with in old cheese, turn to a fly denomi-

nated by Mr. Kirby *Tyrophagus caseus*. Cheese lovers are particularly partial to cheese attacked by them; and I have heard it asserted by such persons, that flies never attack a poor cheese.

Since this paper was read, I have received an anonymous note from some kind Entomologist, with a valuable reference, which I take the liberty of adding, and at the same time beg leave to thank the nameless individual for his communication.

In Arundel's discoveries in Asia Minor, there is a remarkable passage attesting the utility of the levée-en-masse, when called out to destroy locusts.

"In May 8th, 1827.—Left Baidier at seven o'clock, accompanied by all the great Turks, and armed from head to foot with muskets, pistols, and yatagans, in grand procession, to exterminate the locusts. I was awoke at a very early hour by the Turkish tambour, which was beating a summons for the entire population, Turk, Christian, and Jew, to rise en masse and sally out to destroy these destructive insects; arrived on the field of action about eight o'clock, the hedges were darkened by the masses of locusts, though not of more advanced growth than a large fly. Hundreds of people were to be seen, Turks, Jews, Greeks, and Armenians, grouped in all directions, brushing the locusts together in immense heaps with bushes, &c. at the beat of the tambour, and then with a thundering hurrah jumping upon the heaps and killing them. Other parties took a different mode by sweeping the masses into a small stream, where, like immense swarms of bees clustered together, they sank to the bottom."—Vid. vol. ii. p. 290, Discoveries in Asia Minor, by F. V. J. Arundel, British Chaplain at Smyrna.

In addition to the above passage referred to by my anonymous friend, I quote another remarkable passage from Thornton, wherein he states that locusts are dispersed by report of cannon and smoke of powder. "The locusts," he relates, "the curse to which countries are most exposed, where nature has been most prodigal of her gifts, sometimes infest and spread desolation over this delightful region (Moldavia). They even pass the lofty ridge of the Carpathian mountains and light upon Transylvania, where a provident government has called out its regiments to disperse and destroy them with the report of cannon and the smoke of gunpowder."—Vide Thornton's Turkey, vol. ii. p. 326.

INDEX OF SPECIES, WITH AUTHORITIES.

COLEOPTERA.

GENUS.	SPECIES.	COUNTRY.	AUTHORITIES.
SCARABÆUS	<i>Sacer</i> , Linn.	Egypt	Dr. Clarke Lane.
LEPIDIOTA, Kirby	<i>Hypoleuca</i> , Wied.	Java	Wiedemann, and Westermann.
ANOPLOGNATHUS, M. L.	<i>Viridiæneus</i>	New Holland	MacLeay, Cunningham.
ORYCTES	1. <i>Owariensis</i>	Cape Coast	Mr. Palin, Mr. Hope.
	2. <i>Boas</i> , Fab.	Sierra Leone.....	Lieut. Sayer.
	3. <i>Monoceros</i> , Oliv. ..	P. B. S.	Hope, and Palin.
LUCANUS, Lin.....	<i>Cervus</i>	Europe	Scopoli.
TENEBRIO, Lin.	(Sp. unknown)	Egypt	Dr. Clarke, Niebhur.
PRIONUS	<i>Coriarius</i>	Europe.....	Amoureux.
STENODONTES	{ 1. <i>Damicornis</i> }	Surinam	{ Lady Merian.
	{ or Macauco Grub }		{ Sir John Forey.
	2. <i>Montac</i> Grub.....	Mauritius.....	St. Pierre.
MACRODONTIA	<i>Cervicornis</i>	America	Linnaeus.
OMACANTHA.....	<i>Tribulus</i>	Africa	Smeathmann.
LAMIA	{ 1. <i>8-maculata</i> }	East Indies	{ Hope, Heyne.
	{ 2. <i>Rubus</i> , Fab. }		{ Hope, De Saram.
CALANDRA	1. <i>Chinensis</i> ?.....	India	Ælian.
	2. <i>Carian</i> Insect	Mysore, East In...	Heyne.
	{ 3. <i>Palmarum</i>	Mysore, East In. }	{ Linnaeus.
	{ or Grugu Grub.. }		{ Lady Merian.

ORTHOPTERA.

LOCUSTA	1. <i>Migratoria</i>	Crimea.....	Linnaeus, Dr. Clarke.
	2. <i>Tatarica</i>	Crimea.....	Dr. Clarke and others.
	3. <i>Muken</i>	Egypt and Arabia.	Niebhur, Herodotus.
	4. <i>Light Locust</i>	Arabia	Niebhur, Hasselquist.
	5. <i>Dubbe Locust</i>	Arabia	Niebhur, Salt.
	6. <i>Gregaria</i> , Forskal .	Arabia	Aristotle, Blaquiere, Belzoni.
			Grey, Jackson.
	7. <i>Cernensis</i> , Hope ..	Madagascar	Ives's Travels, p. 15.
	8. <i>Devastator</i> , Licht. S.	Afr., Bosjesmans	Lichtenstein.
	9. <i>Pupa</i> , Lin.	Africa	Adamson, Rosenmüller, Ludolphus.
	10. <i>Cristata</i> , Lin.	Arabia	Linnaeus, Shaw, Ives.
	11. <i>Mahrattarum</i> , Hope	{ Mahrattas, Ba- }	{ Major Moor, Forbes, Dampier.
		{ shees, Tonquinese }	
	12. <i>Viridissima</i>	Europe	Major Moor, Forbes, Dampier.
	13. <i>Persarum</i>	Persia, Acridophagi	Morier.
	14. <i>Locusta Onos</i> , Pallas	Monguls, Indians..	Pallas, Zool.
	15. <i>Acrydium</i>	Parthians	Diodorus Siculus, Pliny, Lobos.
			Abyssinia, page 86.
ACHETA	<i>Smeathmanni</i>	Africa	Smeathman, Drury.

HEMIPTERA.

TETTIGONIA	1. <i>Antiquorum</i>	Greece	Plutarch, Aristotle, Athenæus, Aristophanes, Ælian.
	2. <i>Parthorum</i>	Parthia.....	Pliny.
	3. <i>Septendecim</i>	American Indians.	Collinson.
	4. <i>Galang Pupa</i>	Australia	Bennett, Sir J. Mitchell, Lhojtsky.

LEPIDOPTERA.

GENUS.	SPECIES.	COUNTRY.	AUTHORITIES.
PAPILIONES.			
PAPILIO	1. Larvæ of	Hottentots	Sparman.
SPHINX	2. Larvæ of	Chinese	Sir G. Staunton.
COSSUS	3. <i>Ligniperda</i>	Romans	Ray and Linnæus, Sachsus, Schræder, Favand.
BOMBYX	4. <i>Mori</i>	China	Kirby and Spence.
NYCTEROBIUS	5. Sp. unknown	New Holland	MacLeay.
EUPLEA	6. <i>Hamata</i>	Australia	W. Sharpe MacLeay.
	Bugong Moth.....		
CATERPILLARS	7. Sp. unknown	Yariba	Lander.
	Larvæ of.....		

NEUROPTERA.

TERMES	1. <i>Fatale</i>	Caffraria	Lichtenstein.
	2. Sp. unknown	East Indies	Smeathman, Buchanan, Forbes' Oriental Memoirs.
	3. <i>Smeathmanni</i>	Africa	Smeathman.
	4. <i>Arborum</i>	South America....	Koster.

HYMENOPTERA.

APIS	1. Unknown	Cumana.	
BOMBUS ?	2. Unknown	Ceylon	Knox.
APIS ?	3. Unknown	Ceylon	Knox.
APIS	4. <i>Mellifica</i>	Western Barbary..	Dr. Halley.
FORMICA	1. Sp. unknown	South America....	Pinto.
	2. <i>Cupia</i>	South America....	Piso.
	3. <i>Tamajoura</i>	Brazil	Piso.
	4. Sp. unknown	South America....	Humboldt.
	5. Sp. unnamed	Sweden.....	Consett.
	6. Sp. unnamed	St. Paul, Brazil ..	Caldcleugh.
	7. Sp. unknown	Ceylon	Callaway.
	8. Black Ants.....	{ Yariba	Lander, Lieut. Sayers.
		{ Boschmans	Sir James Alexander.

DIPTERA.

MUSCA	1. Unknown	South America....	Pinto.
	2. Larvæ	Europe	Scopoli.
TYROPHAGUS	<i>Casei</i>	England	Kirby.

ARACHNIDA.

ARANEA ?	1. Sp. unknown	African Boshjes ..	Sparman.
	2. <i>Edulis</i>	New Caledonia ..	Labilliardiére, Rœsel.
	3. <i>Edulis</i>	European.....	Reaumur, Shaw, Leland, Spence.

APTERA.

SIRO	Cheese Mite	Kirby and others.
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*Nations described as Eating Locusts, &c., with the
Ancient Authorities attached to them.*

1. Parthians Vid. Pliny, 11, 29; Pliny, lib. 2, ch. 29, lib. 9, c. 29, 35; Plutarch (in Symp.)
2. Æthiopeans Vid. Pliny, 6, 30; Strabo, Leo Africanus, lib. 16, ch. 8.
3. Acridophagi Vid. Herodotus, Strabo, Agatharcides, 5, 272; Diodorus, Bibliot. 3, 11.
4. Syrians Teste Scaliger, contra Cardanum, 639.
5. Lybians Leone teste in descriptione Africæ, Artemidorus.
6. Greeks Aristophanes, Acham, act 4, scene 7; (Plutarch, in Symp.) Athenæus, lib. 4; Pliny, 11, 26; Ælian, Hist. 13—26.
7. Hebrews..... Moses, Levit. ch. 11, v. 21, 22, and the Talmudic Tract Cholin, ch. 3, fol. 65; Heros Nedarum, fol. 40, 42.
8. Persians..... Tavernier.
9. Chaldeans Tavernier, Itiner. Pl. fig. 67.
10. Nasiræans Saubeitus, Actis Erudit. 1694, p. 57.
11. Sinensis Gonsalvus Oviedus apud Vossium, l. c. cap. 78; Dapper, Descript. Africæ, page 396.
12. Arabians Leo Africanus, lib. 9; Agatharcides, lib. 5, c. 27.
13. Nasamones Eustathius in Dionysium.

Modern Authorities.

1. Fez Clenard in Epistolis, 1541.
2. Jews Origen; Chrysostom; Jacobus de Vitriaco; Hermolaus barbarus in Dioscoride, Beda, Kirstenius, in his Notes of St. Matthew, lib. 9; Euthymus in Matthæum, lib. 9.
3. Arabs..... Kirstenius, Hieronymus, Scaliger, Russell, Ædmon, Hasselquist, Forskal, Damir.
4. Lybians Dioscorides, 256; Porphyrius, Hieronymus in Jovin, lib. 2, chap. 6.
5. Barbary Solinus.
6. Æthiopians and Abyssinians.. } Alvarez, Itiner. Æthiop. lib. 1, p. 73; Ludolphus, Æthiopia, ch. 13, p. 67; Lobos' Voyage, p. 86.
7. Egyptians Russell's Aleppo, p. 26; Forskal.
8. Mussulmans Abdallah.
9. Turks..... Ludolphus, p. 6.
10. Chinese Niebhur's Descript. Reg. Sinar. p. 377. If other authorities are required I refer the reader to the Physica Sacra, of Scheuchzer, vol. 2, p. 111, for various other names unmentioned.
11. Madagascar Ysbrand in Relat. de Indiâ Orientali.



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